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ANALYSIS OF FACTORS AFFECTING MARKETING CHANNEL CHOICE BY SMALLHOLDER FARMERS IN AFGHANISTAN

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ABSTRACT

This study aimed to analyze factors affecting marketing channel choice by onion smallholder farmers in the Parwan province of Afghanistan. The study used a random sampling technique for data collection, both primary and secondary sources were used. Primary data were collected through face-to-face interviews from 104 onion small-scale farmers in three main districts of Parwan province producing a high quantity onions. Data were analyzed through descriptive statistics such as mean, standard deviation, minimum and maximum. Multinomial Logistic Regression model (MNL) was used to analyze factors affecting marketing channel choice of onion smallholder farmers in Parwan province. The result of the study revealed that farmers sold their products to three main channels, which were: brokers at farm-gate, traders, and direct sale to Kabul market. Over 60% percent of the respondents sold to brokers at farm-gate, while, the rest of the farmers sold to Kabul market and traders' market channels accounted for 29.8% and 17.3% of total respondents, respectively. The multinomial logistic regression result indicated that farmers having a high level of education producing a high quantity of onion and having access to transportation facilities were more likely to sell to the Kabul market relative to the brokers' channel. Also, educated farmers producing a high quantity onions, and having access to information and storage facility were more likely to sell to traders rather than brokers. Moreover, the probability of choosing brokers increased when farmers had another source of income and faced long distances to market.

Keywords: *Smallholder farmers, Marketing Choice, Value Chain, Afghanistan.*

INTRODUCTION

The agriculture sector makes important contributions to the growth of the economy, food security, poverty reduction, employment creation, and the fiscal health of the nation. In Afghanistan, 72.4 percent of the population lives in rural areas (FAO, 2017). The vast majority of Afghanistan's farms are small, 60 percent of total farms are smaller than 1 hectare, and 90 percent are smaller than 5 hectares (World Bank, 2014). Accordingly, the majority of farmers are smallholders, hence

among smallholder farmers marketing plays a critical role in meeting the overall goals of food security, poverty alleviation, and sustainable agriculture in most developing countries (Altshul, 1988). Access to the market for smallholder farmers is crucial in increasing rural income and eradicating poverty. Channel choice decision is the important part of marketing agricultural products, on the other hand, channel choice decisions are among the most critical decisions facing any individual or an organization. The chosen channels intimately affect all other marketing decisions (Berry, 2010). Furthermore, onion smallholder farmers in Afghanistan are facing with lack of information about product prices and lack of access to credit (CARD-F, 2013). These problems in the form of market institutions are the most significant constraints, avoiding smallholder farmers from risk-taking and market engagement. This results in farmers having low bargaining power and mostly price takers rather than price setters. Powerful actors within the onion value chain manipulate prices and costs to their advantage (SLRC, 2014). Also, the onion market displays considerable price volatility, making it very risky and uncertain for smallholder farmers to engage.

Practically if farmers have a bearing on the profit, which they may make, they will use marketing channel to sell the products. Hence the profit should then drive the choice of marketing channel (Muthini et al., 2015). This is not often the case in Afghanistan. However, it is not clear what factors drive farmers' choice of marketing channel decision. There have been many studies on the choice of a marketing channel for vegetables in developing countries. Xaba and Masuka (2012) on vegetable in Swaziland, Bezabih Emanu (2015) on potato producers in Ethiopia, Ferto and Szabo (2002) on Hungarian vegetable and many more. These authors determined various factors as institutional, technical and socio-economics, which influence channel choice decisions. Unfortunately, there has been no study has conducted in Afghanistan. This study, therefore, seeks to provide the first empirical information decision-making process of farmers on market channels.

The main objective of this study is to analyze factors affecting the choice of marketing channel by onion smallholder farmers in the Parwan province of Afghanistan.

