

# Factors influencing Effectiveness of Niger Seed Market Channels of Selected Primary Agricultural Multipurpose Cooperatives in Abay Chomen District, Oromia Regional State, Ethiopia

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**Abstract-** The total earning from the oilseeds business particularly from the export market of niger seed has increased over the past few years. However, the gain from the business is not fairly distributed and does not properly reach to the primary producers. The objective of the study was to explore key factors influencing the effectiveness of the niger seed market channels of selected primary agricultural multipurpose cooperatives in the study area. Multi-stage sampling technique was used to select the study area and 145 respondents selected using Kothari formula from four purposively selected cooperatives. The data were collected through the survey interview schedule, checklist for focus group discussions and key informant interviews. Binary logistic regression model was employed to analyze the data using SPSS version 16.0. Accordingly binary logit model, variables such as members trust on their cooperatives, access to training and market transparency were found to be the major positively influencing and the significant ones at less than 1% probability level and variables like dividend refund, price of produce, mode of selling and professional management were significant at less than 5%. From the significant variables, variables like price of produce, mode of selling and distance from cooperative market were negatively influencing the effectiveness of niger seed market channels. As per the findings indicated that greater attention should be given by all stakeholders to further improve and maintain the niger seed market channels effectiveness in cooperatives by improving the adverse influence of practices of variables such as members trust on their cooperatives, access to training and market transparency, dividend refund, price of produce, mode of selling and professional management problems in the future intervention which are aimed at for improving the effectiveness of niger seed market channels of cooperatives in the study area .

**Index Terms-** Cooperatives, Effectiveness, Market channels, Niger seed

## I. INTRODUCTION

An estimated 2.5 billion households are involved in agriculture, of which 1.5 billion households are in smallholder farming (World Bank, 2008). According to the same source Africa's contribution to the world, agricultural output was 6.35% (about 133.1 quintals (FAO, 2007)). According to Balasubramanian (2007), agriculture in Ethiopia continues to be the leading sector and in turn smallholder agriculture sub-sector continues to dominate this sector. The Niger seed species constitutes approximately 50% of Ethiopian. Niger seed in Ethiopia is widely grown by smallholder farmers on fragmented land holdings.

There is also large demand for it in the domestic economy since it is used to produce edible oil and oilcake. The total earning from the oilseeds business, particularly from the export market, has increased over the past few years. However, the gain from the business is not fairly distributed and does not properly reach to the primary producers who find them at the end of an extended market channel. The primary producers have no proper access to the final market and marketing and distribution of oil seeds are mainly done by small and medium scale traders with poor marketing facilities, especially for collection, storage and transportation, which cause high post-harvest losses. The marketing channel is long with many intermediaries adding little value to the final product with high transaction costs being incurred. This has been a cause for substantial income loss of the majority of farmers and lacked knowledge on how to add value through partially or fully processing the oilseed products before it is supplied to the market. As niger seed is one of the cash crops of the areas, organizing agricultural multipurpose cooperatives societies has become mandatory to solve market related problems. In order to overcome market failures and to cope with changes in the market environment many developing countries including Ethiopia are returning to agricultural cooperatives (Nicola,

2009). This is due to the fact that cooperatives can reduce transaction costs and improve the bargaining power of smallholder farmers’ visa-a-vis increasingly integrated markets.

In principle, cooperatives members are supposed to sell their produce to primary cooperatives, primary cooperatives sell to cooperative unions. However, from own experience and observations cooperatives members are selling their produce more to small traders than cooperatives in the study area. However, the effectiveness of niger seed market channels in cooperatives was not grasped in these previous studies and they do not represent the situation in all regions. To increase farmer members’ access to their cooperatives market, researchers and development practitioners need to understand how the niger seed market channels in cooperatives are characterized in operating more effectively and the factors influencing the effectiveness of this market channel. This research was attempt to empirically examine the above issues and helps to bridge the existing information gap by generating empirical evidences. Therefore, the objective of the study was focused on exploring factors influencing the effectiveness of niger seed market channel in selected primary agricultural multipurpose cooperatives in the Abay Chomen District, Oromia regional State.

## II. METHODOLOGY

### Study Area and Sampling Techniques

In this study multi stage sampling was employed to select the study area and the sampled cooperatives. From 4 selected primary agricultural multipurpose cooperatives with the total number 1,397 of the members in a representative manner to increase its validity and reliability of the study 145 respondents were selected by Kothari (2004) sampling design formula.

$$n = \frac{z^2 * p * q * N}{e^2(N-1) + z^2 * p * q}$$

Where; **n**= sample size, **N**= total population of the sample frame (1,397), **z** = 95% confidence interval level under normal curve (1.96,) and **p** & **q** are estimates of the proportion of population to be sampled. Then, **P**= proportion of population to be included in the sample 12% of the 1,397 total population.

