

# Farmers' Perception Towards Wheat Row Planting Practices by Smallholder Farming Households in Elfeta District, Oromia Regional State, Ethiopia

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**Abstract:** The purpose of this study was to analyze the perception of farmers towards wheat row planting practices by smallholder farmers in the study area. This study employed both quantitative and qualitative approaches to achieve the study's goals. Primary data were collected from 141 sample households which are selected at randomly. Additional information was also obtained from focus group discussion and key informant interview. The data has been analyzed by using descriptive statistics such as mean, percentage and standard deviation by using Statistical Package for Social Sciences (SPSS) software version 20. Qualitative data were used to validate the responses of questionnaire. The result of the study showed that, 63.6% of the respondents were cannot read and write from non-adopter and 47.8% completion of primary school from adopter farmers in the study area. The result of the study also indicated that 51.7% of both non-adopter and adopter farmers responded as strongly disagree on access to extension service given by DA in the study area. According to the result of the study 53.9% of both non-adopter and adopter farmers responded as strongly disagree on perception on access to credit service given by government in the study area. Additionally, both non-adopter and adopter of the farmers revealed that there was low technical training from government and development agency in the study area. Therefore, the study concludes that, Policies and strategies that focus on farmers' education, implementation of well-established extension package, linkages of farmers, researchers, development agent, and stakeholders are helpful so as to achieve wider adoption of row planting technology of smallholder farmer in the study area.

**Keywords:** Adoption, Elfeta District, Oromia, Perception, Row Planting, Wheat

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## 1. Introduction

Ethiopia's economy more than 85% has persisted heavily dependent upon agriculture followed by 5% industry, and 10% service. The sector is dominated by over 15 million smallholders producing about 95 percent of the national agricultural production [1]. The sector currently contributed 33% of the country's Gross Domestic Product (GDP), 82% of the total exports and 66% of employment [2-4]. Regardless of its contribution to the national GDP by large,

agriculture in Ethiopia is subsistence. Additionally, Smallholder farmers are mostly traditional oriented farming and produced low agricultural production and productivity only for the purpose of hand to mouth feeding system in Ethiopia [5]. As a result, agricultural production failures are common [6, 7].

In Ethiopian agriculture, Cereals are the dominant crop; contributed 87.48% of grain crops are devoted to cereal

production, 32% of agricultural GDP comes from cereal produce, livestock sector ejects about 20% and other areas contribute 8.6% [8, 1]. Furthermore, the majority of the agriculture sector is made up of smallholder farmers who live on less than 1.17 hectares of land [9].

Wheat is among the second most important food crop next to maize in Ethiopia with annual production of about 5 million tons cultivated on area of about 1.8 million ha in Ethiopia. And its production covers only 75% of the national demand and the remaining 25% of the wheat is obtained through imports [10-12]. It is among the major cereal crops that received considerable focus by the national agricultural research system because of the fact that wheat is among the most important crops [13, 14].

In Oromia region of Ethiopia, the total production of wheat in from the total national wheat land coverage is 50.8% and the total production is 56% [15]. Additionally, the study district area coverage of wheat under cultivation was 2,800 ha and the production was 50,400 quintals with a productivity of 18 quintal per hectare EDADO [16]. This indicates that still the country is under food imports, which requires high investment in agriculture sector to close the demand gaps.

The major challenges facing agriculture are low productivity, low improved seed used, and ambiguity on new agricultural technology and dependency on traditional farming system in Ethiopia [17]. Moreover, Low level of adoption of agricultural technology is among the major factors contributing to low productivity in the country [18] and the perceptions of farmers about new agricultural technology are very low [19]. As a result, low agricultural production and productivity are well-known in the country. In an effort to improve wheat productivity and production, the Minister of Agriculture had introduced a row planting of wheat crop in 2012 all over the regions [20]. In spite of these efforts, productivity gains are not as such adequate and introduced technologies are not widely accepted by farmers in different parts of the county as expected. The same thing is also true for the study area.

According to Misgana [21], conducting considerable scientific research works that can contribute to positive perception on wheat production and productivity is a critical issue to minimize wheat yield imports and cut down wheat national demand shortage. Moreover, Ethiopia will need to scale-up the adoption of row planting technology to ensure continued agricultural growth and to gain more perceptions in how the promotion of improved technologies can possibly increase productivity [22].

Agricultural extension activities have been concerned with the promotion, adoption and scaling up of wheat row planting practices; and adoption of the practice is seen as the factor for wheat yield enhancement [17]. From agronomic point of view row planting was accepted that spacing plants between rows and within the row have advantages and some in-row crowding helps to suppress the

excessive tillering of crops [23]. As a result, smallholder farmers in the country have adopted manual wheat row planting as one of their agronomic approaches. The traditional planting method, that is broadcasting seed by hand at high seed rates, reduce yield because uneven distribution of the seeds makes hand weeding and hoeing difficult, and plant competition with weeds lowers wheat growth and tillering [24, 20].

