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ELECTRONIC VOUCHER SYSTEM
A CASE OF MONZE AND MAZABUKA DISTRICTS IN ZAMBIA

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SAHKOINEN VOUCHER -JÄRJESTELMÄN CASE: MONZE JA MAZABUKA-JÄRJESTELMÄT ZAMBIASSA

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Avainsanat: Farmers Input Support Program, elektroninen voucher (e-kuponki), tuetut tulot, sidosryhmät, maatalous

Maatalous on useimpien Saharan eteläpuolisen Afrikan maiden taloudellinen perusta. Sambia on asettanut maatalousalalle suuren aseman, mikä on köyhyyden vähentämiseen tarvittava taloudellisen kasvun moottori. Sambian hallitus on 16 vuoden ajan rahoittanut maatalouden ja karjankasvatuksen ministeriön kautta maanviljelijöiden tuotantotukiohjelmaa (FISP), joka tarjoaa viljelijöille tukea lannoitteista ja maissin siemenistä. Ohjelmassa oli kuitenkin monia haasteita, jotka edellyttivät sähköisen voucher-järjestelmän käyttöönottoa. E-voucher-järjestelmä kohdistaa ennalta määrätyn luettelon tuensaajista jokaisesta valituista piiristä Sambiassa käyttämään sähköisiä kortteja maatalouden tuotantopanosten saamiseksi suoraan maataloustuottajilta.

Tämän tutkimuksen tarkoituksena oli arvioida sähköisen voucher-järjestelmän tehokkuutta Monzen ja Mazabukan alueilla. Nämä alueet valittiin, koska ne ovat Sambian maataloustoiminnan ytimessä. Tutkimuksessa käytettiin kvantitatiivisen ja kvalitatiivisen lähestymistavan yhdistelmää (mutta suurelta osin kvalitatiivisia menetelmiä). E-voucherin tehokkuutta tutkittiin kohderyhmällä, jossa oli 100 maanviljelijää, 20 agro-jälleenmyyjää ja 13 sidosryhmien edustajaa, joten yksinkertaisen satunnaisotannon koko oli 133.

Tutkimusaineisto kerättiin kyselylomakkeiden ja haastattelujen avulla. Haastatteluja käytiin sidosryhmien kanssa, joihin kuului Musika Business Initiative, pankit, maatalousministeriö, Sambian kansallinen viljelijäliitto, osuuskunnan edustajat ja agro-jälleenmyyjät. Kyselylomakkeet annettiin myös FISP-tukiohjelmaan kuuluville pienviljelijöille.

Tulokset paljastivat, että e-voucher-järjestelmä oli erittäin menestyksekkäs, mutta edellytti silti parannuksia ja panostuksia joillakin aloilla, kuten varojen oikea-aikainen maksaminen e-kuponkikortin haltijoille sekä osallistuville pankeille toimitettujen korttien varhainen tuotanto ja jakelu. Maataloustuotteiden jälleenmyyjät tarvitsevat riittävät tieto- ja viestintäteknikkayhteydet, mikä parantaa maataloustuottajien saatavuutta. Tärkeintä koko prosessissa on, että maanviljelijöille ja sidosryhmille, jotka osallistuvat e-voucherin käyttöönottoon, on oltava maanlaajuinen koulutusohjelma.

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Agriculture is the economic backbone of most countries in the Sub Saharan Africa and Zambia is one such country that places the agricultural sector high on the agenda as the potential engine for economic growth required for poverty reduction. The Government of Zambia for sixteen years has been funding a farmer input support program (FISP) through its Ministry of Agriculture and Livestock's that provides farmers with subsidized fertilizer and maize seed. The program however experienced many glitches that necessitated the introduction of an electronic voucher system to mitigate the challenges. The e-voucher system targets a pre-determined list of beneficiaries from each selected district in Zambia to use electronic cards to access farm inputs direct from agro-dealers.

This study therefore was undertaken to assess the effectiveness of the Electronic voucher system in Monze and Mazabuka districts. These areas were selected because they are at the core of Zambia's agriculture activities. The study employed a combination of quantitative and qualitative approach (but largely qualitative methods). The measure of how effective the e-voucher was done through, a multi stage sampling procedure using simple random sampling to select some respondents. One hundred farmers, twenty agro dealers and thirteen stakeholders representing a total of hundred and thirty-three (133) were chosen.

The study collected data through questionnaires and interviews guides. Interviews were conducted with stakeholders that included Musika Business Initiative, banks, Ministry of Agriculture representatives, Zambia National farmers union, cooperatives representatives and Agro dealers, while questionnaires were given to smallscale farmers who included men, women, and youths that were direct beneficiaries of FISP.

The findings revealed that the e-voucher system was hugely successful, but still required more improvement and input in some areas such as timely disbursement of funds to e-voucher card

holders as well as early production and distribution of cards by the participating banks. Sufficient ICT training for agro dealers, improving availability of agro-dealer stock. Most importantly, a nationwide education or training program for farmers and stakeholders involved in implementing the e-voucher needs to be part of the process.

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To my son Joshua Emmanuel I say, “Change is the end result of all true learning”.

Leo Buscaglia.

LIST OF ABRIVIATIONS

AISP-Agricultural Input Subsidy Program

FSIP- Farmers Input Support Program

E-Voucher- Electronic Voucher

DACOS- District Agricultural Cooperatives

GRZ- Government Republic of Zambia

MAL-Ministry of Agriculture and Livestock's

PACO-Provincial Agricultural Cooperatives

SSA-Sub Saharan Africa

IAPRI- Indaba Agricultural Policy Report Institute

ZMW-Zambian Kwacha

UBA-United Bank for Africa

ZANACO-Zambia National Commercial Bank

ZNFU-Zambia National Farmers Union

NAIVS-National Agricultural Input Voucher Scheme

MT-Metric Tones

SPSS-Statistical Package for the Social Sciences

IHM-Individual Household Model

NRC-National Registration Card

MTZL-Mobile Transaction Zambia Limited

CAC-Camp Agricultural Committees

PCO-Program Coordinating Office

POS-Point of Sale

FAO-Food Agricultural Agency

VG-Village Groupings

ZIAMIS- Zambia Integrated Agriculture Management Information System

MFNL-Ministry of Finance and National Planning

HQ-Head Quarters

ICT- Information Communication Technologies

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1.1 INTRODUCTION

1.1 Background to the study

Since the agricultural market reforms in Sub-Saharan Africa (SSA) started in 2000, subsidies for fertilizers and seeds once again became the cornerstone of many SSA governments' agricultural development and poverty reduction strategies. Zambia is a prime example; agricultural activity is the main economic activity engaged in by 58.5 % of households (89.4 % of households in rural areas and 17.9 % in urban areas) (Zambia Central Statistics, 2016). The 2015 living conditions monitoring survey has revealed that 40.8% of the country's population is living in extreme poverty. The survey indicates that 76.6 % of the population in rural areas is poor, with 23.4% of the urban population being poor. Given that the highest levels of poverty are perceived to be in the rural areas and agriculture is a chief source of livelihood and income for most rural communities, support to agricultural sector has been given vast importance.

The failure for the agricultural sector to provide food for people in rural areas is considered a major factor contributing to rural poverty in Zambia. Most people in the rural areas do not have food security. According to World Food Program (2006), people are considered food secure when they have availability and adequate access to sufficient, safe and nutritious food to maintain a healthy and active life. The Zambian Government then decided to introduce some policy reforms in the agricultural sector with the aim to stimulate growth and improve the performance of the agricultural sector to reduce poverty and enhance household food security. These reforms included land reforms, fertilizer and crop market reforms that allow the private sector to participate in the input supply and crop marketing, while reducing government participation Mason et, al. (2013).

In the year 2002 the Zambian government introduced the Fertilizer Support Program which was later renamed the Farmer Input Support Program (FISP). The FISP program was aimed at increasing the supply of agricultural inputs to small scale farmers and contribute to increased household food security and income (IAPRI, 2006). FISP specific objectives were to expand markets for agro-dealers and increasing their involvement in the distribution of agricultural inputs in rural areas while reducing direct role of government. These mechanisms were believed to increase competitiveness and transparency in the supply and distribution of inputs and served as a risk sharing mechanism for small-scale farmers Mason et, al. (2013).

However, FISP experienced several challenges that stalled its successful implementation, some of them being; the failure of farmers to graduate out of the program, poor target and reach of beneficiaries, lack of transparency in input distribution etc. The initial design of the program intended that beneficiaries graduate every two years. However, none of the farmers had graduated since its inception (Hamasaka, 2016). Against this background, the Government piloted the electronic-voucher system (e-FISP) to replace the traditional FISP. The E-program is an effort by the Zambian Government, supported by Zambia National Farmers Union and Musika which aims to improve the distribution of subsidised inputs to smallholder farmers (Hamasaka, 2016). The e-voucher system for FISP was piloted also due to concerns that the private sector in rural Zambia lacked the capacity to effectively provide farmers with inputs and that a failure of FISP would have negative consequences for national food security (Musika, 2014).

During the 2015/2016 farming season, 241,000 farmers across the 13 pilot districts in the Southern Province, Lusaka, Central and Copperbelt Provinces of Zambia received the input subsidy through pre-paid VISA bank cards as opposed to receiving physical inputs centrally procured by Government (IAPRI, 2017).