This study used both primary and secondary data. Survey design method was adopted to collect the data because survey is relatively inexpensive, well suited for simple and short questions and easier to analyze using SPSS (Punch, 1998) to address the objective of the study. Major tools for data collection were semi structured schedules for respondents, focus group discussion and key Informant Interview guided by checklist. Likewise quantitative data were also collected through distributing questionnaires to all sampled respondents under the study, which were the total of 145 cooperatives members’.

### Method of Data Analysis

Data were analyzed using binary logit econometric model through computer soft ware statistical package for social science (SPSS-version 16) at confidence level of 95% and  $\chi^2$  of association was used to test the association between the independent and dependent variables.

### Theoretical framework

Binary logistic is a useful way of describing the relationship between one or more independent variable, as a probability that has only two categorical values. The dependent variable in this study is dummy variable which take the value of one or zero depending on whether the niger seed market channels in selected cooperatives is effective or not. However, the independent variables were either dummy or continuous.

Therefore, binary logistic regression model was employed to analyze the key factors influencing the effectiveness of niger crop market channels in cooperatives. The estimated model is:

$$P_i = F(z_i) \dots \dots \dots (1)$$

$$z_i = \sum_{j=1}^m \beta_j x_{ji} = \log\left(\frac{p}{1-p}\right) = \alpha + \beta_1 X_{i1} + \dots + \beta_m X_{im} + \dots \dots \dots (2) \text{(Engleman, 1981 and Gujarati, 1988). Where,}$$

$P_i$  is the probability that the niger seed market channel is effective, the binary variable,  $P_i = 1$  the niger seed market channel is effective and  $P_i = 0$ , for ineffective market channels).  $z_i$  = estimated variable for the  $i^{th}$  observation,  $F$  is the functional relationship between  $p_i$  and  $z_i$ .  $i = 1, 2, 3, \dots, m$  are observation on variables of effectiveness of niger seed market channel,  $m$  being the sample size 145.  $x_{ji}$  is the  $j^{th}$  explanatory variable for  $i^{th}$  observation



**Table 1: Definition of Variables included in the Empirical Model and their Hypothesized Sign**

Variables	Variable description	Measurement	Expected Sign
Effectiveness of Niger Seed Market channel	Dependent variable indicating value <b>1</b> if effective and <b>0</b> 'if ineffective channel	Dummy variable dependent variable	None
QUNPRO	Quantity produced in quintals	Continuous variable measured in quintals	+
LANH	Size of Land of house holding	Continuous variable measured in hectares	+
EXTSRV	Extension service	Dummy variable 1 = Yes 0 = No	+
CREDAC	Access to credit service	Dummy variable 1= Yes 0=No	+
AMINFCO	Access to market information	Dummy variable 1= Yes 0=No	+
PRICEPRO	Price of quantity produce	Continuous variable measured in ETB	-
AGEH	Age of household	Continuous variables measured in years	+
SEXH	Sex of households	Dummy variable 1=male 0=female	+
TRUSTC	Trust on cooperatives	Dummy variable 1=Yes 0= No	+
INCM	Income of households	Continuous variable measured in ETB	+
MODP	Mode of payment	Dummy variable 1= on cash 0= on credit	+
DISFROC	Distance from cooperative	Continuous variable measured in kilometer	-
TRANSP	Transparency	Dummy variable 1=Yes 0=No	+
ACSEDU	Access to member education	Dummy variable 1=Yes 0=No	+
ACTRAN	Access to training for boards	Dummy variable 1=Yes 0= No	+
TRFFCO	Access Transportation facility from cooperative	Dummy variable 1=Yes 0=No	+
STF	Storage facility	Dummy variable 1= yes 0=No	+
PMGT	Professional management	Dummy variable 1=Yes 0=No	+

Source: Hypothesized by the Author

III. ANALYSIS, RESULT INTERPRETATIONS AND DISCUSSIONS

4.2 Key Factors Influencing Effectiveness of Niger Seed Market Channels of Selected Primary Cooperatives

In the study effectiveness of niger seed market channels in cooperatives is expected to be influenced either positively or negatively by 17 factors including size, number of oxen, income

source, price of produce, market information, patronage refund, quantity produced, distance from cooperative market, mode of selling, access to storage facility service, transparency, professional management, access to credit service, access to training, access to education, members' trust, and access to extension service. Therefore, variables which were statistically significant in the binary logistic model and remain the best predictor of dependent variable were discussed hereunder.

