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Determinants of Teff (Eragrostis Tef) Market Outlet Choice in Woliso and Becho Districts of South West Shoa Zone Oromia Regional State, Ethiopia.

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Abstract

This study was aimed to identifying determinants of (teff Eragrostis tef) the market outlet choice in Woliso and Becho districts of South West shoa zone. Both primary and secondary data were used in this study. Primary data was collected from 138 sampled farmers and 38 traders at different levels by using semi-structured interview. Descriptive analysis and econometric model multivariate probit model were employed to analyze the cross-sectional data. The output results suggest that households had three major market outlet choices (wholesalers, Retailers and other agents like (coop, union) and separate estimation of choice of the three outlets were biased since the choice decisions were interdependent and simultaneous. The joint probability of choosing all the three outlets was 0.63 percent and the probability of failure to the three outlets was only 6.1 percent. The results indicate that smallholder farmers choose at least two outlets at a time. The choice of producers on the three outlets was determined by similar underlying factors. District, Age, total family size, Education level, Farm size, Farming experience, off farm, Livestock (Tlu), Access to market information, Extension service, Access to credit and quantity produced. The outlet choice of Wholesalers was influenced by Education level, off- farm and quantity produced positively. Education level, Farming experience and off- farm were significant determinants of the retailors' outlet choices negatively and age was positively influence. Other agent market outlet was also negatively and significantly affected by district, livestock ownership and off farm and family size is positively affect it. Therefore, efforts are needed to promote producers to choose wholesalers and retailers outlet since they enable them to get premium price margin. Strongly what should be given more emphasizing from government side is to strength union and cooperative organization available in area.

Keywords: Teff (Eragrostis tef), Multivariate probit model; Woliso, Becho;

INTRODUCTION

Teff (Eragrostis tef) is a tropical cereal. It is considered a low-risk crop from the perspectives that it can be cultivated in a broad range of ecological surroundings and under tough

environmental conditions where most other cereals fail. Teff is a major food crop in Ethiopia and Eritrea, Africa, where it is mainly processed into different foods and beverages, such as breads, sweet unleavened bread, porridges, pancakes, biscuits, cookies, cakes, stir fry dishes, casseroles, soups, stews and puddings (Elke K. Arendt, 2013).

The majority of Ethiopia's population earns its livelihood primarily from agriculture. The agricultural sector, which is stunned by subsistence smallholder farmers, is the primary source of livelihood for the majority of the population and the basis of the national economy. Agriculture contributes about 35.8 percent to the national GDP and still about 70 percent of Ethiopian population is employed in the agriculture sector (World factbook, 2018).

Teff (Eragrostis tef) is a major staple food crop in Ethiopia. Teff is grown at middle elevations between 1,800 and 2,200 meters above sea level and in regions that have adequate rainfall. Compared to other cereals, Teff is considered a lower risk crop as it can withstand adverse weather conditions (Fufa et al. 2011).

RESEARCH METHODS

Description of the Study Area

The study was conducted in Woliso and Becho Districts of South West Shoa Zone of Oromia National Regional State.

Southwest Shewa is one of the zones of the Oromia Region in Ethiopia. Based on the 2007 Census conducted by the Central Statistical Agency of Ethiopia (CSA), this Zone has a total population of 1,101,129, of whom 556,194 are men and 544,935 women. 149,878 or 13.61% of population are urban inhabitants (CSA, 2007).

Woliso district is far about 114 km southwest of Addis Ababa. It is located at 8º 32′ 23.0′′ N latitude and 37º 58′ 16.3′′ E longitude and altitude ranging from 1600-2880 meter above sea level. It receives annual rainfall ranging from 900-1900 mm. The mean minimum and maximum air temperature of the area is 10°C and 35°C, respectively. Agro ecologically, it is classified into weinadega (70%) and dega (30%) zones. Chromic and Vertisol are the dominant soil types found in the district. It is bordered by the south by Goro, on the west by Wonchi, on the east by Beco and on the north by Dawo districts of southwest Shewa zone (SWSZANO, 2020).