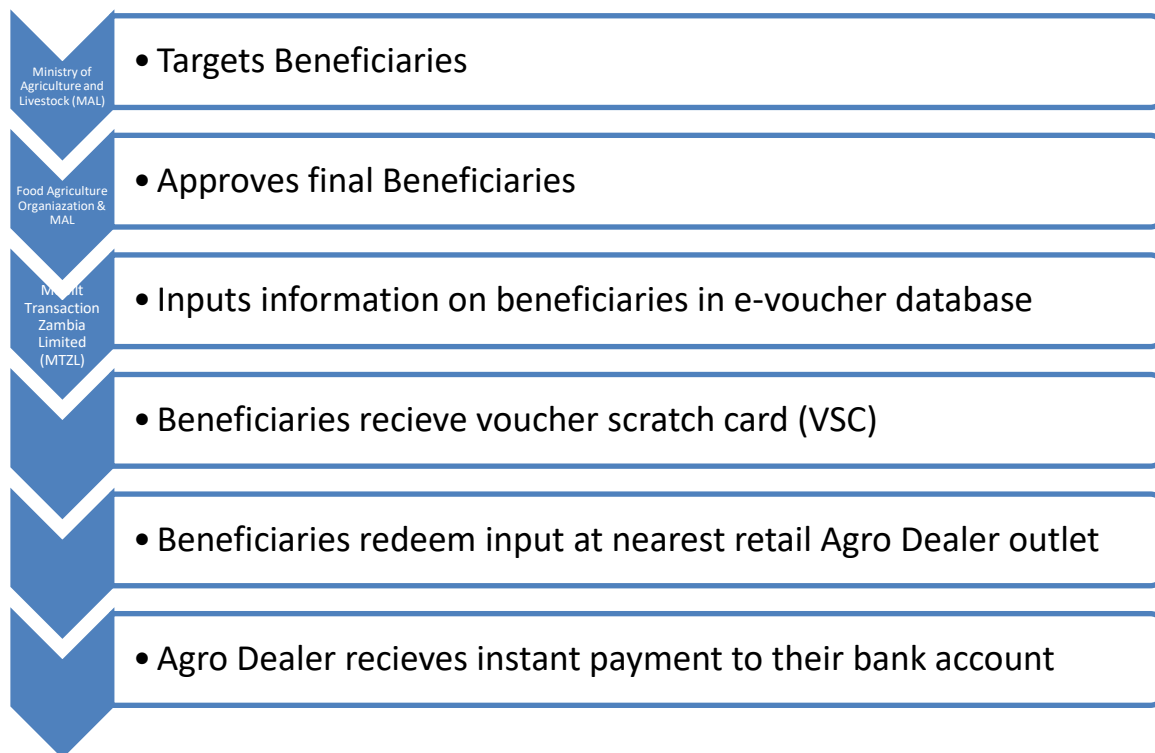


Figure 1. The e-voucher process (Ministry of Agriculture and Livestock 2015).

The main challenges that government faced in the period of the old FISP between 2002 and 2012 according to Ministry of Agriculture and livestock FISP report (2012) were:

- difficulties in identifying beneficiary farmers
- some farmers collecting farming input from more than one input provider while others had completely no access
- very little or no sensitization was carried out by government during the program which later resulted in poor targeting of farmers/beneficiaries
- delays in input distribution
- poor effective use of fertilizer among targeted farmers,
- limited private sector participation which caused long term concerns about the FISP sustainability and poor monitoring of the programme effects.

The Table 1 taken from FSIP Indaba Agricultural Policy Report Institute Brief No. 81. (2017) compares advantages and disadvantages of e-voucher and old FSIP.

Table 1. Advantages and disadvantages of e-voucher vs Manual FSIP System (IAPRI, 2017)

E-voucher Advantages	FISP Manual System (old)
Potential cost savings	-
Timeliness of input delivery	-
Private sector development	-
Crop diversification and input use	-
Disadvantages	Disadvantages
Lost or stolen electronic cards	Leakages, whereby inputs intended for use are diverted and resold on the commercial market
Bias during beneficiary selection	Lack of an exit strategy for weaning off beneficiaries
Inability of selected agro dealers to maintain a consistent supply	Crowding out of private sector fertilizer purchases and suppliers
Delay in redemption of inputs owing to network failure	Poor monitoring of program
	Beneficiary targeting-how it is applied
	Failure to successfully target poor farmers
	Delays in input distribution
	Poor fertilizer use efficiency among beneficiary farmers

Table 1 shows that the manual system of FISP did not offer any advantages compared to that of the newly introduced e-voucher. The Government of Zambia looked at e-voucher from a potential cost saving perspective while also including other key private sector players. The farmers appreciate it from the point of it offering crop diversification and their inputs being delivered on time which was a hindering factor under manual system. However, the system also poses a risk in terms of stolen cards, biasness and delay in input redemption due to network failures in areas with poor network.

In comparison to the manual system the e-voucher covered the problems of farmers diverting input and later reselling and not using them for farming, lack of private sector participation, lack of crop diversity and poor monitoring of the entire program.

1.2 Purpose and Objectives

The purpose of this study is to investigate the effectiveness of FSIP Electronic voucher system in Monze and Mazabuka districts. The study tries to understand from a broad spectrum to what extent the e-voucher system has been beneficial or not to the targeted farmers and other cooperating partners. The study will also seek to advise the Zambian Government to what extent the e-voucher has improved the distribution of farming input to small holder farmers and to what extent has it helped towards the goal of eradication of poverty in the country. The study will also try to help cooperating partners with how to improve the delivery of the e-voucher service from the challenges experienced in the old system.

The objective of the study are as follows:

- a) To find out the impact of E-voucher implementation in lowering the Zambian Government direct involvement and lowering treasury costs.
- b) To find out how E-voucher has impacted on private sector participation.
- c) To find out how E-voucher mechanisms has tackled delivery time and transparency in the supply and distribution of inputs.
- d) To find out what benefits the E-voucher brought to the participants.

1.3 Research Structure

Chapter 1 contains a brief explanation of the research background and provides rationale for the selection of the research area.

Chapter 2 constitutes of a review of literatures from different authors in relation to the FISP in Sub Saharan Africa and the genesis of electronic voucher system in Zambia. Subsections are provided under this chapter to enable us to understand the main purpose and objective of the case study. The section gives the contributions of previous researchers and authors to help facilitate our understanding of the origin of FSIP in Sub Saharan Africa, then principles equity, sustainability and efficiency in relation to the effect of subsidies on maize production are discussed. Furthermore, it contributes of other scholars on the electronic voucher system in Zambia.

Chapter 3 outlines a brief view of the two study areas Mazabuka and Monze it looks at the history and agricultural situation. The chapter goes further to look at how the Electronic Voucher works, its implementation and process in the area.

Chapter 4 addresses methodology and research process for data collection. Case study design method was used with a qualitative method survey with the help of semi-structured interviews and questionnaires. Few key informants from District Agriculture Cooperatives (DACOs) and Agro dealers were interviewed. Questionnaires were also handed out to small scale farmers who were either direct beneficiary or from the same area or family.

Chapter 5 contains the presentation of the primary data collected through questionnaires and interviews. Presentation of primary data findings have been facilitated through bar charts. Brief discussions have been included to explain each chart.

Chapter 6 contains discussions of the research finding. Chapter 7 stressed on suggestions, contributions and recommendations for future research.

2. LITERATURE REVIEW

This chapter is divided into two parts. The first part provides a historical overview of Farmer Input Support Program in Sub-Saharan Africa and characterization of subsidies discussed suggests that the concept is based on the economic principles of efficiency, equity and sustainability hence an in-depth look at these principals in relation to the effect on poverty reduction. The second part provides an empirical evidence of some studies that have been conducted in Zambia on the electronic voucher system as a poverty reduction reform in agriculture.

2.1 Overview of Farmers Input Support Program in Sub Saharan Africa

The evolution of farmer input subsidy programs can be traced as far back as the 1960s in many sub Saharan countries. In Africa, according to Magasu (2016), these programs were characterized by a government-controlled input and output marketing system, in which farmers were supplied with agricultural inputs at controlled and subsidized prices, and often on heavily subsidized credit. However, the experiences under these programs after vast reading and research varied from country to country.

Malawi

In Malawi for instance 88% of the population lives in rural areas and slightly more than half of these are poor. The rural households are almost exclusively maize producers, but only 10% of them are net sellers, whereas around 60% of smallholders are net buyers of maize. This dependency on market purchases of maize leaves poor households vulnerable to the high and volatile maize prices usually observed in Malawi. Thus, the political motives for supporting improvements in agricultural productivity are largely driven by a desire to increase smallholder self-sufficiency in maize production and reduce their exposure to maize market risks (Baltzer & Hansen, 2011, 2012). Magasu (2016) said that the Malawian Government pioneered the return to large scale fertilizer subsidies in 1998 when it started distributing free fertilizer after having discontinued similar programs in the early 1990s. The Agricultural Input Support Programme (AISP) in Malawi, initiated in the 2005/2006 farming season, was built upon a long tradition of subsidising agricultural inputs.

Malawian farmers were even prior to the AISP some of the most intensive fertilizer users in Sub-Saharan Africa, using around 30 kg/ha compared with an sub Saharan average of 9 kg/ha

(Baltzer & Hansen, 2011, 2012)The table 2 below highlights the program costs and budgets associated with the AISP in Malawi during the period of 2005 to 2009,

Table 2. Costs and Budgets of AISP in Malawi (from Doward et al 2010)

	2005/6	2006/7	2007/8	2008/9
Programme budget (USD million)	36	54	82	139
Programme costs (USD million)	51	91	117	285
% of GDP	2.1	3.1	3.4	6.6
% budget overrun	42	69	43	105
% household coverage	N/A	54	59	65
% subsidy	64	72	79	91

The budget allocated to the AISP in Malawi shows an increment of the program cost between the period 2005 to 2007 of USD 18million from USD 36million to USD 54million also representing a 27% budget overrun. This farming period followed with an increment of 1% in the GDP while only representing 54% of household coverage with 8% subsidy increment. The following farming period of 2008 to 2009 continued the trend of incremental budget consumption of USD 57million from USD 82million in 2008 to USD 139million in 2009 representing 3% GDP. This meant that the percentage of household coverage by the subsidies had also increased. The budget overrun increased by 62%.

According to a study done by Kamanga (2010) the Agriculture Input Subsidy Program had a positive impact on the poverty rate. However, the program did not affect the proportion of households living below food security threshold. The poorest of the poor were not made any better off because of the AISP

Tanzania

According to World Bank (2009) Tanzania piloted a subsidy programme in 2008, which later expanded into what is called the National Agricultural Input Voucher Scheme (NAIVS) in

2009. This was launched by the Government of Tanzania in response to the high food and fertilizer prices prevailing in 2007-2008. Agricultural input intensity was very low in Tanzania: farmers used on average 8 kg/ha of fertilizers (below SSA average), and only 5.7% of rice farmers and 0.7% of maize farmers used improved seed varieties together with fertilizers (Baltzer & Hansen, 2011, 2012). For international standards this type of productivity was very low and relative Tanzania's own potential as measure by research field tests and on-farm trials. The program is an ongoing program and the design of NAIVS according to Baltzer (2011) was designed to reach a total of 2.5 million households (around 45% of all smallholders in Tanzania) in 65 districts, and subsidies were specifically targeted at producers of two major food staple crops, maize and rice. Each beneficiary household was entitled to an input package suited for the cultivation of 0.5 ha of maize or rice at a 50% subsidy.

