academicJournals

Vol. 9(11), pp. 312-319, November 2017
DOI: 10.5897/JDAE2017.0849
Article Number: C4810EE66431
ISSN 2006-9774

http://www.academicjournals.org/JDAE

Journal of Development and Agricultural Economics

Full Length Research Paper

Determinants of potato seed market supply through producer cooperatives in Haraghe, Ethiopia

Alemayehu Oljira[1*] and Degye Goshu[2]

[1]Department of Agricultural Economics and Agribusiness Management, College of Agriculture and Veterinary Medicine, Jimma University, Jimma, Ethiopia.
[2]School of Agricultural Economics and Agribusiness, College of Agriculture and Environmental Science, Haramaya University, Ethiopia.

Received 27 May, 2017; Accepted 20 July, 2017

Seed producer cooperatives were initiated by the Integrated Seed Sector Development Program in five regions of Ethiopia including Oromia region since 2009 as an alternative mechanism to narrow the gap between seed supply and demand in the country. Seed marketing is one of the key activities of the program to satisfy the demand of farmers by providing quality seeds in the right place, at the right time and with the right price for sale. Therefore, this study was designed to analyze market performance of potato seed through producer cooperatives in Haramay, Kersa and Chiro districts of Oromia Regional State, Ethiopia by identifying factors affecting potato seed market supply and its intensity. Three stage sampling procedure was used to select potato seed producer households. In the first stage, kebeles in the three districts were categorized into two: those with and without Seed Producer Cooperatives. In the second stage, kebele administrations with Seed Producer Cooperatives were purposively targeted from each district. In the third stage, households in the sample kebeles were stratified into two: member and non-member households. Finally, all farm households who are members of Seed Producer Cooperatives (157) in the sample kebeles were included in the sample. The Tobit model was used to analyze the data. The result of the analysis indicated that Haramaya district, literacy status, family size, extension contact, households' perception to price offered by cooperatives and distance from cooperative market center are the significant factors affecting members' potato seed market supply through cooperatives. Based on the findings, policy interventions like cooperatives capacity building, providing adult education, awareness creation on family planning, provision of extension service and accessible cooperative market center are suggested and forwarded.

Key words: Intensity, marginal effect, seed producer cooperatives, Tobit model.

INTRODUCTION

Important inputs such as fertilizer, improved seeds and chemicals are either unavailable or their prices are usually high, making them very expensive and unprofitable to farmers to use. Seed security is one of the most important sociological, political, economic and scientific challenges in Ethiopia. Securing the supply of quality seed and planting material of the most important food crops is the most effective way to sustain food security. However, inefficient seed marketing and distribution system has resulted in limited use of improved seeds by the majority of Ethiopian farmers which further contribute to low agricultural production and

productivity (Atilaw, 2010).

In spite of decades of efforts by governments, the private sector and donors to strengthen the national seed sector, the seed situation in Ethiopia remains dismal. About 9% of farmer households use improved seed and slightly more than 5% of the total arable land is planted with improved seed. Even though the establishment of Ethiopian Seed Enterprise led to advent of organized seed production and supply system in the country, it remained the main supplier in the formal sector, the enterprise used to have a problem of carry-over stock, while the majority of farmers were unable to obtain improved seed. This problem was attributed to poor seed marketing, reaching the farmer and/or the inabilities of the enterprise to meet the farmers need in terms of varietal choice and product quality (ESE, 2010).

In Oromia region, improved varieties are only planted on 3.7% of the arable land under cultivation (Mesay, 2010). The Ethiopian Seed Enterprise (ESE) is only able to supply a very limited amount of improved seed to the farming community. This restricted use of both improved varieties and quality seeds contributes to low productivity. Therefore, such inefficient distribution channels calls for participation of cooperatives in seed production and marketing as an alternative mechanism to develop a more flexible structure for seed marketing which is believed to provide the demanded crop and variety type. It will provide the demanded variety, crop and type of quality. Such farmer-produced seed may contribute to meeting farmers' demands in a required quantity and time at reasonably acceptable seed price. Accordingly, seed producer cooperatives are initiated by the ISSD Program in five regions of Ethiopia including Oromia region since 2009 as an alternative mechanism to narrow the gap between seed supply and demand in the country. Seed marketing is one of the key activities of the program to satisfy farmers demand by providing quality seeds at the right place, time and price for sale (ISSD, 2012).

