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MARKET PERFORMANCE AND FARMERS' CHOICE OF MARKETING CHANNELS OF HIGH VALUE CROPS IN TANZANIA

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Abstract

Market performance of smallholder farmers of the high value crops can present better opportunities for smallholder farmers in Tanzania. A multi-stage random sampling procedure was employed to select the sample of 204 smallholder farmers. Major marketing channels were identified and described. Stochastic Dominance analysis was employed to map marketing channels most preferred by farmers. Farmers preferred short channels with less marketing functions with higher returns based on quantity sold not price. It was concluded that tomato markets are informal involving sales in the farm-gate, at homestead or periodical village market centre as well as poor means of transportation. At well developed markets farmers are price takers with great reliance on the traders for market information. Farmers did not show trust to traders and perceive a higher risk of being exploited by traders. Market choice, which influences the price received by farmers and volume of sales, is also crucial to achieve increased market performance. This suggests that farmers usually use channels with the higher returns resulting from quantity sold not unit price.

Keywords: Market performance, high value crops, marketing channels, farming, valuation, Tanzania

INTRODUCTION

Production in Tanzania's agriculture sector is dominated by small-scale farmers. Due to a number of production and marketing constraints facing smallholder farmers, market performance of high value crops appear to be low (ESRF, 2010). In Sub-Saharan Africa, Delgado and Siamwala (1997) argued that some of the challenges facing smallholders are lack of markets poor quality of produce and high transaction costs. As a result smallholder farmers become less competitive in the mainstream high value markets. Similarly, marketing of vegetable in Tanzania which is the focus of this paper has been experiencing the same.

In general, markets for vegetables in Tanzania are still evolutionary, fragmented or haphazard (Mnenwa *et al.,* 2005). Albeit, the markets for vegetables are dominated by small traders. The cities, municipalities and other urban centres have yet to establish modern vegetable markets with appropriate receiving, holding and vending facilities in order to reduce spoilage since vegetables are highly perishable. Consequently, there is a considerable produce loss. All of the above factors lead to the poor marketing performance of the tomato subsector.

According to FAO data based on imputation methodology for vegetable production, Tanzania ranked from the twentieth in 2000 to fifteenth position in 2009. In fact, during this period, Tanzania remained in the top 20 vegetable producers in the world (FAOSTAT, 2013). The greatest bulk of the vegetables produced in Tanzania tomato is the single most dominant vegetable crop (URT, 2012). It was found that, the area planted with tomatoes in Tanzania is 26,612 ha. Tomato was our reference crop in this paper. Tomatoes contributed the highest percent of harvested quantity (314,986 tons 64%) to the total harvested quantity of vegetables.

It is therefore important to examine how small-scale producers of vegetables can increase their productivity to enhance their incomes. Such knowledge entails studying the obstacles constraining demand side in terms of the market performance as well as the market opportunities. Specifically the aim of this paper is to examine in more detail the market performance of smallholder farmers of the high value crops and how their marketing can be improved and present better opportunities for smallholder farmers focusing on tomato sub-sector.

THEORETICAL REVIEW ON MARKET PERFORMANCE

According to Kohl and Uhl (1980), one way to begin the study of agricultural market performance is to list some common concerns about the industry. For instance, consumers frequently complain about high and fluctuating food prices, deceptive labels and advertising. Producers voice other complaints such as declining number of farm product buyers, reduced competition for supplies, buyers of agricultural products with control over price, the failure of the

retail and farm prices to move together, excessive marketing costs and prices, and below cost prices. The society on the other hand, might be more concerned with such issues as the agricultural marketing sector's contribution to employment, investment, and economic growth; the standard of living and quality of life; resource use and conservation; and overall health and prosperity of the economy.

Rhodes (1983) indicated that the evaluation of market performance requires specific measures. Trends in retail prices, share of consumers' income spent on food, the farm retail price spreads and the farmers' share of the consumers' food money are popular measures of market performance. Margins, profits and trends in food marketing costs also indicate the market performance (Staatz, 2011). However, each of these has some value and limitations in the measurement of agricultural marketing performance, and no single one tells the whole story. Market performance is a complex notion, and using a single market characteristic in its evaluation may lead to misleading conclusion and recommendation. Therefore, care must be taken in their use and interpretation, and also compromises must be made in public policies that are designed to improve agricultural marketing performance. A balance need to be struck between the demands and satisfactions of each group in the marketing channel. Rhodes (1983) indicated that the balance of these criteria is frequently disturbed by a new technology, a new marketing procedure, a change in markets, or a change in political power, thus, making the analysis of agricultural marketing performance an ever-changing and dynamic arena.

