Innovations

Do Farmers Need Government Intervention in Agriculture? Implications for Rural poverty reduction in the Sidama Region of Ethiopia

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Abstract

The primary rationale for government intervention in the agricultural market is incomplete market structures. And examined farmers' preferences about government intervention in agriculture in the Sidama region of Ethiopia in 2022.This study employed both qualitative and quantitative methods. A multi-stage sampling technique was employed to select 400 sample size. Additionally, the logit regression model substantiated whether farmers need government intervention in agriculture. Results show that Ethiopia's farmers prefer government intervention in agriculture to stabilize the price and input supply and provide information and credit. Relatively older and female farmers need government intervention more than their counterparts. In contrast, relatively more educated farmers and farmers with more income do not prefer government intervention. Pricing decision plays a significant role in marketing decision. Farmers deal with buyers to sell their products in the local area or may provide products to the market by loading them on their shoulders. This system reduces the bargaining power of farmers during the price determination. Hence, farmers need government intervention to provide information about markets and to set fair and guaranteed prices for agricultural products. Farmers suffer from adverse price movements in Ethiopia and need a contractual agreement with buyers and the government to succeed. There is a need for institutional interference to enhance access to the market and infrastructure. Hence, the government should formulate policies to set a fair and guaranteed price that transfers income from consumers to farmers.

Keywords: *Agriculture, Farmers, Government intervention, Logit model*

1. Introduction

Significant price swings in food commodities occur throughout the harvest season as a result of seasonality in the production of crops. Both producers and consumers would benefit from price stabilization because low prices during the harvesting season and high prices during the lean season adversely affect both parties, respectively (Weliwita & Epaarachchi, 2003). Therefore, governments regulate different economic sectors in all countries to foster economic growth and create a suitable environment for living. Economists have raised different opinions on government interventions in the economic system. Some economists favoured government interventions in economic activities, while

some were against the hands of government in economic issues. Government involvement in agriculture varies significantly between various nations and is influenced by several issues (Jelic et al., 2014).

A global challenge is ensuring the sustainability of agriculture. Achieving self-sufficiency, distributing money among economic actors, and ensuring food supplies and affordable consumer pricing are all goals of agricultural policies used by nations. The reason is that, during the harvesting season, farm-gate prices can drop so low that many farmers struggle to break even. This frequently leads to loan repayment defaults, forcing some farmers out of business in other cases. Because farming is unprofitable and unviable during the harvest season due to low prices, small farmers are particularly susceptible to significant price changes(Pe'er et al., 2020).

Additionally, it deters farmers from utilizing the proper dosage of agrochemicals and fertilizers, implementing new technology, and making new investments. Farmers' access to credit from reputable lenders at fair interest rates is restricted by low pricing during the season and low incomes. Due to these issues, the domestic agricultural sector has low productivity and limited growth. To ensure that farmers receive fair prices for their output during harvesting, governments frequently intervene in the commodities market by guaranteeing prices for farm products (Weliwita & Epaarachchi, 2003). On the other hand, due to low commodity prices during harvesting, producers of products in emerging nations incur a significant danger of not recovering even their production expenses (Dick & Wang, 2010; Weliwita & Epaarachchi, 2003).

However, developing countries use agricultural policies to lower agricultural product prices below market prices, providing consumers with affordable food. In contrast, industrial countries use agricultural policies to raise agricultural product prices above market prices and transfer income from consumers to farmers (Wesley et al., 2000). Moon and Pino (2018) surveyed how Americans feel about government involvement in commerce and agriculture. The findings indicated that they strongly favour agricultural protection and that their opinions on issues such as national food security, family farms, environmental sustainability, and the multiple functions of agriculture influence whether they support or oppose government action. Consumers or taxpayers are supposed to oppose public policies that raise their tax burden. However, in the case of the agricultural industry, they have little incentive to do so because many consumers and taxpayers share the costs of farm programs. American citizens prefer government intervention in agriculture, which contradicts the political economy theory. In contrast to lower-income Americans, higher-income Americans were more antagonistic to government intervention in agriculture and less interested in trade policies that shield domestic agriculture from international competition (Moon & Pino, 2018).

Moreover, agricultural failure to provide enough food at low prices, foreign currency, release workers to manufacturing, finance industry expansion, and boost local demand for industry products might cause industrial growth to decline. This beneficial contribution of agriculture to industrial development raises the possibility of government interventions in agriculture (Rock, 2002). Agriculture delivers public goods like farm biodiversity in addition to its fundamental function of ensuring food security. The agricultural industry also plays a substantial role in several environmental problems, such as soil degradation, water contamination, disturbed nitrogen and phosphorus cycles, climate change, and biodiversity loss (Heyl et al., 2021). In 2015, there were 15.6 million agricultural families, with an average farm size of 0.95 ha. However, it benefited from a liberalized economy in the 1990s. Ethiopia has a sizable livestock population with more than 70 million cattle, 57 million birds, 42.9 million sheep, and 52.5 million goats. In addition, the nation has roughly 8.1 million camels, 2.15 million horses, 10.80 million donkeys, and 0.38 million mules (CSA, 2021). Agriculture-related policy often focuses on three primary areas: Enhancing disadvantaged communities' involvement, commercial agriculture's competitiveness in a free market environment, and natural resource base protection are the first three goals (Drimie, 2016).