MATERIALS AND METHODS

Data

The target population for collecting primary data was all smallholder farmers engaged in onion production in Parwan province. A sample of 104 farmers was randomly selected from the three major districts (Charikar, Jabulsaraj and Bagram) for onion production in August 2017. This study used multiple stages random sampling method and both primary and secondary data sources. Primary data were collected through personal face-to-face interviews with the aid of a semi-structured questionnaire consisting of both open and closed-ended questions. Demographical characteristics of households, Choice of marketing channels by households, Institutional factors, and socio-economics factors that influence the decision of marketing channel choice by households are the main four parts that the

questionnaire consisted. The Department of Agricultural Economics and Farmland Management reviewed the questionnaire to confirm its validity.

Collected data were analyzed using the SPSS statistical package (version 19.0) software. Descriptive Statistics such as means, percentage, standard deviation, minimum, maximum, and frequency were used. The Multinomial Logistic Regression model was applied to analyze factors affecting the choice of a marketing channel by onion smallholder farmers.

Analytical Framework and Empirical Model

The multinomial logistic regression (MNL) is used to relate the decisions to participate in the different channels and the factors that affect these choices. The model multinomial logit is widely used in studies involving multiple choices that define dependent variables (Gujarati and Porter, 2009). The multinomial logit model is also a standard method for unordered and multi-categorical dependent variables that assume independence across the choice. It does not allow correlation or substitution between variables (Wooldridge, 2012). The independent variables can be either dichotomous (dummy) or continuous (ratio in scale). In this study, the multinomial logistic regression was employed to analyze factors affecting marketing channel choice by onion smallholder farmers in the Parwan province of Afghanistan.

The general form of the multinomial logistic regression model is:

$$\Pr(y_i = j) = \frac{\exp(x_i\beta_j)}{1 + \sum_{j=1}^J \exp(x_i\beta_j)} \dots\dots\dots$$

(1)

And to ensure identifiability,

$$\Pr(y_i = 0) = \frac{1}{1 + \sum_{j=1}^J \exp(x_i\beta_j)} \dots\dots\dots$$

(2)

Where i^{th} is individual, y_i is the observed outcome, X_i is a vector of explanatory variables and β_j is a vector of regression parameter estimates associated with alternative j.

The model for this study was summarized following Greene (2003), assuming that the probability of the i^{th} farmer chooses the j^{th} of three choices or channels is P_{ij} , the probability that a smallholder farmer chooses alternative j can be explained as;

$$P_{ij} = \frac{\exp(x_i\beta_j)}{1 + \sum_{j=1}^3 \exp(x_i\beta_j)} \text{ (For } j = 1, 2, 3)\dots\dots\dots$$

(3)

P_{ij} is the probability of being in each of the groups 1 and 2.

$$P_{i0} = \frac{1}{1 + \sum_{j=1}^3 \exp(x_i\beta_j)} \text{ (For } j = 0)\dots\dots\dots$$

(4)

P_{i0} is the probability of being in the reference group or group 0.

When using the model, the coefficients of the reference group are normalized to zero (0), hence, for three choices only (3-1) distinct sets of parameters can be

identified and estimated (Greene, 1993). Estimated coefficients measure the estimated change in the MNL for a one-unit change in the predictor variable while other variables are held constant. The sign of the estimated coefficient indicates the direction of the influence of the variables. A positive estimated coefficient implies and increases the likelihood that onion farmers will choose the alternative marketing channel. A negative estimated coefficient indicates there is less likelihood that an onion farmer will change to an alternative channel.

The natural logarithms of the odds ratio of equations (1) and (2) give the estimating equation (Greene, 1993) as:

$$\ln = \frac{P_{ij}}{o_{i0}} (x_i \beta_j) \dots \dots \dots (5)$$

This equation indicates the relative probability of each of the groups 1 and 2 to the probability of the reference group. The estimated coefficient for each choice, therefore, reflects the effect of Xi's on the likelihood of the farmers choosing that alternative relative to the reference group.