Defining market performance

According to Stern *et al.,* (1996), market performance is a multi-dimensional concept that can be assessed by considering a number of dimensions including effectiveness, equity, productivity, and profitability. In other words, market performance refers to economic results: product suitability in relation to consumer preferences (effectiveness); rate of profits in relation to marketing costs and margins; price seasonality and price integration between markets (efficiency). In general, market performance refers to the impact of structure and conduct as measured in terms of variables such as prices, costs, and volume of output (Bressler and King, 1979). In this study, aspects of effectiveness of marketing channels, their distributions of marketing margins and profitability were analyzed to infer on market performance.

EMPIRICAL LITERATURE REVIEW ON MARKET PERFORMANCE

In a study that sought to describe the performance of vegetable supply chain in Swaziland, Xaba et al., (2012) used market margins and marketing channel analysis to identify and assess existing marketing channels used by vegetable farmers. The largest producer's share was

obtained through direct sale to consumers. Channels that included restaurants had high total gross margins and low producer's share of the consumer price. It was found that commercialising vegetable production encourages farmers to be market oriented.

Acharya (1998) examined vegetable marketing channels and evaluated the marketing efficiency of the most common vegetable marketing channels in India. He found that marketing efficiency was not in adequate level in all channels where marketing cost and marketing margin were higher than fifty percent of selected vegetable price. This indicates that marketing efficiency was not in satisfactory level in vegetable sector. He suggested that the performance of the existing overall marketing channels should be updated by reducing the number of intermediaries, reducing the gap between the unit income of the farmers and the market price. Farmers should be educated by the respective institutional bodies to change and differentiate their cultivation patterns in different due time periods. New marketing channels can be introduced by the government in the rural areas. In addition, introducing new vegetable packaging systems to minimize the wastage of vegetables are the main steps to develop marketing efficiency of vegetable market channels (Acharya, 1998).

Sandika (2011 indentified long-term behaviour of Market Margin (MM) of middlemen on vegetable marketing channels in Sri Lanka. It was observed that usually when the Retail Price (RP) and Producer Prices (PP) increase the MM decrease and vice versa. It is clear that when the RP and PP are high the middlemen try to control the market prices by reducing their MM. It may help to protect the consumers directly because RP and PP normally increase due to low supply of the production of vegetable and/or high demand for it. When the prices are low they try to get more benefits by increasing their MM as rational entrepreneurs.

Ravallion (1986) used the method of static price correlation to measure agricultural market integration as an indicator of market performance and illustrated it, using district-level data on rice prices for Bangladesh. The results of his study show that, market segmentation was poor for all districts. Also, there was weaker form of short-run market integration because short-run market integration within one month cannot be reasonably accepted for any district. These results suggested some significant departures from the conditions for both short run and long run market integration. And in short-run rice markets in Bangladesh were not well integrated.

As revealed in the above studies, in market analysis, market margins analysis can be used to determine the performance of markets. Marketing margins consist of marketing functions such as transportation, storage and processing. They are therefore, the same as returns to all factors of production (land, labor, and capital and entrepreneurship) involved in marketing. Looking in these two ways, a gross marketing margin for a particular commodity is the difference between what the consumer pays for final product and the amount the producer

receives (Adeyokumnu, 1973). Moreover, marketing margins are often estimated for different levels such as wholesale and retail levels in the markets.

High marketing margins are sometimes regarded as evidence of inefficiency and the middlemen are often blamed for earning excessive profits (Collinson, et al., 2002). This is not always so. However, an increase in absolute margin is not clearly an indicator of efficiency or inefficiency of the markets. It may mean that returns to factor inputs have increased rather than that the inputs are being wastefully utilized. Then again, the increase in margins may be due to an improvement in the services performed or the utilities created for the consumers.