Ethiopia's development strategies are intended to help its citizens on all fronts. Ethiopia's huge landmass and abundant human resources are the nation's significant endowments, as stated in the Ethiopian Rural Development Policies and Strategies. These factors led to the necessity for quicker and more comprehensive economic growth, the construction of economic infrastructure, social development, and the quickening of the establishment of a democratic system that was centered on the development of its people. Ethiopia's economy is centered chiefly on agriculture, which accounts for 40% of its GDP, 80% of its exports, and over 75% of jobs, with industry and services showing a recent moderate increase. Because most agriculture is rainfed and heavily dependent on rainfall, just 5% of the land is irrigated. Due to Ethiopia's highly erratic rainfall patterns, there is a very high risk of seasonal dry spells and annual droughts. The most significant recent droughts were in 1973–1974; 1983–1984; 1987–88; 1990–91; 1993–94; and 2015–2016. Even now, the 2015–16 drought is considered the worst in more than 30 years (National Plan Commission, 2017). Hence, agriculture interventions are recently become a contentious topic and attracted the mind of many researchers. In industrialized economies, the agricultural sector was relentlessly driven into hyperproduction by the agricultural policy in the second half of the 20th century, which contributed to the drop in the price of staple farm goods on the global market. Because of this, we are now routinely faced with reflections on complete liberalization or no government interference in market flows within the agricultural sector.

On the other hand, proponents of agrarian interventions emphasize the need for future modifications and the appropriate dosage of government interventions. They highlight emerging areas where government intervention is necessary, such as national food safety and security or environmental preservation and rural value systems (Jelic et al., 2014). Few new seeds, fertilizers, and insecticides are used, and inadequate market links exist. Based on the above problems, this article examines whether farmers need government intervention in agriculture.

2. Materials and Methods

Description of the Study Area

Sidama Region is found 275 km south of Addis Ababa, Ethiopia's capital city. It is one of 10 regions in Ethiopia and consists of 36 rural woredas for administrative purposes. The Region is bordered to the West by the Bilate River, which separates it from the Wolayita zone to the South by the Oromiya region, and on the north and east by the Oromiya region (figure 1). Hawassa City is the capital city of the Sidama region. It was formed on 18 June 2020 by the Southern Nations, Nationalities, and Peoples' Region (SNNPR). The former administration of Sidama Zone transformed itself from a zone (lower) rank to a Region (higher). It had a 98.52% public vote in favor of being a Region by referendum in 2019. The population of the Sidama region was around 5 million in 2017 who speak the Cushitic language Sidama (also known as Sidaamu Afoo). Sidama Region is defined by three agroecological zones: the highlands (32%), the midlands (48%), and the dry midlands/lowlands (20%).

Sidama Region is known for its intensive, diverse, and well-established agroforestry systems in which a diversity of perennial and annual crops is grown together. According to CSA 2013, the economy of the Region is mainly agriculture-based, which is predominantly the primary source of employment, export earnings, and livelihoods.