Shortage of appropriate potato seed tuber is a major bottleneck in potato market supply (Emana and Nigusse, 2011). Recognizing the Integrated Seed Sector approach for strengthening the Ethiopian seed sector through interventions in different seed systems, Ethiopian Ministry of Agriculture and Rural Development together with other key public, private and civil society seed sector stakeholders endorsed the concept note on Integrated Seed Sector Development (ISSD) in the country. Besides projects on agro-biodiversity conservation, policy development and private sector development, the ISSD programme included the projects on Local Seed Business (LSB) development and on partnerships and innovation in the seed sector. Through the LSB project, seed producer cooperatives have been supported since 2009 to be technically better equipped and more commercial in their seed production and marketing efforts, and are more autonomous in their operations in the seed sector (ISSD, 2012). Therefore, this study aimed to investigate determinants and intensity of potato seed marketed surplus through cooperatives.

Literature review

Market is traditionally defined as a specific geographical area where buyers and sellers meet for exchange of goods and services. The most common way to obtain goods and services we do not produce ourselves is to buy them from others who specialize in producing them. To make such purchases, buyers seek out sellers in markets. Markets are ways in which buyers and sellers can conduct transactions resulting in mutual net gains that otherwise would not be possible (Hyman, 1989).

Modern market may be defined as an arena for organizing and facilitating business activities and for answering the basic economic questions like how much to produce, what to produce and how to distribute production. A location, product, time, group of consumers, or level of the marketing system may define it. The choice of market definition to use depends on the problem to be analyzed. Market is an institutional and organizational arrangement to facilitate exchange of one thing for another. The most observable features of a market are its pricing and exchange processes. A market is thought of as a meeting of buyers and sellers: a place where sellers and buyers meet and exchange takes place, an area where price-determining forces (supply and demand) operate and an area where there is a demand for good (Kebede, 1990). But a market is more than a physical place. It is a mechanism or an institution through which buyers and sellers exchange information and transact.

Another basic concept that is closely related to market is marketing. This term came into use with division of labor and specialization and became common with urbanization and industrialization over many years. The term marketing has been a very debatable concept and defined in different ways by different scholars. This is because marketing, or more specifically, agricultural marketing, projects different impression to different groups of people in a society, like farmers, traders and consumers. Marketing is also described as the performance of all business activities involved in the flow of food products and services from the point of initial agricultural production until they are in the hands of

*Corresponding author. E-mail: alemayehu2016@gmail.com.

consumers. The definition of marketing as a process by which individuals and groups obtain what they need and want by creating and exchanging products and values with others involves work (Kohls and Uhl, 1985).

Marketable surplus is the quantity of the product left out after meeting the farmers' consumptions and utilization requirements for kind payment and other obligations such as gifts, donations, charity, etc. Thus, marketable surplus shows the quantity left out for sale in the market. Marketed surplus shows the quantity actually sold after accounting for loses and retention by the farmers, if any and adding the previous stock left out for sale (Thakur et al., 1997). Thus, marketed surplus may be equal to marketable surplus, it may be less if the entire marketable surplus is not sold out and the farmers retain some stock and if loses are incurred at the farm or during transit.

The importance of marketed and marketable surplus has greatly increased owing to the recent changes in agricultural technology as well as social patterns. In order to maintain the balance between demand for and supply of food grains with the rapid increase in demand due to higher growth population, urbanization, industrialization and overall economic development, accurate knowledge on marketed and marketable surplus is essential in the process of proper planning for the procurement, distribution, export and import of agricultural product. The importance of marketed and marketable surplus has greatly increased owning to the recent changes in agricultural technology as well as social patterns. In order to maintain the balance between demand for and supply of food grains with the rapid increase in demand due to higher growth in population, urbanization, industrialization and overall economic development, accurate knowledge on marketed and marketable surplus is essential in the process of proper planning for the procurement, distribution, export and import of agricultural product (Malik et al., 1993).

The most common form in which commercialization could occur in peasant agriculture is through production of marketable surplus of staple food over what is needed for own consumption. Another form of commercialization involves production of cash crops in addition to staples or even solely. At the farm household level, commercialization is measured simply by the value of sales as proportion of the total value of agricultural output. At the lower end, there would always be some amount of output that even a subsistence farmer would sell in the market to buy basic essential goods and services. For this reason, the ratio of marketed output upto a certain minimum level cannot be taken as a measure of commercialization (Neway, 2006).