Following the experiences gained by Food Security Policy (2017), the NAIVS pilot programme defined the targeting as:

- Full time farmers residing in the village
- Farmers cultivate less than one hectare of maize or rice
- Farmers use the subsidised input of maize or rice production
- Farmers agree to serve as good examples in how to use good agricultural practices
- Farmers are willing and able to cover the co-financing
- Female-headed households are given priority
- Farmers, who have not used inputs in the past five years, are given priority.

The experiences gained from the subsidy programme in Tanzania highlights the potential trade-off between objectives of raising national food production on one hand and benefiting the poorest and most vulnerable households on the other, or in other words between efficiency and equity (World Bank, 2017)

Zambia

The Fertilizer Support Programme (FSP) in Zambia, later renamed Farmers Input Support Program (FISP), follows earlier attempts at stimulating the adoption of agricultural inputs, mainly fertilizers and hybrid seeds, in the production of maize. Earlier programmes focused less on direct subsidies and more on controlling input prices and making sure that inputs were available to smallholders through state-managed production and distribution. Indirect and unintentional

subsidisation was provided in the form of state-provided credit, of which only 5-10% was recovered (Baltzer & Hansen, 2011, 2012).

FSP was launched at the start of the 2002/2003 farming season it wanted to break from earlier programmes by subsidising inputs directly rather than providing credit and by focusing on the development of a competitive private input supply sector rather than relying on state-managed distribution. Specific objectives of the programme according to Musika newsletter (2009) can be summarised as:

- “To ensure timely, effective and adequate access of smallholder farmers to agricultural inputs in the form of fertilizer and hybrid maize seeds”
- “To facilitate the development of a competitive private sector in the supply of agricultural inputs”
- “To facilitate the process of farmer organisation, dissemination of knowledge and creation of other rural institutions that will contribute to the development of the agricultural sector”.

The volume of fertilizer subsidised by the government has increased over time, from 40,000 Metric Tonnes (MT) to over 182,000 MT in 2011/2012, and the number of intended beneficiaries increasing from 120,000 to 914,670 over the same period (Mason, Mukuka, & Jayne, 2013). However, the fertilizer pack size intended for each farmer was reduced to half, from eight 50 kg bags to four 50 kg bags, effectively allowing for the increase in number of beneficiaries. In aggregate, World Bank (2010) estimated that total production in Zambia increased by 146,000 tonnes of maize 2007/8, corresponding to 89% growth in output because of the FISP.

In 2015 FSIP innovated through piloting of the e-voucher. This development was intended to address several weaknesses in the earlier FISP design by giving freedom to farmers to choose inputs appropriate for them, allowing for more timely access to inputs, nurturing rather than hindering private sector input markets, reducing costs, and improving accountability. The e-voucher system was piloted in 13 districts in the 2015/2016 agricultural season to target 241,000 farmers (Luke & Anthony, 2017)

In the approved 2017 budget, FISP was allocated a total of ZMW) 2.8 billion (which is a redenomination of ZMW as at January 1, 2013), of which around ZMW 1.7 billion is set to be

spent on the e-voucher system with the balance of ZMW 1.1 billion being committed to clearing outstanding debt to input suppliers and service providers from previous seasons (National Assembly of Zambia, 2016).

Ghana

The fertilizer subsidies were implemented in Ghana in 2008 and extended to 2009, were very different from the programmes implemented in Malawi and Zambia. It was never meant to be a comprehensive programme aimed at achieving a sustainable increase in smallholder adoption of agricultural inputs. Rather, it was designed in great haste as an emergency measure to mitigate the adverse impacts of the extremely high fertilizer prices. (Baltzer & Hansen, 2011, 2012).

The Ghanaian Government re-introduced the fertilizer subsidy programme in 2008 with innovations that sought to avoid the drawbacks of the past. The rationale was to increase productivity and/or production in line with government's commitment to ensuring food security and improving the living standards of Ghanaians. The new programme, per recommendations of the Abuja Summit was expected to help increase usage to at least 50 kg/ha by 2015. The countrywide programme started with an initial number of vouchers covering 600,000 bags of 50 kg inorganic fertilizers (subsidised cost of USD 15 million). Farmers obtained the subsidy in the form of fertilizer-specific and/or region-specific vouchers (Fearon, Kwami, & Boateng, 2015)

2.2 Sustainability

“Sustainability means enduring into the long-term future; it refers to systems and processes that are able to operate and persist on their own over a long period of time” (Robertson, 2017). Support programs are sustainable if they can be maintained in the long term without running out of public funds or if the results of a wider application of agricultural production and improvement of agricultural productivity remain after their completion. Subsidies are a significant value that is transferred from the state to farmers, suppliers and other interested parties. In this way, stakeholders have a great apparent interest in extending and expanding support. When subsidies are allocated and directed to specific groups, the people who control the allocation of subsidies can take advantage of their power for personal benefit. Policy makers may also wish to extend state aid regardless of their performance, as it shows leadership and willingness to

act. Therefore, the policy of production aid poses the risk that the program has a life of its own, becomes more inefficient, less fair and, ultimately, unbearable.

2.3 Efficiency

There is strong indication to suggest that agricultural inputs raise productivity substantially, and that they are essential for sustaining intensive agriculture in the long run without depleting soil fertility Crawford et al. (2006) The challenge is not only that public agricultural spending in sub-Saharan Africa is lagging behind other regions, its impact is also spoiled by subsidy programs and transfers that tend to benefit the privileged to the disadvantage of poor people and the agricultural sector itself (World Bank, 2017). Inadequacies in the budgeting processes also reduce expenditure efficiency. Considering this scenario, addressing the quality of public spending and the efficiency of resource use becomes even more important than addressing only the level of spending.

2.4 Equity

Equity simply entails the quality of being fair and impartial (Stolowy & Leba, 2006). Therefore, it can be said that countries that implement improper policies, aid to agricultural production can be a useful tool to promote equality by focusing on aid especially for the poorest small-scale farmers. However, it is not entirely clear if such redistribution objectives are compatible with the efficiency criteria. On one hand, the poorest small farmers are more likely to lack due to market failures, such as credit constraints and vulnerability to crop change risks. On the other hand, poor small farmers may not have additional resources, such as skills, scale of operations, productive assets or financial resources, even paying subsidized rates to make efficient use of subsidized inputs. In other words, the use of agricultural inputs by poor small farmers simply may not be profitable, even with market failures.

2.5 Empirical Evidence On E-voucher In Zambia

A review of several literature shows that some studies have been carried out on farmer input subsidy electronic voucher in Zambia. The research findings of these studies vary depending on the specific objectives and therefore in the model and the variables under consideration.

Machina et al., (2017) for example, conducted a study to find out if the electronic voucher system had created jobs in five districts. Their main objective was to consider the potential of the e-voucher with regards to supporting growth of traders and job creation. They used a simple

multiplier effect model to determine the number of jobs created and the potential of creating new jobs in Chipata, Kalomo, Kapiri Mposhi, Mazabuka, Ndola and consequently country-wide. A qualitative approach was used on 13 randomly selected agro-dealers. Simulation results indicated that the rolling out of the e-voucher had created jobs among local dealers, both in new agro dealers and in existing ones as they expanded. Indaba agricultural policy research institute (IAPRI) estimated that 1,700 direct jobs were created in 31 e-voucher pilot districts.

The findings according to Machina et al., (2017) clearly demonstrated that Zambian companies were responding to the e-FISP positively and that the full roll out created significant opportunities for employment across all districts. These benefits would not have been felt if traditional FISP were to continue.

Siame (2017) conducted a survey to assess the impact of e-voucher to small holder farmers in Kabwe district. The main objective was to assess the performance of the e-voucher system by hearing from smallholder's farmers in Mpima block (Semine camp) and Waya block (Waya camp) in Kabwe town. Siame used a survey research design with structured and semi-structured questionnaires. Data was analyzed using Statistical Package for the Social Sciences (SPSS). The key findings to this study revealed that the e-voucher system was largely successful but required more improvements such as designing a proper e-voucher exit strategy. Siame assumed that FISP had no graduation or exit strategy for the beneficiaries. Similarly, it was assumed that the FISP e-voucher beneficiaries ought to exit or indeed graduate after three years of using the e-voucher. The study concluded and recommended that the government continue to monitor the e-voucher system in all parts of the country by supporting, different researcher's other than the traditional ones to undertaking independent studies. The government shall benefit more from different institutions and individual than relying on traditional researchers. Similarly, the study recommended for a better sustainable exit strategy that leads to the formation of value adding enterprise along the agricultural value chains by those exiting the e-voucher system (Siame, 2017).

Furthermore, Kuteya & Chapoto (2017) undertook a study that aimed at assessing e-voucher performance and recommendations for nationwide rollout during the 2017/2018 farming season through interviews. The analysis of the findings of this study indicated that the e-voucher pilots demonstrated that e-voucher could be a success, opening the way to reducing the cost of

providing input subsidies and diversifying the agriculture sector. The study findings also revealed that when the modalities were in place the e-FISP system worked, and is understood by farmers; however, getting these modalities into place was still a significant challenge.

Although similar studies have been conducted in Zambia the literature reviewed above established the uniqueness of this study. Literature reviewed shows that studies that have been conducted in Kabwe district for instance focused much on assessing the impact of E-voucher by hearing only from the agro dealers' point of view and not farmers and other stakeholders. In the Machina et al., (2017) study focus was to understand if E-voucher had created jobs. Individual household Modeling Approach was used while the current study focused on effectiveness. The individual household model method (IHM) provides reliable estimates of household income, with detailed information on household assets, demography and specific income sources (Evidence for Development, 2018). Literature reviewed also shows that similar studies in Zambia have been conducted by Indaba Agricultural Policy Research Institute (2016), Policy Monitoring Research Center (2017), and Balad Zulu (2017). However, none of these studies focused on Monze and Mazabuka.

3. CASE STUDY ON MONZE AND MAZABUKA DISTRICTS

After having presented the literature review in the earlier chapters, this chapter gives the outline/framework of electronic voucher system and a brief history and agricultural situation in the two study areas Monze and Mazabuka.

