

CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Tropical AgriSciences



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**Faculty of Tropical
AgriSciences**

**Farmers bargaining power and Agricultural
Market and Information Services**

Bachelor's thesis

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Declaration

I hereby declare that this bachelor's thesis entitled "**Farmers Bargaining Power and Agricultural Market and Information and Services**" is independently done by me, all texts in it are original, and all the sources have been dully quoted and acknowledged by means of complete references and according to the citation rules of the FTA.

18th of April 2019

Prague

.....
GODWIN YAO FENOO

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Abstract

Marketing of agricultural products has become a major challenge for most smallholder farmers in Sub-Saharan African. Among the marketing constraints faced by these farmers are lack of access to market information, information asymmetry, poor organization of inputs markets and low bargaining power. The study analysed farmers bargaining power within the agricultural marketing chain and identified role of agricultural market and information services (AMIS) amidst farmers bargaining power in some selected developing countries within the Sub-Saharan region. Information used for the thesis were obtained from the secondary datasets obtained from scientific databases of Thomson Reuters and Science Direct as well as Food and Agricultural Organisation of the United Nations (FAO), World bank and Internal Monetary Fund (IMF). The results show that, some AMIS provided information on a limited range of commodities, while others cover a wider range of cereals, vegetables, tubers and other staple and cash crops. Also, information on products prices did not increase or reduce transaction cost of producers. In addition, information on products prices did not increase or reduce transaction cost of producers. However, it improved the producers bargaining power. We also found that farmers who are regular users of AMIS received significantly higher prices more than the prices received from the producers who were not regular users of AMIS. Since small-scale farmers encountered numerous output market challenges such poor access to marketing information (e.g. products prices) and are often exploited by market intermediaries usually at farm gate prices, the study suggest the need to encourage small-scale farmers to patronise Agricultural Market and Information Services in both government and private sectors to attain useful information about the production to obtain higher products price which will subsequently increase their incomes and contribute to improved livelihood within the Sub-Saharan region and beyond.

Keywords: Agricultural Market Information Services, agricultural producers, bargaining power, traders, agricultural markets

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List of the abbreviations used in the thesis

AIS	Agricultural Information services
AMIS	Agricultural Market and Information Services
ANOPACI	National Association of Professional Agricultural Organizations
CSR	Cooperate Social Responsibility
DAFO	District Agriculture and Forestry Officers
FAO	Food and Agriculture organisation
FAOUN	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
GEOGAM	Group on Earth Observations Global Agricultural Monitoring
ICT	Information Communication Technology
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
IGC	International Grains Council
KAC	Kenya Agricultural commodity Exchange
MACE	Market Agricultural Commodity Exchange
MAMO	Malian agricultural Market Observatory
MDB	Market Development Bureau
MDB	Marketing Development Bureau
MDG	Millennium Development Goals
MIS	Market Information Services
MOA	Ministry of Agriculture
MVMIS	Madagascar Vegetable Market Information Service
NAMBOARD	National Agricultural Ministry Board
OECD	Organisation for Economic Co-operation and Development
PO	Producer Organisation

RATIN	Regional Agricultural Trade Intelligence Network
SSA	Sub- Sahara African
TGT	Total Gain from Trade
UNCTD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
WBG	World Bank Group
WFG	World Food Programme
WTO	World Trade Organisation
ZAMIS	Zambia Agricultural Marketing Information Services
ZNFU	Zambia National Farmers Union
MACE	Malawi Agricultural Commodity Exchange

1. Introduction

Marketing of agricultural products has become a major challenge for most small-scale farmers in Sub-Saharan African (Dillon and Barrett 2017). Some of the marketing problems include lack of access to market information, information asymmetry between producers and sellers, and poor organisation of the input and output markets.

Performance of a market depends on the qualities of information and how it circulates among the various market actors. However, sometimes the economic and market agents often have inadequate and false information (Svensson and Yanagizawa 2009). Moreover, information asymmetries are frequent, thus traders on their part have better access to information while producers are often neglected and are most often misinformed. This leads to inequitable price formation and isolation, which caused a lot of problems to the producers (CTA 2008). Developing countries such Ghana, Zambia, Tanzania and others have taken keen interest in investing substantially in agriculture, since the sector that provides employment and income generation for rural folks and contribute significantly to GDP growth and foreign exchange (Aina 2007 and Aker 2010).

The contribution of agriculture to the economies of nations necessitated the establishment of agricultural market and information services as a means of increasing the efficiency of marketing systems and promote improved price formation. The need for such systems became most evident after the liberalisation of agricultural markets in the 1980s as part of the economic structural adjustment programmes (Tollens 2006). AMIS grew to be a big organisation in the 1980s and served as measures to economic liberalisation when the governments stopped intervening directly into major export and domestic food crop markets affairs (Tollens 2006).

To be able to link farmers to viable market opportunities and better regional trades and increase farmers' competitiveness is made possible through the functions of AMIS. Despite the existence of AMIS in SSA countries, little is known particularly among small-scale farmers about their scope, context in which they occur, level of variability and major functions. Against this background, the study seeks to review concepts of AMIS and bargaining power of farmers in sub-Saharan Africa and document lessons learnt from past experiences.

2. Aims of the thesis

2.1 Main Objective

The main objective of the thesis is to analyse bargaining interactions between farmers and traders and to identify the role of local AMIS that affect the bargaining position of local farmers in Sub-Saharan African countries.

2.2 Specific objectives

- i. To review the concepts and efficiency of AMIS amidst farmers bargaining power in Tanzania, Zambia and South Africa
- ii. Examine the influences of access to Agricultural and Market Information Services by farmers
- iii. Explore bargaining interactions between farmers and actors in the market chain

3. Methodology and Data

Secondary Data Source

The objectives of the thesis were obtained from analyzing secondary data resources, including articles, institutional sources and scientific journals such as, World Development and African studies, AMIS website and project reports documents as well as policy brief among others.

Reports, data and graphic representation used in the literature review were used to make situational analysis of agricultural market and information services between countries (e.g. Tanzania, South Africa and Zambia). The reports and the statistical database used were acquired from the WB, IMF, UN and FAO. The publication used were from Science Direct, Web of Science, Google Scholar and Scopus. The sources used for the review were in English. All the sources we used have been quoted and acknowledged by means of complete and according to the citation and reference rules of the FTA.

4. Literature review

4.1 Overview of Agricultural Market and Information Services (AMIS)

The Agricultural Market and Information Services (AMIS) is an inter-agency platform that enhances food market transparency and policy response that are geared towards food security. This was established in the year 2011 by the members of G20 Ministers of Agriculture, followed by the global food price hikes in 2007/08 and 2010. Which brought together the main trading countries of agricultural commodities, AMIS aims to assess global food security supplies and focused on the following crops such as wheat, maize, rice and soybeans and provides a platform that coordinates policies and actions in times of market uncertainties (AMIS 2015).

The importance of information for effective functioning of markets in developing countries has been a central pivot of economic theory since the formative work of (Stigler 1961). Promotion and marketing of this agricultural produce plays an important role in the attainment of basic goals of food security, poverty reduction and sustainable agriculture in the future for other generation, mostly among smallholder farmers in developing countries in Africa (Aitshul 1998). AMIS works on four main pillars, thus analysis, outreach, market monitor, and capacity building and development. Together, AMIS membership represents many global productions, consumption and a large trade of targeted crops, in a range of 80-90 percent in the globe.