Empirical studies of supply relationships for farm products indicate that changes in product prices typically (but not always) explain a relatively small proportion of the total variation in output that has occurred over a period of years. The weather and pest influence short run change in output, while the long run changes in supply are attributed to factors like improvement in technology, which result in higher yield. The principal causes of shift in the supply are changes in input prices, and changes in returns from commodities that compete for the same resources. Changes in technology that influence both yields and costs of production/efficiency, changes in the price of joint products, changes in the level of price, yield risk faced by producer and institutional constraints such as average control programs, also shift supply (Tomek and Robinson, 1990).

Seed marketing is the most important as well as challenging aspect of seed industry because of the nature of the product. Seed is a living organism, therefore, its quality deteriorate fast. Thus, its shelf life is limited and it must be marketed within the season. Another peculiar feature of seed is that it requires two to three years lead time to meet the specific requirements, that is, to meet the demand for a particular seed, its production has to be organized at least two years in advance. Changes in weather, price of crop, and price of competing crops may change the prospects of demand for the seed of a particular variety at the commencement of sowing season (Singh, 2004).

Seed marketing should aim to satisfy the farmer's demand for reliable supply of a range of improved seed varieties of assured quality at an acceptable price. However, the difficulties of organizing effective seed delivery systems, especially to small-scale farmers, have often been underestimated in comparison with the attention given to other seed industry activities. Historically, more attention and resources have been devoted to the physical aspects of seed production and storage than to the difficult organizational issues involved in managing sales and distribution. Marketing is one of the most important, yet misunderstood business activities and frequently means different things to different people. To the retailer in the agricultural sector, for example, it is selling seed together with other inputs to the farmer. To the farmer, it is simply selling what he produces on his farm. However, whatever the circumstances, a well-defined sequence of events has to take place to promote the product and to put it in the right place, at the right time and at the right price for a sale to be made (FAO, 1994).

Of all agricultural services, difficulties with organizing effective seed delivery, particularly for poor small-scale farmers, have been under-estimated in comparison with the attention devoted to, for example, agricultural produce marketing, fertilizer delivery, credit and extension services. And within the seed sector itself, more attention has been devoted to the physical aspects of production, processing and storage than to the difficult organizational issues which is essential if the sector is to function well. As a result, many developing countries have persisted, in the apparent absence of alternatives, with loss-making parastatal seed companies despite their

failure to meet the needs of small farmers effectively (Cromwell et al., 1992).

RESEARCH METHODOLOGY

Study area

The study was conducted in three districts in Eastern Ethiopia: Kersa, Haromaya and Chiro (Figure 1). With an area of 545 km^2, Kersa district is found in the Northern part of Eastern Hararghe Zone of Oromia Regional State. Its topography is characterized by mountains, plateaus, hills, plains, valley and gorges. It extends between 1,400 and 3,200 m altitude. The district is classified as highland (7%), midland (91%) and lowland (2%) agro climatic zones. According to the 2007 National Census Report, the total population of the district was 170,816 of which 50.4% were men and the remaining were women. About 6.7% of its population was urban dwellers. Average family size for rural and urban area was 4.3 and 4 persons, respectively. The estimated land use pattern revealed that 28.5, 2.3 and 6.2% were arable, pasture and forest lands, respectively, while the rest was attributed to degraded, built up and other areas. Sorghum, maize, haricot bean, barley and wheat are the dominant crops grown in the district (ORSFED, 2004).

The second district, Haromaya is also located in Eastern Hararghe zone of Oromia regional state. The altitude of this district ranges from 1400 to 2340 masl. A survey of land in Haromaya (released in 1995/96 shows that 36% is arable or cultivable, 2.3% pasture, 1.5% forests and the remaining 60.1% is considered built up, degraded or otherwise unusable. Chat, vegetable and fruits are important cash crops in the district. In 2007, the National Census Report, the total population for this district was 271, 018, of which 50% were men and the rest were women. About 18.46% of its population was urban dwellers. Nearly 97% of the dwellers are Muslims and the remaining minority of the population are Christian (ORSFED, 2004).

Chiro district is found in the Northern central part of West Hararghe zone of Oromia Regional state, Ethiopia. The district stretched between 1,300 and 3,170 masl. Climatically, this district is classified into lowland (49.4%), midland (32.8%) and highland (17.8%). Sorghum, haricot bean, maize, barley, wheat and teff are widely cultivated crops in the district. The population of the district was about 308,553 of which 92.7% were rural and the rest urban population. Young, economically active and old age populations accounted for 46.9, 50.3 and 2.8%, respectively (ORSFED, 2004).