In this model, market channel choice represents the dependent variable, (selling to brokers at farm-gate, selling to traders, and direct sale to Kabul market), where selling to brokers has been set as the reference group. By fitting explanatory variables into the multinomial logistic regression model, the model presented:

$$P_{ij} = \beta_0 + \beta_1 AGE + \beta_2 EDU + \beta_3 FRMEXP + \beta_4 OTHINC + \beta_5 MRKINFO + \beta_6 STRG + \beta_7 DSTMRK + \beta_8 QNT + \beta_9 MRKCST + \beta_{10} TRAN \dots \dots \dots (6)$$

Variables (Dependent and independent)

In this study, the marketing channels represent a dependent variable, the alternatives of onion smallholder farmers for the choice of marketing channel described as selling to brokers at farm-gate, selling to traders at the local market, and direct sale to the Kabul international market. Hence, the dependent variable for the model is a discrete variable taking a value of (1, 2, 3). The alternative channel “selling to brokers” had been set as the reference group because this channel was chosen by most of the farmers accounting for about 52% of total respondents. Therefore, the model used to assess the odds of selling to traders at local market compare to selling to brokers at farm-gate and direct sale to Kabul market against selling to brokers’ market channel.

The independent variables (explanatory) and their expected relationship with dependent variables are described in Table 1. A positive sign for the estimated coefficient indicates a higher likelihood of choosing the alternative channel over the base category as that explanatory variable increases and a negative sign indicates a decrease in the likelihood of choosing the alternative channel over the base category as that variable.

Table 1. Description of dependent and independent variables used in MNL model

Dependent variable				
Variables	Description	Measurement		
Marketing channels for onion	Selling at farm-gate or direct sale to Kabul market	1=selling to brokers at farm-gate 2=selling to traders at local market 3=direct sale to Kabul market		
Independent Variables				
Variables	Description	Measurement		Exp. sign
AGE	Age of household head	continuous	Years	-/+
EDU	Education of household head	Dummy	1=Yes, 0=No	+
FRMEXP	Farming experience of household head	continuous	Years	+
OTHINC	Another source of income	Dummy	1=Yes, 0=No	-
MRKINFO	Market information about the price	Dummy	1=Yes, 0=No	+
TRAN	Possession of transport	Dummy	1=Yes, 0=No	+
STRG	Access to storage facility	Dummy	1=Yes, 0=NO	+
DSTM RK	Distance to Kabul market	Continuous	Kilometer	-
QNT	Quantity of onion for sale	Continuous	Ton	+
MRKCST	Cost of marketing	Dummy	1=Yes, 0=NO	-

*Source: Survey of 104 onion smallholder farmers

RESULT AND DISCUSSION

Socio-economics characteristics of sampled household

Age, education, farming experience, another source of income, the quantity of Onion for sale distance to market, and cost of marketing, therefore, selected to determine factors affecting marketing channel choice (Table 2).

Table 2. Summary of socio-economic characteristics of households' heads

Variable	Mean	S.D	Min	Max
Age (Years)	47.5	12.1	21.0	73.0
Education (Years)	3.5	4.8	0.0	16.0
Farming experience (Years)	30.9	12.0	5.0	58.0
Other source of income (prs)	0.43	0.49	0.0	1.0
Family member (Person)	8.5	2.8	3.0	14.0
Total Land size (Hectare)	0.7	0.5	0.2	3.3
Land size under cultivation of onion (Hectare)	0.4	0.2	0.1	1.0
Quantity produced (Ton)	20.0	15.0	3.0	70.0
Distance to Market (Km)	63.0	7.5	54.0	76.0
Cost of Marketing (Channel)	0.5	0.5	0.0	1.0

*Source: Field survey 2017

Multinomial Logistic Regression Result for Factors Affecting Marketing Channel Choice

The independent variables that were considered for this model tested for their significance. The multinomial logistic regression results on traders' market channel and Kabul market channel choice were compared to brokers' market channel and are presented in Table 3. The result shows the estimated coefficient (β values), significant value, and exponential betas (odds ratio) of the independent variable in the model. The result of Cox and Snell R^2 shows that 71% of the variation in the choice of marketing channel was the result of the independent variable. The log-likelihood and chi-square statistics indicate that the model is adequate to explain the relationship between an explanatory variable and farmers' choice of marketing outlets.

The level of education (*EDU*) was significant and has a positive relationship with the likelihood of choosing traders and the Kabul market at a 5 percent level of significance as expected compared to the base category (brokers). Farmer with more level of education are more likely to choose Kabul International market and traders at the local market channels over the farm-gate channel.