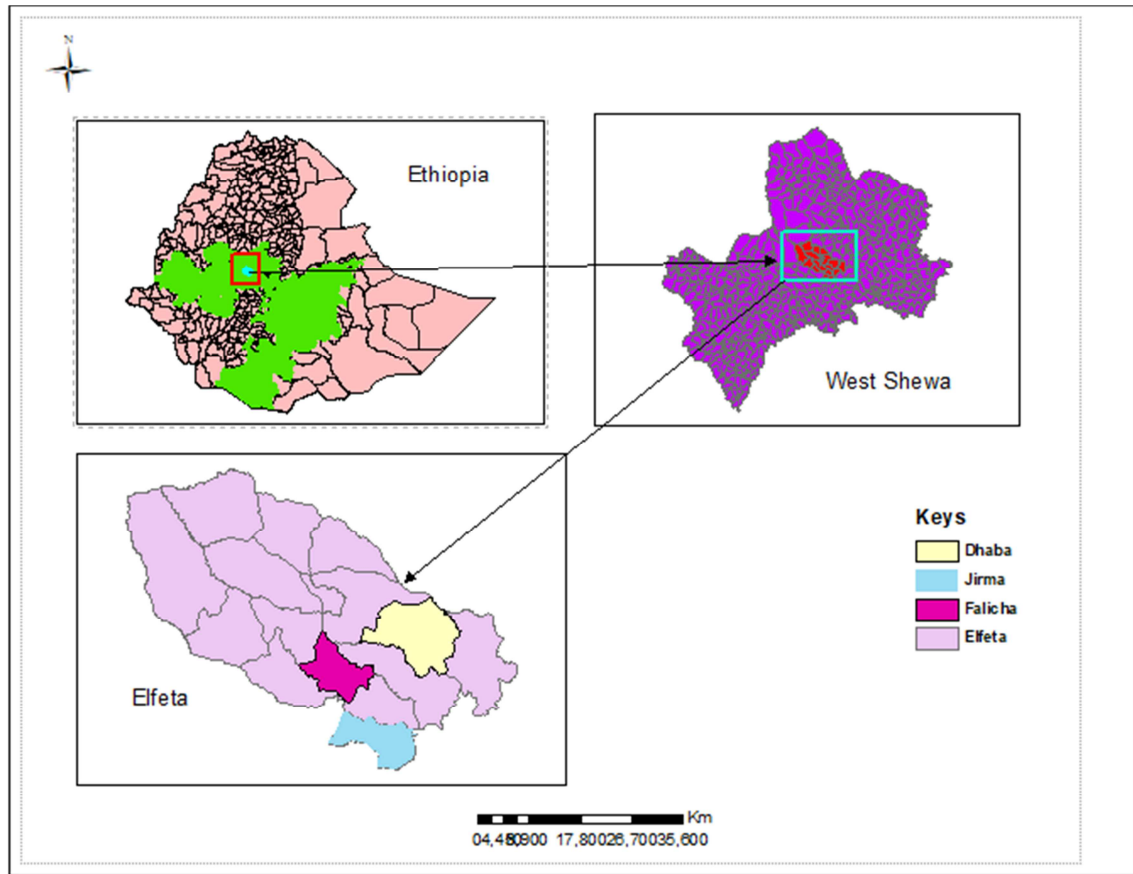
In the study area, the production and productivity of wheat is very low when compared to the potential yield of the study area and it was performed through cultivating the uncultivated area of land and work to increase the productivity of wheat on the specific area of land by increasing the utilization of the necessary inputs that helps to increase production like, improved way of farming, fertilizer, varieties and different cultural practices that enhance the overall production of the sector. This indicates that there are different factors directly or indirectly on perception of technologies that believed to bring change in smallholder farmers' productivity.

Generally the initiation of this study was focus on as the area has potentials for wheat production but row planting technology was rarely practiced in the area. Those farmers who are adopters of wheat row planting practices had got enough production from their farm gates. But, most of the farmers still they do not accept to practice row planting technology in the area. Thus, why they didn't accept and uses the wheat row planting technology in the study area. Therefore, this study, attempt to fill these gaps by providing further evidence on the perception of farmers towards wheat row planting practices of smallholder farmers.