Data collection

Both primary and secondary data on a wide variety of variables were gathered to meet the objective of the study. Semi-structured questionnaire was used to generate primary data from members of Seed Marketing Cooperatives. Secondary data was collected from published and unpublished sources of past reports and studies conducted by institutions, researchers and local seed business reports.

Sampling technique

Multi stage sampling technique was used to select potato seed producer households. In the first stage, *kebeles* in the three districts were categorized into two: those with and without Seed Producer Cooperatives. In the second stage, *kebele* administrations with Seed Producer Cooperatives were purposively targeted from each district. In the third stage, households in the sample *kebeles* were stratified into two: member and non-member households. Finally, all farm households who are members of Seed Producer Cooperatives in the sample *kebeles* were included in the sample (Table 1).

Data analysis

Data obtained regarding whether Seed Marketing Cooperative members use their cooperatives as their market outlets and to what extent members market their seed through cooperatives, was analyzed using Tobit model. A strictly dichotomous variable is often not sufficient for examining the intensity of usage for such problems. Tobin (1958) proposed a limited dependent variable model, later called Tobit model to handle dependent variables which are a combination of these cases. This model enables one to estimate the likelihood and extents (intensity) of events. The volume of marketed surplus was, therefore, estimated using the following Tobit model:

$$y_i = \chi\beta + \varepsilon_i \quad (1)$$

$$y_i = \begin{cases} \chi\beta + \varepsilon_i, & \text{if } y_i^* > 0 \\ 0 & \text{if } y_i^* \le 0 \end{cases} \quad (2)$$

y_i is the marketed surplus (log) of potato seed (in quintals) supplied by household i to its cooperative, X is a vector of explanatory variables determining intensity of marketed surplus of potato seed, β is a vector of parameters to be estimated, and ε_i is the error term assumed to be independently and normally distributed.

Definition of variables

In this study, the total quantity of potato seed (Qt) marketed by individual member household through the cooperative was taken as the dependent variable. Marketed surplus of small holders through their cooperatives is hypothesized to be influenced by a combined effect of various factors, such as household socioeconomic and other institutional characteristics.

Farm experience (fexp)

This is a continuous variable measured in number of years. It refers to number of years a farmer spent in farming activity. As farmers got more experience in agricultural production, the probability of increasing production and hence supply would be higher. Abay (2007) conducted vegetable market chain analysis in Amhara National Regional State Fogera Woreda. Accordingly, his findings revealed that farm experience was positively related to volume of vegetable marketed supply. Therefore, in this study, farm experience is expected to have positive impact on potato seed marketed supply through cooperatives.

Family size (fmsz)

This variable is a continuous variable and refers to the total number of family household. It is assumed that household with larger family size consume more of what is produced in the house and little will

