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Analysis of the Teff Market Chain: The Case of Bako Tibe District, West Shewa Zone, Oromia, Ethiopia

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Abstract

Teff is a major cereal crop in Ethiopia and an important source of food and farm income. Despite its importance, smallholder producers in many areas face constraints that reduce their participation in output markets. This study analyzed the structure, conduct, and performance of the teff market and identified factors associated with the quantity of teff supplied to the market in Bako Tibe District, West Shewa Zone, Oromia Region, Ethiopia. Both quantitative and qualitative data were collected from primary and secondary sources. The four-firm concentration ratio (CR4) was 40.29%, indicating a weak oligopolistic market structure in the study market. The regression results show that education level, sex of the household head, access to market information, cooperative membership, quantity of teff produced, and extension contact were positively associated with the quantity of teff supplied to the market, while distance to the nearest market was negatively associated with market supply. The findings indicate that improving market information, strengthening producer cooperatives, expanding effective extension services, improving rural market infrastructure, and reducing transaction and transportation costs could facilitate greater market participation by smallholder teff producers.

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Keywords

Teff; market chain; market structure; market conduct; market performance; market supply; Structure–Conduct–Performance; Ethiopia

Introduction

Teff is one of Ethiopia's most important cereal crops and plays a major role in household food consumption and agricultural income. Teff production is concentrated particularly in the Amhara and Oromia regions. Previous studies cited in the original study indicate that these two regions account for the majority of the national teff area and production. The crop has also attracted international attention because it is naturally gluten-free and has potential for wider food markets. In Oromia, teff occupies a substantial share of cultivated land and contributes significantly to cereal production. West Shewa is among the important teff-producing areas, and Bako Tibe District is one of the districts where teff is produced for both household consumption and sale. The major crops grown in the district include teff, maize, and pepper, while livestock production is integrated with crop production.

Market outlet selection and the quantity supplied to the market are important household decisions because they influence farm revenue and incentives to invest in production. Farm households choose among available marketing options according to expected returns, bargaining conditions, transaction costs, market access, and the availability of market information. Consequently, understanding the organization and performance of the

teff market is important for identifying constraints that limit commercialization.

Statement of the Problem

Transforming smallholder agriculture from subsistence-oriented production toward a more market-oriented system can increase farm income and strengthen rural economic activity. However, agricultural markets in Ethiopia have historically faced constraints including inadequate market infrastructure, high transportation and transaction costs, limited access to market information, weak farmer bargaining power, insufficient financial services, and poor market linkages.

Teff producers may also face production constraints arising from limited access to improved technologies, inadequate credit, dependence on family labor, climatic variability, soil fertility problems, and pest pressure. On the marketing side, limited transparency, weak coordination among market actors, insufficient competition, and inadequate negotiating capacity may reduce the returns received by producers. Bako Tibe District has considerable potential for teff production, yet the original study identified marketing inefficiencies, weak coordination among market participants, infrastructure constraints, limited support services, transaction costs, transportation costs, and limited negotiating skills as important challenges.

Although teff is widely produced in the district, the market organization and the factors determining the quantity supplied to the market had not been adequately documented for the study area. This study therefore examines the teff market chain in Bako Tibe District and identifies factors associated with market supply.

The general objective of the present study was to analyse the teff market chain in Bako Tibe District, with particular emphasis on examining the structure, conduct, and performance of the teff market and identifying the key factors influencing the quantity of teff supplied by smallholder producers. Specifically, the study aimed to assess the organizational and operational characteristics of the teff market, evaluate its marketing performance, and determine the socioeconomic, institutional, and production-related factors influencing the market supply decisions of smallholder farmers in the study area.

Significance of the Study

The study provides empirical information on the organization and performance of the teff market in Bako Tibe District. By identifying market channels, market structure, marketing constraints, and factors associated with market supply, the findings can support producers, traders, cooperatives, extension personnel, planners, and other agricultural development stakeholders. The results may also provide a basis for further research on cereal commercialization and teff value-chain development in the district.