## 2. Research Methodology

### 2.1. Description of the Study Area

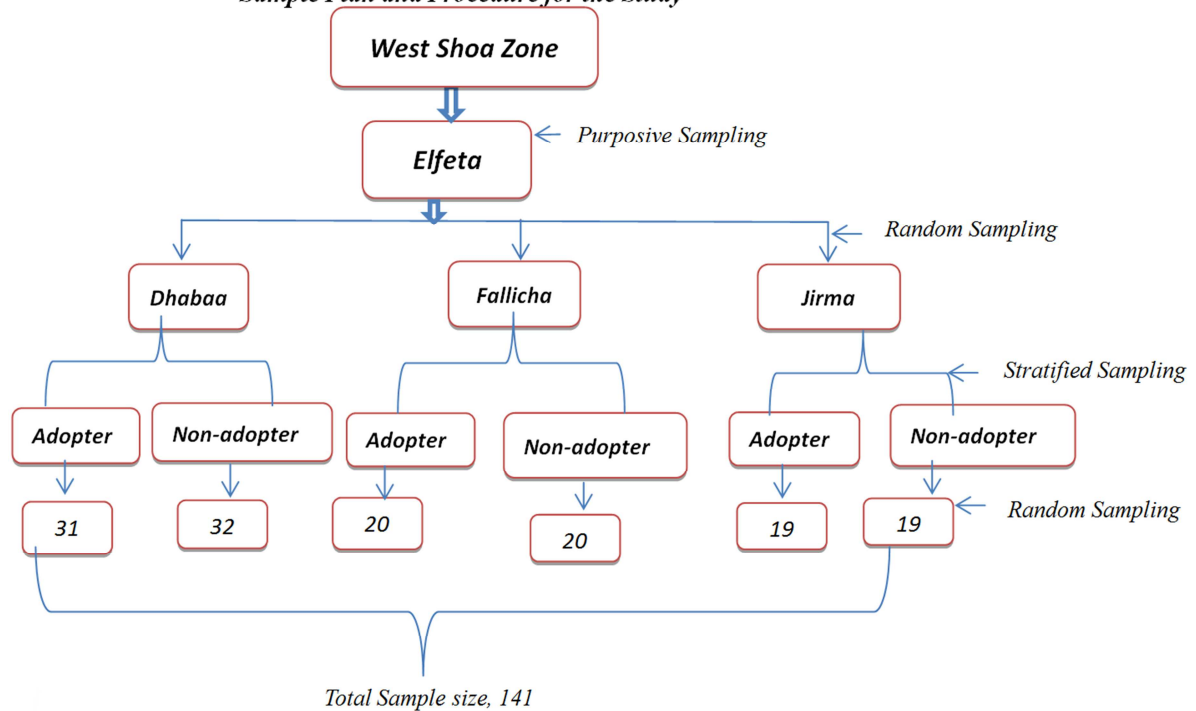
Elfeta district is one of the twenty two rural districts in West Shoa Zone and lies about 68 Km North of Ambo town. The district town, Bake is located to the North West of Addis Ababa having about 112km distance from the center. The district is bounded by Jeldu in the East, Dandi and Ambo in South, Ambo district in the West and Chobi in the Northern direction. In general, the altitude ranges from 1900 to 3100 meters above sea level [25, 26]. Elfeta District has total land area of 39,342 hectares out of which 66% hectares used for farming, 19.57% are used for grazing, 9.3% hectares are covered by forest, 2.5% are covered by river and water bodies and 2.78% hectares are unusable land [27]. Elfeta district has 15 rural and 2 Kebele administrations. The district has the population of 87,965 out of which 43,297 are male and 43,734 are female [28]. The total number of households is 8,704 of which 8,067 male and 637 female headed [29]. The economic activity of the district is mostly agriculture plus very small percent of trade and others.



Source: Ethiopian Mapping Agency, 2020

Figure 1. Map of the study area (Elfeta district).

#### Sample Plan and Procedure for the Study



Source: Developed by researcher, 2019

Figure 2. Sampling techniques.

## 2.2. Research Design

A descriptive survey design and mixed research approach were adopted, because it involves both quantitative and qualitative research approaches.

The study adopted purposive sampling, simple random sampling methods and stratified sampling methods to select respondents. First, the district was selected purposively because of wheat production potential and the existing low adoption of wheat row planting technology. Secondly, wheat producing kebeles were identified. Out of 15 kebeles in the district, 12 kebeles were dominant wheat producers, while 3 of the kebeles were selected purposively because of high wheat production potential and the low technology adoption. To select sample respondents from the three Kebeles Administrations, first the household heads in the three Kebeles Administrations were identified and stratified in to two strata which is adopter and non-adopter categories. Then the sample respondents from each stratum were selected by using Random sampling technique.

Since a number of household heads in the three Kebeles Administrations is not proportional, probability proportional to sample size were used to determine the number of respondents from each stratum. Then, Random sampling technique was used to draw 141 respondents from each stratum. The total samples of 70 household

heads were adopter and the remaining 71 household heads were non-adopter. The sample size for collecting data through household survey was determined by using the sample size determination formula developed by Yemane [30].

The formula is

$$n = \frac{N}{1 + N(e)^2} = \frac{1445}{1 + 1445(0.08)^2} = 141$$

Where n was the sample size for the study, N was the population of interest which was 1445; e was the precision level which is 0.08 in this study. The sample sizes from each kebeles were determined based on their proportion to total share of households residing in each kebeles.

In addition to 141 sampled households, sample respondents such as key informants farmers, Development agents and Agricultural Extension services were selected purposively from each kebeles. One (1) Key informants farmers was selected from each 'kebeles' with a total of Three (3). From Three sample 'kebeles' one (1) Agricultural Extension expertise from Agricultural office, Three (3) Development agents from individual in the study sites and totally Seven (7) key informants were selected. A total of three (3) Focus Group Discussions were conducted and there was one (1) FGD for each kebeles.

**Table 1.** Total Sample respondents on Adoption of wheat row planting in Elfeta district.

S/ No	Actors	Sample selected	Participants
1	Sample respondents farm households	141	Adopter and Non- adopter
2	key informants,		More knowledgeable from different Position
2.1.	Development agents	3	For each kebeles
2.2.	Agricultural Extension expertise	1	From Agricultural office
2.3.	Model farmers	3	For each kebeles
3	Focus Group Discussions	Three group (3) (24person)	Model farmers, Adopter and non-adopter
Total		141 respondents, 7 key informants + 3 FDG	

Source; Developed by researcher. (2020).

