

Full Length Research Paper

Market Channel Choices in Communal Vegetable Production: A Logistic Analysis of Determinants in Zimbabwe's Chinamhora District

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Communal vegetable production is a key activity in Zimbabwe, contributing significantly towards food security and rural development. A study carried out in Chinamhora District determined factors influencing tomato market channel choices. Primary data were collected through formal interviews and questionnaires included household and production characteristics, markets information and social capital. Interviews with buyers provided information on prices and farmer-market relations. The logistic model was used to analyse determinants of market choices. The study revealed that informal markets are more accessible than formal markets and produce price was the major determinant of market channel choice. Thus, informal markets offer great prospects for the development of communal farmers. The study recommended that farmers should develop effective mechanisms for collaboration and linkages and invest in market intelligence for them to improve their livelihoods.

Key words: Communal, horticulture, formal, informal, market choice, typology.

INTRODUCTION

Smallholder agriculture is likely to remain the major engine for rural growth and livelihood improvement for some time in most of sub-Saharan Africa (Dorward et al., 1998). Farmers have realised the potential that vegetable production has in improving their lives through increasing farmers' access to cash to spend on clothes, school fees, inputs and promoting farm production. Vegetable production therefore ensures food security, employment and income generation in rural areas, thereby reinforcing the overall development and poverty reduction goals in most countries (Heinemann, 2002). Over the last decade, Zimbabwe's smallholder horticultural production expanded with the vegetable sector taking a lead. About 60% of all locally marketed vegetables are produced by communal farmers, contributing between US\$150 and 200

million (Ministry of Lands, Agriculture and Rural Development, 1991). Support programs by the government, non-governmental organisations and the private sector played key roles in addressing production constraints; while the programs have improved production, marketing of the produce remains a major challenge. Smallholder farmers' participation in markets is limited by structural and technological factors. According to Dorward et al. (1998), Freeman and Silim (2001), IFAD (2003), Jayne et al. (2002), Kherallah and Kirsten (2002) and Killick et al. (2000), the problem of market access is linked to farmers' inability to meet market standards, low volumes of produce, wide dispersion of producers, presence of middlemen and perceived low prices in the formal market. Gender, educational levels, lack of information and ethnicity are also barriers to market access. Thus, lack of market information can be hypothesized as the major determinant of market channel choice. However, in order to empirically determine which factors influence market channel choice, a study of this

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Table 1. Parameter estimates of the logit regression model for the determinants of market choice.

Market choice	Coefficient	Std. err	P>z
Gender	-0.127722	0.1761695	0.431
Age	-0.0001592	0.0075098	0.174
Education	-0.0488542	0.0270457	0.599
Training	0.1001571	0.1272783	0.516
Experience	0.0116857	0.0085885	0.462
Produce price	-0.1735193	0.3304043	0.009***
Family size	0.0170272	0.0262121	0.041
Non- farm income	-0.0000342	0.0000465	0.415
Farm size	0.0390994	0.0148704	0.074*
Cooperative member	-0.3672905	0.2055635	0.027
Extension	-0.1053333	0.1951804	0.601
Access to supermarkets	0.0840146	0.3286458	0.857
Mobile phone	-0.1174953	0.1907813	0.066*
Production cycles	-0.0113891	0.063335	0.145

* 10% significance level, ** 5% significance level and *** 1% significance level.

nature became imperative.

Therefore main objective of the study was to determine the factors which influence market choice by communal farmers.

RESEARCH METHODOLOGY

Study areas

The research was carried out in Chinamora District. The area is readily accessible by road. Most of the horticultural produce from Chinamora is sold at the Mbare Fresh Market Produce, 2 km south of Harare City Centre. On average, 75 tons of horticultural produce is marketed through this market daily, with tomatoes, leaf vegetables and onions being the main products (Food and Agricultural Organization, 2001). Prices are determined by the price discovery system, and so are subject to daily fluctuations.

Data collection and analysis

Interviews and structured questionnaires were administered to 120 tomato farmers in a two-stage sampling procedure. In the first stage, vegetable growing areas were identified. In the second stage, households were stratified and randomly selected based on lists of tomato growers provided by extension workers in the areas. Administered questionnaires and surveys provided information on farmers' household characteristics, market channels, vegetable production characteristics, social capital, and access to markets and infrastructure. Factors influencing market choice were analysed using a two stage econometric analysis approach. In the first stage, the logistic regression model evaluated the determinants of market channel choice (Y) by farmers. Farmers' market choice was the dependent variable. If farmers accessed formal markets, Y = 1; if they accessed informal markets, Y = 0. The regression model showing the probability that farmers make a decision to supply the formal market is:

$$\text{Prob}(Y = 1) = (1/1+e^{-BX}).$$

The equation is a logistic cumulative distribution function where:

$$B'X = B_0 + \sum B_i X_i + V_i$$

Where: e = natural logarithm, B₀ = intercept term, B_i = vector of coefficient, X_i = vector of explanatory variables (shown in the equation as follows):

V_i = error term.