In the estimation and utilization of marketing margins possible problems that can arise are because of non-homogeneity of commodity with resulting variation in quality for a particular commodity and non-standardization of quantity measure, the lag in time between the different processes involved in marketing between wholesale and retail, during which effective price changes could have taken place. The price used for estimating the margins may also contain elements of trend, cycle, and seasonal and irregular variations, so that correct estimates of value (form, time, place and possession utilities) added to commodities during marketing may be difficult to estimate (Adekanye, 1982). The data on marketing costs are needed to disaggregate the gross marketing margin of an enterprise at different marketing stages (Holtzman, 1986). This provides us information on the costs of particular marketing functions, which can be compared with costs incurred by other enterprises to assess the operational efficiency (Scarborough and Kydd, 1992).

RESEARCH METHODOLOGY

Research design

This research operated within the survey research design. The cross-sectional data was collected from the selected sample and on more than one case using structured and semi-structured questionnaires for the survey as well as unstructured questionnaire for interviews and focus group discussions. Moreover, the correlational analysis was employed to explore relationships and make predictions. The benefit of this would be that the researcher would be able to focus on the breadth and depth of the research. Mvomero and Morogoro Rural and Urban districts were purposively selected as study areas to represent diverse agro-ecological zones, socio-economic environment, cultural diversity and varying production systems. Mvomero district is considered a high potential area growing most of vegetable crops. Morogoro rural district on the other hand grew mainly maize and vegetables while Morogoro Urban is considered to have low crop production since inhabitants mostly do engage in off-farm activities.

Sampling and data collection techniques

A multi-stage random sampling method was used to select the sample of farmers in Mvomero, Morogoro Urban and Morogoro Rural districts of Morogoro region representing rural, urban and peri-urban settings of high potential agricultural areas of Tanzania respectively. A list of all farm households which defines the distribution of vegetable farmers, villages and their vicinity and name of vegetable producers was then. 204 households were then systematically sampled from the lists whereby the sampling units were heads of the households or spokesperson of the respective households. Data collection methods employed multi-methods, using both quantitative and qualitative techniques, with more emphasis on quantitative approach. It must be noted that the questionnaire survey was used as main data collection instrument because it enables researchers to examine and explain relationships between constructs, in particular cause-and-effect relationships (Saunders et al. 2007). Other methods employed included structured and semi structured interviews, checklists for focus group discussions and field observations.

Data Analysis Approach

Analysis of market performance

This paper presents analyses of smallholder market performance by identification of the marketing channels preferred by farmers. Using stochastic dominance analysis, major marketing channels that were most preferred by farmers with high price were mapped.

Analysis of the marketing channels

Kohls and Uhl (1990) define marketing channels as “alternative routes of product flows from producers to consumers”. They focus on the marketing of agricultural products, as does this study. Their marketing channel starts at the farm-gate and ends at the consumer’s front door. The marketing channel approach focuses on firm’s or household’s selling strategies to satisfy consumer preferences. Preferred major marketing channels by farmers were indentified with questionnaire interviews administered to farmers.

Analysis of the choice of the marketing channel

We also analyzed marketing channels in ranking those choices in terms of prices of the major channel. Stochastic dominance analysis (SDA) was used to compare and rank the distributions of farmers according to their level and dispersion of returns in terms of selling price. The comparison and ranking is based on cumulative density functions (Mas-Colell et al. 1995).

Stochastic dominance is capable of determining whether any strategy dominates another completely or in part with respect to expected utility from uncertain outcomes. Stochastic dominance techniques have been applied to a number of agricultural settings to rank alternative depreciation methods (Richardson and Nixon, 1984), agricultural policy decisions (Kramer and Pope, 1981), sorghum storage decisions (Rister, et al., 1984), value of weather forecasts (Mjelde and Cochran, 1988), and farm level marketing strategies (Bailey and Richardson, 1985). Anderson, Dillion, and Hardaker (1977) provided a review of stochastic dominance criteria and its use in evaluating plant breeding, fertilizer rates and risk-efficient farm plans.

The most commonly used stochastic efficiency rules are the First Degree Stochastic Dominance (FSD) and the Second-Degree Stochastic Dominance (SSD). FSD is basically applicable when the only assumption regarding the utility function is that “more” is preferred to “less” (Lansigan, 1997). It can be implemented simply by direct observation of the position of the curves of two non-intersecting cumulative distribution functions (CDF). The CDF of the strategy lying to the right of the other dominates the other strategy, thus making it more risk- efficient. @ RISK application software was used to facilitate the application of SDA.