By enhancing transparency, policy situations and coordination in international food markets, AMIS has helped and prevented a lot of unexpected price hikes and further strengthen global food security situations (AMIS 2015). In general, there are three basic problems listed to explain the lack of effectiveness of agricultural marketing and bargaining systems in developing countries, thus lack of information, the asymmetric of information and the dispersion of information (Bardhan 1989; Stiglitz 1991; Galtier et al. 2014; Courtois and Subervie 2015).

Makhura (2001) realised that the market of small-scale farmers is faced by poor infrastructure, distance from the market, lack of own transportation means, middlemen involvement, and inadequate market information. The sector continues to meet a lot of problems at the global, regional and national levels that require special attention to address them. Some of the issues and factors that faced developing countries are long and

discontinuous supply chain, inadequate policy support and limited facilities for storage in the villages. A lot of studies, shows that smallholder farmers have limited access to physical, technical knowledge and financial resources that restrict their ability to expand and invest in technologies that increase efficiency and add value to primary production (Devaux et al. 2009).

To duel well in the global economy and other businesses, agriculture intellectuals must have proposed different mechanisms of empowering rural smallholder farmers Dorward et al. (2004) proposed to improve the marketing system to enable smallholder farmers to benefit more from their produce (Kleih 2004). Reliable market information may also help farmers decide on where to sell, when to sell, who to sell to and how to plan their production (Kindness and Gordon 2001; Ferris and Robbins 2004; Kleih et al. 2006) respectfully. And more importantly, farmers should be aware of the types and quality of produce being and sought for by national, regional, and international customers that will help the nation to earn more from exports (Ferris and Robbins 2004).

4.1.1 Bodies and organisations in AMIS

To carry out its main routines and functions, AMIS consists of the following bodies that steers its affairs.

The Global Food Market Information Group

This entails assemble of technical representatives of AMIS participants providing reliable, accurate, timely and comparable market signals and policy information as well as issues relating to prices of the AMIS official crops such as wheat, maize, rice and soybeans. The countries that does this discussion are Nigeria, Russia, Spain, France, Brazil, Italy, India, Germany, USA, Vient Nam, Ukraine, United Kingdom and others (AMIS 2015).

The Rapid Response Forum

This consists of senior officials from AMIS that promote discussions on critical market issues and ways of addressing them and encourage the coordination of policies and the development of common strategies for the organisation. The forum usually meets once in

a year and can meet at short notice when global market conditions warrant this policy action to be taken ([AMIS 2015](#)).

The Secretariat

It comprises of eleven international and inter-governmental organizations such as FAO, GEOGLAM, IFPRI, IFAD, IGC, OECD, UNCTAD, the World Bank Group, WFP, and WTO gives or provide short-term evidence of market positions, assessments and analyses of results and support for all functions of the Information Group and the Forum of AMIS. The Secretariat ([AMIS 2015](#))

4.1.2 Overview of Agricultural Market Information Services (AMIS) in Sub- Sahara Africa (SSA)

Sub-Saharan African (SSA) is the most deprived and poorest region in the world. The mean per capita income in 2010, was \$688 relative to \$1,717 of the other developing countries. A few decades ago, per capita GDP in the Sub-region was 0.16 percent per year. This default in result over the long term has rendered the continent into a state of lack ([Chauvin et al. 2012](#)).

The modern economic philosophies emphasise information as one of the pivotal factors that determines the performance of the market products of farmers. In the theory of viable markets of the general balance systems, information concerning scarcity of resources and its uses is available to all the economic agents in the market. And this allow for optimal allocations and uses of the resources by the agents in the market places. Thus, the price summarizes all the information relating to the product. In other words, the equilibrium price sends information to the economic agents and this plays an important role to some extent to the other part of the market places ([Grossman and Stiglitz 1976](#)). According to ([Fama 1970](#)) a market is “informationally efficient” if prices at each level of the goods and services merged is all the available information about the future values of the product.

4.1.3 Structure of Agricultural Market Information Services (AMIS) in Sub- Sahara Africa (SSA)

Agricultural products marketing services started in most of the developing countries of SSA in the 1980s. Where most of the managements of these countries controlled and

regulated the major export crops, strategic food commodities and inputs in each country (Kherallah et al. 2000). There was a common saying that, private traders were exploitative and expensive that, markets could not be trusted with the critical task of feeding the nation (Kherallah et al. 2010). The oligopolistic input market forces, monopolistic produce marketing boards, seasonal and territorial administrative commodity prices and fixed wholesale and retail prices (Barrett and Mutambatsere 2005).

The government enterprises were given the power and mandate to organise food markets and fix their national prices for farmers and consumers in these developing countries of Africa. And to some extent, are to manage the export crops products by giving inputs on credit, fixing their prices, and controlling the processed and export of the crops (Mbiha et al. 2001; Kilima et al. 2008; Kherallah et al 2010). The assessment report and the statistics of the studies discovered that, the government-controlled markets, were perform abysmally and farmers were exploited due to low prices of their produce, and due to high taxes and high costs made the enterprises to delayed payment (Pokharel and Thapa 2007; Kherallah et al. 2010)

The market information system (MIS) is a structure that is designed to collect, gather, process, and disseminate information on conditions and dynamics of agricultural markets to different stakeholders such as farmers, traders, processors, and other interested parties in agroindustry through one or more information channels for decision making (Muganga 2011).

4.1.4 Steps in market information services in developing countries

The Market information systems (MIS) were developed in two steps in developing countries. The first stage was generation of MIS which was established in 1980, when most developing countries liberalised their agriculture sectors. The first-generation models had allayed results, a major study on 120 first generation MIS in developing countries carried out by FAO in 1996, which revealed that only 53 of the 120 fulfilled the lowest operations criteria (CTA 2008). Even though they prospered in providing information to institutional decision makers on the development of agricultural product prices, their impact was relatively weak on the market structures and the behaviour of agricultural producers. They did not meet specific information requirements especially those of the producers in a timely manner (Chiatoh and Gyau 2016).

And the next one was the second generation followed in the 2000s, driven by various factors such as complications faced by the MIS of the first generation to achieve and impact their aims of the new chances offered by the development of ICT. Before then, spread of price, data from the group point to the central unit, would take several days (Chiatoh and Gyau 2016)

But with the second-generation MIS, “real time” information can be brought within a few hours. Another fundamental change is the opportunity of interactivity, enabling a two-way connection, for example, between farmers and markets or extension agents (David-Benz et al. 2012). Second generation MIS are further sprinted into three categories (Kizito 2011). These are as follows:

- Farmer organization-based MIS, they are achieved by farmer organizations. Examples include, Malian Agricultural Markets Observatory (MAMO), Zambia National Farmers’ Union SMS MIS (ZNFU 4455), Madagascar Vegetable Market Information Service (SIEL), and the National Association of Professional Agricultural Organizations (ANOPACI).
- Private MIS, these are private entities that were provided information within but are not involved in trade of agricultural commodities. Examples include Esoko in Ghana and Infotrade in Uganda, and those attached to emerging commodity exchanges such as the Kenya Agricultural Commodity Exchange (KACE) and Malawi Agricultural Commodity Exchange (MACE).
- Trader and NGO-based MIS, these are run by trader administrations or associations such as the Regional Agricultural Trade Intelligence Network (RATIN), housed in a trader organization (Eastern Africa Grain Council), and the Rice Observatory (OdR), a group of rice value chain actors in Madagascar. The marketing channels were typically very inefficient, with centralized storage and processed facilities (Barrett and Mutambatsere 2005).