3.1 Background of Monze and Mazabuka Districts

Monze and Mazabuka are both towns located in the southern part of Zambia, located 180 and 125 kilometres respectively from the capital city, Lusaka. The southern province is one of Zambia's ten (10) provinces and home to Zambia's premier tourist attraction the "Victoria Falls". The centre of the province, the Southern Plateau, has the largest area of commercial farmland of any Zambian province, and produces most of the maize crop (Central Statistics of Zambia, 2016).

A rail line and the Lusaka-Livingstone road forms the principal transport axis of the province, running through its centre and its farming towns: Kalomo, Choma, Pemba, Monze, and Mazabuka. In addition to maize, other commercially important activities include sugar cane plantations and cattle ranching.

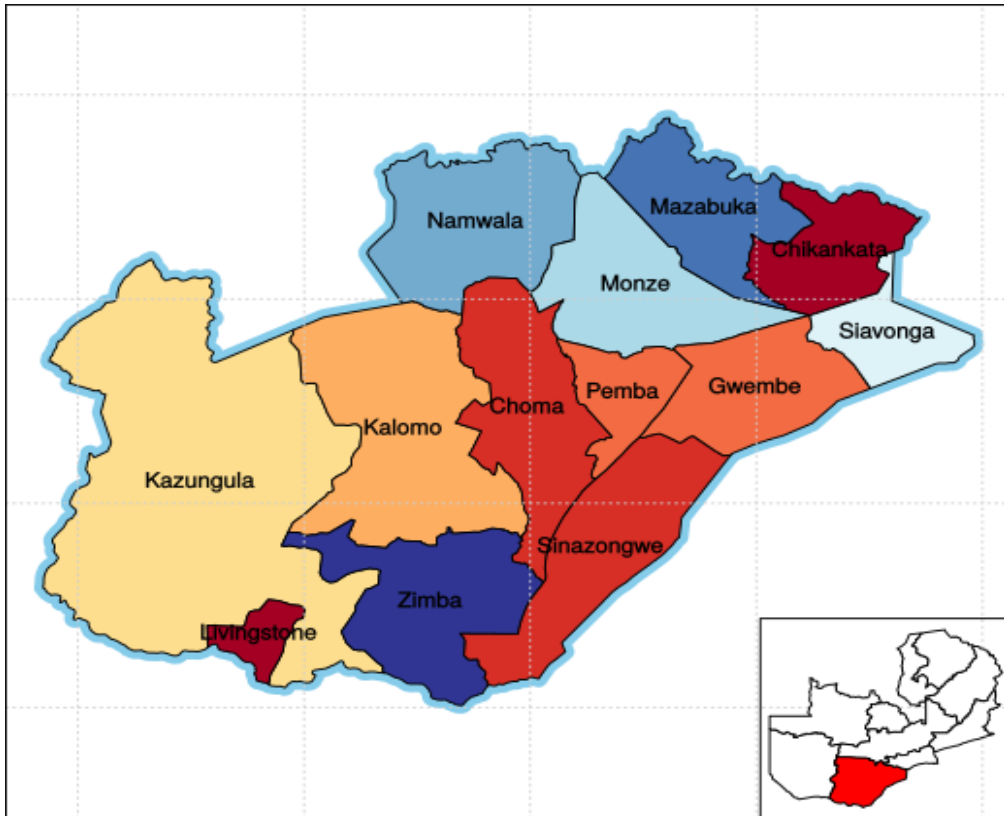


Figure 2. Districts in southern province of Zambia. Source: (Williams, 2003)

Mazabuka district affectionately called the sweetest town for its sugarcane production, prides itself as one of the oldest administrative centers in Zambia, having developed into an organizational center in the 1920's (Benedict, 2015). Mazabuka has all the category of farmers, with small scale farmers being the high percentage followed by the medium or emergent farmers and the smaller percentage are commercial farmers. In the farmer register of 2016, 30,002 farmers are in the small-scale category. According to the Central Statistical Office (2015) it has a population of 182,205, and the annual growth rate is 4 %. Mazabuka is assumed to have the highest population count in the region, representing about 18.4 % of the total population of Southern Province and approximately 2.33 % of the total population of Zambia (Zambia Tourism Board, 2016)

Monze district on the other hand as of the census of conducted 2010 has a population of 163,578 and at one point in the past, the district used to produce more than 25% of the maize crop in Zambia (Central Statistics of Zambia, 2016)

The farmers input support program (FISP) has been in operation in the two districts since its inception in 2002. Despite the continued support through subsidizing agricultural inputs largely

for maize production to small scale farmers, the manual program had not helped to improve small scale farmers' maize production and household income", thereby leaving these farmers perpetually dependent on the subsidy facility, without which they were unable to grow a maize crop

Table 3. Input distribution during the period 2003-2012 farming seasons(Farmer Input Support Program Implementation Manual 2012, 2013) .

Season	Fertilizer (MT)	Maize Seed (MT)	Subsidy Level (%)
2002/2003	48,000	2,4	50
2003/2004	60,000	3000	50
2004/2005	46,000	2500	50
2005/2006	50,000	2500	50
2006/2007	84,000	4234	60
2007/2008	50,000	2550	60
2008/2009	80,000	4000	75% for fertilizer, 50% for maize seed
2009/2010	5,342	8790	76% for fertilizer, 50% for maize seed
2010/2011	178,000	8985	76% for fertilizer, 50% for maize seed
2011/2012	182,454	3000	79% for fertilizer, 53% for maize seed

From the Table 3 it can be seen that between the farming season of 2002 to 2006 the subsidy levels for both maize seed and fertilizer were both at 50%. However, the proportion in the following season during the period 2006 to 2008 went up to 60% this was driven by an increased maize production by the small-scale farmers due to a good rain pattern in the years. The increment in subsidy levels of both maize and fertilizer in the period 2009 to 2012 from 60% in the previous seasons to 76 and 50% respectively necessitated an increment in maize and fertilizer supply to the farmers.

3.2 How E-voucher works

The Ministry of Agriculture and Livestock (MAL) together with the Food Agriculture Agency (FAO) selects eligible farmers for input into Electronic Voucher database managed by Mobile Transaction Zambia Limited (MTZL). The system is linked electronically to individual beneficiary's National Registration Card (NRC) numbers. When it is time for collection, the beneficiaries go to the agro-dealer and present their NRC card and voucher. The agro-dealer enters the NRC number and reference pin into the system. The agro-dealer's bank account is instantly credited, and the beneficiary is given the inputs (Hamasaka, 2016).

The e-voucher is a payment card given to the cardholder (the smallholder farmer in this case) the prepaid card provides the cardholder with access to the agricultural input supply of their choice up to the fixed amount. The cardholder can go to any approved agro dealer and purchase the goods by simply swiping on an electronic point of sale machine (POS) to pay for the goods. Funds from the government are sent into the card holders account, and the card holder control and access funds as they would with any normal bank account.

The Program Coordinating Office (PCO) works both through the provincial (PACO) and district structures (DACO) including Camp Agricultural Committees (CAC) (Zambia National Farmers Union, 2015, 2016). Among the functions of the PCO was to create awareness of the e-voucher system to all stakeholders. While DACO's office, through the agricultural camp officers, was responsible for awareness of farmers about the operation of the e-voucher system, Musika was responsible in the creation of awareness and training of agro dealers (input suppliers). The MAL produced an e-voucher implementation manual that contained detailed information about the program and specific roles for each implementing agent. The MAL implemented the 2015/2016 e-voucher pilot in collaboration with Zambia National Farmers Union

(ZNFU). Using their already existing e-VISA card platform, ZNFU facilitated the printing, distribution and activation process of e-cards through the banks. The other implementing agents included agro-dealers and input suppliers who stocked and supplied agricultural, livestock/veterinary and fisheries inputs to farmers. The participating agro-dealers and input suppliers were selected through a consultative process in the pilot districts using an agreed upon criteria. These agro-dealers/ input suppliers were required to acquire Point of Sale machines through their own arrangements with the banks (Zambia Daily Mail, 2016)

4. RESEARCH METHODOLOGY AND DATA COLLECTION

4.1 Research Design

Byman (2008) defined research design as a strategy drafted to be used in completing or realizing a specific task in an orderly manner through an empirical research to be carried out. For this study, a case study approach was chosen. A case study was considered ideal for this study because it presents facts and ideas about the subject under investigation. A case study approach is appropriate when the focus of the research is on a contemporary phenomenon in a tangible context. In such contexts, case studies are useful to highlight the in-depth knowledge of the study (Yin, 2012).

4.2 Research Strategy

This study applied a qualitative approach to generate data about the effectiveness of E-voucher in Monze and Mazabuka districts. Qualitative analysis involves the collection and analysing of data which are surveys, interviews, focus groups, conversational analysis, observation on the context within which the study occurs (Flick, 2007). The general goal for the researcher is to study in detail and to develop an in-depth understanding of the natural setting, the complexity and the context (Kumar, 2011).

4.2.1 Target Population

“The target population for a survey is the entire set of units for which the survey data are to be used to make inferences. Thus, the target population defines those units for which the findings of the survey are meant to generalize” (Lavrakas, 2008).

Similarly, the population in a study is a group of experimental data or persons (Sulant & Dillman, 1994). With this definition in mind, the study population for this study consisted of Various stakeholders (banks), FISP farmer beneficiaries, Agro-dealers and MAL Provincial and District Agricultural Coordinators (DACOs) in Monze and Mazabuka. Out of this group, the larger composition consisted of the farmer beneficiaries. This group of respondents were chosen because they represent a true picture of what is standing on ground. The farmer beneficiaries who are the end users are assumed to give a sound opinion of their feelings of the e-

voucher system while other stake holders were chosen because they all play a significant role in the entire e-voucher process.

4.2.2 Sample Size and Sampling Techniques

“The sample size of a survey most typically refers to the number of units that were chosen from which data were gathered” (Lavrakas, 2008). A multi stage sampling process was used to select the study sites, of which ZNFU/Musika, Agro dealers and MoA Provincial and District Agricultural Coordinators (DACOs) were selected as respondents. Multistage sampling divides large populations into stages to make the sampling process more practical; it is combination of simple random, cluster and stratified sampling (Stephanie, 2014).

Monze is divided into eight (8) village groups (VGs) namely; Mugalolo, Bweengwa, Moomba, Sialwindi, Chiyoma, Siatontola, Makonka and Kaumba, while Mazabuka has six (6); Magoye Kalimanzila, Mwanachingwala, Nasegwa, Luwanya, and Sindamu respectively. Village groupings are a usual form of community for societies that practice subsistence agriculture, and also for some non-agricultural societies each group usually consists of 100 or less farmers.