## 2.3. Method of Data Collection and Processing

Both primary and secondary data sources were used for the study. Primary data was collected from sample respondents, development agents, and agricultural experts. The majority of primary data were collected from respondents through scheduled interviews. In addition, focused group discussion (FGD) and Key informant interview were used for data collection. Secondary data were also collected from office reports, journal and proceedings. Secondary sources of data that support primary data was used for this study purpose; published and unpublished documents like official reports, articles and journals. Both quantitative and qualitative data types were used to address the objectives of the study.

In order to accomplish the specified objective primary and secondary source of data were developed in this research. For this study primary data were collected on one-to-one interview using both scheduled and semi structured interview schedule. This focused on collecting the data of socio-

economic and demographic characteristics of the respondents from the selected households by using semi structured interview schedule and focus group discussions (FGDs) in response to the research objective. The secondary data sources were collected from published materials, such as books, journals; scientific research works books, unpublished documents from district agricultural offices and other related sources to supplement primary data.

Data entries were started after the actual data collection and manual editing was completed. Data was entered into the computer using the SPSS software Version 20. Once the process of data entry accomplished, cleaning of the data were started. Data cleaning and editing focuses on checking whether the assigned value for each case is legitimate, on the logical consistency and structure of cases. Descriptive statistics such as mean, percentage, standard deviations and frequency were used to analyze the perception of farmers towards wheat row planting technology and different socio-economic characteristics of the sample respondents quantitatively in the study area.

### 3. Results and Discussion

#### 3.1. Demographic Characteristics of the Respondents

Sex of the household head can have an effect on the activities of agricultural production. Social influences, experiences, flexibility in adopting new technologies, decision making in farm operations, and participation in social organizations may be associated with sex of households. Survey results shown that out of the sampled respondents 49.6% (n=62) and 50.4% (n=63), and 56.3% (n=9) and 43.7% (n=7) are male and female from non-adopter and adopters respectively. The statistical summary provided in (Table 2) indicated that the proportion of male-headed households were quite higher than that of female-headed households in the study area.

**Table 2.** Sex of the respondents in the study area.

	Adoption category		Total
	Non-Adopter	Adopter	
Female	9 (56.3%)	7 (43.7%)	16 (100.0%)
Male	62 (49.6%)	63 (50.4%)	125 (100.0%)
Total	71 (50.4%)	70 (49.6%)	141 (100.0%)

Source: Field Survey, 2020

The study depicted that majority of female household were found in non-adopter farmers which indicates that they are less capable due to resource and less potential for production in adopting their agriculture specifically wheat row planting as compared to male household counterparts. This implies that majority of rural female household heads are poor and they only work for self-sufficiency. The interviewed female sample respondents pointed out that they were involved in agricultural activities for only family consumption and they had no off farm and non-farm income activities.

Descriptive statistical analysis revealed that there was association between sexes of household head among adopter category. It implies that more male household headed participated in wheat row planting and owing to their access to information and economic status. It was in agreement with FGD that male household heads have more experience to agricultural activities, especially plough and have more information about crop production related issues.

**Table 4.** Education attainment of the respondents Education attainment of Household \* Adoption category Cross tabulation.

		Adoption category		Total
		Non-Adopter	Adopter	
Education attainment of Household	Cannot read and write	26 (63.6%)	20 (36.4%)	46 (100.0%)
	Read and write	18 (50.0%)	18 (50.0%)	36 (100.0%)
	Primary school	24 (52.2%)	22 (47.8%)	46 (100.0%)
	Secondary school	3 (30.0%)	7 (70.0%)	10 (100.0%)
	College/University	0 (0.0%)	3 (100.0%)	3 (100.0%)
Total		71 (50.4%)	70 (49.6%)	141 (100.0%)

Source: Field Survey, 2020

As showed from (Table 4), 63.6% (n=26) and 36.4% (n=20) of the respondents cannot read and write from non-adopter and adopter respectively. The result also revealed that, 47.8% (n=22) of the respondents complete of primary school from adopter categories in the study area. This indicated that

**Table 3.** Age of household head of the respondents.

	Frequency	Percentage (%)
15-25	2	1.4
26-35	11	7.8
36-45	13	9.2
46-55	31	22.0
56-65	51	36.2
above 66	33	23.4
Total	141	100.0

Source: Field Survey, 2020

Age of household heads is essential variables in farm operations. These variables can influence access to improved agricultural technologies and recommended agronomic and farming practices. It is usually assumed that older people may have higher accumulated capital, more contacts and access to extension services and higher labor force. These characteristics may make older people more prepared, adopt and use improved farm inputs and farm practices. However, in some cases, younger farmers are more active, better educated, have more access to information and can adopt improved farm technologies.

The effect of age may be positive or negative on adoption of technologies. Consequently, an age of household can determine the agricultural production specifically wheat row planting technology adoption in study area.

According to the data from Table 3 older people are in the productive age group i.e. an age that is believed to make people dynamic and flexible in input adoption; to exert their overall potential on agricultural and non-agricultural activities so as to increase their income. In fact, middle aged farmers may participate in different off-farm activities that could reduce the time available for farm practices. Likewise, beyond lack of experience, younger farmers are improbable to be stable and motivated to do their farm activities. They prefer searching of some lucrative off-farm activities. Contrary to these, old age farmers have an accumulated farm experience like plot preparation, clearly identifying what and when to sow crops. Besides, they are too stable and mostly could not think some other off-farm, non-farm activities and migration.

farmers categorized as non-adopter have no more education in the study area. This might be the variable that influences adoption of wheat row planting technology in the study area.