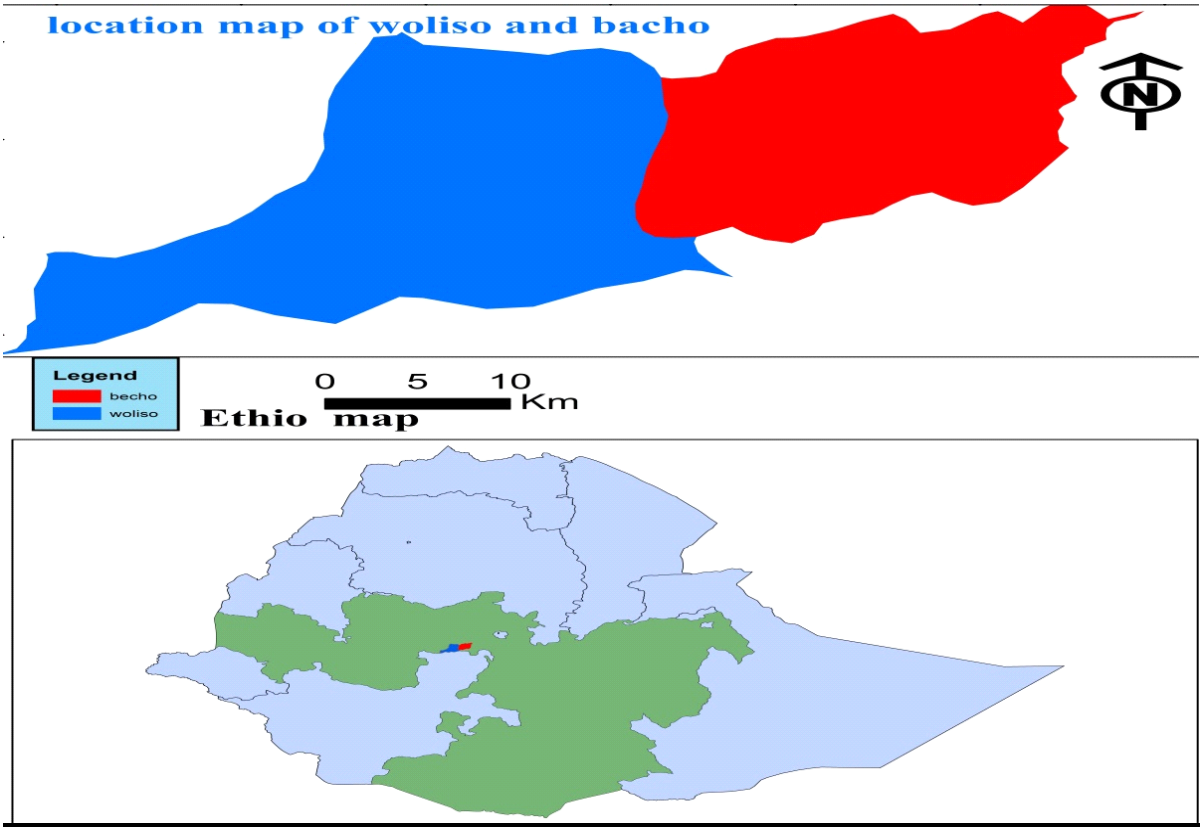


Figure 1. Map of study area

Source of Data and Data Collection Tools

The data used for this study was collected from primary and secondary sources. Formal sample survey methods were used to collect primary and secondary data. The formal survey was undertaken through formal interviews with selected farmers and traders and unions using a semi structured questionnaire for each group. Totally 138 sample farmers were selected randomly based on proportional to the population size using Cochran formula. Accordingly, the required sample size at 95% confidence level with degree of variability of 5% and level of precision equal to 9% are recommended to obtain a sample size required which represent a true population and 38 traders were selected purposively based on researchers' judgment.

Sampling Procedure and Sample Size

In this study, multi-stage sampling technique was used. In the first stage both districts were selected purposively based on their potentiality of Teff production among the districts available in the zone. As report of Agricultural and Natural resource, office of Southwest Shewa zone in 2020 G.c indicates 100 and 75 percent of potentiality production of teff available in Becho and woliso respectively. In second stage all Kebelesof the two Woredas (Woliso and Bacho) were stratified into high and Low Teff producing kebeles then by using simple random sampling techniques, eight high potential Teff producer Kebeles from both woredas were selected. Finally, Teff producing sample households were selected from high Teff producing stratum using systematic random sampling technique.

Table 1.Distribution of sample households across districts and sample kebeles.