The randomly selected groups for Monze were Bweengwa, Moomba and Mugalolo. Mazabukas selection was Magoye, Mwanachingwala and Luwanya. Further 15 farmers were selected from Bweengwa, 15 from Moomba groups and 20 from Mugalolo in Monze a total of 50 farmers. The same routine was used for Mazabuka, 15 from Magoye, 15 from Mwanachingwala and 20 from Luwanya. The total number of farmers that were selected as respondents in the two districts was one hundred.

DACOs have one representative in each district and each was chosen, the same criteria applied for Musika, ZNFU and all co-operating banks the numbers were purposively selected by the official positions they held in their companies thus were right respondents to provide the required information regarding the topic under study. However, one bank did not have a representative in Monze and therefore information was obtainable from one representative in Mazabuka. The agro dealer size was a total of 20. The composition of the sample size is summarized in Table 4.

Table 4. Composition of sample size (Respondents n=133)

	Mazabuka respondents	Monze respondents	Total respondents
Individual interviews-FISP direct beneficiaries	50	50	100
DACOs	1	1	2
Musika representative	1	1	2
ZNFU Representative	1	1	2
Agro Dealers	10	10	20
Co-operating Banks;			
United Bank for Africa (UBA)	1	0	1
ZANACO	1	1	2
Barclays Bank	1	1	2
Chairpersons of Cooperatives	1	1	2
Total number of respondents	67	66	133

4.3 Method of data collection

A research cannot be performed without data and for these data to be available various, means are used to acquire them. This means that the quality of the research depends on correctness, suitability, quality and quantity of the data collected. The criteria for data collection depended on the required time, cost to get it and lastly how the data was made available (Pawar, 2004).

4.3.1 Primary Data

Information gathered can come from a range of sources. Likewise, there are a variety of techniques to use when gathering primary data Adams et, al (2014). This study is based on primary data that was collected from six (6) randomly selected agricultural camps in Monze and Mazabuka (three in each) districts. The questionnaires (see Appendix 1-6) helped to collect

data from those farmers who received subsidized seed or fertilizer during the 2015, 2016 and 2017 farming seasons. The questionnaires aimed at collecting relevant information concerning the comparisons of manual FISP and e-voucher. Questions relating to what farming inputs they received in the previous system, perceived challenges of manual system and what benefits they felt the new system had brought. The questionnaire has four sections: A, B, C and D:

- Section “A” is on personal data of the respondents
- Section “B” is on the farming patterns/ inputs received in previous system
- Section “C” contains questions on the perceived problems of manual system and finally
- Section “D” is on the perceived benefits the e-voucher has brought to the farmers.

A total of one hundred farmers were randomly selected from the village groupings in the two study areas. Considering the nature of this research which is mainly qualitative, only fifty farmer respondents in each district gave their consent to take part in the research which was sufficient to provide the required information. Other respondents selected were, Agro-dealers (20), Ministry of Agriculture and Livestock’s representative, ZNFU representative and finally Musika Business Initiative representative.

The study used semi-structured questionnaires and interview guide. Semi-structured questionnaires were used only on the farmer respondents. The questionnaires were given to the respondents by the researcher, since some respondents could not read and write properly the questionnaire was read to them and answers written down on their behalf by the group leader. The questionnaires contained both open ended and closed-ended questions where the respondents were asked to agree or disagree with a statement. Interviews were administered on the ZNFU, Musika, DACOs, chairpersons of cooperatives and bank representatives via one on one at their offices. The respondents that could not be reached physically were interviewed via telephone and email. Interviews were found to be ideal for this group of respondents, because they facilitated adaptability of formulation of questions. They are also ideal when collecting in-depth information on the subject which was the case with this study. Furthermore, interviews allowed the researcher to probe on certain issues raised by the interviewees that were of interest to the research. The use of the two tools in information gathering complemented each other to allow triangulation and authentication of the information.

The time frame used to collect, and sort data was five months between December 2017 and May 2018. Data’s from farmers where collected directly from the farmers through the help of chairpersons of cooperatives in the selected village groupings. The villages were in remote far

flung areas and so it was difficult due to poor road network and expensive for the researcher to visit the villages personally.

4.3.2 Secondary Data

Secondary data are collected by someone else for a purpose other than the researcher's current project and has already undergone the statistical analysis (Business Jargons, 2017). The secondary data collected in this research was records on total number of registered farmer beneficiaries, approved agro dealers list, budget allocations from Ministry of Finance and Census records which showed the population of the two study areas

5. ANALYSIS AND FINDINGS

This chapter begins by providing basic information of the interviewees, and then a presentation of the research results against the five (5) research objectives. The results were sorted and presented based on the titles resulting from the research questions. Most of the data was qualitative. Therefore, qualitative data was analyzed manually while quantitative data was analyzed using Microsoft Excel to come up with tables and charts. Raw data was sorted out, analyzed and presented according to themes from the research questions.

5.1 Social-Economic Characteristics of Sample Respondents

This section provides social-economic characteristics of the participating farmers or beneficiaries. The characteristics were broken down into age, gender and education level. The data obtained from the farmers on age is presented in Table 5 and Figure 3. For a better presentation, Figure 3 shows the graphical age distribution among the farmers with the two covered districts. From the figure, it can be seen that the farmers below the age of 25 represent 18% of the farmers, those between the ages of 25 and 50 represent 50% of the total farmers and those above 50 years of age represent 32%.

Table 5: *Age of responding farmers (data from respondents)*

Age Range	Below 25	25-50	Above 50
Monze respondents	8	30	18
Mazabuka respondents	10	20	14
Total	18	50	32

The respondents in the three Monze groups results showed that out of the fifty farmers eight were below twenty-five years of age while thirty were between the ages of twenty-five to fifty, those that indicated that they were above fifty were only eighteen. The results in Mazabuka groupings showed a higher number of respondents that were below twenty-five (10),

but lower number of those that were between the ages of twenty-five to fifty (20). Those farmers that indicated that they were above fifty were only fourteen respectively. Of the total one hundred farmers in both districts results showed that 50% of the farmers were between the ages of 25-50, while 32% were above 50 and only 18% were below the age of 25. These figures show notably an increment in the younger and active generation taking up agriculture as a source of livelihood as typically in the Zambian society majority of people who are involved in farming activities are the elderly who fall in the above 50 age range while the youth prefer to take up white color jobs in the big cities.

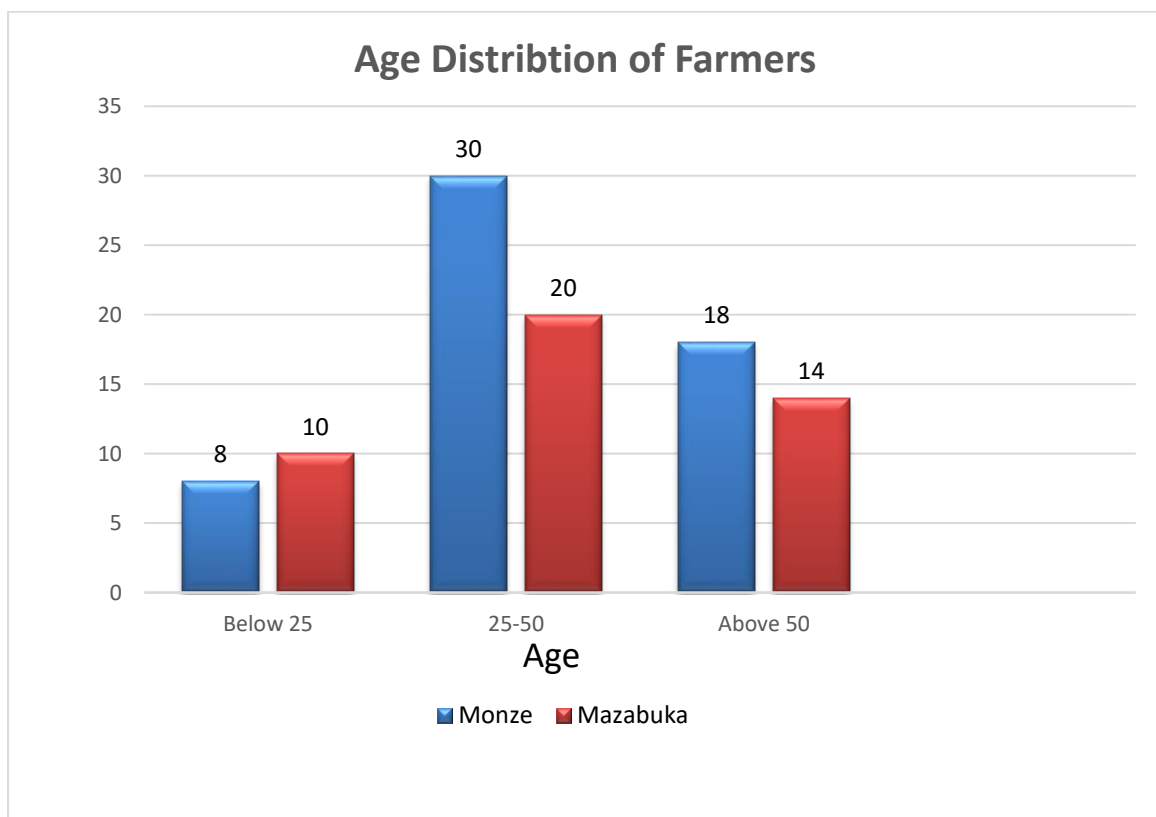


Figure 3: Graphical representation of the age of the participating beneficiaries/farmers

Table 6 shows the gender composition of the beneficiaries. The gender composition of the farmers by percentage in each of the two districts is shown in Figure 4. In summary, the figure indicates that 57% of the beneficiaries are male while 53% are female.