EMPIRICAL RESULTS

Marketing channels of tomato

Marketing channels for tomato producers can, in general, access nearby rural consumers and traders easily through informal transactions involving sales in the farmgate, at homestead or village market centre. Producer markets are informal and are held periodically at an appropriate location in the village. These are in close proximity to production areas, so the produce is transported to market by head-load, bicycle, motorcycle or animal power driven carts. Direct transactions between farmers and consumers often take place. Some larger rural markets such as Nyandira and Doma are registered and supported by the local government. These are periodic and are outfitted with permanent stalls where farmers sell to traders and rural consumers so that the produce is transported to market by minibuses, small trucks and motorcycles. These markets also draw farmers from further distances.

Most producers do not sell their tomato product directly to the ultimate consumers, between them stands a set of intermediaries performing a variety of functions. These intermediaries constitute a marketing channel or distribution channel. In the study area the marketing channel for marketing of tomato involved assemblers, retailers, brokers and wholesalers. However, the final destination with respect to farmers was not necessarily the consumers. In this case, the following major marketing channels were observed in study area

through which trading of tomato was taking place on a large scale by the selected tomato growers (Figure 1).

According to Ramakumar (2001) four parameters are required to measure performance of the channel. These include volume handled and price related parameters such as producers share, total marketing margin, and rate of return. Out of which number of tomato farmers in the major channels was considered. Other parameters were left out due to lack of some data. This study also established average unit price of the bucket of fresh tomato of the channel based on the responses from the farmers. The study does not cover prices of other forms of tomato as a result of processing because this function in the study area is minimally performed if not altogether. From the survey conducted in the study area, it was observed that the marketing of tomato was done mainly through the following four channels (Figure 1. The figure shows the direct flow of tomato from farmers to the immediate marketing agents in the marketing channel involving farm-gate prices.

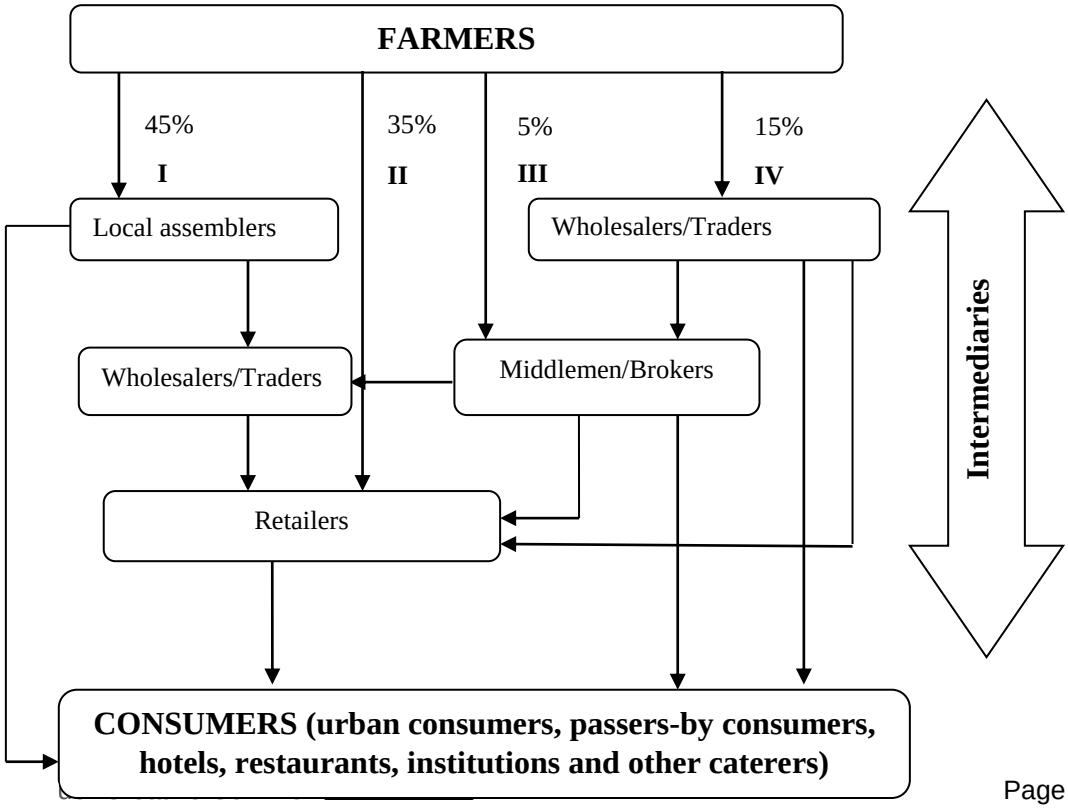
a) 45% of farmers in the sample sell their fresh tomato products through channel-I (Farmer → Local assembler).