The dependent variable is binary. Dependent variable: level of adoption (formal = 1 and informal = 0):

$$(1) M_k = \beta_0 + \beta_1 \text{gender} + \beta_2 \text{age} + \beta_3 \text{education} + \beta_4 \text{Training} + \beta_5 \text{Experience} + \beta_6 \text{price} + \beta_7 \text{family size} + \beta_8 \text{non-farm income} + \beta_9 \text{farm size} + \beta_{10} \text{greenhouse} + \beta_{11} \text{transport} + \beta_{12} \text{cooperative membership} + \beta_{13} \text{extension} + \beta_{14} \text{credit} + \beta_{15} \text{access to support} + \beta_{16} \text{access to processor} + \beta_{17} \text{production cycle} + \beta_{18} \text{marketing risk} + \beta_{19} \text{mobile phone} + u$$

Where: β_0 is the intercept term, β_1 to β_{19} are the unknown parameters to be estimated, and M_k is the market channel choice.

RESULTS AND DISCUSSION

Econometric modelling of the determinants of market choice

Mobile phone ownership significantly determined market choice (p<0.10) (Table 1). Farmers with mobile phones were likely to participate in the informal markets. They were most likely to get real time market prices, given that informal markets have flexible prices compared to formal markets. Producer prices influenced farmers' markets choice. Farmers received higher prices from the informal market than from the formal market. This is true for farmers who are good negotiators. Although, education

level was insignificant, it was negatively related to market channel choice, with the more knowledgeable farmers likely to participate in the formal market. Farmers who have more education tend to be good negotiators and are risk averse. They can gather and understand production and marketing information so that they can adjust their production and marketing systems according to the different market demands. Farm size was positively related to market choice. Farmers with more land were more likely to participate in their current marketing channel. Farmers with more land had the capacity to grow more tomatoes, and could stagger their production to ensure all-year supply of tomatoes to supermarkets. Cooperative membership significantly determined smallholder farmers' participation in markets, with cooperative members less likely to participate in the formal markets ($p < 0.10$). This is contrary to the conventional assumptions that collective action enables small farmers to attain economies of scale and reduce specific transaction costs. A possible explanation for this may be that most cooperatives in this study area are bound more by social motives rather than business goals. In most cases, cooperatives are formed around development circles with the government taking the lead, forcing individuals into groups to ease coordination of development programs. The majority of the farmers market their produce as individuals, which is a clear sign that there is little collective action among farmers in marketing produce. Therefore, cooperative membership may influence production strategies and not marketing strategies. Another possible explanation is that most formal markets usually deal with individual farmers.

Most supply contracts are entered into between the market and an individual for the sake of accountability. Most smallholder farmers' cooperatives do not have a legal mandate to do transactions on behalf of farmer thus formal transaction between cooperative and formal markets are a less likely event. Market risk significantly determines market choice ($p < 0.01$). Market risk size is positively related to market channel choice, with farmers with more marketing channels likely to participate in formal marketing channels. Farmers who are risk averse supply supermarkets, an assured market for their tomatoes. Tractor ownership, proximity to supermarkets and production cycle were not significant determinants of market choice. Farmers who own tractors are expected to participate in formal markets given their perceived ability to produce over a large area and most likely throughout the year. Thus, they are like to meet the quantity, and maintain consistency demanded by formal markets. The study revealed a negative relationship between tractor ownership and participation in formal market. A possible explanation for this is that 60% of farmers in the Chinamora grow tomatoes on less than half an acre which means land preparation can be done without the use of tractors.

Also, farmers with tractors incur more production costs

and would need to sell their produce at higher prices to cover their operation costs. They are likely to sell to hawkers whose prices are flexible and more favourable than formal market prices where prices are stagnant.

Conclusion

The logit regression analysis showed that producer price was the major determinant of market choice among farmers. Other factors such as ownership of cell phone significantly determine the market choice. This study recommends that farmers should develop effective mechanisms for collaboration and linkages, invest in market intelligence, and create a sea change in thinking and practice, and building trust. This will enable them to enhance their bargaining power on prices. Farmers should expand farm sizes and also access mobile phones since such assets significantly influence market channel access. Farmers are encouraged to join cooperatives to enhance their chances of accessing critical production inputs and the government should provide extension services to improve vegetable production.

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