The result from cross tabulation indicated that there is statistically significant among farmers adoption category by

years of schooling of household head. It implies that more educated farmers tend to adopt their farming technology. The implication is that as the household head increases his year of education, his/her participation in technology use increases wheat row planting technology.

### 3.2. Perceptions of Farmers Towards Wheat Row Planting Practices

People have different attitude and willingness to carry out a certain task depending on their historical background, need for change; and social, economic and political environments.

**Table 5.** Perception towards wheat row planting technology attributes.

		Adoption category		Total
		Non-Adopter	Adopter	
Perception towards wheat row planting technology attributes in the study area	Low	27 (73%)	10 (27%)	37 (100.0%)
	Medium	26 (53.1%)	23 (46.9%)	49 (100.0%)
	High	18 (32.7%)	37 (67.3%)	55 (100.0%)
Total		71 (50.4%)	70 (49.6%)	141 (100.0%)

Source: Field Survey, 2020

As a result of the study indicated that three type of question were asked for both non-adopter and adopter farmers to crack their perception towards wheat row planting technology attributes in the study area. As indicated in Table 5 above 73% (n=27) of non-adopter farmer were replied for perception towards wheat row planting technology attributes as low in the study area. This indicates that those non-adopter farmers have low positive perception on wheat row planting technology attributes in the study area. This may be because lack of enough training and follow up for non-adopter farmers regarding to row planting technology.

#### 3.2.1. Farmers Perception on the Success of Wheat Row Planting Technology

The study revealed that farmers have different perception depend on their assumption and their level of knowledge on the success of row planting technology on wheat production

in the study area. According to the data from Table 6, five options were given to the farmers to catch their perception on row planting technology on wheat production in the study area. From those 42.9% (n=30) responded by non-adopter farmers as very bad on the Farmers perceive the success of row planting technology on wheat production in the study area. But 52.9% (n=37) responded by adopter farmers on perceive the success of row planting technology on wheat production as good in the study area. This indicates that some changes are there on perception of adopter farmers than non-adopters perception on row planting technology on wheat production in the study area.

These shows that still there were some gaps between non-adopter and adopter farmers of knowledge on perception on row planting technology on wheat production in the study area.

**Table 6.** Farmers perceive the success of row planting technology on wheat production.

Adoption category	Farmers perceive the success of row planting technology on wheat production in the study area					Total
	Very bad	No change	Medium	Good	Very good	
Non-Adopter	30 (42.3%)	26 (36.6%)	9 (12.7%)	2 (2.8%)	4 (5.6%)	71 (100.0%)
Adopter	4 (5.7%)	2 (2.9%)	14 (20.0%)	37 (52.9%)	13 (18.6%)	70 (100.0%)
Total	34 (24.1%)	28 (19.9%)	23 (16.3%)	39 (27.7%)	17 (12.1%)	141 (100.0%)

Source: Field Survey, 2020

#### 3.2.2. Perception of Farmers on the Capacity of Seed Germination and Output Quality

Seed systems are composed of set of dynamic interaction between seed supply and demand, resulting in farm level

utilization of seed and thus plant genetic resource. The seed system is essentially the economic and social mechanism by which farmers' demand for seed and various traits they provide met by various possible sources of supply (FAO, 2004).

**Table 7.** Perception of farmers on the capacity of seed germination and output quality.

Adoption category	Perception of farmers on the capacity of seed germination and output quality in the study area.					Total
	Very low	low	Medium	high	Very high	
Non-Adopter	31 (43.7%)	12 (16.9%)	24 (33.8%)	2 (2.8%)	2 (2.8%)	71 (100.0%)
Adopter	1 (1.4%)	2 (2.9%)	9 (12.9%)	27 (38.6%)	31 (44.3%)	70 (100.0%)
Total	32 (22.7%)	14 (9.9%)	33 (23.4%)	29 (9.20%)	33 (23.4%)	141 (100.0%)

Source: Field Survey, 2020

The result of the study indicated that about 43.7% (n=31) responded by non-adopter farmers on perception on the

capacity of seed germination and output quality as very low in the study area. Accordingly, the result of the study showed that about 44.3% (n=31) responded by adopter farmers on perception on the capacity of seed germination and output quality as very high in the study area (Table 7). As a result, the non-adopter farmers did not aware and perceive on the capacity of seed germination and output quality as expected in the study area.

### 3.2.3. Perception of Farmers Confident About Wheat Row Planting Practices

From the study revealed that different farmers have their

own different level of perception and confident on the wheat row planting practices in the study area. The study showed that five likert scale question were asked both adopter and non-adopter farmers for the purpose of this study.

Depend on this 27.7% (n=39) of both non-adopter and adopter farmers responded as strongly disagree on confident about wheat row planting practices in the study area. The result showed that, the majority of Farmers haven't full confidence on perception to produce wheat by row planting system and also the farmers have ambiguity about wheat row planting practices in the study area.