b) 35% of the farmers used channel-II (Farmers → Retailer)

c) 5% of the farmers dispose their fresh tomato through channel-III (Farmer → Middemen/Broker)

d) 15% of the farmers sell tomato through channel-IV (Farmers → Wholesaler/Trader)

Figure 1: Marketing channels of tomatoes in the study area



As shown in Figure 1, fresh tomato of the majority of farmers is bought by local assemblers who sell the commodity in the village markets to retailers in nearby urban consumers through wholesalers/traders. In turn the retailers sell them to the ultimate consumers at retail urban market. In this channel famers sell fresh tomato at low prices. However, farmers usually incur less cost since local assemblers buy tomato from the farmers' homestead. Some assemblers even participate in harvesting tomato they want to buy in the farm. Buckets are the unit measure for tomato sold to local assemblers. The reason for a high number of farmers selling through this channel could be the prices in this channel are more reliable and stable (Acharya and Agarwal, 2008).

Some farmers sell their fresh tomato to retailers in the rural area. These are small scale traders operating in village open air markets or makeshift roadside sheds and stands selling tomato to travellers. Other farmers sell tomato to urban retailers in the terminal markets usually from Morogoro. Also urban retailers include small scale traders selling tomato in stalls in high density residential areas, on pavements in busy urban streets or in door to door hawking in residential areas. This channel was also more preferred since buyers are always available as opposed to other markets where market days are held twice a week.

There are local brokers who negotiate deals between farmers and buyers (channel III). This channel was the least mentioned by farmers. The produce is transacted at farm level and that there is a broker in-between the farmer and the buyer. There are also buyers from outside who buy larger quantities to sell in wholesale markets. These buyers hire transporters and sell tomato to the distant markets. Some brokers sell tomato to local retail traders. There is little transparency in the trade, which put farmers in a disadvantaged position. In addition, brokers do get involved more during the scheduled market days only. That is why it might be less preferred by farmers since they are not assured of tomato market all the time.

Wholesaler/trader channel is characterised by a product exchange at a rural markets (channel IV). Examples of these markets are Nyandira, Mlali and Doma in Mvomero District. A farmer takes his produce to these rural wholesale markets but at the same time a farmer might also collect/buy from neighbour farmers. Traders buy from farmers at these markets after which they transport it to the urban wholesale markets. In some cases there are brokers in between farmers and traders. Again this channel is also affected by market unreliability and farmers could not negotiate prices from a strong position. There is great reliance on the traders for market information (FAO, 2010 and Sivakumar et al., 2008).

On average, the highest price of tomato per bucket was realized under farmers to retailer and farmers to wholesaler/trader marketing channel (Table 1). On the other hand, farmer to local assembler and middlemen/broker marketing channels had the lowest prices of tomato

per bucket. All marketing channels had the same minimum prices of tomato of TZS 1,500 per bucket. Channel I though farmers sell at low prices, it appears the channel could attract many because here farmers sell immediately to local assemblers. Direct selling is reliable and involves less marketing costs (Arinloye et al., 2012). Low average price in channel III coincided with few farmers selling through this channel. Griffith and Rob (2005) in a framework for linking farmers to markets found that producers are normally price takers and are frequently exposed for cheating by any intermediary. Higher prices as the case in channel IV failed to attract farmers involved in the study. This could also be the mistrust between farmers and some marketing actors such as traders and wholesalers. Since farmers do not have formal contract with buyers, a great deal of trust is essential.