District	Kebeles	Number of households	Proportion	Sample households
Becho	Awash Bune	1615	0.22	28
	Jato	965	0.12	17
	SimbiroCiracha	958	0.12	17
	Boji	600	0.08	11
Weliso	Gurura Baka	1250	0.16	22
	Doyo Kora	780	0.10	14
	Senkale Ale Mariyam	650	0.08	12
	Ale Koya	968	0.12	17
Total		**7786**	**1**	**138**

Source: Agriculture Bureau of Becho and Weliso (Own computation).

The required sample size was determined by Cochran's (1977) proportionate to size sampling methodology. The aim of the calculation is to determine an adequate sample size which can estimate results for the whole population with a good precision.

$$n = \frac{z^2 pq}{e^2}$$

Where; n = Sample size; Z= confidence level (α = 0.05); p = proportion of the population containing the major interest (assumed to be 90%=0.9), q = 1-p (0.1) and e = allowable error or margin of error which is 0.05 and Hence, Z = 1.96;

$$n = \frac{(1.96)^2(0.9 * 0.1)}{(0.05)^2} = 138$$

Data Analysis Technique

Determinants of Market Outlet Choices

To identify determinants of Teff market outlet choices, Multivariate probit model was used. The multivariate probit model is a generalization of the probit model used to estimate several correlated binary outcomes jointly. The decisions of choosing wholesalers, Retailers and other agents (cooperative and union) are correlated (all decisions are binary), then the multivariate probit model would be appropriate for jointly predicting these three choices on an individual-specific basis.

Table 2. Summary of Variables used in the MVP model

Variables	Type	Measurement
District	Dummy	1 if woliso and 2 if Becho
Age	Continuous	number of age of households
Total family size	Continuous	number of family in adult equivalent
Education level	Continuous	number of education level
Farm size	Continuous	Total land owned by a farmer.
farming experience	Continuous	number of years' experience in farming
Off farm	Dummy	1 if a farmer has off farm activity and 0 otherwise
Livestock(TLU)	TLU	number of livestock owned(TLU)
Access to Mkt information	Dummy	1 if a farmer has access to information and 0 otherwise
Extension service	Continuous	number of visit of the extension agent
Access to credit	Dummy	1 if a farmer has access to credit and 0 otherwise
Quantity produced	Continuous	Number of quantity produced

RESULT AND DISCUSSION

Households Characteristics

The variables used to describe demographic characteristics of sample farmers were educational level, sex, marital status, age and family size. The results presented in table 3 below indicates that 89.86% of the respondents were male household heads. While the remaining 10.14% were female household heads. The results also reveal that 94.93% of them were married and 5.07% widowed.

Table 3 Demographic and socioeconomic characteristics of respondents

Variables		Frequency	Percent
		N=138	N=138
Sex	Male	124	89.86
	Female	14	10.14
education Level	illiterate	21	15.22
	Read and Write	25	18.12
	1-6 (attended schools)	36	26.09
	7-8 (attended schools)	29	21.01
	9-12 (attended schools)	27	19.57
Marital Status	Married	131	94.93
	Widowed	7	5.07
Age	Mean	43.94	
Family Size	Mean	2.60	

Source: Own computation, 2020

Determinants of Market Outlet Choices

In the multivariate probit model outputs, the samples were drawn 100 times as (table 4) reported. The matrix rho21, rho31, rho32 represented the correlation coefficient matrix between Retailers and wholesalers, other agents and wholesalers, other agents and Retailors, respectively.

The likelihood ratio test result indicated that the correlation coefficients are statistically different from zero in one of the three cases, confirming the appropriateness of the multivariate probit specification, and outlet choices are mutually interdependent. The Wald $\chi 2$ test value of 50.29, which is significant at 1% level, indicated that separate estimation of choice of these outlets is biased and the decisions to choose the three outlets were interdependent.

The outlet choice of Wholesalers was influenced by Education level, off- farm and quantity produced positively. Education level, Farming experience and off- farm were significant determinants of the retailors' outlet choices negatively and age was positively influence.

Other agent market outlet was also negatively and significantly affected by district, livestock ownership and off farm and family size is positively affect it.

Table 4 Multivariate probit simulation results of determinants of Market outlet choices.