**Table 8.** Farmers confident about wheat row planting practices in the study area.

Adoption category		In the last year farmers often have confident about wheat row planting practices in the study area					Total	Mean	Sta. Dev.
		SD	D	N	A	SA			
Non-Adopter	Frequ	32	23	9	3	4	71	4.06	1.11
	%	45.1%	32.4%	12.7%	4.2%	5.6%	100.0%		
Adopter	Frequ	2	4	2	27	35	70	1.83	0.92
	%	2.9%	5.7%	2.9%	38.6%	50.0%	100.0%		
Total	Frequ	39	30	11	27	34	141	2.94	1.015
	%	27.7%	21.3%	7.8%	19.1%	24.1%	100.0%		

Source: Field Survey, 2020

SD=strongly disagree, D=Disagree, N=Neutral, A=Agree, SA=strongly agree

### 3.2.4. Satisfaction on Access to Extension Service Given by DA

The data result of Table 9 showed that different farmers have their own different level of perception on satisfaction on access to extension service given by Development Agent (DA) in the study area. The study showed that five likert scale question were asked both adopter and non-adopter farmers for the purpose of this study on perception of farmers on satisfaction on access to extension service given by DA in the study area. The result of the study indicated that 51.7% (n=73) of both non-adopter and adopter farmers

responded as strongly disagree on perception on satisfaction on access to extension service given by DA in the study area. This finding indicated that few farmers who got extension service have satisfied and practiced wheat row planting technology. But the majority of non-adopter and adopter farmers were not satisfied to extension service given by DA in the study area. This may be because most of the DA was willingly advice, encourages, support, and give training for selective model farmers (adopters) and they did not provide additional assistance especially for non-adopter farmers.

**Table 9.** There were satisfactions on access to extension service given by DA.

Adoption category		There were satisfaction on access to extension service given by DA					Total	Mean	Sta. Dev.
		SD	D	N	A	SA			
Non-Adopter	Frequ	46	18	4	3	0	71	4.43	0.81
	%	64.8%	25.4%	5.6%	4.2%	0.0%	100.0%		
Adopter	Frequ	27	19	18	3	3	70	2.09	1.06
	%	38.6%	27.1%	25.7%	4.3%	4.3%	100.0%		
Total	Frequ	73	37	22	6	3	141	3.36	1.47
	%	51.7%	26.2%	15.6%	4.4%	2.1%	100.0%		

SD=strongly disagree, D=Disagree, N=Neutral, A=Agree, SA=strongly agree

Source: Field Survey, 2020

### 3.2.5. Perception Towards Credit Service Given by Government

The result of the study indicated that out of 141 respondents, 53.9% (n=76) of both non-adopter and adopter farmers responded as strongly disagree on perception on access to credit service given by government in the study

area. This revealed that majority of the respondents were not used and benefited from credit in the study area. This may possibly because of low accessibility of credit service supply institution, high interest rate and fewer farmers' awareness towards credit use in the study area.

**Table 10.** *There was access to credit service given by government.*

Adoption category		There was access to credit service given by government					Total	Mean	Sta. Dev.
		SD	D	N	A	SA			
Non-Adopter	Frequ	46	19	5	1	0	71	4.58	0.65
	%	64.8%	26.8%	7.0%	1.4%	0.0%	100.0%		
Adopter	Frequ	30	10	10	13	7	70	3.09	1.37
	%	42.9%	14.3%	14.3%	18.6%	10.0%	100.0%		
Total	Frequ	76	29	15	14	7	141	4.08	1.22
	%	53.9%	20.6%	10.6%	9.9%	5.0%	100.0%		

SD=strongly disagree, D=Disagree, N=Neutral, A=Agree, SA=strongly agree  
Source: Field Survey, 2020

### 3.2.6. Perception Towards Access to Necessary Input

The study showed that five likert scale question were asked both adopter and non-adopter farmers for the purpose of this study on perception of farmers on access to necessary input in the study area. The result of the study indicated that 71.8% (n=51) of non-adopter farmers responded as strongly disagree

on perception on access to necessary input in the study and 32.9% (n=23) adopter farmers responded neutral on they have on perception on access to necessary input in the study area. This finding revealed that both non-adopter and adopter farmers have no accessibility of necessary input which is needed for wheat row planting in the district (Table 11).

**Table 11.** *There was access to necessary input.*

Adoption category		There was access to necessary input					Total	Mean	Sta. Dev.
		SD	D	N	A	SA			
Non-Adopter	Frequ	70	12	7	0	1	71	4.59	0.74
	%	71.4%	16.9%	9.9%	0.0%	1.4%	100.0%		
Adopter	Frequ	18	10	23	12	7	70	2.95	1.34
	%	25.7%	14.3%	32.9%	17.1%	10.0%	100.0%		
Total	Frequ	69	22	30	12	8	141	3.96	1.24
	%	48.9%	15.6%	21.3%	8.5%	5.7%	100.0%		

SD=strongly disagree, D=Disagree, N=Neutral, A=Agree, SA=strongly agree  
Source: Field Survey, 2020

### 3.2.7. Perception on Access Technical Training from Government and Development Agency

The result of the study showed that different farmers have their own different level of perception on there was access technical training from go and development agency in the study area. The study showed that five likert scale question were asked both adopter and non-adopter farmers for the purpose of this study on perception of farmers on there was access technical training from government and development agency in the study area.

The result of the study indicated that 47.9% (n=34) of non-adopter farmers responded as strongly disagree on perception on there was access technical training from government and development agency in the study area. On the other hand, 28.6% (n=20) of adopter farmers responded neutral on they have on perception on there was access technical training from go and development agency in the study area. This finding clearly revealed that there was little access technical training from government and other agricultural development agency specifically on row plating technology in the district.