Scope and Limitations

The study focused on the teff market chain within Bako Tibe District and used information collected from producers and market participants operating in the study area. The analysis of market performance was therefore geographically limited and should not automatically be generalized to markets outside the district. The study also relied partly on respondents' reported information, and limited availability of consistent secondary data constrained some aspects of the analysis.

Materials and Methods

Description of the Study Area

Bako Tibe Woreda is located in West Shewa Zone of Oromia Region, approximately 236 km from Addis Ababa. It is bordered by Caliya and Ilu Galan districts to the east, East Wollega Zone to the west, Jimma Rare District of Horro Guduru Wollega Zone to the north, and Bonaya Boshe District to the south. The district comprises 26 kebeles.

According to district administrative information used in the study, the district population was approximately 139,051, with 49.6% male and 50.4% female. The district receives its main rainfall from approximately April to September/October. Mean annual rainfall was reported as 1,000–1,200 mm, while mean annual temperature ranged from 13.2°C to 27.9°C. Elevation ranges from approximately 1,500 to 2,800 m above sea level. The district includes dega, weynadega, and kola agro-ecological zones.

Agriculture is the major livelihood activity, and the farming system is predominantly mixed crop–livestock production. Major crops include teff, maize, and sorghum, while horticultural crops include pepper, banana, mango, onion, sugarcane, tomato, and potato. Livestock species include cattle, sheep, goats, equines, and poultry.

Source for district characteristics: Bako Tibe Woreda Agricultural Office (2022), as reported in the original study.

Data Types, Sources, and Collection Methods

Both quantitative and qualitative data were used. Quantitative information included production and marketed quantities, land size, livestock holdings, prices, costs, and household characteristics. Qualitative information concerned market behavior, marketing constraints, institutional services, and perceptions of market participants.

Primary data were collected using a structured questionnaire, focus group discussions (FGDs), and key-informant interviews. The questionnaire was prepared in English, translated into Afaan Oromo, and pretested on 15 respondents who were not included in the final sample. Feedback from the pretest was used to improve clarity before the final survey. Key informants were selected from individuals considered knowledgeable about teff production and marketing. FGDs were conducted in the sampled kebeles using a checklist, with approximately 6–8 participants per group. Secondary information was obtained from district agricultural reports, statistical sources, published and unpublished studies, and relevant institutional documents.

Sampling Procedure and Sample Size

A three-stage sampling procedure was used. First, 17 teff-producing kebeles were purposively identified from the district's 26 kebeles with support from the agricultural office and development agents. Second, four teff-producing kebeles—Sedan Kite, Guto Meti, Cheka Dimtu, and Tulu Sangota—were selected randomly from the identified teff-producing kebeles. Third, a sampling frame of teff-producing households was obtained from the respective kebele administrations, and 150 households were selected using simple random sampling with probability proportional to the number of teff-producing households.

Data Analysis

Descriptive statistics, the Structure–Conduct–Performance (SCP) framework, marketing-margin analysis, and multiple linear regression were used to analyze the data.

Descriptive Analysis

Frequencies, percentages, means, standard deviations, and ranges were used to summarize demographic, socioeconomic, institutional, and market characteristics of respondents.

Structure–Conduct–Performance Analysis

The SCP framework was used to examine market concentration, barriers to entry, market conduct, and market performance. Market concentration was measured using the concentration ratio of the largest firms. The concentration ratio is expressed as:

$$CR_r = \Sigma S_i \ (i = 1, 2, \ldots, r)$$

Where S_i is the market share of the ith firm and r is the number of firms included in the concentration ratio. Market share was calculated as the quantity handled by a firm divided by the total quantity handled by all firms.

Market conduct was examined in relation to buying, selling, pricing, and other market practices. Market performance was assessed using marketing costs and margins.