Table 6: *Gender composition of the farmers.*

Gender of farmers	Monze	Mazabuka
Male	30	27
Female	20	23
Total	50	50

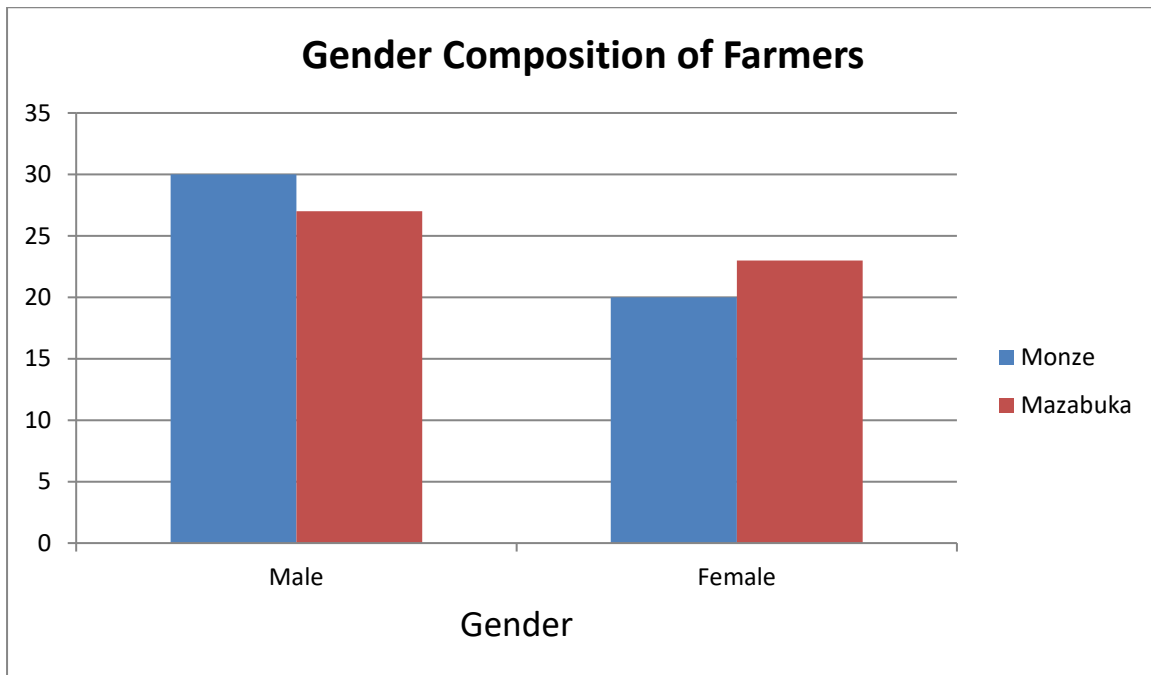


Figure 4: *Graphical representation of the gender composition of the farmers.*

Table 5 show that most of the respondents had accomplished education up to secondary level followed by college, primary and university. There were a couple of respondents, who had not attained any education. Two questionnaires came back with missing information.

Table 5. *Education level of farmer respondent's*

	Monze Farmers	Mazabuka Farmers	Percentage %
Primary level	9	8	17
Secondary Level	20	22	42
College level	10	12	22
University	6	5	11
None	4	2	6
Missing information	1	1	2
Total	50	50	100

5.2 How Beneficiary Targeting is Applied at Cooperative Level

Selection Process of Farmers According to the information gathered from the cooperative leaders in the study areas, to become a beneficiary of FISP, a farmer needs to go through some prescribed processes. Figure 5 gives a summary of these processes. Under the new e-voucher system, each benefitting farmer is expected to deposit ZMW 400 into his/her own account to activate the card, while the government commits ZMW 1, 700 for each farmer.

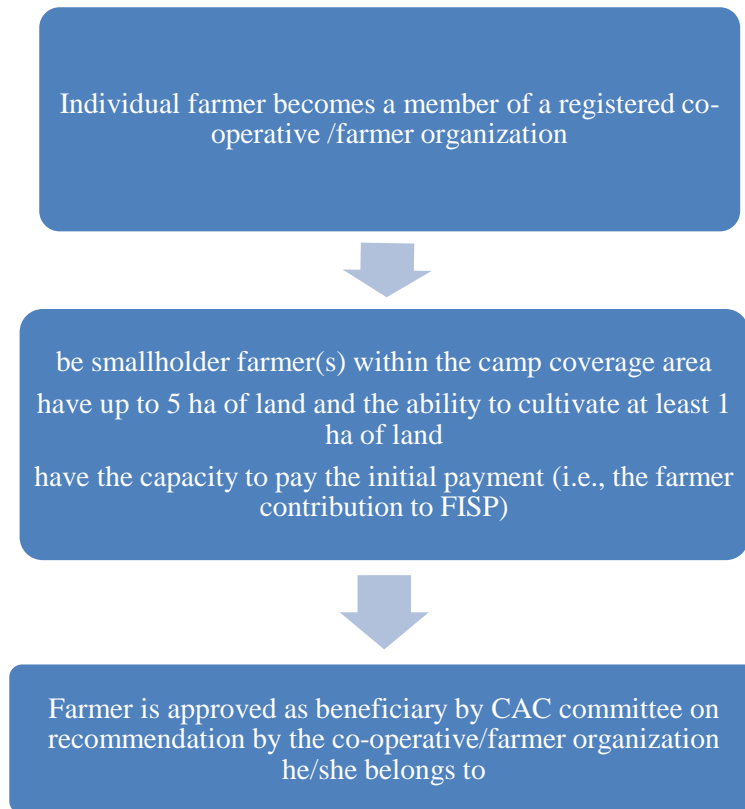


Figure 5. *Beneficiary targeting at co-operative level* (Ministry of Agriculture and livestock, 2017)

5.3 Input Distribution

In order to find out how the E-voucher system has tackled delivery time and transparency in the supply and distribution of inputs, the farmers were asked what inputs and quantities of the inputs they had received in the new and old systems. They were also asked if they got the inputs on time.

In response to the above questions, the farmers indicated that in the old manual system allocation for each farmer was 100 kg (50 kg x2) basal dressing fertilizer, 100 kg (50 kg x2) top dressing fertilizer and 10 kg of maize seeds. They also indicated that they received the inputs on time before the start of the rainy season during the 2016 season while majority of them complained of delay during the 2017 season.

In addition, the farmers were asked what benefits the E-voucher had brought to them. In response to this question, a female farmer from Bwengwa village group in Monze said that with

the E-voucher system they are free to choose exactly the type of fertilizers and variety of seeds to buy, unlike in the past old system, where they had no option but to receive whatever was made available.

In order to know if the inputs were not diverted for another purpose, the MAL representatives were asked how they are ensuring that the right beneficiaries of FISP are the ones receiving the inputs under the new system. The below statements under quote is the response from the MAL representatives.

“All beneficiaries from the onset are registered into the system using their unique National Registration Card (NRC) number and mobile number belonging to the owner of that NRC. A pin is sent to the mobile number belonging to the beneficiary. Also, when they go to the agro dealers to buy their inputs the agro dealers ask for the NRC of the farmer before handing them the inputs after swiping. The agro dealers are trained well enough because we have given them strict rules and regulations to avoid these problems of people getting inputs on behalf of other people or stolen card situations”.

The Minister of Agriculture and Livestock’s during a press briefing held in Lusaka on January 20th, 2017 also said, “there was a delay in the delivery of farming inputs during the 2016/17 farming input owing to the election petition”. Figure 7 shows the delivery mechanisms of the inputs through the e-voucher and the old manual systems

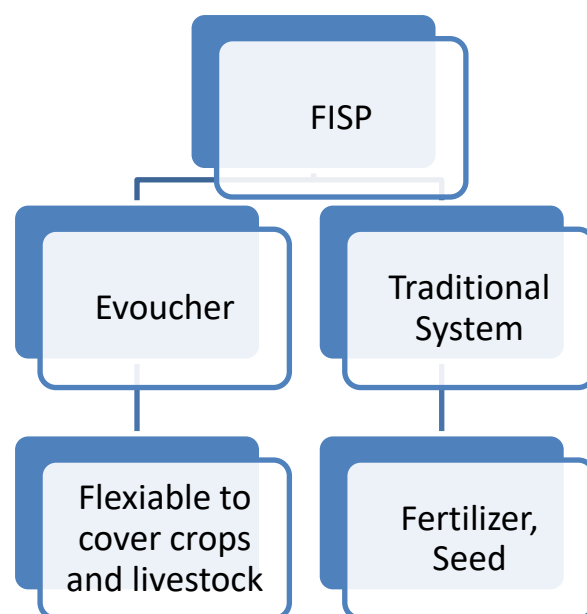


Figure 6. delivery mechanism of farming inputs in the two systems (data from respondents)

It can be seen from figure 6 that during the manual FSIP farmers were only able to receive fertilizer and seed while the new e-voucher provides a more flexible and allows farmers to choose which type of input they require in that farming season.

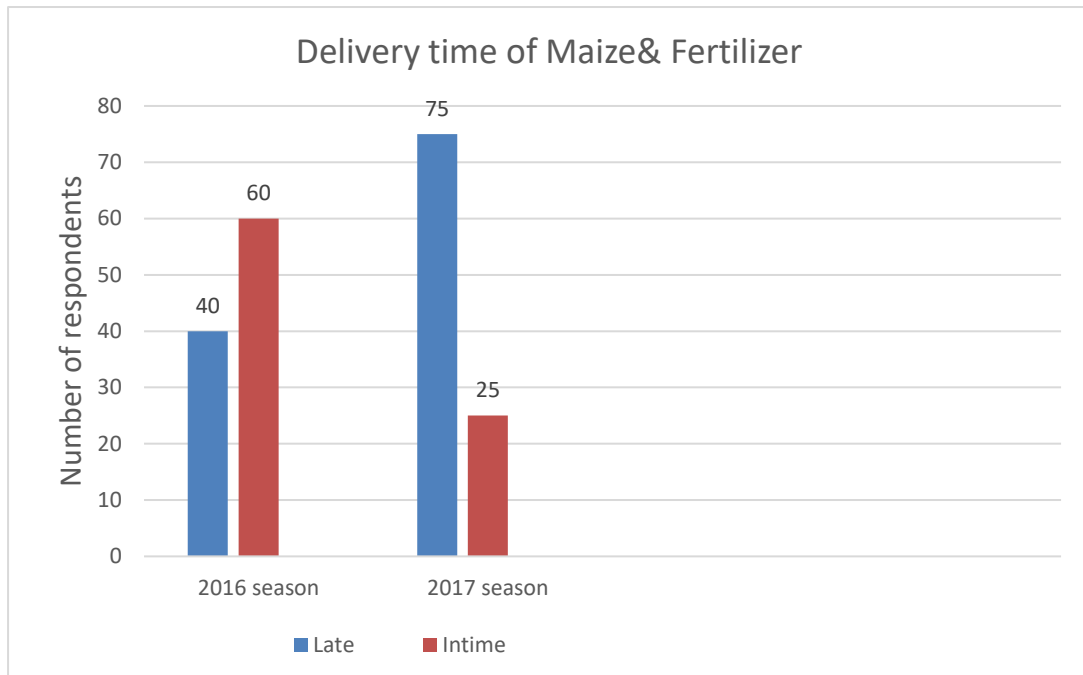


Figure 7, Response on delivery time on inputs

5.4 Farm produce and farm sizes per household

Each participating farmer was asked to specify the size of their farms and what they planted/produced on their farm land during the farming season. Table 5 shows the sizes of the farm land cultivated by the farmers. Figure 9 shows the graphical representation of the farm sizes owned by the farmers in the two districts. The results indicate that 19% of the farmers have less than 1 hectare of farm land, 53% have 1-2 hectares, 21% have 3-5 hectares and 14% have above 5 hectares of farm land.