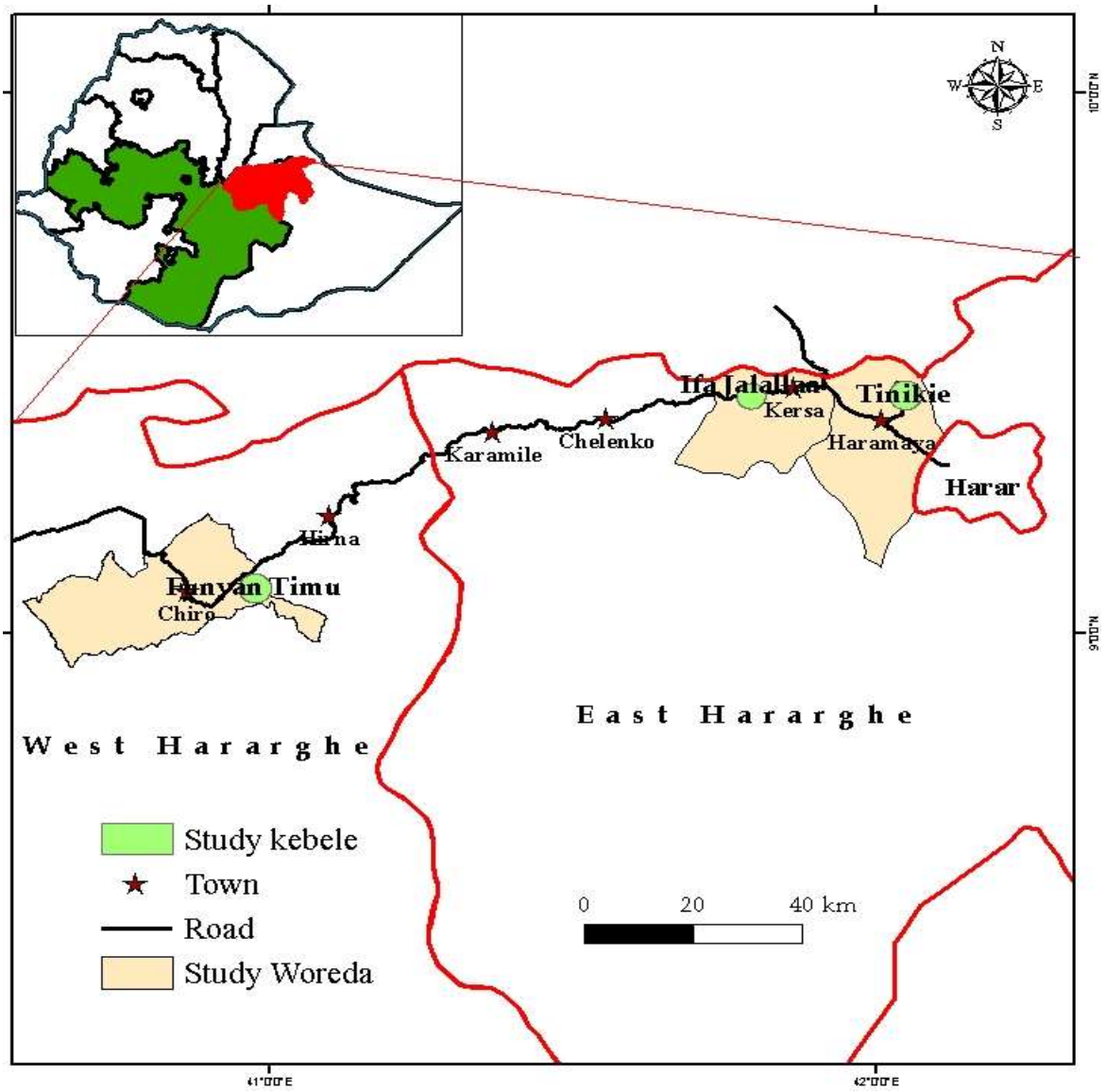

Figure 1. Geographical location of the study areas.
Source: ZoFED (2004).

Table 1. Sampling frame and sample size.

District	*Kebele*	Cooperative	Number of members
Kersa	Ifa Jalala	Hakan Guddina	80
Haromaya	Tinike	Rare Hora	41
Chiro	Fugnan Dimo	Abdi Jalala	36
Total			157

remain to be marketed. Therefore, this variable is expected to have negative influence on intensity of potato seed marketed supply through cooperative. A study by Singh and Rai (1998) found marketed surplus of buffalo milk to be negatively affected by family size.

Literacy status of household head (litert)

It is a dummy variable that takes 1 if the household is literate and 0 otherwise. This is due to the fact that a literate farmer can adopt better practices than illiterates that would increase marketed

supply. The literate household head would have better awareness of cooperative and acquire information and education on the benefit of cooperative easily (Belay, 2006). Hence, literate farmers are in a better position to know the benefit of cooperatives and are likely to market their potato seed tuber through cooperatives. Therefore in this study, this variable is expected to have positive coefficient.

Number of years of membership (memb)

This variable is a continuous one and it refers to number of years since the farmer has been member of the cooperative. Farmers having longer years of membership are in a better position to know the benefits of the cooperative than farmers with shorter years of membership (Cain et al., 1989). In this study, this variable is hypothesized to influence the marketing of potato seed tuber through the cooperative positively.

Distance of household home from cooperative market center (mktd)

It is a continuous variable measured in single foot per hour. It refers to the distance of the cooperative from the farmer house. The proximity of the cooperative to the farmer's house reduces the cost of time and labor spent by the farmer in searching for a buyer of his potato seed. The other advantage is that as the farmer is close (near) to the cooperative, they will have more knowledge on the cooperative and its benefits (Bishop and McConnen, 1999). Therefore, in this study, the distance of the cooperative from the farmer house is expected to influence the marketing of potato seed through the cooperative negatively.