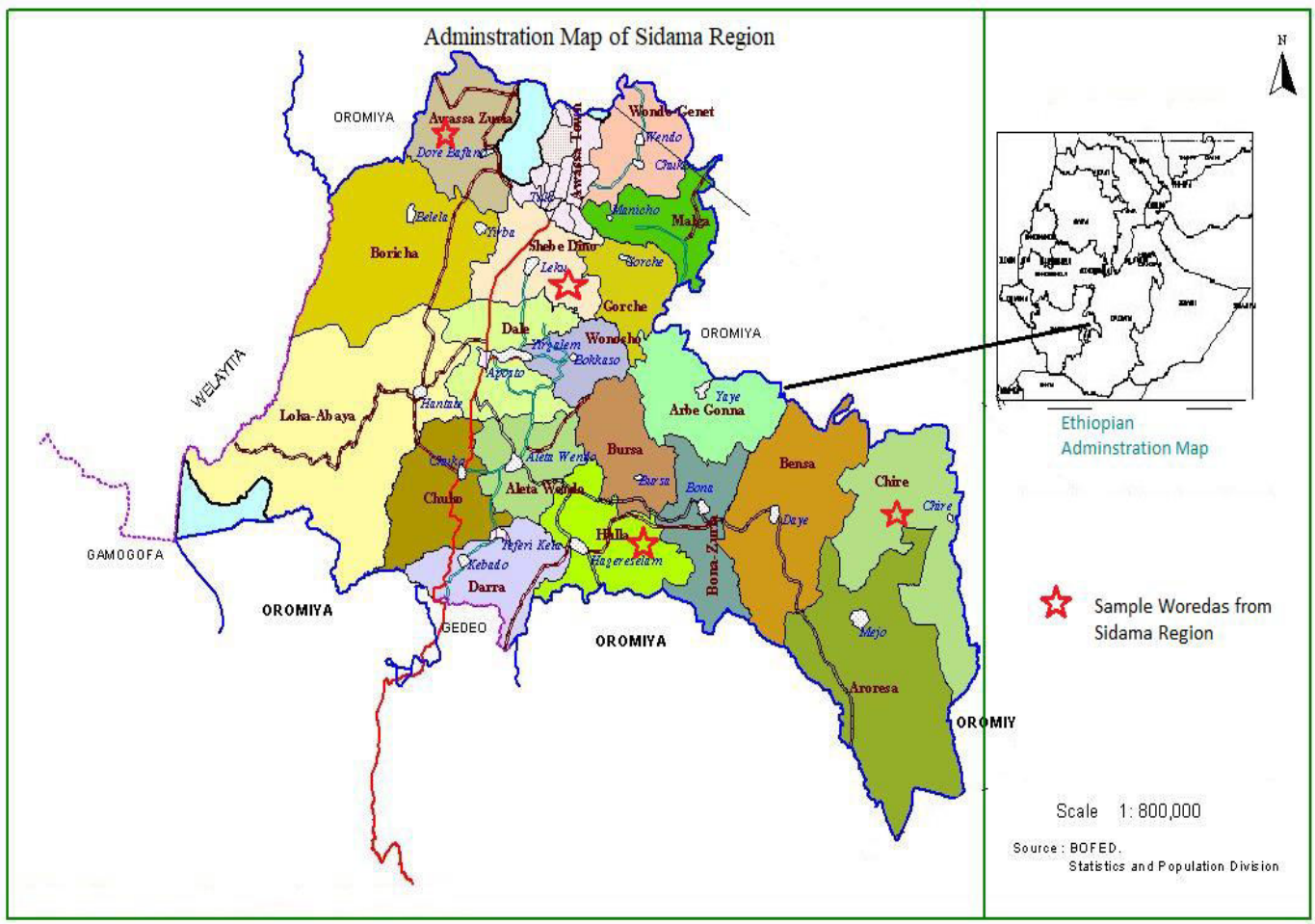

Figure 1: Administrative map of the Sidama Region

Study Design

For this study, primary and secondary data were gathered from various sources. Both quantitative and qualitative data methods were used to collect accurate and comprehensive information to meet the stated objectives. It is better to combine quantitative and qualitative data collection techniques. Because qualitative data offers elaborations, and explanations, meanings, whereas quantitative data offers precise summaries and comparisons. Various strategies combining quantitative and qualitative methods were used for this study while considering all of these factors. The researcher used the primary data source to collect information from respondents. Data from the households were primarily gathered using questionnaires. There are both closed-ended and open-ended questions in the survey. During the survey, 10-15 key informants, including elders, local officials, and development professionals, participated in group discussions.

Types and Sources of Data

This study used both primary and secondary data types. Primary data sources were collected from households using data collection instruments like crucial informant interviews, focus group discussions, and structured questionnaires. Secondary data were collected from reports of different institutions like the national bank, planning and development ministry, finance bureau, agriculture office, Ethiopian economic association, central statistics authority; articles and journals; books, and magazines. The data collected from different sources were related to the nature of agricultural markets and rural poverty.

Sample Size Determination and Sampling Procedures

To determine sample size, a sample size determination formula was adopted, which is the clearest and precisely represents the target population's proportion. The formula is given as follows (Madow, 1968): $n = \frac{N}{1+N(e)^2}$ Where n represents the sample size, N represent the population size, e (5%) is the level of precision or error margin, and $N = 661{,}690$ is the total rural population size of selected sample Woredas and data of rural population size of each Woreda was taken from CSA (2013) report. Hence,

$n = \frac{661{,}690}{1+661{,}690(0.05)^2} = \frac{661{,}690}{1+661{,}690\,(0.0025)} = \frac{661{,}690}{1+1654.225} = \frac{661{,}690}{1655.225} = 399.758 \approx 400.$

Thus, the sample size was 400. Multi-stage sampling technique was used to select the determined sample size. In the first sage, the Sidama region was chosen out of 10 regions of Ethiopia with a purposive sampling technique since Region consists of several imperfect agricultural markets; Sidama Region is divided into 36 Woredas, referred to as districts, for administrative purposes. The same Woredas were categorized into three agroecological zones: these zones are the lowlands (7 Woredas), the midlands (18 Woredas), and the highlands (11 Woredas). In the second stage, two *Woredas* from the midlands Zone, one *Woreda* from the lowland Zone, and one Woreda from the highlands were selected based on the extent of the number of *woredas* in each zone and discussion with extension officers as shown. In the third stage, sample households were selected from each sample *Woreda* by random sampling method based on the proportion of the rural population size, as shown in Table 1.

Table 1: Targeted rural population and sample size distribution among sample Woredas

No.	Name of Woredas	Agroecological Zone	Total rural population	Sample size
1	Hawassa Zuria	*Lowland*	140,189	85
2	Chirre	*Midlands*	133,003	80
3	Shebadino	*Midlands*	250,134	151
4	Hula	*Highlands*	138,364	84
	Total		661,690	400

Data Management and Analysis

Data were presented using frequency and percentage-based descriptive statistics and inferential statistics like the Pearson Chi-square and binary logistic regression model. The information gathered through key informant interviews, focus group discussions, and document analysis was analysed through narration to triangulate the quantitative results.