Table 4.1: Parameters Estimates for Binary Logistic (Variables in the Equation)

		Coefficient( B)	S.E.	Wald	df	Sig.	Exp(B)
Step1	INCM	.331	3.761	.008	1	.930	.718
	DIVIR	2.020	1.020	5.370	1	.020**	13.891
	QUNPRO	.054	1.141	.002	1	.962	1.056
	OXENH	.151	1.604	.009	1	.925	.060
	PRICEOPRO	-2.808	1.268	4.901	1	.027**	11.601
	AMINFCO	.539	.938	.330	1	.566	.583
	TRFFCO	.320	1.223	.069	1	.794	1.377
	STF	5.977	3.641	2.695	1	.100*	2.149
	DISFROC	-2.197	1.291	2.897	1	.089*	9.007
	MOPS	-3.345	1.625	7.519	1	.042**	6.456
	TRUSTC	3.45	1.401	1.65	1	.000***	24.784
	ACTRAIN	2.126	1.681	2.673	1	.003***	21.881
	ACSEDU	.516	2.257	.052	1	.819	1.675
	CREDAC	4.344	1.297	1.702	1	0.091*	9.709
	EXTSERV	2.367	1.301	3.280	1	.070*	7.124
	PMGT	2.358	1.038	5.166	1	.027**	23.322
	TRANSP	4.513	1.626	4.038	1	.000***	23.671

a. Variable(s) entered on step 1: INCM, DIVIR, QUNPRO, OXENH, PRICEOPRO, AMINFCO, TRFFCO, STF, DISFROC, MOPS, TRUSTC, ACTRAIN, ACSEDU, CREDAC, EXTSERV, PMGT, TRANSP

Source: computed from survey data, 2014

Note: \*\*\*, \*\*, and \* is Significant at 1%, 5% and 10% probability level respectively

4.2.1 Analysis of Results from Logistic Regression Model

The influence of statistically significant variables are interpreted and discussed here under:

**Members' trust on their cooperatives (TRUSTC):** All the activities of the cooperative are carried out with the consent, trust and full participation of members in the cooperative market channels. Cooperatives lost trust by its members could not have effective market channel and thus cannot exist in competitive market environment. It was hypothesized that members' trust has positive influence on the effectiveness of niger seed market channels in cooperatives under the study. The result of the survey revealed that this variable is also positively associated with the independent variable and statistically significant at 1% (0.000, P-value <0.01) of probability level. This implies that the coefficient of Exp (β) value signifies that this members' trust on their

cooperative is a use full explanatory variable having positive influence on the effectiveness of niger seed market channels in cooperatives. According to the likelihood ratio, more the trust on cooperative, it is more likely an increase in the effectiveness of niger seed market channels in cooperative by 24.784 times, if other variables held ceteris paribus.

**Access to Training (ACTRAIN):** This variable is very crucial for the effectiveness niger seed market channels in cooperatives as it has positive influence on the effectiveness of niger seed market channels in cooperatives. In line with this hypothesis, this independent variable and effectiveness of niger seed market channels in cooperatives were positively associated and significant at level of 1% (0.003, p<0.01) probability level. As per the binary logistic regression result shown in the table 4.1 above, as training access increases, so also the effectiveness of

niger seed market channels of cooperatives increases by factor 21.881 times, if other variables are held constant.

**Transparency (TRANSP):** This variable is fundamental for efficient management of cooperatives, to promote homogeneity and limit free riding or opportunistic tendencies by members (Develtere et al. 2008). It is a dummy variable with value 1, if leaders are transparent; and 0, if not. The result of the survey revealed that this variable also positively associated with the independent variable and statistically significant at 1% (0.000, P-value <0.01) of probability level, which is dittoed by the coefficient of Exp ( $\beta$ ) value also. According to the likelihood ratio, the more the availability of transparency in cooperatives, the more effective will be the niger seed market channels in cooperatives, by a factor of 23.671, if other variables are held ceteris paribus.

**Dividend Refund (DIVIR):** Patronage dividend distribution is one of the promotional strategies that can encourage members' participation in cooperative activities. This variable is expected to positively influence the effectiveness of niger seed market channel in cooperatives. In line with this hypothesis, this independent variable and effectiveness of niger seed market channels in cooperatives were positively associated and significant at level of 5 % (0.020, P < 0.05). The Exp ( $\beta$ ) value signifies that this variable is a useful explanatory variable having positive influence on the effectiveness of niger seed market channels in cooperatives. As an increase in the availability of patronage dividend refund contributes to an increase in the likelihood of effectiveness of niger seed market channels in cooperatives by factor of 13.891, if other variables ceteris paribus.