Credit (crdt)

This is a dummy variable which takes a value 1 if the farmer obtained credit from rural financing institution operating in the area, 0 if otherwise. Access to credit would enhance the financial capacity of the farmer to purchase the necessary inputs (Musema, 2006). Therefore, it is hypothesized that access to credit would have positive influence on market participation and volume of sale. It also helps in renting land and purchasing other inputs that increase agricultural production. Therefore, in this study, access to credit is expected to have positive coefficient.

Access to extension service (exn)

The objective of the extension service is introducing farmers to improved agricultural inputs and to better methods of production. In this regard, extension is assumed to have positive contribution to farmer' potato seed market supply through cooperatives. It is a dummy variable with a value of one if a household head has access to extension and zero if otherwise.

Land holding (land)

This variable is a continuous one and refers to the total area of farmland in hectare that a farmer owns. The usage of the cooperative as marketing agent requires substantial economic resources of which land is the principal one (Klein et al., 1997). It is assumed that the larger the total area of the farmland the farmer owns, the higher would be the potato seed tuber produced. This implies that farmers who have larger land holding may patronize the cooperative's output marketing in a better way. Therefore, it is expected that this variable may take positive coefficient.

Perception of members to cooperative price (price)

This is a dummy variable taking a value of 1 if the cooperative price for the farmer's potato seed tuber is similar or better than other marketing agents in the area and, 0 if otherwise. The price effect is one form of cooperative effect that the cooperative passes on the farmer's economy (Chukwu, 1990). Therefore, if the cooperative charge competitive price in the area, the farmers market their produce through cooperatives (Klein et al., 1997). Therefore, cooperative price influence the marketing of potato seed tuber through the cooperative positively.

Number of livestock owned (tlu)

This variable is a continuous one and refers to the total number of livestock the household own in terms of tropical livestock unit (TLU). It is assumed that the household with larger TLU can have a better economic strength and financial position to purchase agricultural input such as fertilizer and hire labor during peak season. The member also transports their product using pack animals to the cooperative or elsewhere. So, this variable is expected to have positive coefficient.

District (distr)

This is a categorical variable enabling the capturing of unobserved, district specific characteristics which cannot be captured by other explanatory variables. It can be measured as taking the value of 1 if Kersa, 0 if otherwise; 1 if Haromaya, 0 if otherwise and 1 if Chiro and 0 if otherwise. The two dummy categories will enter the model while the third will be a base category serving as a benchmark for comparison. Misra et al. (1993) showed that there is performance variation among cooperatives in different places in United States. Therefore, this variable is expected to influence the marketing of potato seed through cooperative positively or negatively depending on the performance of the district in which the farmer is found.

RESULTS AND DISCUSSION

The Tobit model estimated results of the variables that are expected to determine marketed surplus and intensity of potato seed market supply are presented in Table 2. Out of 12 variables, 6 were found to be significant factor for potato seed marketed supply and its intensity. Accordingly, Haramaya district, literacy status, family size, extension contact, perception of household to potato seed price offered by cooperatives and distance from cooperative marketing center significantly affected the intensity of potato seed market supply through cooperatives.

The district (dstr) affects potato seed market supply through cooperatives, showing that farmers in Haramaya district use their cooperative as marketing agent relative to farmers in Kersa and Chiro districts (Table 2). The probability of potato seed marketing through cooperatives increases by 1% if the given household is a member of seed producer cooperatives in Haramaya district and intensity of potato seed supply among cooperative users' increases by 5.28 quintal. The implication is that performance of cooperative varies from district to district, and may be subject to many factors such as institutional

Table 2. Tobit model results of the effect of change on explanatory variables and intensity of potato seed market supply.