Specification of the empirical model

The logistic regression technique was used when the dependent variable is dichotomous (binary), in which case the farmer either "needs government intervention" or "does not need it." In this study, the dependent variable is government intervention among rural farmers. Farmers either need government intervention or do not need it. For more than one independent variable, that is, for K independent variables $(X1, X2, \ldots\ldots\ Xk)$, the binary logit model can be written as:

$$Z(x) = \frac{\{Exp\ (B0\ +\ \Sigma Bi * xi)\}}{\{1 + Exp\ (B0 + \Sigma Bi * xi)\}} - - - - - - - - - - - - - \quad (1)$$

Derivation of the logit model can be performed as follows:

Let $p = \frac{exp(z)}{\{1+exp(z)\}} - (2)$

$$1 - p = \frac{1}{\{1 + exp(z)\}} - \quad (3)$$

$$\frac{p}{1-p} = \exp(z) = \text{odds} \quad ----------(4)$$

Taking the natural logarithm of the above would result:

$$\frac{p}{p-1} = e^{B_o X_o} * e^{B_1 X_1} * e^{B_2 X_2} * \ldots\ldots\ldots\ldots e^{B_n X_n} \quad ---------(5)$$

$$ln\left[\frac{pi}{1-pi}\right] = B_o + B_1 X_1 + B_2 X_2 + B_3 X_3 \ldots\ldots B_n X_n \quad ------(6)$$

Where p = chance of willingness of government intervention

1—p = chance of do not need

$\ln[pi/(1-pi)]$ = is the probability or risk of the event occurring, which is the odds of farmers do not need government intervention.

Xi = $X_1, X_2, X_3 \ldots\ldots\ldots\ldots\ldots X_n$: are the independent variables used in the model.

Bi = $B_1, B_2, B_3 \ldots\ldots\ldots\ldots\ldots\ldots B_n$: are the regression coefficients indicating the magnitude of change (increased or decreased) in the independent variable.

A factor alters the odds ratio zi when an independent variable increases by one unit. This factor will be more significant than one if the coefficient is positive, increasing the probability (increased chance of needing government intervention). When B is zero, the factor equals one, keeping the odds flat. If the coefficient is negative, the factor will be less than one, meaning that the probabilities decrease (reducing the need for government intervention).

3. Results and Discussions

Sources and Types of market information for farmers

The farmers who use appropriate market information enable to know more about the crops they should produce. This information rises from different sources. The following figure indicates the farmers that use market information from various sources. As we can see from figure 2, the respondents (farmers) who get information from government only 30% (120) out of 400 respondents. Although the information provided by local farmers is sometimes inaccurate and unreliable, most of them around 15 percent (60) of respondents are forced to use information from local farmers. And those who get market information from cooperatives are 19% (76). Around 23% (92) of individuals do not know where to sell, how to produce, or how to use in a modernized way rather than what they have traditionally done by themselves. Respondents who get agricultural market information from users were 13 percent

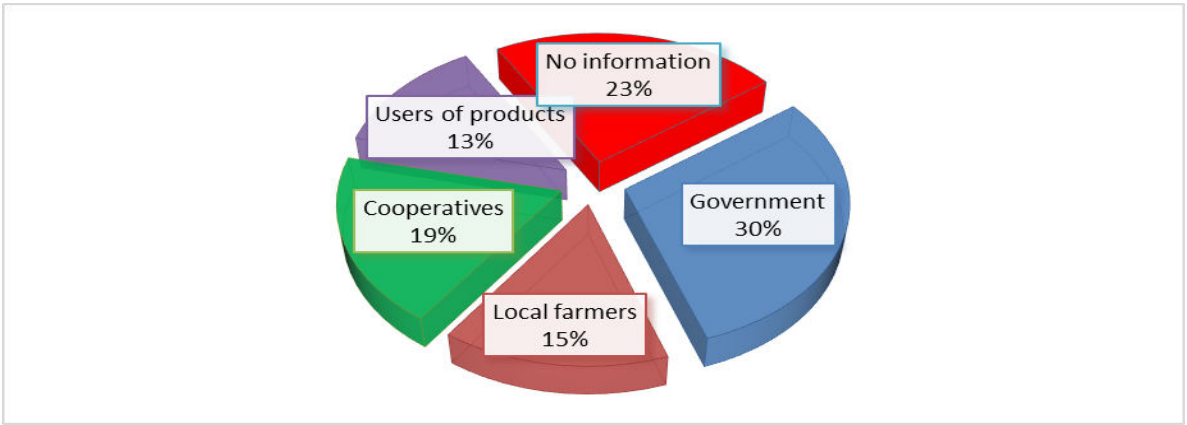

Figure 2: Source of market information about primary cash crops product

As we see in figure 2, the farmers get information from different sources. These various sources of information provide further information on multiple issues that are related directly or indirectly to the marketing and production of significant cash crops product, as the following table shows:

Table 2: The information provided to the farmers

The information provided by the source is	Number of respondents	Percentage (%)
Primary cash crops product demand in the market	62	20
How to supply their product to the market	74	24
Where to sell their product	34	11
The demand in the market and how to supply their product to the market	46	15
How to supply their product to the market and where to sell their product	37	12
The level of demand and where to sell	34	11
Demand, supply, and where they sell it	21	7
Total	308	100

Source: survey questionnaire, 2022

Table 2 shows that the types of information provided to the farmers were demand level for products, how to supply their product to the market, and where to sell their product. The result of this study shows that 11 percent (34) of farmers have information about where to sell their product, 20 percent (62) respondents get information on demand for the product, 24 percent (74) get information on how to supply their products, 15 percent (46) households get information on the demand for their product. About 12 percent (37) of respondents get information on how to supply their products and where to sell them. And only 7 percent (21) of farmers have full access to information on how to provide, where to sell, and the level of demand for their products. Information is helping the farmers to get higher or better prices for their products to increase the quality and quantity of the significant cash crops product. The data shows that some farmers get information on different things, but the complete information is not efficiently available. This shows a lack of adequate market information on the products they produce in this Region.

Type of marketing and price determination methods

Farmers deal with buyers to sell their products in the local area or may provide products to the market by loading on their shoulders or by a trip to the local market on horses etc. Table 3 shows how farmers are marketing major cash crops products.

Table 3: Different types of marketing methods

Marketing the product by	Number of respondents	Percentage (%)
Retailing	60	15
Selling to marketing middleman by a trip to the local market by loading on their shoulder	172	43
Marketing middleman buying by coming to the village	140	35
Selling to marketing middleman by a trip to market and marketing middleman buying by coming to the village	28	7
Total	400	100%

Source: survey questionnaire, 2022

Table 3 indicates that 43% (172) of farmers sell their products to marketing intermediaries by a trip to the market by loading on their shoulders, 35% (140) of farmers sell their products by selling to marketing intermediaries by coming to the village, 15% (60) of respondents are selling their products through retailers, and the rest of 7 % (28) of respondents are selling their products by Selling to marketing middleman by a trip to market and marketing middleman buying by coming to the village. Pricing decision plays a significant role in marketing decision. Most of the time price of the product is determined jointly by producers and consumers at the farm and the retail level in the marketing system. Figure 3 shows the information on by whom the significant cash crop price is determined in the study area.

According to figure 3, 37.5 percent of farmers responded that consumers or users determine the price of their major cash crops. At the same time, 18.5 percent of farmers responded that farmers determine the price of their products. About 16.75 percent of respondents said that agricultural product price is determined by negotiation with the consumer or marketing middleman, and 4.75 percent of respondents assess their significant cash crops price using market demand and supply. The rest of the 12.5 percent of respondents assess their product price by negotiation and demand and supply of the market.