Marketing Margin

Gross marketing margin was used to describe the share of the final consumer price accounted for by marketing activities. Producer share was used to indicate the portion of the final price received by producers. The analysis followed the marketing-margin framework reported in the original study.

Econometric Analysis

A multiple linear regression model was fitted to identify factors associated with the quantity of teff supplied to the market. The model was specified in matrix form as:

$$Y = X\beta + u$$

Where Y is the quantity of teff supplied to the market, X is the vector of explanatory variables, β is the vector of coefficients, and u is the disturbance term.

Multicollinearity among continuous explanatory variables was assessed using the variance inflation factor (VIF), while the contingency coefficient was used for dummy variables.

The reported VIF values ranged from 1.03 to 1.64, and the contingency coefficient was 0.184, indicating no serious multicollinearity problem according to the criteria used in the original analysis.

Results and Discussion

Characteristics of Sampled Producer Households

The mean age of household heads was 39 years, with ages ranging from 20 to 58 years. Mean schooling was 3.71 years (SD = 2.55), indicating generally low formal educational attainment among respondents. The mean household size was 3.09 persons, while mean teff-farming experience was 27.56 years.

Of the 150 sampled households, 128 (85.33%) were male-headed and 22 (14.67%) were female-headed. Most respondents were married (92%). The reported religious composition was Protestant (84%), Orthodox (10.67%), and Muslim (5.33%).

Socioeconomic Characteristics

All sampled households reported owning cultivated land. Farm size ranged from 0.63 to 8 ha, with a mean of 2.91 ha. The average area allocated to teff was 1.30 ha, ranging from 0.57 to 4 ha. Mean livestock ownership was 8.60 tropical livestock units (TLU), ranging from 3 to 18.37 TLU.

Household Asset Ownership

Land, housing, and plowing equipment were reported as widely owned productive assets. Livestock ownership was reported by 91.33% of households, while 48% owned honey-bee colonies.

Institutional Characteristics

Access to credit was reported by 44.57% of respondents, while 55.43% reported no access. The average reported travel time to the nearest teff market was 70.58 minutes, with a minimum of 15 and maximum of 180 minutes. Market information was limited: 47.07% reported receiving price information from nearby markets, 14.28% from central markets, and 19.64% from both sources. The study also reported that 82% of households had extension contact.

Characteristics of Teff Traders

The trader sample comprised 25 respondents. Approximately 92% were male and 8% female. The reported religious composition was Protestant (68%), Orthodox (24%), and Muslim (8%). Trader age ranged from 28 to 49 years, with a mean of 38.5 years. Mean family size was 3 persons, and mean teff-trading experience was 23.96 years. Among sampled traders, 72% had a designated purchasing place, while all respondents reported ownership or access to a resident store, separate store, mobile phone, and weighing scale. Other assets included bicycles, motorcycles, pack animals, animal carts, vehicles, and hand-pulled carts.

Determinants of the Quantity of Teff Supplied to the Market

Multiple linear regression was used to examine factors associated with the quantity of teff supplied to the market. The model explained 79% of the variation in market supply ($R^2 = 0.79$; adjusted $R^2 = 0.77$; $N = 150$). Education, sex of the household head, access to market information, cooperative membership, distance to the nearest market, quantity produced, and extension contact were statistically significant at the levels reported in the original analysis.

Education of the Household Head

Education was positively associated with the quantity of teff supplied to the market at the 5% significance level. The estimated coefficient indicates that a one-year increase in schooling was associated with an increase of approximately 0.179 quintal in market supply, holding the other variables constant. This result is consistent with the interpretation that education may improve farmers' ability to obtain and use market information and production knowledge.

Sex of the Household Head

Sex of the household head was positively associated with market supply at the reported 1% level ($p < 0.01$). The coefficient was 1.76, indicating a higher predicted quantity supplied by male-headed households than female-headed households, conditional on the other variables in the model. The original study attributes this difference partly to differences in household consumption and marketing decisions. This interpretation should be treated as an empirical hypothesis rather than a causal conclusion because the regression is observational.