Variable	Coefficient	Std. Err	Marginal effect after Tobit
Constant	11.95	6.164	-
Chiro district	-4.81	4.499	-4.03
Haramaya district	6.84***	1.416	5.28
Literacy status	6.51**	2.944	5.58
Family size	-2.02***	0.551	-1.75
Farm experience	0.09	0.147	0.08
Number of years of membership	0.17	0.514	0.14
Livestock owned	-0.3	0.653	-0.02
Land holding	10.13	8.465	8.77
Extension contact	5.89**	2.834	5.09
Access to credit service	0.89	3.288	0.78
Distance from Coop market	-0.61***	0.173	-0.52
Sigma	11.93	0.8979	
LR $\chi^2(12)$		107.18	
Pseudo R^2		0.1256	
Left-censored observations		25	
Uncensored observations		132	
Predicted value (log)		38.47(3.65)	

*** and ** represent level of significance at 1 and 5%, respectively.
Source: Survey result (2014).

factor, climatic condition, organizational strength of cooperatives and infrastructural facilities. It had been observed during field survey that seed producer cooperative in Haramaya district is well organized than Chiro and Kersa in terms of provision of different services and benefits to its members. Haramaya district has better infrastructural facility such as transportation and market information access relative to that of Kersa and Chiro. Therefore, it might be because of the availability of such infrastructural facilities that Haramaya district positively affect potato seed market supply and its intensity through cooperatives. Misra et al. (1993) also found that there is performance variation among dairy marketing cooperatives in different places in United States.

Literacy status (litert) positively influenced potato seed market supply through cooperative market channel. The probability of potato seed market through cooperatives increases by 0.2% if a given household is literate. If the household is literate, intensity of potato seed marketed supply through cooperatives increases by 5.58 quintal among cooperative members who used cooperative market channel.

The implication is that households who have formal education are in a good position in using cooperative market channel as their market outlet. Family size (fams) influenced negatively, intensity of potato seed market supply through cooperatives (Table 2). If family number increases by one person, the probability of potato seed market supply through cooperatives decreases by 0.01% and its intensity among cooperative market channel users declines by 1.75 quintal. The implication is that larger family size requires larger amounts of agricultural products for consumption, reducing marketable surplus. A study by Singh and Rai (1998) also found marketed surplus of buffalo milk to be negatively affected by family size. However, a study conducted by Amha (1994) showed that household size had significant positive effect on quantity of teff marketed and negative effect on quantity of maize marketed.

Access to extension service (extc) influenced positively, potato seed marketed supply through cooperatives (Table 2). If a given household has extension contact, the probability of potato seed market supply through cooperatives increases by 0.038 and its intensity increases by 5.09 quintal. This suggests that access to extension service improved production and farmers could be aware of the various aspects of the production and productivity of potato seed.

The distance of household from cooperative marketing center (dcoop) influenced negatively, potato seed market supply through cooperatives (Table 2). If the distance of household increases by an hour from the cooperative collection center, the probability of potato seed market supply through cooperatives decreases by 0.01%. The nearer the producers' home to cooperative marketing center, the more the potato seed supplied to the market through cooperatives. As the distance of household from cooperative marketing center increases by an hour, intensity of potato seed marketed through cooperatives decreases by 0.52 quintal. The plausible reasons for this

are that proximity of the cooperative marketing center for the farmer reduces the costs of time and labor for searching buyer. Closeness (nearness) of the farmer to the cooperative also helps in more knowledge on the cooperative and its benefits.

CONCLUSIONS AND RECOMMENDATIONS

Since most of the cooperative leaders lack leadership and agribusiness skill to compete in the free market economy, there is need to have an extensive work from government and nongovernmental organizations on capacity building for cooperative employees aiming to improve their leadership and technical skill. Family size of the households is another important variable that needs government intervention for family planning.

Literacy status requires government intervention in facilitating adult education programme for farmers. Government also needs to participate in extension service, suggesting that access to this service improved production and productivity of farmers and has considerable impact on market supply. Farmers with frequent extension contact could be aware of the various aspects of the production, productivity and marketing of potato seed.

Cooperatives are required to provide relatively better price to ensure smooth relationship with their members. As much as possible, cooperatives are required to establish collecting or assembling centers so that farmers can access them without spending much time to find buyers. Finally, further studies on seed marketing system through cooperatives should be conducted in other parts of Ethiopia so that a well-organized regional and national seed production and marketing system can be implemented.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

ACKNOWLEDGEMENTS

The authors thank the Integrated Seed Sector Development (ISSD) project for full research grant. They also thank the ISSD staff: Reta Waggari, Nigussie Dechasa, Amsalu Ayana, Alemayehu Asefa and Dandana Galmessa for their valuable comments and support. Individuals and organizations that facilitated and showed cooperation during the study are thus acknowledged.

REFERENCES

Abay A (2007).Vegetable Market Chain Analysis in Amhara National Regional State: The Case of Fogera Woreda, South Gondar zone. M.Sc. Thesis Presented to School of Graduate Studies of Haramaya University.