4.1.5 Agricultural Market and Information Services in Tanzania

In Tanzania, the market information system was introduced in 1970, when the Marketing Development Bureau (MDB) was operated under the Ministry of Agriculture. Funds for operating MIS were first provided by the United Nations Development Programme UNDP in 1972, and the Food and Agriculture Organization FAO served as the executing

agency (Nkuba 2016). In its early stages, the MDB was accountable in advising the government on marketing policies and providing training and regular market reports information to the users. After a period, MDB was given some additional tasks, such as price controls for consumers and price recommendations for producers, especially for the main cash crop commodities and staples crops (Nkuba 2016).

Furthermore, MDB was expected to do a research on crop cultivation costs on behalf of cooperative unions that were formed in the town (Temu et al. 2001). In its early stages, MDB provided official information on just quantities and commodity prices, by the early 1980s. MBD's role had expanded to cover unofficial parallel markets. The acknowledgement of this information came in 1986, after the economy had shifted to a market led economy. Since then, MDB has been going through role adjustments, structural changes, and expanded coverage of products (Nkuba 2016). Because of these and many other changes, the title of the department has been changed from MDB to Agriculture Information Service (AIS), and to its current name of Market Information System (Temu et al. 2001).

4.1.6 Agricultural market and information services in Zambia

Agricultural marketing in Zambia went through a series of transformation over the past few years. Zambia opened its Agricultural Marketing Information Centre (AMIC) as part of the policy of market freedom and has got the right to collect, analyse and spread market information on agricultural produces and inputs (Mwanaumo 1999). The country introduced maize output marketing and input marketing. The Market information service that had been set up by the Ministry of Agriculture in conjunction with the FAO assistance, has played an important role to facilitate this process and has improved the production of maize produced by the small-scale farmers.

Unlike Tanzania, for instance, which had the production of maize prior to the liberalisation, had got effective parallel market in grains. The Zambia maize marketing was controlled completely by the government (Rashid et al. 2010). first through NAMBOARD and subsequently through the cooperatives In Tanzania it was very easy for the private sector to do maize business with the government's trading activities and used all the resources of the government at that time but not like that of Zambia traders. But rather they were expected to start from the beginning and do everything on their own.

The provision of market information was considered an important step to encourage such a trade (Shepherd 1997).

ZAMIS started its maize trade in Zambia in May 1993, and before then, most of the staff were working in a cooperative stock-management information system. Initially, the traders and farmers needs were given high margin, but it was later said that, ZAMIS would be extended to cater for farmers and by the end of 1995 this thing took place. This Service is coordinated and supervised by the Ministry of Agriculture in Lusaka. The Service department collected and spread the wholesale and retail prices of maize, maize meal and other food crops, fertilizer and seeds in the country. The wholesale prices of maize and others serve as a reference prices for the private sector and as such, play an important role in sponsoring produce movement from production to consumption areas (Shepherd 1997).

With the launched of ZAMIS in May 1993, information on prices and market did well, were spread through the following three channels, weekly radio broadcasts, weekly market bulletins and the price boards broadcasting. All these price broadcasting channels ran into problems. The post office in Zambia made an increased to the postal charges to the twin of 400 per cent which made it impossible for the Ministry to finance the distribution of weekly market news and the price boards did not find it easy with the farmers. While the bulletin on radio continued to be published because sponsorship from a local bank put it upon themselves to finance the bulletin. Future sustainability will depend very much on attraction and retaining of such sponsorship and other ones from benevolent companies (Shepherd 1997).

ZAMIS realised that it was not enough just to publish prices and leave it for farmers to interpret the data and must also be aware of potential market outlets. For that reason, the Ministry tried to introduce local newsletters on a provincial basis to advise farmers which where to market their products. A small FAO project also trained extension workers and farmers in how a liberalized market should function. The project paid attention to improving on-farm storage, which became increasingly important now that farmers have no outlet for their crop directly after harvest.

The farmers in Zambia indicated that information needed for decision-making by small scale farmers included, calculation of gross profit margins for a farm produce, possible markets information, stability and availability of the produce in the market, prices of

inputs and estimated transport costs for inputs should be known by farmers (Mushigwani et al 2002). Some of the studies in Zambia, revealed that, farmers who profited from the price information services wanted to get or know other information as well. Such as weather forecasts, advice on crop production, marketing and use of appropriate seeds and fertilizers that helped farmers to grow crops that are needed in the market and will give them great gross profit margins (Awasthi 2007).

Terero (2011) proposed that one way to link farmers to market is by improving the physical infrastructure around them. Agricultural stakeholders such as small-scale farmers should use efficient ICT applications and tools at different level of time in agricultural value chains to plant, market and sell their produce from pre-production to advisory services, marketing and consumption period. The use of mobile phones, radios, posters and other gadgets of information network of advertising produce by small scale farmers is substantial and very much needed Donovan (2011) reported that the use of mobile phones in the farming industry helped to increase the level of income of farm household, improve market efficiency, reduce transaction costs of farmers and present a great deal of opportunities for new way and innovations.

4.1.7 Private market information in South Africa

A private service centre run by Agritel information service centre provides information on market situation in South Africa's wholesale markets and its major abattoirs. Agritel collected data on every day and all the markets information and it then processes them and packages them to a more user-friendly format (Hyne 2018) The result is a combined service which covers both prices and volume of data from such as commodities, varieties, classes, sizes, and packages Agritel had about 400 users who pay monthly dues which range from US\$ 28 to US\$38 which depended on the number of services given and markets the user wishes to access. The users included producers, packers, caterers, butchers, wholesalers, market agents, and the markets themselves (FAO 1997). In addition to this, they paid subscription fees, users must have access to Beltel. Access can be obtained through a terminal hired from Beltel or using a personal computer and modem to access them. The telephone call made for Beltel is toll-free The Agritel service is completely menu-driven and easy to use (Hyne 2018).

The historical information was made to show trends which were from the beginning of the service. Agritel made the use of market information through its fullest potential and people really use. It is, however, only cost effective and ease access and readiness of fully computerised data system outplay. It is unlikely that, Agritel would be commercially viable if the company had to collect the information on its own and being able to rely on available data sources ([FAO 1997](#)).

4.2 The influences of access to Agricultural and Market Information Services by farmers

4.2.1 Challenges of small-scale farmers amidst market information and services

Despite the importance of agriculture to the economic development in SSA countries, small-scale farmers are bedevilled with numerous output market challenges and as such are not well connected to the market channels for information about prices of their farm products and market information (Aina 2007).