Table 1: Average price for a bucket of tomato in TZS per marketing channel

Marketing channel	n	Mean	Std. Dev.	Min.	Max.
1. Marketing channel I (Farmer→ Local assembler)	91	3,626.37	1,541.272	1,500	7,000
2. Marketing channel II (Farmers → Retailer)	71	4,774.65	3,057.530	1,500	11,000
3. Marketing channel III (Farmer → Middlemen/Broker)	10	4,050.00	2,020.039	1,500	7,000
4. Marketing channel IV (Farmers → Wholesaler/Trader)	30	6,950.00	3,369.104	1,500	11,000

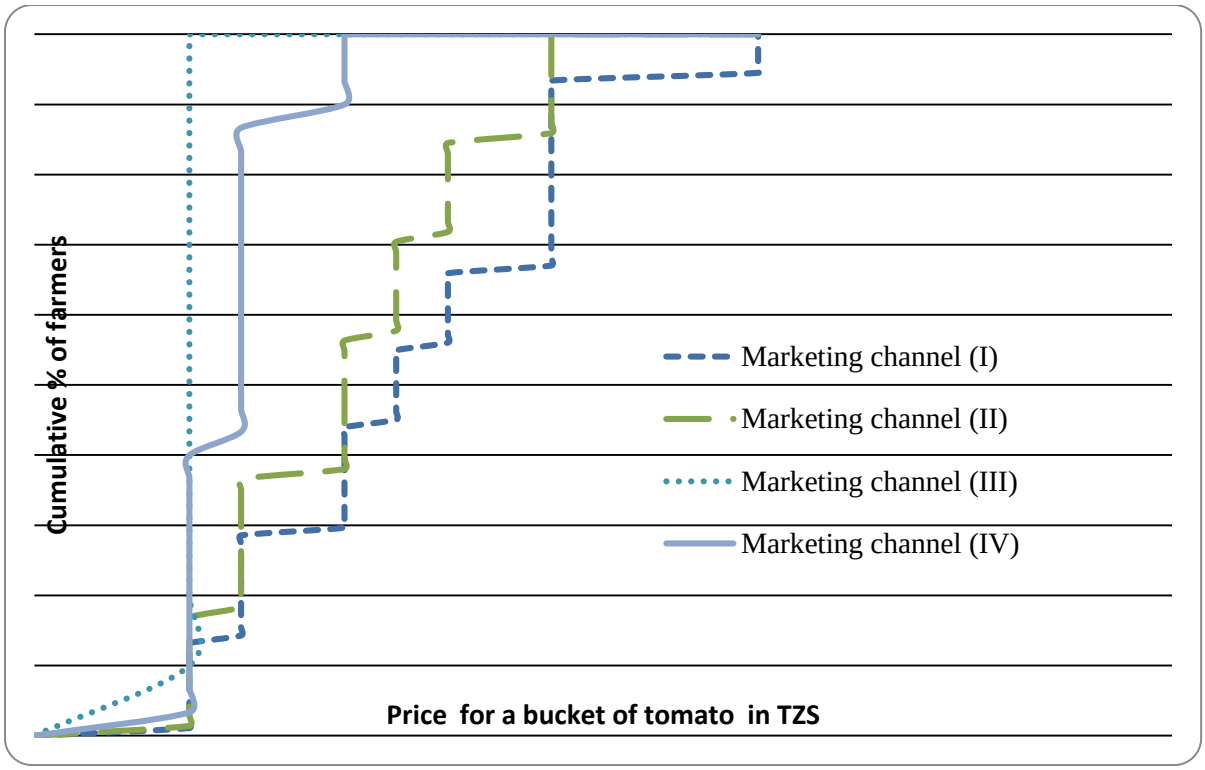
Assessment of choice of tomato marketing channels

Market choice, which influences the price received by farmers, is also crucial to achieve increased market participation. Stochastic dominance compares the cumulative distributions of outcomes (e.g. net returns per hectare) based on two observations about humans. First, people generally prefer more to less, and second, people prefer to avoid low-value outcomes. With Palisade's @RISK software, stochastic dominance (SD) was employed to compare prices across marketing channels and identify optimal marketing channels. Here it is worth re-stating that optimal marketing choices are identified based on the farm gate prices only. Intangible costs such as search costs and opportunity costs of time are not considered when identifying the optimal marketing strategies since their estimation needs adequate market information (Larochelle et al., 2010).

SD analysis has been used in financial contexts to study portfolio alternatives and their associated risks. Of the recent, the approach has been adopted in agricultural settings to analyze crop choices and comparing efficient and remunerative marketing channels (Hardaker et al, 2004; Anderson and Dillon, 1992; Anderson and Hardaker, 2003; Dillon, 1971 and Danilo et al., 2007).