Table 5. Farm size of each Farmer

Land	Monze farmers	Mazabuka farmers
Less than a hectare	10	9
1-2 hectares	23	30

3-5 hectares	12	9
Above 5hectares	4	10
Total	50	50

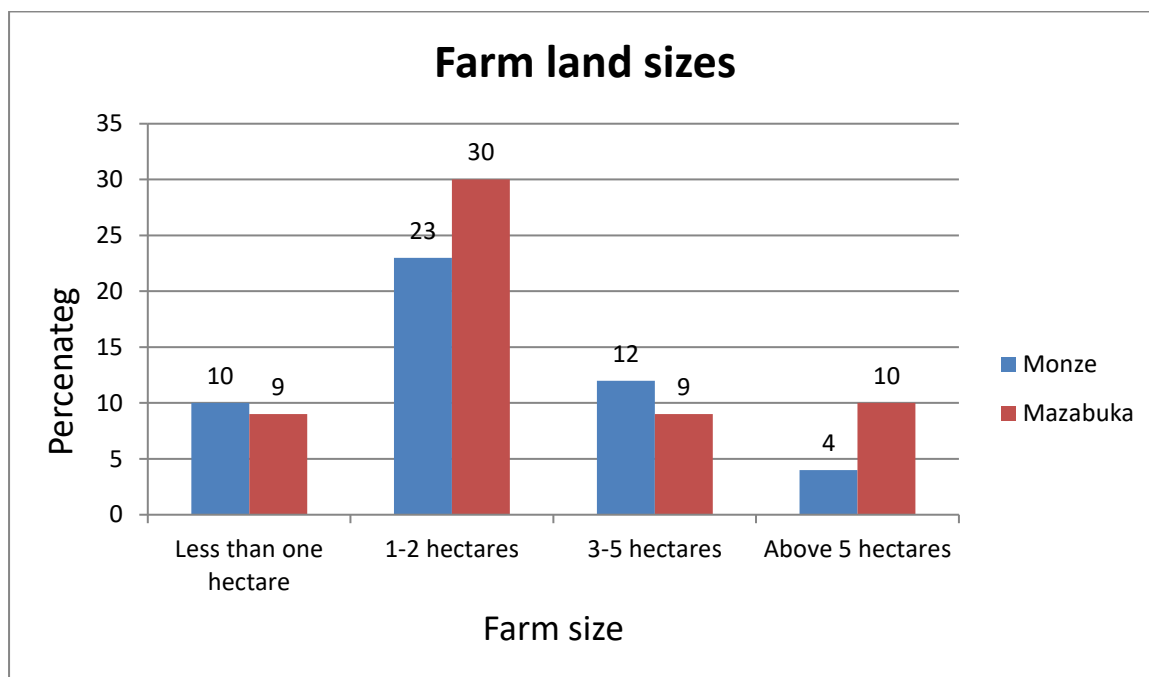


Figure 8, Farm land size of each Farmer

Table 6 summarizes results of types of crops grown by the farmers. Figure 9 shows a better representation of the types of crops grown by the participating beneficiaries in the two districts.

Table 6. Farm produce cultivated per house hold (Data from respondents)

Types of Crops	Monze Farmers	Mazabuka Farmers
Maize	50	50
Groundnuts	30	44
Wheat	37	20
Soya Beans	28	18
Tomatoes	43	48

All crops	7	5
Total	195	185

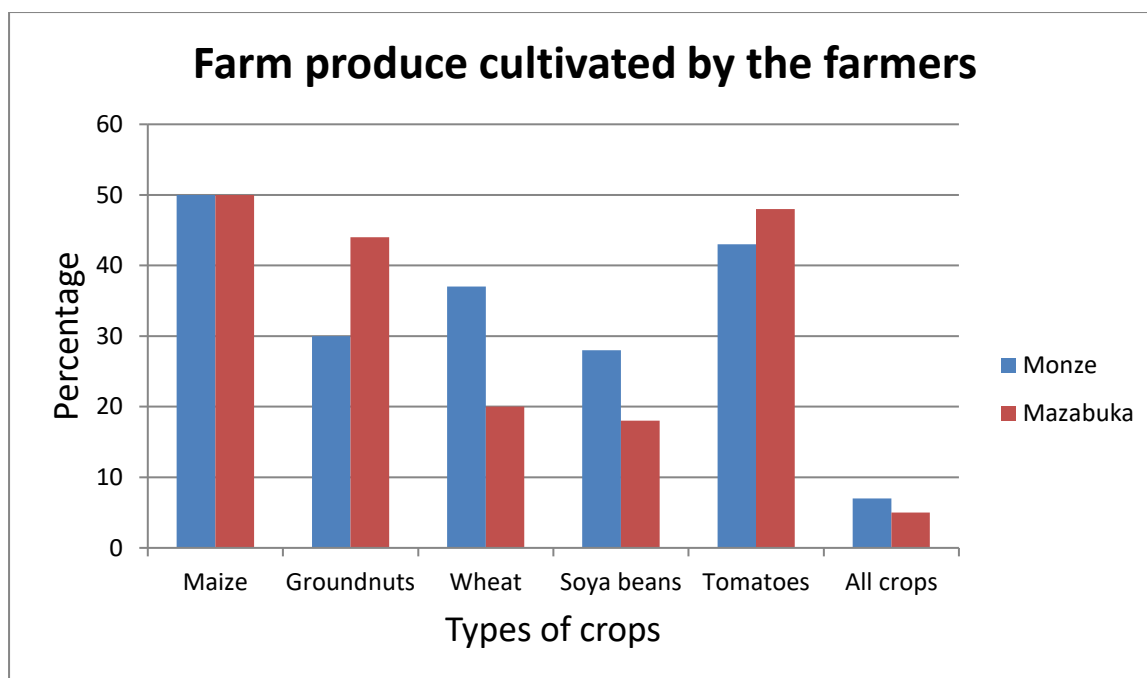


Figure 9, Farm produce cultivated per house hold

5.5 Budget performance of FSIP E-voucher

According to the government, the introduction of the e-voucher system was meant to save resources by reducing procurement, transportation and other costs associated with FISP. During one of the interviews conducted, a representative of MAL was asked if the Zambian government have indeed been able to lower the said logistics costs associated with FISP. The following was the response from the representative;

“The shift is in line with Government’s commitment to safeguarding expenditure and channeling support to the right people. “The e-voucher has eliminated a lot of costs. So far, a lot of farmers that appeared more than once as beneficiaries of FISP have been eliminated. The ghost farmers are removed from the database of beneficiaries due to enhanced targeting through the ZIAMIS platform. This has also made a reduction on leakages and increased the number of intended beneficiaries by linking the e-cards to a particular farmer and their National Registration Card (NRC). With the reformed FISP and the clean-up exercise, Government will save

over ZMW2 billion”, he said. He further said; “the administrative costs for the e-voucher amounts 5% of the entire subsidy budget compared to 35% under the old FISP system. So, this a great shift for us as a ministry and the country in general”.

A budget was presented in the Parliament on Wednesday, 5th October 2016 for various ministries. Table 7 summarizes budget allocation for 2016/17 in the Ministry of Agriculture key programs.

Table 7. Ministry of Agriculture Budget Composition to key programs in 2016 and 2017 (National Assembly of Zambia, 2016)

Program Description	Ministry of Agriculture 2016 ZMW	% of National Budget	Ministry of Agriculture 2017 ZMW	% of National Budget	% Change 2017 vs. 2016
Ministry allocation (% against National)	2,382,266,379	6.5	5,435,167,921	8.4	29.2
Farmer Input Support Program (FISP)	755,220,645	31.7	-	-	-
E-Voucher system Pilot / Roll out	248,330,1650	10.4	2,856,399,170	52.6	
Administration costs/other costs	1,378,715,569	57.9	2,578,768,751	47.4%	10.5%

The Ministry of Agriculture approved budgetary provision for 2016 was ZMW2,4 billion representing 6.5% of the National budget compared to ZMW5,4 billion representing 8.4% in 2017. This represented a 128% increment. The manual system of FSIP consumed ZMW 755,220,645

representing 31.7% of the national budget prior to 2016. The introduction of e-voucher system saw a major reduction of the ministry of agriculture consumption of the national budget by 21.3% in 2016. As a success in 2016 the budget allocation had to be increased in 2017 as no budget was allocated to the manual system of FISP after 2016. the allocations given to other costs in the ministry all reduced in 2017 by 10.5%.

5.6 Involvement of Agro dealers in FSIP e-voucher process

Agro dealers interviewed were asked to indicate what role they played in the e-voucher process. Secondly to respond also to objective D, on how the new e-voucher system had affected their business a question was asked:

What benefit has e-voucher brought to your business? Are there any big concerns in comparison to manual FISP?

Majority of the respondents seemed to be quite pleased with the system, although some respondent's main concerns were failure to transact through Zambia Integrated Agriculture Management Information System (ZIAMIS) a web-based system, late accreditation of funds by banks to their accounts and insufficient ICT training.

Two of the dealers in Mazabuka explained:

Agro dealer 1: "The farmers' response has been good since the launch of the e-voucher program. Although demand is strong for maize and fertilizer, farmers have also bought vegetable seeds, poultry and veterinary drugs. Others also buy chickens a day old in our store. Our sales volumes increased because we made sales among all products in stock," he said.

Agro dealer 2: "As Agro-dealers, we followed the farmers right in the community with our products. The response from the fertiliser companies was good as they provided trucks to deliver the fertiliser to farmers in far flung areas," she said.