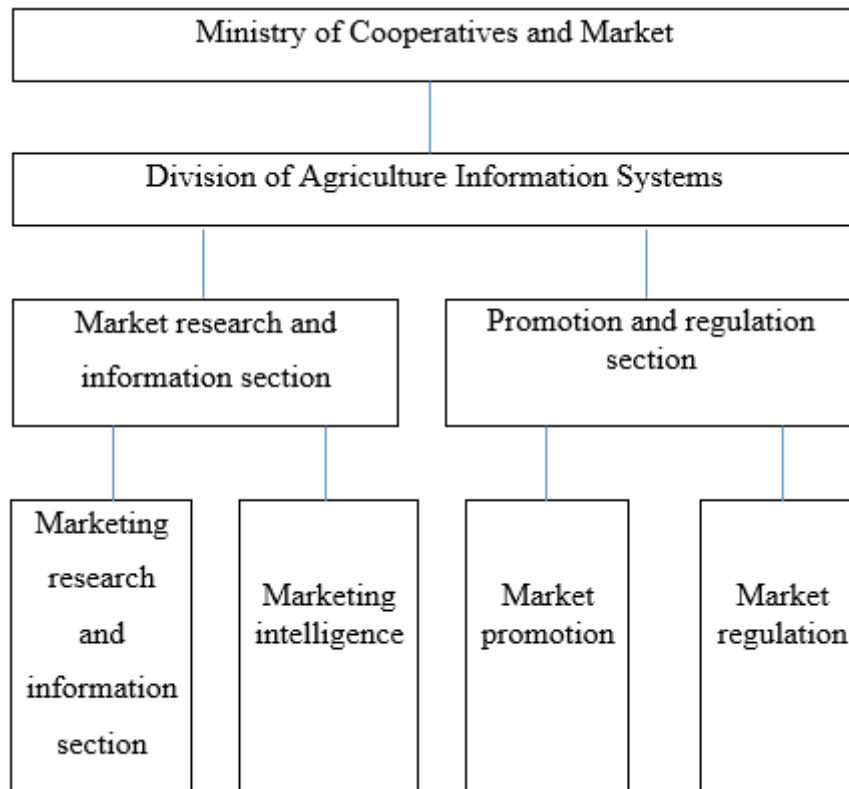
Schemermeier and LightFoot (2007) argue that, small-scale farmers are oppressed and do not get a good share of the final consumer price due to poor access to marketing information about their produce? The farmers in the rural areas of developing countries only receive marketing formation from their fellow farmers' through a word of mouth (Gordon and Kindness 2001).

Lack or poor access to marketing information has left rural farmers to be oppressed by other agents in the supply chain. Rural farmers often are not aware of the prices of what they produce at distant markets and let alone knowing or getting information from colleague's farmers in the area. The poor access to information by the small-scale farmers motivates the traders and middlemen to visit the farmers at their homes, local market areas to make purchases of their produce at their door steps.

The traders and middlemen took advantage of the farmers lack of knowledge on the market prices, poverty level and weak bargaining powers which are by influenced market illiteracy, low social status and poor academic background of the farmers (Lightfoot and Scheuermeier 2007). Intermediaries time and again ignorance of market rules and pricing lacks transparency in the market for farmers (Rao 2007). The marketing information that is spread to farmers may not meet or fulfil its objectives, because it will too late and not understandable to farmers (Robbins and Ferris 2004).

Under current modifications, MIS has been moved from the Ministry of Agriculture into the Ministry of Cooperatives and Markets. Figure 1 illustrates the current structure of MIS under the Ministry of Cooperatives and Markets.

Figure 1. Agricultural Market Information System in Tanzania



Source: Nkuba 2016.

4.2.2 The efficiency of agricultural marketing systems

Creation of agricultural market information services increases the efficiency of marketing systems and promote high price formation for farmers (Tscshirley et al. 1995; Ferris et al. 2008; Svensson and Yanagizawa 2009). It is a known fact that, the resources are easily misallocated by consumers and producers when they are faced with the imperfect market information in there.

There are two things that normally happened, and these are, consumers end up by paying too much or too little and producers end up by producing too much or too little to the public. The best way to remedy these outcomes is to give all the market participants or agents with the needed information at the lowest possible cost. Because of such efforts, the information market now becomes more efficient and it act as a motivating factor establishing MIS for the farmers and producers (Svensson and Yanagizawa 2009).

4.2.3 Market information on agricultural products

Market information on products varies and consists of market news such as information on prices, quantities, market conditions, and business contacts, market analytical reports also include e.g., reports that makes changes in market conditions and their effects on stakeholders, and business reports such as e.g., providing information that can help stakeholders to identify reliable trade partners. Finally, the most valuable source of information is market news reports that provide traders with price information and business contacts (Magesa et al. 2014).

According to Molla et al. (1995) the market information is a public good which used the same time by many individuals without a reduction in its quantity and value. For instance, information about the available product, thus product A at location B can be used at the same time by thousands of individual users and traders in that same area. Furthermore, if the information provided is durable, accurate, reliable, and accessible to the public, then it will increase efficiency and improve market transactions (Shepherd 1997).

Other researchers (Tschirley et al. 1995) also clearly put it that, market information is a public good according to economist's theories. Market information services included frequent collection of product prices from large and small markets, sorting, storing, and finally disseminating them to other beneficiaries through the chosen channels (Kizito et al. 2011).

Market information in most developing countries is considered as a public good service provided by the government agencies (Ferris et al. 2008). Giving the whole activity of providing marketing information to the private sector could cause a lot of problems that will not be beneficial to the economy as anticipated. The cost of investing in a timely market information services by a private agent may exceed the profit that is perceived to be collected by the private agent. The cost of collecting the market information may be greater as individual traders or people may collect the same information for the organisation (Tschirley et al. 1995).

4.2.4 The importance of Agricultural Market and Information Services

There are different ways of disseminating commodity prices among the stakeholders. These methods include televisions, radio, email, newspapers, internet, mobile phones, and other devices (Magesa; Michael and Ko 2014) information that is commonly and usually

used by marketing systems can be grouped into three dimensions, thus up to date, or current information, which facilitates efficient bargaining, and historical information that is compiled over time (Shepherd 1997).

Farmers need information to be able to sell their produce, this is often used in bargaining of the price between stakeholders. Access to timely and enough market information services and analysis has great impacts and effect on participants in the market places (Kaganzi et al. 2008; Yanagizawa et al. 2009).

Aldridge (1992) discusses a case study in which the market information systems of Mali (Système d'Information sur le Marché) monitored 13 markets in Bamako and the information that was shared enabled or made way for consumers to find the lowest priced markets within the city. Easy access to market information also encourages long-distant trade by way of giving traders a reliable information about the conditions in distant markets and provided transparency in the market by way of creating awareness of all parties involved and prevailing market prices and other relevant information reports (Shepherd 1997).

Farmers and market participants are advice and encouraged to plant more for the buyers because of increased transparency in the market and low risk involvement among the participants in the market, and efficient sharing of market shares and signals (Aldridge et al 1992).

Improved market information strengthens both the availability of and access to food (Aldridge et al. 1992). Retailers in Bamako, Mali cited this as major benefits that attribute to access to market information because the transaction costs of transporting and transferring ownership of cereal crops such maize, wheat, millet and others were reduce (Staatz et al. 1992).

4.2.6 Types of market players in the agricultural marketing chain

Different types of actors in the market are involved in taking the produces from the farms to rural areas, urban consumers and markets. These players or agents are farmers who produces the produce, sell them and buy them at times and the traders are the people who

buys from the farmers at the farmgate and, they include retailers, intermediaries, semi wholesalers and wholesalers, and the transporters (Eskola 2005).

The Farmers always sell their produce to intermediaries, such as retailers, semi wholesalers and other traders. And these agents also sell directly to wholesalers in local and urban markets in the various Sub Sahara African countries. Wholesalers are the main and primary market agents that are responsible for inter-regional trades, selling the commodities to other wholesalers, retailers and consumers (Eskola 2005).

4.2.7 Types of markets in AMIS

There are four types of markets in MIS and which operate all over the world to help the flow of produce from the farmers end to the buyers and other important market agents (Eskola 2005). These act as the key places to transact businesses between the farmers and the traders, namely village markets or farmgate, regional markets, national markets and export markets. The traders buy and sell commodities of their choices on a system of these traditional markets which are held on a weekly basis.