Access to Market Information

Access to market information had a positive and statistically significant association with the quantity of teff supplied. Better access to price and market

information may enable farmers to make more informed production and selling decisions and reduce uncertainty surrounding market participation.

Cooperative Membership

Cooperative membership was positively associated with the quantity of teff supplied to the market. Cooperatives may facilitate access to agricultural inputs, market information, collective marketing, and other services. The result supports the importance of strengthening producer organizations as a mechanism for improving market participation.

Distance to the Nearest Market

Distance to the nearest market was negatively associated with market supply at the reported 5% significance level. The coefficient of −0.19 indicates that an additional unit of market distance was associated with an approximately 0.19-quintal reduction in the quantity supplied, holding other variables constant.

The unit of distance should be verified against the original survey coding because the descriptive section reports travel time in minutes whereas the regression interpretation refers to kilometers.

Quantity of Teff Produced

Quantity of teff produced was positively associated with market supply and was highly statistically significant. The coefficient of 0.61 indicates that an additional quintal of production was associated with an approximately 0.61-quintal increase in market supply, conditional on the other variables. This finding is consistent with the expectation that greater production generates a larger marketable surplus.

Extension Contact

The number of extension contacts was positively associated with market supply at the reported 10% significance level. The estimated coefficient suggests that an additional extension contact was associated with an approximately 0.10-quintal increase in the quantity supplied.

Extension services can provide information on production technologies, crop management, post-harvest handling, and marketing.

Market Structure, Conduct, and Performance

Market Structure

The four-firm concentration ratio in the study market was 40.29%. The original analysis interpreted this as a weak oligopolistic market structure. This result suggests that a relatively small number of firms account for a substantial share of market activity.

The study also identified barriers to entry, including licensing procedures and limited initial working capital.

Market Conduct

Market conduct concerns the buying, selling, pricing, and negotiation practices followed by market participants. The study identified concerns related to limited bargaining power of producers, insufficient transparency, transaction costs, and coordination among market actors. These conditions may affect the terms under which producers sell their teff.

Market Performance

Market performance was assessed using marketing margins and marketing costs. The study emphasizes transportation and transaction costs as important constraints. Improved market infrastructure and stronger linkages among producers, cooperatives, traders, and other market actors could reduce some of these costs and improve the efficiency of the market chain.

In conclusion, this study analyzed the teff market chain in Bako Tibe District, West Shewa Zone, Oromia Region, using data from 150 producer households and market participants. The SCP analysis produced a four-firm concentration ratio of 40.29%, which the study classified as a weak oligopolistic structure. The study also identified barriers to market entry, including licensing requirements and limited working capital.

The regression analysis showed that education level of the household head, sex of the household head, access to market information, cooperative membership, quantity of teff produced, and extension contact were positively associated with the quantity of teff supplied to the market, whereas distance to the nearest market was negatively associated with supply. Access to credit, off-farm income, livestock ownership, equine ownership, land allocated to teff, farming experience, and family size were not statistically significant at the reported conventional levels.

The sample distribution was as follows

Kebele	Teff-producing households	Proportion	Sample households
Sedan Kite	496	0.15	21
Guto Meti	1585	0.45	68
Cheka Dimtu	809	0.23	35
Tulu Sangota	610	0.17	26
Total	3500	1.00	150

Characteristics of Sampled Producer Households

Variable	Mean	SD	Minimum	Maximum
Age (years)	39	8.54	20	58
Education (years)	3.71	2.55	0	8
Family size (persons)	3.09	2.13	1	9
Teff-farming experience (years)	27.56	9.28	8	52

Source: Own survey, 2026.