Another source of income (*OTHINC*) has a negative sign as expected. The odds of selling to the Kabul market channel were 0.044 times less than those of selling to brokers at farm-gate. Thus, the odds of selling to brokers at farm-gate would increase by the presence of another source of income.

The variable of the quantity of onion produced (*QNT*) was significant ($p < 0.05$) with a positive sign traders market channel and Kabul market channel compared to

brokers at farm-gate. The possible reason is that farmers with a high quantity of products will afford transportation costs to the Kabul market and transaction costs of selling to traders.

Table 3. Factors affecting marketing channel choice by onion smallholder farmers

Variable	Traders			Kabul Market		
	Coef.	Sig.	Exp()	Coef.	Sig	Exp()
Intercept	27.176	0.030		26.174	0.031	
AGE	-0.096	0.673	0.908	-0.143	0.507	0.867
EDU	3.441	0.053**	31.219	3.529	0.035***	34.106
FRMEXP	-0.057	0.810	0.944	-0.024	0.916	0.976
OTHINC	-20.922		8.200*10 ⁻¹⁰	-3.119	0.090*	0.044
QNT	0.578	0.021**	1.782	0.543	0.029**	1.721
MRKCST	-0.624	0.638	0.536	19.196		2.170*10 ⁸
DSTM RK	-0.519	0.008***	0.595	-0.457	0.015**	0.633
TRAN	-1.271	0.341	0.281	3.345	0.018**	28.349
STRG	4.312	0.003***	74.613	0.222	0.829	1.248
MRKINFO	4.623	0.003***	101.755	1.413	0.302	4.106

*Source: Field Survey 2017

1. Cox and Snell $R^2 = 0.716$; Nagelkerke $R^2 = 0.828$; McFadden $R^2 = 0.628$; -2loglikelihood = 77.421; Chi-square = 130.85; $df = 20$; $p=0.0000$
2. *** Significant at 1%, ** Significant at 5% and * Significant at 10%
3. The reference group (Base category) is (2) selling to brokers at farm-gate

The likelihood of choosing the Kabul market channel was positively and significantly ($p<0.05$) affected by access to better transportation (*TRANS*) at a 5 percent level of significance. This result indicates that households with better access to transportation or those who possessed a vehicle are more likely to travel and sell at the Kabul market channel in comparison to brokers at farm-gate.

Distance to market (*DSTMRK*) has a significant and negative relationship with the likelihood of choosing traders at a 1 percent level of significance. It also has a significant and negative relationship with the likelihood of choosing the Kabul market channel outlet at a 5 percent probability level as presented in Table 3. The result indicates that producers who face the longest distance to the market choose the farm-gate channel among others relative to the base category. The possible explanation might be related to the limitation on access and cost of transportation and bad road condition in which farmers want to sell to brokers at farm-gate.

A positive and significant ($p < 0.01$) relationship was found between traders' market channel and access to a storage facility (*STRG*) as expected. Thus, the odds of selling onions to traders' market channels will increase with the presence of a storage facility.

The variable of market information (*MRKINFO*) is positively associated with a higher probability of selling to the trader's market channel as opposed to the broker's market outlet at a 1 percent level of significance. The traders usually pay a high price for the products. Therefore, farmers with information about prices will sell to traders more likely.

CONCLUSION

This study revealed that onion producers in Parwan province face three major channels; brokers, traders, and direct market. Majority of farmers sold to brokers at the farm-gate while traders account for the smallest percentage of farmers. Based on the result of multinomial logistic regression, among ten selected socio-economic and institutional factors, six factors significantly affected the choice of marketing channel. The factors education (*EDU*), the quantity of onion produced (*QNT*), and access to transportation (*TRANS*) significantly affect the probability of choosing Kabul Market over brokers' market channel. Having education (*EDU*), quantity of onion (*QNT*), market information (*MRKINFO*), and access to a storage facility (*STRG*) significantly affected the probability of choosing traders over a broker's market channel. Moreover, the factors market distance (*MRKDIS*) and another source of income (*OTHINC*) significantly affected the probability of brokers over traders and the Kabul market.

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