The geographical location of the market may affect its density and the way the market function. The movement of farm produce by the traders from one market to another is influenced and associated with market information through ICT facilities, telephones, radios and others which helped improves good haggling performance in the market by enabling transparency, competitiveness and efficiency and increase the welfare of farmers (Shepherd 1997). The agricultural markets are unorganized, seasonal, and not enough market centres in the localities for operation. These markets centres are again dominated by these middlemen, who controls the prices of farm produce by way of causing fluctuation in prices, variation in measuring units and it is difficult to create trust and good will.

4.2.8 The need for agricultural market and information services

Academics consider agriculture market information as a public good (Tschirley et al. 1995; Ferris et al. 2008). They argue, if left to private companies, they would have companies and may keep that information secret to them which may lead to repetition of data collection and waste of time and money. Also, private companies may not recover the investment costs as the sold information might spread easily to people who do not pay

for it to give. Again, a study on improving information and performance in grain marketing (Tschirley et al. 1995) showed that the social benefits providing accurate and timely market information exceeds the returns that a private company would receive from investing in such activity. Thus, several moves, both by governments and private sectors are in place to ensure provision of market information to smallholder farmers.

Kohls (1985) and Chemonics (2010) posit that marketing of farm produce for human consumption is very important for food security and safety, because the aim of any producer is to deliver the products or services to the final consumer for utilisation.

Farmer organizations also find ICT better in providing services to their members. SMS systems also enable farmers to compare prices in different markets and to take a stronger negotiating position when selling their produce. For example, Zambia's National Farmer Union ZNFU is utilizing SMS systems to provide marketing information to its members, likewise Burkina Faso Farmers use ICTs to share new production, processing, and marketing Skills (Harrod and Jansen 2011). Developing and utilizing ICT applications in delivering agricultural information are constrained by several factors. Some of these challenges are related to market access and infrastructure, other to ICT infrastructure and the mode of delivery of information. A study to develop market information in East Africa (Ferris and Robbins 2004), found that agricultural markets are characterized by a long chain of transactions between farmer gates and consumers, lack of competitiveness between traders, and poor access to appropriate market information. Smallholder farmers are restricted to market access due to lack of information. Due to lack of or asymmetric nature of information, excess price dispersion across markets is common Aker (2010). A report on reviewing information on marketing of agricultural commodities in Uganda (Bibangambah 2002) revealed that organic coffee growers were paid the prices of non-organic coffee. Due to poor functioning markets, traders and processors in Uganda complained of lack of access to timely information to facilitate marketing of agricultural goods (Ferris and Robbins 2004). Poor roads may also limit access to markets and market information by rural farmers. Ugandan farmers received less prices than they could have achieved if they had means of transporting their produces to the markets (Bibangambah 2002; Ferris and Robbins 2004). Lack of supporting policies, clear legal and regulatory framework may also lead to exploitation of smallholder farmers by other market participants. Single buyers for certain commodities have been a problem due to lack of

competition. The problems of low prices due to single buyer, delayed payment and selling commodities on credit have discouraged coffee growers in Northern Tanzania and thus are opting for planting cereals.

In addition, failure to access relevant materials, reliable and timely information serves as a barrier to entry into both production and trade activities in the market (Ferris et al 2008). Nowadays, most traders find it difficult to trade without much information and resources. Furthermore, poor access to market information news and others increase costs of businesses because the actors are forced to invest their personal funds to collect data for processing into information (Magesa et al. 2014).

4.2.9 Impact of Agricultural Market and Information Services on farmers output markets

Access to markets and market information services have positive impacts on the welfare of farmers and improved efficiency. A study on the impact of market information services on rural maize farmers in Uganda (Svensson and Yanagizawa 2009) reveals that access to market information resulted in higher farm-gate prices and improved farmers' relative bargaining power positions vis-à-vis and the local traders in the locality. Another study in Niger by (Aker 2010) also show that access to market price information through mobile phone, radio, and other publicities coverage reduced agricultural price dispersion across markets by about 10 percent.

A study proposed and developed to do efficient grain marketing systems in Ethiopia (Tschirley et al. 1995) noted that improving the market agent's awareness, create high prices in the various markets throughout.

Access to timely, reliable, up-to-date of creditable information also benefit governments to effectively plan and address the food insecurity problems they have in each country. Due to this food insecurity problems around, many countries in (SSA) have planned of establishing market information services (Shepherd 1997; Ferris et al. 2008; Svensson and Yanagizawa 2009). In a case study of Nepalese marketing information of mandarins done by (Pokhrel and Thapa 2007) no support was found for any middlemen that were exploiting the producers in the process of marketing. This also has been the end of several geographically diverse studies of agricultural markets in developing countries (Hayami

1999; Enete 2009). In a report on Bolivian potato farming (Jones 1984) instead found that the role of middlemen has contributed so much and given a positive impact on small scale producers and should be considered when policies for rural development is to be made.

There were some people who challenged or criticised the role of middlemen in marketing arguing that, they are opportunistic, and their behaviours raised transaction costs of businesses and create imperfections in the market. And that their high margins in profits misrepresented the market by driving a block between the price paid to farmers and by final consumers (Tara 2011). According to Getnet (2008) the middlemen are popularly seen as “parasites”, who do not create any wealth or value because they do not actually create anything good or real which represent anything such as a physical product or direct service. The people who are in support of middlemen involvement, reason that middlemen are responsible from moving products from producers to final consumers, as well as overcoming the time, place, and possession gaps that separate goods and services from those who need or want them (Kotler and Keller 2009). Mesarić and Dujak (2010) said that, the middlemen are important as a component of value chains in the function of consumption, production and competition development Rubistein and Wolinsky (1987) said that, the role of middlemen is to reduce the time preference losses that occur when agents must search for a trading partner.

4.2.10 Costs of information

In Benin, there was no Market Information Service, so farmers who wanted to sell their surpluses beans and maize had to search for information about market conditions in the country. It is very easy to gather information on local markets as these are visited regularly to buy consumer goods (FAO 1997). Information on conditions in markets later away was more difficult to obtain in the country. These markets were visited less regularly by members of the household or other inhabitants of the village in the area.

The transportation cost to visit these outlets and gather information that has been creating an entry barrier, as the quantities handled were often small, less than hundred kilograms (Yeats 1976 and 1977). Small traders, quite plentiful on the Benin maize market, faced the same type of problem. Traders got small quantities in the villages, often less than 100 kilograms sold at nearby regional market centre, that is the only market for which

information was available. Even wholesalers had a small area of intervention as quantities handled were small, less than 1000 kg. per market day. They often ran in a network of a few market places in Benin (Amjadi and Yeats 1995).

Generally, traders go to the market in person and decided whether it was profitable to buy or sell. Information costs was made mainly of transport costs, taxi of the trader and the opportunity cost of labour or time spent to be with the goods in market. Transport costs could be big, especially when only small quantities were traded daily. For most traders, gathering information on other outlets was costly and not easy to be collected, because of limited turnover and because of the hazard of such a loss (FAO 1997).