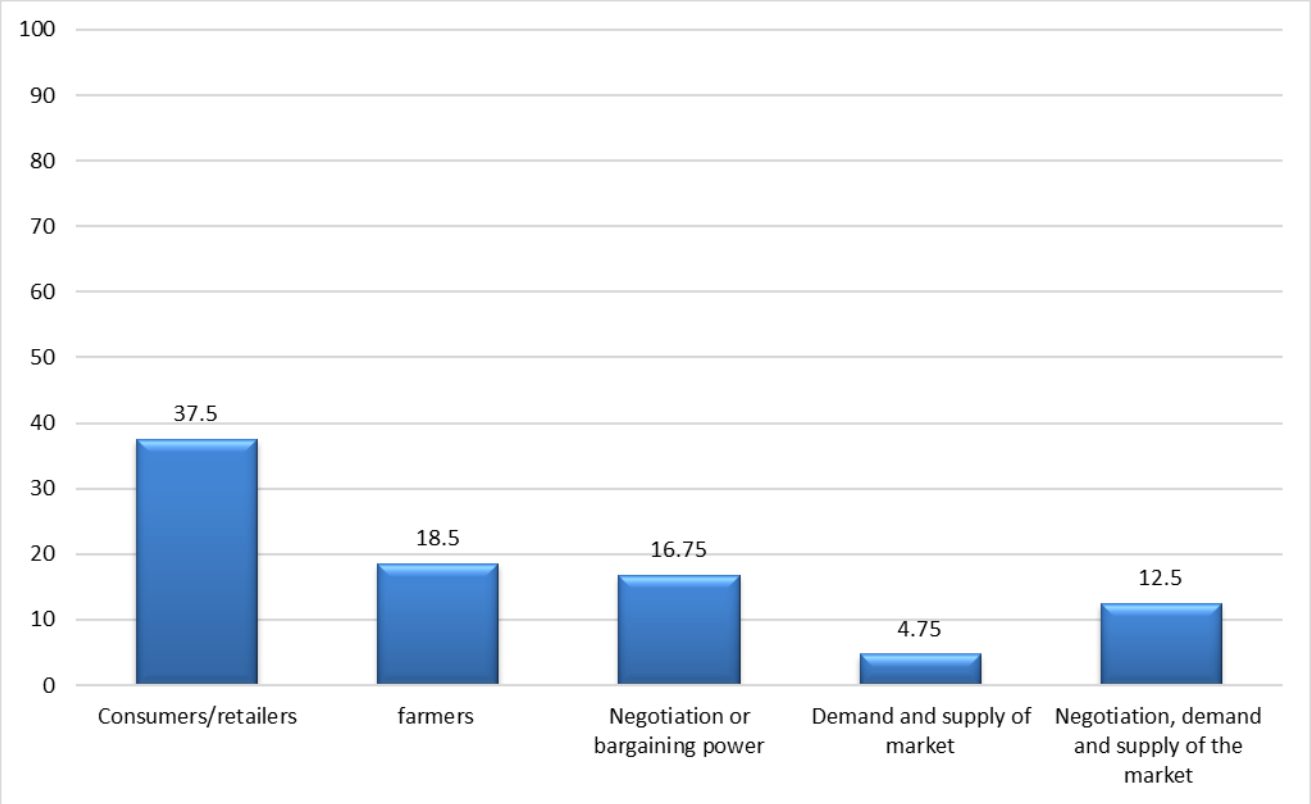

Figure 3: Price determination of significant cash crops by percentage

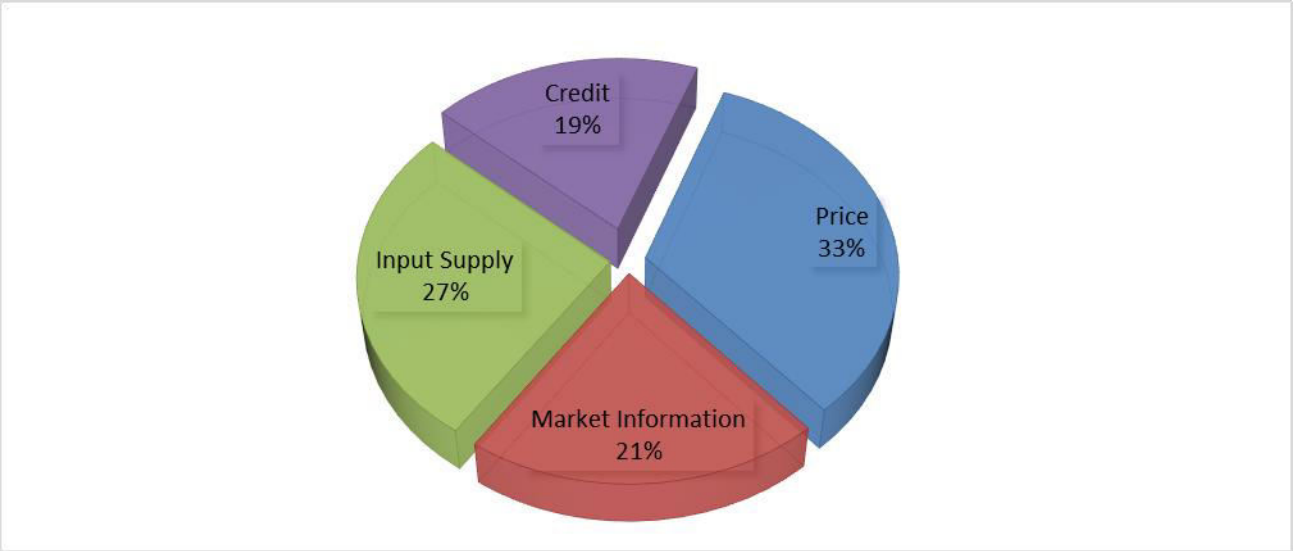

Figure 4: Reasons for preference of government intervention in agriculture

Walking distance to the primary market was used to incorporate the effect of the development of roads and market infrastructures on agricultural production. It thus implies that the longer distance from a household to the nearest market makes farmers disadvantaged by increasing the transportation costs incurred in purchasing the inputs and deters the farmer from purchasing more inputs. Moreover, farmers need government intervention to access information on the demand level for their products, how to supply their products to the market, and where to sell them. The information helps the farmers to get higher or better prices for their products to increase the quality and quantity of the significant cash crops product. The data shows that some farmers get information on different things, but the complete information is not efficiently available. This shows a lack of adequate market information on the products they produce in this Region. The farmers who use appropriate market information enable to know more about the crops they should produce. The above figure indicates that of those farmers who need government intervention, 21 percent need government intervention to provide market information through agricultural experts and extension agents (figure 4). Although the information provided by local farmers is sometimes inaccurate and unreliable, most of them are forced to use information from local farmers. And those get market information from both agricultural experts and extension agents. Most farmers do not have information about where to sell and how to use it modernized rather than what they have traditionally done by themselves. Farmers need information on multiple issues related directly or indirectly to the marketing and production of significant cash crops products. Farmers deal with buyers to sell their products in the local area or may provide products to the market by loading on their shoulders or by a trip to the local market on horses etc. This system reduces the bargaining power of farmers during the price determination. Hence, farmers need government intervention to provide information about markets.