Amha W (1994). Food grain marketing development in Ethiopia after Reform 1990. A case study of Alaba Siraro. The PhD Dissertation Presented to Verlag Koster University. Berlin 293p.

Atilaw A (2010). A base line survey on the Ethiopian seed sector submitted to the African Trade Association, the African Seed Trade Association, Addis Ababa.

Belay D (2006). Performance of primary Agricultural Cooperatives and determinants of members' decision to use as marketing agent in Ada'aLiban and Lume Districts of Ethiopia. An M .Sc. thesis presented to the School of Graduate Studies of Haramaya University, Ethiopia.

Bishop D, McConnen R (1999). Purpose of Cooperative. VOCA/ Ethiopia, Addis Ababa, Ethiopia.

Cain JL, Toensmeyer UC, Ramsey S (1989). Cooperative and proprietary firm performance as viewed by their customers. J. Agric. Coop. 4:81-89.

Chukwu SK (1990). Economics of the Cooperative Business Enterprise. Marburg, Germany.

Cromwell E, Friis-Hansen E, Turner M (1992). The organization of the seed sector in developing countries, a conceptual frame work of analysis. ODI, London pp. 1-8.

Emana B, Nigusse M (2011). Potato value chain analysis and development in Ethiopia. Case of Tigray and SNNP Regions. Addis Ababa, Ethiopia.

Ethiopian Seed Enterprise (ESE) (2010). Annual report. ESE, Addis Ababa.

Food and Agriculture Organization (FAO) (1994). Sustainable potato production guidelines for developing countries. Rome, Italy.

Hyman R (1989). The Political Economy of Industrial Relations: Theory and Practice in a Cold Climate (Basingstoke, Macmillan).

Integrated Seed Sector Development (ISSD) (2012). Annual report on Eastern Ethiopia, Haramaya, Ethiopia.

Kebede A (1990). Sheep marketing in the central highlands of Ethiopia. An M.Sc. thesis presented to the School of Graduate Studies of Alemaya University, Ethiopia.

Klein KK, Richards TJ, Walburg A (1997). Determinants of cooperative patronage in Alberta. Can. J. Agric. Econ. 45:93-110.

Kohls RL, Uhl JN (1985). Marketing of agricultural product. Fifth Edition.McMillian Publishing Company, NewYork, USA.

Malik DP, Sign SN, Rai KN (1993). Marketed and Marketable Surplus of Wheat and Paddy Crops in Kurukshetra District of Harayana. Indian J. Agric. Mark. 7(1):59-67.

Mesay Y (2010). Analysis of Factors Determining Farmers" Participation in Local Seed Multiplication: the case of Womberma and Guagusa Shekudad Woredas of Amhara National Regional State. M.Sc. Thesis Presented to School of Graduate Studies of Haramaya University.

Misra SK, Carley DH, Fletcher SM (1993). Dairy farmers' evaluation of dairy cooperatives. Agribus. Int. J. 9:351-361.

Musema R (2006). Analysis of red pepper Marketing: The case of Alaba and Silitie in SNNPRS of Ethiopia. A M.Sc. Thesis presented to School of Graduate Studies of Haramaya University pp. 96-95.

Neway G (2006). Commercialization of small holder agriculture in Ethiopia. Note and Papers Series, No 3. Ethiop. Dev. Res. Inst. 52p.

Oromia Regional State Finance and Economic Development annual Report (ORSFED) (2004). Unpublished Annual Report. Finfinne, Ethiopia.

Singh S (2004). Rural marketing focus on agricultural inputs, Institute of Rural management, University of California at Berkeley 105p.

Singh V, Rai KN (1998). Economics of Production and Marketing of Buffalo Milk in Haryana. Jan.-Mar., Indian J. Agric. Econ. 53(1):41-52

Thakur DS, Harbans Lal DR, Sharma KD, Saini AS (1997). Market supply response and marketing problems of farmers in the Hills. Indian J. Agric. Econ. 52(1):139-150.

Tobin J (1958). Estimation of relationships for limited dependent variables. Econometrica 26:24-36.

Tomek WG, Robinson KL (1990). Agricultural Products Prices. Third Edition. Cornel University Press. Ithaca and London 360p.

Zone Finance and Economic Development (ZoFED) (2004). Zonal Abstract, Bonga, Kaffa Zone, Southern Nation Nationalities and People's Region (SNNPR).