Figure 2 shows the cumulative distribution of farmers for marketing channels in terms of price per bucket. The distribution curves do not cross which implies that this is the first degree dominance. Graphically, First-order Stochastic Dominance (FOSD) exists when the cumulative distributions functions do not intersect, if they do cross, then the FOSD results are indeterminant which calls for the need of the second step of Second-order Stochastic Dominance (SOSD). FOSD can be used to identify the alternative with the higher returns. Using FOSD criterion, we could identify marketing channels that have the highest payoff and more preferred by farmers which are referred to as optimal marketing choice.

Figure 2: Farmers cumulative distribution for major marketing channels



Market choice, which influences the price received by farmers, is also crucial to achieve high market participation. FOSD assumes that decision makers in this case farmers prefer more to less (Anderson and Hardaker, 2003). Under this criterion, marketing channel I is preferred as it

generates highest payoff with high volumes of sales at every level of probability compared with those generated by other channels. Graphically, the preferred distribution is always to the right of other distributions. We can say in this order, marketing channel III was the least preferred.

CONCLUSION

As far as market performance is concerned we can conclude that tomato markets are informal involving sales in the farm-gate, at homestead or periodical village market centre. The produce is transported to market by head-load, bicycle, motorcycle or animal power driven carts. Distant famers do transport produce to market by minibuses, small trucks and motorcycles where most producers do sell through a set of intermediaries dominated by local assemblers. This revealed that farmers usually incur less cost using this channel. At well developed markets farmers are price takers as there is great reliance on the traders for market information. Farmers did not show trust to traders which suggested less preference to these markets despite their higher prices offered. Farmers perceive a higher risk of being exploited by traders. Market choice, which influences the price received by farmers and volume of sales, is also crucial to achieve increased market performance. This suggests that farmers usually use channels with the higher returns resulting from quantity sold not unit price.

REFERENCES

Acharya S.S. (1998) Vegetable production Marketing and price policy in India, Mittal publications, New Delhi.

Acharya, S.S. and Agarwal, N. L. (2008) 'Agricultural Marketing in India', Fourth Edition, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi, P.No.41.

Adekanye, T.O. (1982). Marketing Margins for Food: Some Methodological Issues and Empirical Findings for Nigeria. Canadian Journal of Agricultural Economics, 30 (2): Pp 333-344.

Adeyokumnu, T. O. (1973). The Marketing of Rice in Egba Division, Western Nigeria. Bulletin of Rural Economics and Sociology, 8: Pp 243-253.

Anderson, J.R., J.L. Dillion, and J.B. Hardaker (1977). Agricultural Decision Analysis. Ames: Iowa State University Press.

Arinloye, D-D. A.A. Pascucci, S., Linnemann, A. R. L., Coulibaly, O. Hagelaar, G. and Omta, O.S.F.W. (2012). Market Channel Participation of Small-Holder Pineapple Farmers in Benin. Conference Proceedings in: The 2012 Las Vegas International Academic Conference October 15 - 17, 2012 in Las Vegas, Nevada (USA). Pp 394-412.

Bailey, D. and J.W. Richardson (1985). Analysis of Selected Marketing Strategies: A Whole-Farm Simulation Approach." Am. J. Agr. Econ. 67:813-820.

Bressler, R. G. and King, R. A. (1970). Markets, prices and international trade. New York: John Wiley.

Collinson, C.D., U. Kleih, D.G. Burnett, R.S.B. Ferris, J.N. Jagwe, A.K. Muganga (2002) Transaction cost analysis: Plan for the modernisation of agriculture. The Natural Resources Institute and The International Institute of Tropical Agriculture (FoodNet). Consultative Group on International Agricultural Research (CGIAR). Washington DC, USA.

Danilo, A., C.B. Barret, D. Boughton, B. Cunguara, David. Mather, D. Tschirley, and R. Benefica. (2007). Market Participation by Rural Households in a Low-Income Country: An Asset Based Approach Applied to Mozambique, Faith and Economics, Vol 50, 64-101.

Delgado, C.L. and Siamwalla, A. (1997). Rural Economy and Farm Income Diversification in Developing Countries. MSSD Discussion paper No. 20. Washington, D.C.: International Food Policy Research Institute.

Dillon, J. L. (1971): An Expository Review of Bernoullian Decision Theory: Is Utility Futility? – Review of Marketing and Agricultural Economics 39: 3-80.