Pricing decision plays a significant role in marketing decision. Most of the time price of the product is determined jointly by producers and consumers at the farm and the retail level in the marketing system. Farmers suffer from adverse price movements in Ethiopia. Moreover, the Ethiopian government uses agricultural policies to lower agricultural product prices below market prices and to support consumers with affordable food. However, according to the findings of Wesley et al. (2000), industrial countries use agricultural policies to raise agricultural product prices above market prices that transfer income from consumers to farmers. According to figure 4, 33 percent of farmers need government intervention in the fair price determination of their major cash crops.

Farmers in Ethiopia need government in agricultural marketing to set guaranteed prices for farmers' crops. Without the guaranteed price scheme in Ethiopia over decades, farmers failed to produce good commercial agricultural products for the market. Farmers' access to credit from reputable lenders at fair interest rates is restricted by low pricing during the season and low incomes. Low farm-gate prices during

the harvesting period make farming unprofitable and unviable. Ethiopian government often did not intervene in agricultural marketing by offering guaranteed prices to ensure that farmers receive remunerative prices for their products. Due to these problems, the domestic agricultural sector experiences low productivity and slow expansion. Farmers require government intervention in agriculture to ensure they obtain remunerative prices for their products throughout the harvesting season. Although the guaranteed pricing program has been in operation for a while, the outcomes of the study conducted in Sri Lanka indicate that it has never yielded results that were satisfactory (Weliwita & Epaarachchi, 2003).
The government can also play an essential role in providing agricultural production inputs. In Ethiopia, the role of government is mainly to help farmers by providing inputs for production and, in certain instances, assisting farmers in irrigation, providing improved seeds and water management practices, and disseminating information on other agricultural practices. Government is highly involved in providing inputs for production. Hence around 27 percent of farmers need government intervention to provide inputs for production (figure 4).

One of the cornerstones of effective rural development programs is giving farmers access to sufficient financing. Long recognized by policymakers, suboptimal production practices are the only option available to rural producers who cannot meet their capital requirements. Farmers that have access to financing may be able to make timely purchases of profitable inputs. It might result in increased productivity and efficiency. This demonstrates that farmers got more productive when they had more access to loans. Investing in production credit on the farm is anticipated to result in better output levels. Access to financing is, therefore, more likely to increase the productivity of agriculture. Expanding agricultural productivity is positively impacted by credit availability. This suggests that credit-accessible farmers are more technically proficient than their credit-inaccessible counterparts. Therefore, of the farmers that require government engagement in their farming, around 19 percent required it to provide credit through credit (figure 4). Farmers require government assistance in the form of credit because of several causes. First, the amount, timing, and payback process of financing provided by other companies may not adequately meet the needs of farmers, and the service may even be inefficient. Second, farmers may require government assistance in credit services due to the severity of the loan diversion issue and farmers' improper use of funds. Third, the lack of competitive credit systems might make it more challenging to choose between options for collateral requirements, loan repayment terms, interest rates, and conditions for defaulting on loans. Fourth, farmers could not access the service for various reasons, including the service's unavailability for the intended purposes and the exorbitant interest rates demanded by lenders.

Determinants of farmers' preferences for government intervention in agriculture

The binary logistic regression result indicated that six out of seven variables in the model significantly influenced farmers' need for government intervention in the agricultural market (Table 4). These include sex, age, education level, income, family size, and farm size. In Table 5, given below, to test the null model over the final model chi-square, the difference of -2 Log Likelihood is 69.746 with 17 degrees of freedom and its p-value of 0.000 < 5% significance level. This shows that there is no evidence to accept the null model. Therefore, the final model with predictors fits the data well, implying that the predictor variables had a significant effect.

Education level significantly determines farmers' need for government intervention ($p< 0.001$). It was found that as the educational status of farmers changes by one grade, the odds of the farmers needing government intervention decrease by a factor of 0.67 while other factors remain constant. In other words, Farmers who attained more educational levels were 0.67 times less likely to need government intervention than those without education. This means the likelihood of wishing for government intervention is found to be lesser than those who were not educated. Moreover, farmers with high levels

of education are likely to make the optimal decision while getting their education. Once farmers are educated and enter the agriculture market, they need less government intervention than farmers with low levels of education. This shows that farmers without education were more exposed to asymmetric information and marketing problems. Therefore, this study confirms that farmers' education makes them more competent and stand by themselves without depending on government intervention economic system. This result is consistent with the findings of Moon and Pino (2018), who found low income and less-educated households need government intervention to stabilize prices in agriculture.