**Table 12.** *There was access technical training from Go and development agency.*

Adoption category		There was access technical training from Go and development agency					Total	Mean	Sta. Dev.
		SD	D	N	A	SA			
Non-Adopter	Frequ	34	31	5	1	0	71	4.38	.75
	%	47.9%	43.7%	7.0%	1.4%	0.0%	100.0%		
Adopter	Frequ	8	13	20	18	11	70	2.46	1.2
	%	11.4%	18.6%	28.6%	25.7%	15.7%	100.0%		
Total	Frequ	42	44	25	19	11	141	3.61	1.25
	%	29.8%	31.2%	17.7%	13.5%	7.8%	100.0%		

SD=strongly disagree, D=Disagree, N=Neutral, A=Agree, SA=strongly agree  
Source: Field Survey, 2020

### 3.2.8. Perception on Technical Training on Production with Different with Row Plant and Broadcasting Methods

The data result depicted that different farmers have their

own different level of perception on their there were technical training on production with different with row plant and broadcasting methods in the study area. The result of the study indicated that 49.3% (n=35) of non-adopter farmers responded



as strongly disagree on perception on there were technical training on production with different with row plant and broadcasting methods in the study area. On the other hand 37.1% (n=26) of adopter farmers responded highly strongly agrees on they have on perception on there were technical training on production with different with row plant and broadcasting

methods in the study area. This finding indicated that, the majority of non-adopter farmers couldn't participated on technical training on production differences with row planting and broadcasting (the traditional way of planting) methods because they resist new agricultural technology specifically the wheat row planting practice in the district.

**Table 13.** *There were technical training on production with different with row plant and broadcasting methods.*

Adoption category		There were technical training on production with different with row plant and broadcasting methods					Total	Mean	Sta. Dev.
		SD	D	N	A	SA			
Non-Adopter	Frequ	35	26	8	2	0	71	4.26	0.85
	%	49.3%	36.6%	11.3%	2.8%	0.0%	100.0%		
Adopter	Frequ	3	5	20	16	26	70	1.79	1.12
	%	4.3%	7.1%	28.6%	22.9%	37.1%	100.0%		
Total	Frequ	38	31	28	18	26	141	3.26	1.45
	%	27.0%	22.0%	19.9%	12.8%	18.8%	100.0%		

SD=strongly disagree, D=Disagree, N=Neutral, A=Agree, SA=strongly agree  
Source: Field Survey, 2020

### 3.2.9. Summary of Focus Group Discussion and Key Informant Interview

Concerning the perception of farmers towards wheat row planting practice, members of focus group responded that those farmers who knows the advantages of row planting have prefer to apply it and farmers those who don't knows the advantages of row planting prefer to apply the broadcasting method of planting. The others may perceive as if it may not grow what my chance is when I apply the row planting system. Most of them raised the problem related issues as they perceive on row planting system.

Farmers who understood the importance of wheat row planting technology adopt and want to practice row planting, and farmers who did not know the benefit of row planting was practiced broadcasting method of farming. Other farmers perceived that row planting technology take time and need more fertilizers so, they prefer to practice the old one which is broadcasting method due to they thought and fear that row planting system may not successful in their environment.

Focus group discussion from both non-adopter and adopter replied that currently the perception of farmers on satisfaction on access to extension service given by DA is that there is a gap on the quality of training given for DA from different governmental colleges. For instance, before 8 years ago government had been provided the training on general agriculture like Animal science, plant science, Natural resource management and so on. During that time the trainee (DA) were competent enough so that they were providing professional support for the farmers. On the other hand, the current training curriculum changed to provide training on the sub-topic which leads to lack the DA's about the general knowledge to help farmers on their problems. For instance, as of the current curriculum, the training given under plant science separately includes Field crop, Industrial crop, crop protection and so on enabling the DA's to provide only specific knowledge unlike the previous DA's providing general knowledge to change a number of farmer'

perceptions. Therefore, the implication behind is there may be a huge lack in DA's competency which needs a possible solutions. On the other hand, there is no appropriate advisory service by DA. They come to kebele administration only at salary time to take a letter for payment otherwise they continuously live in the town. Although, the government expect them as they are the nearest to the community for providing service, it is not practical and they take free salary by the name of community.

On the other hand, key informant interview responded that Farmers who understand the advantage of wheat row planting technology wanted to adopt and practice on their farm gates but majority of the farmers still practicing broadcasting system of planting since they think that row planting take time, need more labor force and more fertilizers.

The response of the key informants implies that" The farmers are in debate about row planting technology as a result that the government and the community surrounding are not in a common agreement on the emerging technology. The farmers know the advantages of row planting technology but they employ broadcasting method on its season prior to contact with government body consulting the row planting technology. In relation with this although government collect the needs of the farmers on time, mostly there is delay of supply provision based on the farmers' needs collected earlier or they provide the supply after the season when farmers are not in need about the supply. That is why this row planting technology is not practiced and internalized highly by the farmers. We hope that there is no a problem regarding the knowledge and attitude of the farmers about the technology, but what the problem is on practical implementation even though we are consulting them to practice it. On the other hand, they replied that Farmers who understand the advantage of wheat row planting technology wanted to adopt and practiced on their farm gates but majority of the farmers still practiced broadcasting system of planting since they think that row planting take time, need more labor force and more fertilizers.