4.2.11 Spatial and temporal arbitrage interaction

There are times when spatial and temporal arbitrage interaction comes in to see if more money could be gotten on the produced sent to different places. In the southern part of the country, two major seasons are possible, that is July-August and December-January, while in the northern part, there is only one major season, and which was September-November. The fact that harvest periods never agrees, and the distances between markets are short and maximum of 500 kilometres, which made interacting spatial and temporal arbitrage possible to the market people (Bardhan 1990)

However, rainfall is not reliable and may arrive early or late in the season, and harvests may be average or plentiful. Generally, surpluses in the northern part are covered to the southern part at the end of the lean season in April and June. When harvests in the southern part are abundant and early, due to early rainfalls, prices may reach the highest levels in April as stocks are small during a relatively short period before the beginning of the new season of harvest period (Killick 1988). When harvests in the southern part are averagely late, then prices become very high in July, and this attracts surpluses from the northern part of the country or even further away from Nigeria (Bardhan 1990)

After the beginning of the harvest period, prices go down in the south, while prices in the northern part of the country become very high since the harvest will start later in this region. These conditions to store become difficult and risky and consequently the value of correct information is more important to farmers of this country (FAO 1997).

4.3. Analysis of bargaining interactions between farmers and traders

4.3.1. Farmers market power

Power is the strength and ability of to direct or influence the behaviour of others. The existence of leading firms can coordinate the entire value chains to a distinctive characteristic and many governance forms of current agricultural markets (Carbone 2017). In principle, strong firms might use their power to make profits and value from the weaker ones. The problem is known in the works and it originated many gifts (McCorrison 2002). Among the definitions of power, the work mainly focuses on market power and bargaining power.

Market power is defined as, the ability of a firm or group of firms to raise and maintain price above the level that would prevail under competition and it is referred to as market or monopoly power (Khemani and Shapiro 1993) similar defined by (Perloff *et al.* 2007). The definition can easily to be included as monopsony or oligopsony power, as it is the ability to lower and maintain purchasing price below the perfect competition level.

This market power theory is based on two key assumptions:

- the firm(s)' actions to influence the market equilibrium
- the firm's planning and optimization problem relative to market equilibrium.

A general conclusion deriving from this theory is that, market power results in a reduced trade and holds everything else constant apart from loss of social welfare (Dockner 1993; Sexton and Zhang 2001).

From a broader perspective, market power has the ability to behave self-sufficiently, to a noticeable extent, from a competitor's sides, customers and finally, consumers (Alex Danau *et al.* 2011). To be able to place sales prices higher above the products costs to get a profit, it is an essential thing and very good for farmers' subsistence and development. Yet farmers have still got little market power to operate and have put on unfavourable positions on their specific markets. There are a lot of factors that causes it in the agri-food sector, farmers remain 'scattered all over' and are the only ones to be subjected to true race. In a worldwide context, farmers are not having so much money to be compare with big firms, that is characterised by economic, technical and financial concentration leading to the existence of gradually large and powerful firms (Alex Danau *et al.* 2011). Most of the farmers are isolated and small as compared with other sectors operators and especially compared with the people who buy the agri-food concerns, such as processors,

distributors and retailers. Their market power is thus very poor and totally uneven as compared to the great power of the firms with which they have commercial relations with. This bad position on the market is made up by other difficulties for farmers and when it comes to setting prices of produce to make a profit.

4.3.2 What makes farmers to increase their market power?

There are a lot of methods that can be used as collective or individual bargaining power. The collective bargaining power are based on instruments such as market discipline, that is aimed at managing the supply and pooling production, and the formation of cooperative integration of the commodity value chain (Sneessens 2009).

These strategies can be classified according to their level of intervention and explanation, as shown below:

- strategies that can be conducted on the market level, such as supply management and border protection, which are exclusively collective strategies that involve all the farmers as a group to do so,
- strategies that farmers can adopt to deal with firms and merchants, such as pooling production to negotiate its sale collectively (Sneessens 2009). Collective marketing and contractual sales are terms negotiated collectively and even the farmers' integration of commodity chain through which involvement in process and distribution. These strategies can be single or collective, which depends on the condition and the instruments used.
- methods that farmers could be adopt on the level of the individual farm, such as farming according to specific standards or practices of selling their products through short circuits. These are individual or collective ways that involve only a portion of the farmers (Sneessens 2009).

4.3.3 What does farmers and the sellers do about bargain power?

Bargaining power is also defined as the power to obtain a franchise from another person by threatening to impose a cost, or withdraw a benefit, if the person does not grant the franchise (Kirkwood 2005). Unlike market power theory, where the emphasis is laid on the definition to a specific negotiation among certain parties, whilst industry level studies are less common than in market power theory. Bargaining power is seen as, the capacity

to bargain for a produce, produced by a farmer and then sale on a favourable terms and naturally occurring in advance.

In principle, the bargaining power and market power are the result in lower prices or surplus transfers. This difference in market power is achieved through the result of purchasing or supplying less, whereas the bargaining power uses the threat of withdrawing from the transact cost (Kirkwood 2005). The key difference is that the exertion of market power always determines lower trade level as compared to perfect competition. While this concluded that it is not necessarily true in the case of bargaining power. In African, the meaning of power gives rise to undesired thing together, because it is used to refer to the state, its institutions and their authority. The term “bargaining power” is open to interpretation and discussion and, however, it has a meanings that is great and extend it to be beyond the capacity of economic scope. Of course, “empowerment” itself is a concept of word with many meanings or interpretation, but in general it refers to the process of becoming stronger and more confident, especially in controlling one's life and claiming one's rights (Khwamsamat nai kantolong 2010).

Truly if, “bargaining power” is to be discussed, we need to visit home and to consider both settings, negotiate, and how the agenda for it has been set for the people. Do any real negotiations take place among the farmers place before?

Many projects in SSA countries, has helped farmers to create groups over several years. The state itself has helped groups as well, starting with the collectivised style of cooperative in the year. Yet, the laws legalising agricultural co-operatives to come back has not been in place now to make them. As such, farmers groups may be encouraged to form an instrument of outsiders’ purposes, however well-intentioned. Based on our findings, it appears that the conditions and requirements for farmer organisations are to bring the greatest possible benefits to farmers (Khwamsamat nai Kantolong 2010).

4.3.4 The bargain between the farmer and the trader

The bargaining started by modelling the bargaining interactions between a farmer and a trader. Related to the work of (Fafchamps and Minten 2012) the question we feel to ask here is as follows. How much would an informed farmer receive in terms of price gain compared with a situation without price information? According to a two-way model,

two-period and offer-offer schema with asymmetric information by (Dorward and Poulton 1999; Aryeetey and Nyanteng 2006), the farmer does not know the market price with certainty unless he subscribes to the AMIS, whereas the trader is always aware and informed. When the farmer does not subscribe to the AMIS, he assigns a probability to each possible state of the market price and accepts or denied at the offers of the trader according to his expectations of his transportation costs. We solve this game by backward induction and compare the equilibriums he reached with and without AMIS (Courtois and Subervie 2018).

If the market price is high, the model predicts that the individual also gains to the farmer from being informed is positive. The reason for this is that if the farmer is not informed then the farmer assigns a nonzero probability to the low-price state, which the trader exploits by offering a low price. Similarly, if the market price is low, the model predicts that the individual gain for the farmer from being informed is negative. This is because the uninformed farmer assigns a nonzero probability to the high-price state, whereas the market price is low (Courtois and Subervie 2018).

4.3.5 How do the farmer or trader secure their deal

To secure the deal, the trader is forced to offer a higher price which compared with the situation in which the farmer is informed. In this case, asymmetric information can even be led to a deal failure as soon as the profitability condition of the trader no longer holds. Such a situation never occurs when both agents are informed.