ESRF (2010) Strengthening Micro-Enterprises in Tanzania: The Case of Small-Scale Vegetable Farmers in Arusha. Economic and Social Research Foundation.

FAO (2010) Good Agricultural Practices (GAP) on horticultural production for extension staff in Tanzania. FAO Working GAP Paper series. FAO, Rome.

FAOSTAT (2013) Food and Agricultural commodities production. Retrieved from http://faostat.fao.org/site/339/default.aspx. The site visited on 10 September, 2011.

Hardaker, J.B., Huirne, R.B.M., Anderson, J.R., Lien, G. (2004): Coping with Risk in Agriculture. – 2nd edn. CABI Publishing, Wallingford-Cambridge.

Holtzaman, J. S. (1986). Rapid Reconnaissance Guideline for Agricultural Marketing and Food Systems Research in Developing Countries. MSU International Development Working Paper No. 30. East Lansing, Michigan: Department of Agricultural Economics.

Kohls, L. R. and J. N. Uhl, 1980. Marketing of Agricultural Products. 6th ed. Collier Macmillan Canada, Inc. Canada.

Kramer, R.A. and R.D. Pope (1981). "Participation in Farm Commodity Programs: Stochastic Dominance Analysis." Am. J. Agr. Econ. 63:119-128.

Lansigan, F.P., Pandey, S., and Bouman, B.A.M. (1997). Combining crop modeling with economic risk-analysis for the evaluation of crop management strategies. Field Crops Research. 51:133-145.

Larochelle, Catherine and Alwang, Jeffrey; (2010) Market participation and marketing performance : A case study of Bolivian potato farmers. Virginia Tech. USA.

Mas-Colell, A., Whinston,M. D. and Green, J. R. (1995). Microeconomic Theory. Oxford, UK: Oxford University Press.

Mjelde, J.W. and M.J. Cochran. (1988) Obtaining Lower and Upper Bounds on the Value of Seasonal Climate Forecasts as a Function of Risk Preferences. West. J. Agr. Econ. 13:285-293.

Mnenwa, G.C. Ashimogo and E.N. Mbiha (2005). Vegetable production through target marketing. DAEA, SUA Morogoro.

Ramakumar, R., (2001). Costs and margins in coconut marketing: some evidence from Kerala. Indian Journal of Agricultural Economics. 56 (4):668-680.

Ravallion, M. (1986). Testing Market Integration. American Journal of Agricultural Economics, 68 (1): 102-109.

Rhodes, V. J., (1983). The Agricultural Marketing System. 2nd ed. John Wiley & sons, Inc. USA.

Richardson, J.W. and C.J. Nixon. (1984). Selecting Among Alternative Depreciation Methods: A Stochastic Dominance Approach." Paper presented at AAEA meeting in August, Ithaca, New York.

Rister, M.E., J.R. Skees, and J.R. Black. (1984). Evaluating Use of Outlook Information in Grain Storage Decisions." So. J. Agri. Econ. 16:151-158.

Sandika, A.L. (2011) Impact of middlemen on vegetable marketing channels in Srilanka . Tropical Agricultural Research & Extension. 14(3).

Saunders, M. et al. (2007) Research methods for business students, 4th Edition. London: Financial Times Prentice Hall.

Scarborough, V., and J. Kydd, (1992). Economic analysis of agricultural markets: A manual. Marketing Series No 5. Natural Resources Institute. University of Greenwich, Chatham, U.K. 166p.

Sivakumar, D., Njie, D., Vermulen, H. Korsten, L. and Rolle, R. (2008) Horticultural Chain Management for Eastern and Southern Africa – Theoretical Manual. FAO and Commonwealth Secretariat.

Staatz, J. M., Kizito, A. M., Weber, M. T. and Dembélé, N. N. (2011) Evaluating the Impact on Market Performance of Investments in Market Information Systems: Methodological Challenges. Michigan State University

Stern, L.W., Ansary, A.I.E. and Coughlan, A.T. (1996). Marketing Channels, 5th Edition, Upper Saddle River, NJ: Prentice Hall International.

United Republic of Tanzania (URT) (2012) National Sample Census of Agriculture Smallholder Agriculture Volume II: Crop Sector – National Report.

Xaba, B. G. and Masuku, M. B. (2012). An Analysis of the Vegetables Supply Chain in Swaziland. Sustainable Agriculture Research 2(2) pp 1-10.