Characteristic	Category	N	Percent
Sex	Male	128	85.33
	Female	22	14.67
Marital status	Single	6	4.00
	Married	138	92.00
	Widowed	2	1.34
	Divorced	4	2.67
Religion	Protestant	126	84.00
	Orthodox	16	10.67
	Muslim	8	5.33

Socioeconomic Characteristics

Variable	Mean	SD	Minimum	Maximum
Livestock holding (TLU)	8.6	4.09	3	18.37
Land holding (ha)	2.91	1.57	0.63	8
Land under teff (ha)	1.3	1.11	0.57	4

Source: Own survey, 2026.

Household Asset Ownership

Asset	Number of households	Percent
Land owned	150	100
House owned	150	100
Livestock	137	91.33
Plowing tool	150	100
Honey-bee colony	72	48

Source: Own survey, 2026.

Institutional Characteristics

Institutional characteristic	Access (%)	No access (%)
Credit service	44.57	55.43
Market proximity/access	76	24
Market information	47.07	52.93
Extension contact	82	18

Source: Own survey, 2026.

Characteristics of Teff Traders

Variable	Mean	SD	Minimum	Maximum
Age (years)	38.5	7.46	28	49
Family size	3	1.65	1	6
Teff trading experience (years)	23.96	5.01	16	32
Education status	4.67	0.6	5	12

Source: Own survey, 2026.

Physical asset	N	Percent
Purchase place	18	72
Bicycle	7	28
Motorcycle	12	48
Pack animal	4	16
Animal cart	2	8
Vehicle	8	32
Resident store	25	100
Separate store	25	100
Mobile phone	25	100
Hand-pulled cart	2	8
Weighing scale	25	100

Source: Own survey, 2026.

Determinants of the Quantity of Teff Supplied to the Market

Variable	Coefficient	SE	t-ratio	p-value	Significance
Education level of household head	0.179	0.08	2.1	0.01	**
Sex	1.76	0.63	2.8	0.0	***
Access to market information	1.42	0.58	2.45	0.01	**
Access to credit	0.85	0.6	1.41	0.14	NS
Cooperative membership	1.71	0.69	2.51	0.01	**
Distance to nearest market	-0.19	0.09	-1.91	0.05	**
Off-farm income	0.56	0.45	1.23	0.12	NS
Livestock ownership	-0.02	0.05	-0.45	0.39	NS
Ownership of equines	0.33	0.29	1.12	0.21	NS
Land allocated to teff	-0.2	0.14	-1.45	0.08	NS
Quantity of teff produced	0.61	0.04	14.19	0.0	***
Teff-production experience	0.03	0.02	1.33	0.3	NS
Number of extension contacts	0.1	0.05	1.9	0.05	*
Family size	0.234	0.1	1.51	0.4	NS
Constant	1.05	2.2	0.48	0.26	NS

Notes: Dependent variable = quantity of teff supplied to the market; N = 150; R^2 = 0.79; adjusted R^2 = 0.77. ***, **, and * denote statistical significance at 1%, 5%, and 10%, respectively. NS = not statistically significant. Source: Own survey, 2026.

Recommendations

• Strengthen agricultural extension services so that producers receive practical information on production, post-harvest management, quality, and marketing.

• Improve access to reliable and timely market-price information through extension networks, cooperatives, mobile communication, and local market information systems.

• Strengthen teff producer cooperatives so that members can improve access to inputs, information, collective marketing, and bargaining opportunities.

• Improve rural roads and market infrastructure to reduce transportation time and marketing costs, particularly for producers located far from market centers.

• Improve access to appropriate financial services and working capital for producers and legitimate market entrants.

• Promote transparent and competitive market practices and strengthen coordination among producers, cooperatives, traders, and relevant public institutions.
• Future studies should use larger samples and, where possible, panel or longitudinal data to strengthen inference about factors affecting market supply.

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Data Availability

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Ethics Approval and Consent to Participate

According to the original study, ethical clearance/official authorization was obtained from the West Shewa Zone administrative office and relevant district and sub-district authorities before data collection.

Participants were informed about the purpose of the study and the identity of the researcher. Participation was conducted with attention to participants' interests.

Conflict of Interest

The author declares no conflict of interest.

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