District agricultural expert said that, we were delivered training to the farmers on wheat row planting through Development agents based on the row planting situation and its importance. Training were provided especially on preparation stages, Implementing stage and finalizing stage we give technical assistance and continuous monitoring for the farmers when they started during sowing activities. However, there were differences on the involvement of training and acceptance of row planting technology between and within the farmers. As said non-adopter farmers always resist the new technology and also they need the productivity differences between rows planted and broadcasted wheat from their environment adopter farmers whereas adopter farmers easily accept the row planting technology and implement on their farm gates since they got good productivity.



*Figure 3. Picture of Adopter farmer.*

W/ro Wasane Fetena is 40 years old adopter farmers live in Daba kebele. She had the mother of 6 children. She said that, before 5 years I was non-adopter farmers who sowing wheat by traditional way of planting. During strategy of scaling up training delivered by Ministry of Agriculture in 2004 E.C and the training was received to kebele farmers, she was conducted training on row planting and raised doubt questions about the technology. Before 4 years, she saw row planting wheat on the field of adopter farmers and then she decided to start row planting on a plot of land as trial. In the year of 2009, I practiced wheat row planting technology on 2 hectares of land. During 2009/10 production year she was harvested good yield from her farm gate. Currently, she is a role model farmer in Daba kebele leading her family with happier.



*Figure 4. Picture of non-adopter farmer.*

Obbo Getu Feyisa is 48 years old non-adopter farmer who live in Jirma kebele. He is the father of 8 children. He always

resist new agricultural technology and follows traditional way of planting. He doesn't accept the advantage of wheat row planting technology. Also, he perceived that row planting technology take time and need more fertilizers so, he prefer to practice the old once which is broadcasting method of planting due to he thought and fear that row planting system may not successful in their environment. He said that row planting system was not culturally acceptable and not passed from the previous generation. He also said that in local language "Buddeen muraa fi Midhaan gumaan jibba". This means related row planting with division of one enjera in to four parts for four people in order to save enjera which is the source of dissatisfaction for user. These views indicated that broadcasting system is more productive, satisfactory and attractive than row planting system for non-technology adopters. He believed that row planting made poverty due to planted one by one and fear new technology.

## 4. Conclusions and Recommendations

### 4.1. Conclusions

Concerning the education of household result showed that, 63.6% and 36.4% of the respondents cannot read and write from non-adopter and adopter respectively. The result also revealed that, 47.8% of the respondents complete of primary school from adopter categories in the study area. This indicated that education attainment and farmers' wheat row planting in their farm clearly revealed the importance of education in understanding agricultural production as the limiting issue of their productivity and overall farming society's livelihood. This revealed as the use of education increases his/her year of education, his/her participation in in technology use increases adoption of wheat row planting technology so that education is the base of knowledge to cope with every challenges facing once own life and increases the awareness of farmers about adoption of new agricultural technologies.

The finding of the study revealed that different farmers have their own different level of perception and confidence on the wheat row planting practices in the study area. Depend on this 27.7% of both non-adopter and adopter farmers responded strongly disagrees on confident about wheat row planting practices in the study area. The result showed that, the majority of Farmers haven't full confidence on wheat row planting system and also the farmers have ambiguity about wheat row planting technology in the study area.

The findings of the study indicated that 51.7% of both non-adopter and adopter farmers responded as strongly disagree on access to extension service given by DA in the study area. This finding indicated that few farmers who got extension service have satisfied and practiced wheat row planting technology. But the majority of non-adopter and adopter farmers were not satisfied to extension service given by DA in the study area. This may be because most DAs were willing to advice, encourages, support, and give training for selective model farmers (adopters) only and they did not

provide additional assistance especially for non-adopter farmers. The result of Focus group discussion implies that currently there is no more satisfaction of access to extension service given by DA is that there is a gap on the quality of training given for DA for both adopter and non-adopter farmers. This is as a result of that there is a gap on the quality of training given for DA from different governmental colleges.

The result of the study indicated that out of 141 respondents, the majority (53.9%) of both non-adopter and adopter farmers were strongly disagree on the access to credit service given by government in the study area. This revealed that majority of the respondents were not used and benefited from credit in the study area. This may possibly because of low accessibility of credit service supply institution, high interest rate and fewer farmers' awareness towards credit use in the study area.

The result of the study indicated that 47.9% of non-adopter farmers responded as they strongly disagree on the issues that there was access technical training from government and development agency in the study area. On the other hand, 28.6% of adopter farmers responded that they are neutral on there was access technical training from go and development agency in the study area. This finding clearly revealed that there was little access to technical training from government and other agricultural development agency specifically on row planting technology in the district.

#### 4.2. Recommendations

Based on the result of the study, the following recommendation is forwarded.

Therefore, the author recommended that developing educational training program for smallholder farmers have to strengthened level of household is and considered in order to increase adoption of wheat row planting by involving different stakeholders including the district agricultural offices, education office and NGOs need to strengthen adult education programs to change farmers' attitude and orientation towards new technologies as well as the policy makers and development planner should support smallholder farmers in designing technological interventions to increase their participation in new technology adoption and their positive perception towards new technologies.

### Conflict of Interests

The authors declare that they have no competing interests.

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