**Price of produce (PRICEOPRO):** The price influence is one form of cooperative effect that the cooperative passes on the members' economy. So, charging similar or better price for members' niger seed produces increases marketing through cooperatives. This variable influenced the members to market through cooperative channels which decreases the effectiveness of the channels at the significance level of 5 % (0.027, p<0.05). Charging competitive price for quintals of members' seed increases the probability of effectiveness of niger seed marketing channel in cooperative. And its intensity by 11.60 is the likelihood ratio. This independent variable is hypothesized to influence positively the effectiveness of niger seed market channels in cooperatives. However, the survey result indicates negative influence on effectiveness of niger seed market channels in cooperatives. The implication is increasing in a unit likelihood ratio of the price from non-cooperatives market channels reduces the effectiveness of niger seed market channels in cooperative by a factor of 11.601, if other variables are held constant.

**Distance from cooperative (DISFROC):** This variable has negative influence on effectiveness of niger seed market channels in cooperatives and found to be statistically significant at less than 10% significance level (0.089, p-value <0.1). The negative relationship indicates that the farther is a household (cooperative members) from the cooperative market, the more difficult and costly it would be to get involved in the niger seed market channel in cooperatives. The influence also confirms that one-kilometer increase in cooperative market distance from the niger seed producers reduces the probability of effectiveness of niger seed market channels in cooperatives by 9.007, if other variables ceteris paribus

**Storage Facility (STF):** This independent variable and effectiveness of niger seed market channels in cooperatives were positively associated and significant at level of 10 % (0.100, p<0.1). The variable expected positive influence on the effectiveness of niger seed market channels in cooperative. The Exp ( $\beta$ ) value signifies that this variable is a useful explanatory variable having positive influence on the effectiveness of niger seed market channels in cooperatives. That is, an increase in the availability of storage facility for members contributes to the more likely increase in the likelihood ratio of the effectiveness of niger seed market channels in cooperative, by a factor of 2.149, if other variables are held constant.

**Mode of payment system (MOPS):** This independent variable and effectiveness of niger seed market channels in cooperatives were negatively associated and significant at level of 5 % (0.042, p<0.05). This implies that as the cooperative needs to purchase on credit the members' produce rather than on cash mode of purchasing; members decreased their sale proceeds through cooperative market channels. The Exp ( $\beta$ ) value signifies that this variable is a useful explanatory variable having negative influence on the effectiveness of niger seed market channels in cooperatives. This implies that as and when members sell their niger seed on credit to cooperatives, it will decrease the likelihood ratio of the effectiveness of niger seed market channels in cooperative by a factor of 6.456, if other variables are held constant.

**Access to Extension Service (EXTSERV):** This explanatory variable and the variable effectiveness of niger seed market channels in cooperatives (dependent variable) are positively associated and significant at level of 10% (0.070, p<0.1) probability level. The Exp ( $\beta$ ) value revealed that this variable is a use full explanatory variable having positive influence on the effectiveness of niger seed market channels in cooperatives, by a factor of 7.124 times, if other variables are held ceteris paribus.

**Credit Access (CREDAC):** The p-value is 0.091 (<0.10). This indicates that it is statistically significant predictor variable, which has a positive partial effect on the effectiveness niger seed market channels in cooperatives and the same holds true with its Exp ( $\beta$ ) value. Therefore, the null hypothesis which states that the more credit accessibility from cooperatives received, the more effective will be the niger seed market channels in cooperatives is not rejected since a unit increase in credit services has increased the likelihood of the effectiveness of the niger seed market channels in cooperatives, by a factor of 9.709, if other variables remain constant.

#### IV. CONCLUSION

The binary logistic regression model indicated that eleven variables included in this model were found to have a significant influence on the likelihood of the effectiveness of niger seed market channels in cooperatives. Accordingly, variables such as members trust on their cooperatives, access to training and market transparency were found to be the major influential and the significant ones at less than 1% probability level. From the study result it is possible to conclude that effectiveness of niger seed market channels in selected cooperatives requires set of services offered by the channels involving not only the factors, but also the provision of different services including member education and training in the study area, if not effective niger seed market

channel of cooperatives cannot be addressed. So, study on determinants of market channel preferences among niger seed farmers of cooperatives is necessary to maintain a competent market channels in cooperatives, which could be attempted by other prospective researchers in future.

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