	Wholesalers		Retailors		Other Agents	
Explanatory Variable	**Coef.**	**Std. Err.**	**Coef.**	**Std. Err.**	**Coef.**	**Std. Err.**
District	0.037	0.285	0.028	0.283	-1.287***	0.329
Age	0.013	0.016	0.028*	0.016	-0.010	0.018
Total family size	0.011	0.068	-0.005	0.058	0.111*	0.066
Education level	0.235**	0.107	-0.175*	0.100	0.091	0 .109
Farm size	-0.003	0.098	0.123	0.095	0.121	0.108
farming experience	0.009	0.016	-0.026*	0.015	-0.012	0.017
Off farm	1.077***	0.346	-0.579*	0.301	-0.783**	0.345
Livestock (TLU)	-0.023	0.039	-0.022	0.029	-0.054*	0.031
Access to Mkt information	0.305	0.479	-0.391	0.459	0.886	0.574
Extension service	-0.746	0.714	1.226	0.852	-2.457	114.56
Access to credit	-0.381	0.259	0.159	0.243	-0.032	0.276
Quantity produced	0.061**	0.026	0.006	0.025	-0.054	0.035
_cons	-3.350	1.256	-0.376	1.322	5.226	114.57
rho21	-0.651	0.108	-6.02	0.000	-0.816	-0.388
rho31	-0.379	0.150	-2.52	0.012	-0.632	-0.054
rho32	-0.317	0.146	-2.18	0.030	-0.569	-0.010
Predicted probabilities	41.1%		50.2%		37.8%	
Joint probability (success)	0.63					
Joint probability (failure)	6.1					
Observations	138					
Number of simulation(draws)	100					
Log likelihood	-208.08159					
Wald chi2(36)	67.20					
Likelihood ratio test of rho 21 = rho31 = rho32 = 0: chi2(3) = 50.29***						

Note: ***, **and * statistically significant at less than 1%, 5% and 10% significance level.
Source: Model result 2020

The likelihood of teff producers to choose wholesalers, retailers and other agents was 41.1%, 50.2%, and 37.8% respectively. Producers are more likely to sell their produce to Retailors followed by wholesalers. Other agents (cooperative and Union) purchase small volume of

produce in the district market and hence, are less preferred by producers. The joint probability of producers to choose all the three outlets simultaneously was less likely (0.63%). This was due to the fact that all the three outlet choices were simultaneously accessible in the study district by the smallholder farmers. Besides, the three outlet choices were competitive. However, the joint probability of failure to choose all the three outlets was unlikely (6.1 %). The results generally verify that The joint probabilities of success or failure of choice three market outlet suggest that households are more likely to fail to jointly choice three market outlet .The likelihood of households to jointly choice three market outlet is only 0. 63% compared to their failure to jointly choice (6.1%).

CONCLUSION AND RECOMMENDATIONS

Conclusion

Teff is a major food crop in Ethiopia and Eritrea, Africa, where it is mainly processed into different foods and beverages, such as breads, sweet unleavened bread, porridges, pancakes, biscuits, cookies, cakes, stir fry dishes, casseroles, soups, stews and puddings. The agricultural sector, which is stunned by subsistence smallholder farmers, is the primary source of livelihood for the majority of the population and the basis of the national economy of country. However, Producers are not obtaining their benefit as their efforts in equitable manner due to miss choosing market out let choice around their areas. It is apparent that the choice of producers on the three outlet choices was determined by similar underlying factors. The result of multivariate probit indicated extension service, lagged price, and distance to the district market were crucial determinants of outlet choices. Therefore, efforts are needed to enable producers to get well organized extension services and better transport facilities. Moreover, concerned institutions need to offer an integrated institutional service that maximizes the utility of smallholder farmers.

Recommendation

The empirical evidence in this paper suggests that it was more likely for households to choose at least two outlets simultaneously. This was due to the fact that all the three outlet choices were simultaneously accessible in the study district by the smallholder farmers. Besides, the three outlet choices were adversely affecting each other owing to the fact that they are competitive in the market. Therefore, efforts are needed to promote producers to choose wholesalers and retailers outlet since they enable them to get premium price margin. Strongly what should be given more emphasizing from government side is to strength union and cooperative organization available in area. Financially strong cooperative organization would made contract farming with teff producers. Therefore, local government should support unions and cooperative organization available in area in order to choose them rather than traders like wholesalers and retailers.

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