Male farmers were 0.687 times less likely to need government intervention than female farmers. Hence, female farmers are more exposed to agricultural production problems than their counterparts. Hence, they need the help of government intervention in agriculture production and marketing. However, the age of farmers was positively and significantly related to farmers' need for government intervention in agriculture. If the age of farmers increases by one year, the odds of the farmers needing government intervention increases by a factor of 1.388 while other factors remain constant. This shows that aged and older farmers were more exposed to asymmetric information and marketing problems. Therefore, this study confirms that youth and younger farmers were more skilled and could stand by themselves without depending on government intervention economic system. Another essential variable that has a statistically significant and positive effect on farmers' need for government intervention is the family size of farmers. This shows that the likelihood of needing government intervention for farmers with a small family size is lower than for farmers with a big family. This result is similar to the findings of Weliwita & Epaarachchi (2003), who suggested that to ensure that farmers receive fair prices for their output during harvesting, governments frequently intervene in the commodities market by guaranteeing prices for farm products

Farmers with better economic positions are less likely to need government intervention than their counterparts. This shows that having a better income decreases the probability of being dependent on government decision-making in agricultural marketing. It is found that impoverished farmers are more likely to need government intervention than relatively richer farmers. In other words, it could be noted that the likelihood ratio of odds for the need for government intervention is 0.864 times higher than economically poor farmers. This result is in line with the findings of Moon and Pino (2018) that in contrast to lower-income Americans, higher-income Americans were more antagonistic to government intervention in agriculture and less interested in trade policies that shield domestic agriculture from international competition. Another important variable that has a statistically significant and negative effect on farmers' need for government intervention is the farm size of farmers. This shows that the likelihood of needing government intervention from farmers with small family sizes is higher than from farmers with small family sizes.

Table 4: Estimates of logistic regression on the need for government intervention

Variable	Coefficient (β)	Standard Error	p-value	Odds Ratio
Sex	-0.375	0.186	0.044**	0.687
Age	0.328	0.455	0.041**	1.388
Family size	0.516	0.159	0.001***	1.676
Education	-0.401	0.308	0.003***	0.670
Income	-0.146	0.415	0.024**	0.864
Membership to cooperatives	-0.559	0.391	0.153	0.572
Farm size	-0.573	0.183	0.002***	0.564
Constant	0.499	0.455	0.273	0.627
Log likelihood = -82.8283 LR chi2(7) = 81.51		Pseudo R2 = 0.3298 Prob > chi2 = 0.0000		Number of obs = 400

Source: Model output (2022) and *** and ** indicate the significance level at 1 and 5 percent, respectively

Table 5: Summary Statistics of the Likelihood Ratio Test

Model	Model Fitting Criteria	Likelihood Ratio Tests			Hosmer - Lemeshow Test		
	-2 Log Likelihood	Chi-Square	Df	Sig.	Chi-Square	Df	Sig.
Null model (Intercept only)	992.905	69.746	17	0.000	11.359	8	0.182
Final model	923.159						

The Hosmer-Lemeshow test, which splits individuals into ten ordered groups of subjects and compares the actual number in each group observed to the number predicted by the logistic regression model, is an alternative to the likelihood ratio test. The estimated probability was used to generate the ten ordered groups; those with estimated probabilities below 0.1 constitute one group, those between 0.9 and 1.0 make another group, and so on. The observed outcome variable is used further to divide these categories into two groups. The model was used to determine the anticipated frequencies for each cell. A probability value was calculated using the chi-square distribution with 8 degrees of freedom to check the logistic model's fit. The null hypothesis that there is no difference between observed and model-predicted values is not rejected if the Hosmer-Lemeshow goodness-of-fit test statistic is more significant than 0.05, indicating that the model fits the data with an acceptable level of accuracy. That is, the Hosmer-Lemeshow goodness-of-fit test results for well-fitting models are non-significant. Non-significance is desirable because it shows that the model's predictions and actual observations are not significantly different. The Hosmer-Lemeshow statistic has chi-square values of 11.359 and 0.182, indicating that the test is not statistically significant. As seen in Table 5, our model is a good fit because the p-value is higher than the significance level (0.05). This demonstrates no real discrepancy between the observed and anticipated model values, indicating that the model adequately fits the data and is consistent with earlier testing.

Conclusion

Results show that Ethiopia's farmers prefer government intervention in agriculture to stabilize the price of inputs and provide information about markets for products. Although the information provided by local farmers is sometimes inaccurate and unreliable, about 15 percent of respondents are forced to use the information from local farmers. And those who get market information from agricultural experts and local farmers are 19 percent. Around 23 percent of individuals do not know where to sell, how to produce, and how to use in a modernized way rather than what they have traditionally done by themselves. Farmers suffer from adverse price movements in Ethiopia and need a contractual agreement with buyers and the government to succeed. Relatively older and female farmers need government intervention more than their counterparts. At the same time, relatively more educated farmers and farmers with more income do not prefer government intervention. Farmers deal with buyers to sell their products in the local area or may provide products to the market by loading them on their shoulders. This system reduces the bargaining power of farmers during the price determination. Hence, farmers need government intervention to provide information about markets and to set fair and guaranteed prices for agricultural products. There is a need for institutional interference to enhance access to the market and infrastructure.

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Ethics approval and consent to participate

This manuscript does not report any experimental research or research on humans.

Competing interests

The authors declare that we have no competing interests with any organization or individual.

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