Jensen (2007) studies on fisheries in India, where fishermen at sea are unable to observe prices in coastal markets indicates that fishermen sell almost all their catch in the local market because of high transport costs and lack of storage capacity. This induces price gaps across markets more than transportation costs, resulting in an inefficient welfare state because fish supply varies across markets. Similarly, Aker and Fafchamps (2013) find that mobile phone coverage reduced the spatial dispersion of producer prices by 6% for a semi perishable commodity “cowpea”, and Aker (2010) also stipulated an estimate of the impact of mobile phones on price dispersion across grain markets in Niger. Svensson and Yanagizawa (2009) address the market power issue by estimating the impact of a radio-based MIS on Ugandan farmers. Contrary to what one might expect from a first-generation AMIS Kizito (2018) show that access to the radio program

strongly improves farmers' bargaining power at the farmgate, increasing farmers' prices by 15%. [Goyal \(2010\)](#) also estimates that, the impact of providing price information to Indian farmers in a framework where farmers sell their soybeans in local wholesale markets in which traders possess price information across markets and farmers do not. The author shows that the introduction of Internet kiosks provide price information translates to a 1% to 3% increase in farmer prices and a 33% increase in profit. The first evaluation of a mobile-based MIS was conducted by [Fafchamps and Minten \(2012\)](#). The authors consider not only the bargaining power channel but also the spatial arbitrage channel.

4.3.6 Bargaining position in SSA countries

The agricultural sector plays a major role in developing of (SSA) countries. The growth of this sector is a great source of economic growth in many developing countries ([Gollin 2010](#)). It also has the largest contribution to poverty reduction ([Loayza and Raddatz 2010](#)). Agriculture plays a very massive role to the economy. It has a contributed to Gross Domestic Product (GDP) of African countries and the contribution of the market in (SSA) countries. Another important thing that the provision of the needs of the food because of the increasing number of population means that the needs of food also increased.

According [Akhmad \(2007\)](#) there are efforts that has been to be made to raise the farmers' bargaining position in the continent of Africa.

- Consolidation of farmers in one umbrella to unify them to the economic movement in any agricultural chain, from pre- production to marketing. The consolidation is first performed by making all the processes in agricultural chain collectively, such as covering the capital collectively, production collectively, until marketing collectively.
- The collective production means production planning collectively to determine patterns, the type, the quantity, and production cycles. It should be done to achieve the production efficiency with large-scale production from many farmers.
- The collective marketing of agricultural products. It should be done to achieve the marketing costs efficiency with large-scale quantity and increasing the bargaining power of farmers in the trade of agricultural products ([Courtois and Subervie 2018](#)).

Bargaining power expresses an idea of a total of market forces that influenced prices, then manipulation of bargaining power would include any action by which a firm attempts to establish more favourable prices than those previously prevailing (Fletcher et al 1961). The agricultural sector has a very important role in the development of food security system in (SSA). Food security is one of the major areas of Government program to achieve the goal of food self-sufficiency fulfilment of African. According (Branson and Douglas 1983) the weak bargaining position of farmers is generally caused by farmers to have less or have access to markets, market information and inadequate capitalization. Meanwhile, according Sesbany (2011) another problem that faced farmers are constraints to market their products because they do not have their own marketing channels, so that farmers use more cutting-sale system. Selling cutting system has an impact on the sale of less than the maximum because as much as 40 % of the harvest belongs to middlemen. Improving farmers' prosperity can be achieved through increased bargaining position is farmers not to do transaction individually, but farmers can gather strength in a group or institution that can collect the aspirations of farmers together.

4.3.7 Social institutions and farmers bargaining power

We need thorough and on-going information about the benefits of agricultural institutions to farmers. According to Jamal (2008) agricultural institutions can play an optimal role when the growth and development is controlled entirely by the farmers. Meanwhile, according Sesbany (2011) increase farmers' bargaining position can improve access of rural communities in economic activities fair, so the shape of the gap and the losses suffered by farmers can be avoided. According to Elizabeth and Dervish (2003) institutions in village were born to fulfil the social needs of its people.

The characters of these needs are not linear, but it tends to be the individual needs of its members in the form of, physical needs, the need for a sense of security, the need for social relationships, recognition and development of recognition. The main benefit of the institution is to collect the needs of one side of the social life of the community and as social control, so each person can regulate their behaviour according to the will of the people (Sesbany 2011). Therefore, the farmers' bargaining position should be increased through institutional farmers by forming farmer groups in each region or localities. The formation of farmer groups as one way to make the system of coordination and control of

the condition of farmers in each of the regions, especially in addressing some of the problems encountered.

Correcting of the bargaining position of farmers through institutional of agriculture is expected to provide a significant and positive impact to get a change to the prosperity of farmers. Farmers' prosperity not only fulfilled the material, but also the spiritual prosperity also meets them properly (Sesbany 2011).

4.3.8 Group selling by producers

Group selling by producers is a key factor that make the activity of producer organisations (POs) profitable. Consider a simple model of series of bargaining among multiple agents. If each supplier and each buyer pick a random participant and to starts a bilateral negotiation with him or her how to buy a produce Inderst-Wey model (2007).

If the negotiation does not hold but fails, then they move on to negotiate with another person, then this model can be described as the horizontal integration process.

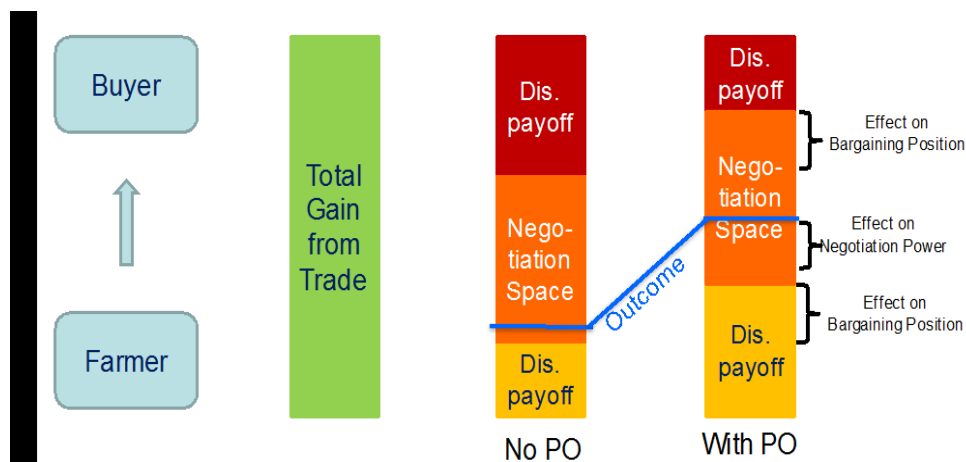
We displaced much joint selling group, selling as a reduction in the number of suppliers in the market places and we propose a simplified version of the Inderst-Wey model (2007).

The theoretical model gives the basic economic mechanism that allow POs to rebalance their bargaining power along with the food supply chain. Figure 2 summarizes the key findings. Assuming a farmers is bargaining with a buyer over the value of a trade, then the PO can improve the outcome in the three follow ways: -

- **Effects on negotiation power.** The (PO) can improve farmers' ability to negotiate with the buyer. A PO can take to an expert negotiators who has better access to law services, and more in general has access to human resources, financial positions and technical resources that are unaffordable for the single farmers. Such access can improve the ability to counter buyer power.
- **Effects on buyer's bargaining position.** PO's horizontal integration can bring buyer's trade options down by way creating its bargaining position. The reduction of the buyer's disagreement payoff, holding everything else constant, increases the negotiation space and giving farmers the chance to appropriate more value.

- **Effects on farmers' bargaining position.** The associated or a group farmers may have chances to different producers and marketing channels that are not available to individual firm. This implies is that, a PO can increase farmers' disagreement payoff. If this is the case, the bargaining space is reduced to the buyer's detriment and farmers can keep or make a higher share of the TGT ([Alessandro Sorrentino et al. 2017](#)).

Figure 2 . Rebalancing bargaining power: the role of PO



Sources: Sorrentino (2017).

However, small POs might be unable to improve farmers' bargaining position and significantly alter the negotiation outcome and the effectiveness of a PO in improving farmers' bargaining position depends on the concentration of the downstream market. The more the downstream sector is combined, the larger the size of the PO should be.

4.3.9 Bargaining power and the relationships between the food supply chain

The purpose of this side is to develop the simplest possible way of bargaining model and be able to illustrate the basic functioning of POs. As a bilateral model based on the typical Nash bargaining model has been used ([Nash 1950](#)).

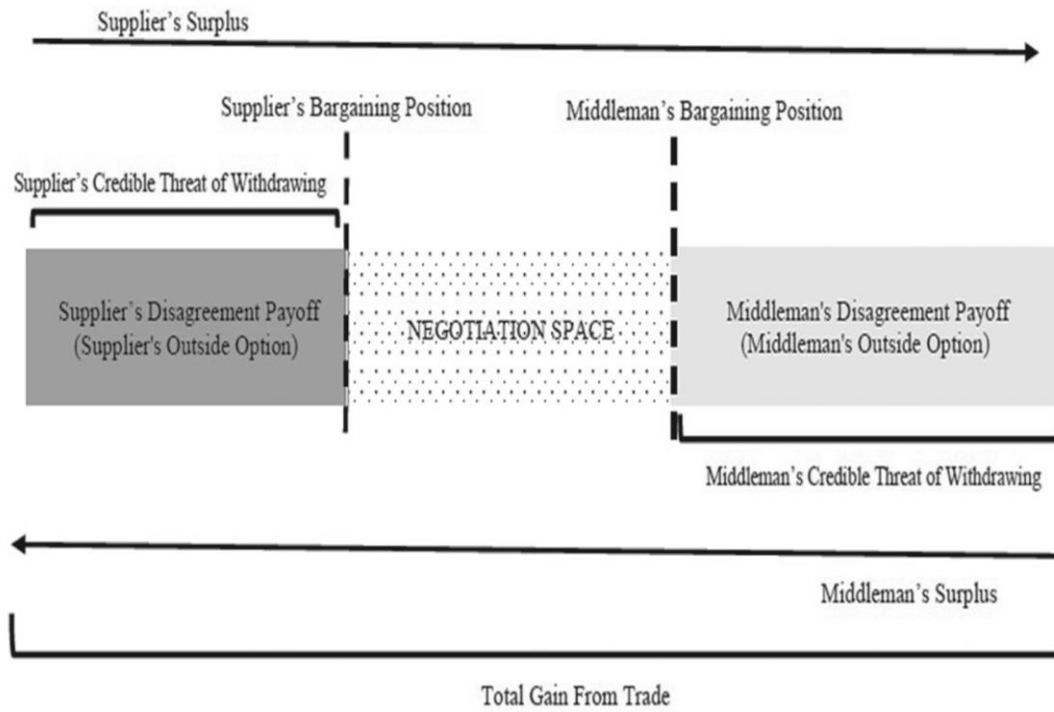
Consider a buyer and a seller negotiating about a trade chance in the market. A food processor or retailer acts as middleman between the farmer and the consumers. He buys a product X from the farmer and sells it to the consumer. The negotiation is successful if buyer and seller agree on the quantity supplied, the wholesale price and all other contract

terms, lump-sum transfers such as trade spending. If the negotiation is successful a contract is written, trade happens, and parties share the total gain from trade (TGT) according to the rules agreed in the contract. If the negotiation fails, then trade does not exist, and parties gain the profits from the next best available alternatives then, the so-called disagreement payoffs or outside option profits. For simplicity, it is then assumed that the parties first agree on the quantity that maximizes TGT, and then bargain over its distribution using lump-sum transfers. In our simplified model the middleman receives the sale revenues paid by consumers and then uses the lump-sum transfer to share the economic benefit with the farmer (Dukes et al. 2006). Figure 3 summarizes the key elements of a simple bilateral bargaining between the two parties. The TGT can be distributed into three areas. The farmer's disagreement payoff is the surplus that the farmer would receive from the next best alternative if the transaction fails, the dark grey area in Figure 3. If the middleman offers a share of TGT that is smaller than the disagreement payoff, the farmer can credibly threaten to withdraw from the trade. The middleman's disagreement payoff is his/her surplus from the next best outside option the light grey area in Figure 3. The middleman can credibly threaten to fail any negotiation resulting in a lower share of TGT than the disagreement payoff. The difference between the TGT and the aggregate disagreement payoff if positive is the negotiation space (Sorrentino et al. 2018).

The boundaries between the disagreement payoff areas and the negotiation space are the agents' bargaining positions.

Any point in the negotiation space is a feasible negotiation area of outcome because no agent can credibly threaten the other to fail the trade. The only specific outcome within the negotiation space depends on the relative magnitude of negotiation power. Negotiation power is defined as the ability to impose a negotiation outcome that is as close as possible to the most desired point in the negotiation space. It depends on the ability of imposing negotiation rules, negotiation skills, patience, technical constraints, risk attitudes and information (Dukes et al. 2006). If the middleman has a strong negotiation power compared to the farmer, then the outcome transfer is closer to the farmer's bargaining position than to the middleman's one. Vice versa, if the middleman is relatively weak, the outcome is close to his or her position.

Figure 3. Bilateral, zero-sum bargaining



Sources: Inderst-Wey (2007) model

5. Conclusion

This study examined the bargaining interaction of farmers and concepts of AMIS in selected developing countries in Sub-Saharan Africa: Zambia, Tanzania and South Africa using secondary datasets. We found that, the major dissemination methods used by AMIS include modern ICTs, SMS, Internet and other traditional ICTs such as radio, notice boards and print media. Information provided is mostly price-based. Some AMIS provided information on a limited range of commodities, while others cover a wider range of cereals, vegetables, tubers and other staple and cash crops. Also, information on products prices did not increase or reduce transaction cost of producers. We also found that farmers who are the regular users of AMIS received significantly higher prices more than the prices received from the producers who were not regular users of AMIS.

We found that farmers in Zambia benefited from price information as well as meteorological information for their crop production as well as obtained information on potential market outlets to sell their products/services. In addition, marketing development bureau (MDB) under the auspices of the ministry of agriculture in Tanzania liaised with the government to provide training and market information to users and control products prices for small-scale farmers. Similarly, Agritel, a private market information service was mainly used in South Africa as the market information provider of farmers and other market actors in the agricultural market chain They provide information on market prices daily.

Since small-scale farmers encountered numerous output market challenges such poor access to marketing information (e.g. products prices) and are often exploited by market intermediaries usually at farm gate prices, the study suggest the need to encourage small-scale farmers to patronise agricultural market and information services in both government and private sectors to attain useful information about the production to obtain higher products price which will subsequently increase their incomes and contribute to improved livelihood within the Sub-Saharan region and beyond.

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