Another dealer from Monze had this to say: "The new electronic voucher system was more user-friendly than FSIP before. "The new system is different, it has diversity to it especially with these inconsistent climate change, so it's important for farmers to see the benefits". He also however stated that" some banks response time was inadequate, as some farmers that came to my shop had challenges using their POS machines due to network failures. some cards for farmers were not activated because of either Government or the farmers depositing money late

which made dealing with customers quite a headache. He further said some banks took a long time to credit my money from the sales which made it difficult to buy more stock”.

The dealers were asked to state whether they received their money on time from the banks after sales by stating yes or no or if not sure. Results are summarized in figure 8. From the figure, it can be seen that only 30% indicated to have received their money on time, 45% indicated otherwise while 25% said they were not sure.

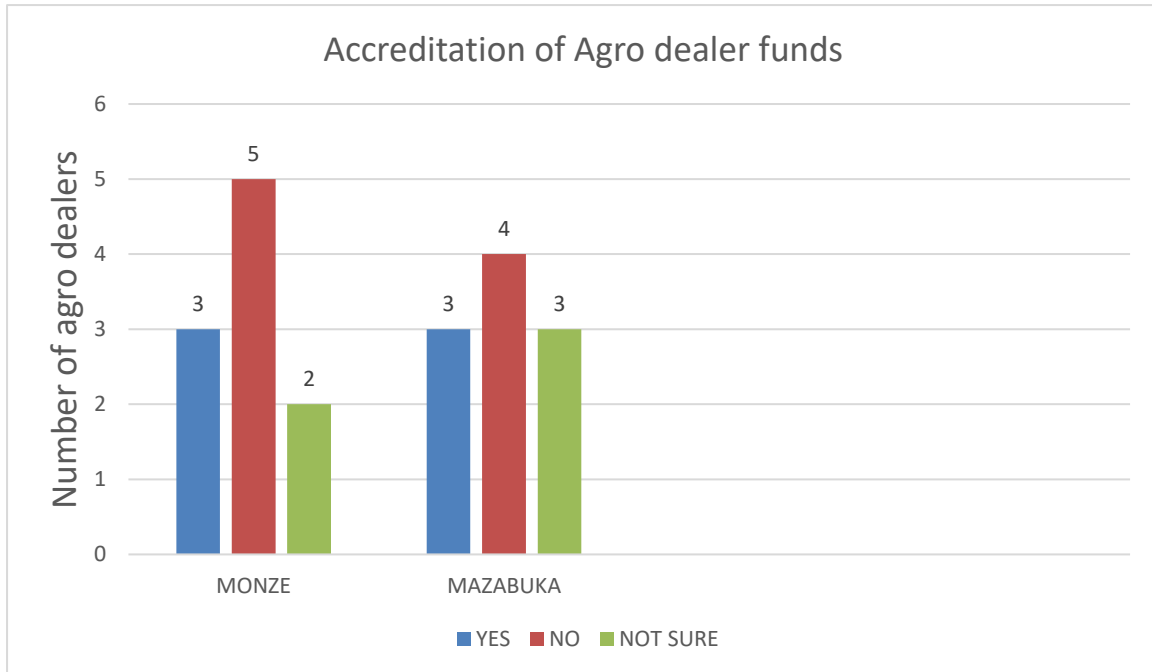


Figure 10, Accreditation of funds to agro-dealers accounts.

5.7 Involvement by other stakeholders

Questions were directed at representatives of Musika, ZNFU and the banks via one-one interviews to explain what role they played in the entire e-voucher program. Interviews were conducted separately at each respondent’s place of work and answers were summarised as follows;

Musika representative

Musika Development Initiatives, a company that works to stimulate private-sector investment in smallholder markets role in the entire e-voucher pilot program is to facilitate the training of agro dealers in each of the 13 pilot districts. The education programs help define the roles and responsibilities of agro dealers of agricultural products within the framework of the program and include presentations from banks on their offer of the point of sale machine. A total of 12

main dealers and 180 local distributors participated in the pilot project and noted a total increase in sales due to the high demand for different products from farmers.

ZNFU representative

ZNFU assists the ministry by allowing the E- Voucher program to ride on ZNFU already existing VISA card system, which was implemented under the LIMA Credit Scheme (Lima means to farm in Zambian local language). ZNFU facilitated the printing, distribution and activation process of e-cards through the banks.

Bank representatives

Bank 1: “We work in collaboration with Musika. What we do is present our banking services to agro-dealers especially on our offer of the point of sale machine which they will use for transactions in their shops. We offer them a rate that is complete and tailored only for FSIP sales. We do these presentations when Musika is conducting the training for the approved agro dealers”.

Bank 2: “We also work with the MAL and ZNFU, and our work involves the actual printing of the e-cards. We receive instructions from ZNFU on the total number of beneficiary cards that will be needed for that farming season and then we print”. Said another bank representative

5.8 E-voucher Model

The FISP e-voucher model was presented at 2017 Zambia International Trade Fair in Ndola town in the Copperbelt province of Zambia. Figure 9 summarizes the model adopted.

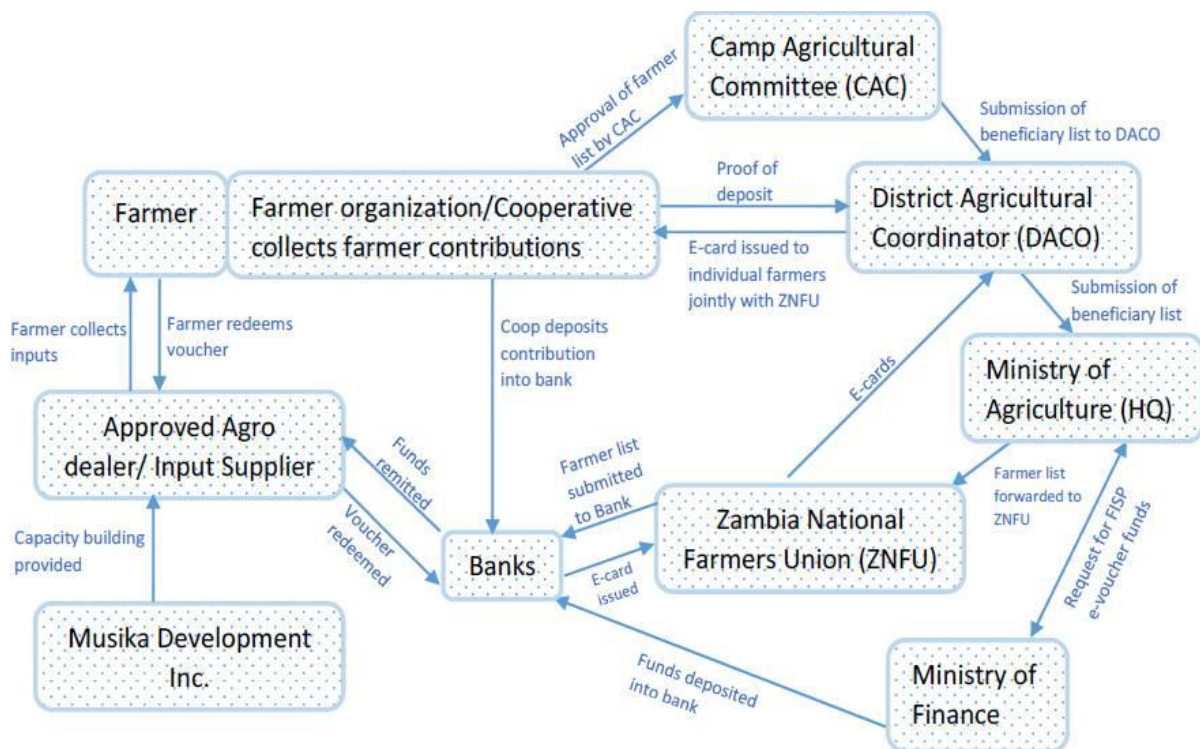


Figure 11, E-voucher Model (MAL 2016)

The model is a composition of all the players of the entire e-voucher program. The CACs identify and select beneficiaries from the various village groupings/farmer organizations which the farmers belong to (as explained in figure 8), next the names of the selected eligible beneficiaries are submitted to DACOs office for eligibility and verification. The final approved list is then forwarded to the Ministry of Agriculture and Livestock (MAL). The ministry’s headquarters (HQ) sends list of beneficiary farmers to the Ministry of Finance and National Planning (MFNP) to request for funds for e-voucher, once these funds are approved by MFNP. The list is then forwarded to ZNFU to facilitate the registration of farmers in their system and printing of e-cards. The banks facilitate the printing of the e-cards after receipt of request with farmer list from ZNFU and deposit total amount of money from Ministry of Finance. Musika facilitates capacity building and training for all registered and approved agro dealers for that farming season. The end user (farmer) redeems the input/voucher from the agro dealers and finally the agro dealers redeem their funds from sales from the participating bank they have chosen.

6. DISCUSSION OF RESEARCH FINDINGS

This chapter presents the discussion of the findings presented in the previous chapter. The findings are discussed in relation to the research questions. The reviewed articles in Chapter 2 Sitko et al., (2012), Siame (2016), Kuteya et al., (2016), IAPRI (2016), Machina et al., (2017), encouraged the introduction of e-voucher system to mitigate the disadvantages of the FISP manual system mentioned in table 1 of chapter one. Effort was made to confirm and extend on the existing knowledge. This discussion, therefore, is based on the extent to which the findings of this study correspond with the researchers' comparison in other districts and whether the objective has been achieved or the research questions have been answered.

6.1 Social economic characteristics of respondents

Gender

The level of participants in figure 4 shows that 42% were female and 55% were male. This is a good ratio as this shows that more women have taken a keen interest in agriculture and a higher level of women's participation in agricultural production should have a positive correlation with food security and nutrition because women are major custodian of families' welfare. This also shows that there is no biasness in the selection of beneficiaries in the e-voucher process.

Age

The age of the respondents shown in figure 3 shows that 50% of the respondents fell in age range of 25-50, 32% above 50 and 18% below 25. This means that an increased number of youths have taken up interest in agriculture as a source of food security. This also means selection of beneficiaries is beneficial especially in the age range where farmers are strong and have youthful energy for farming.

Education

Education plays a vital role in decision making and helps understand various farming techniques that are beneficial to a farmer. About farming, the level of education of the beneficiaries in table 4 is enough, but it is insufficient if they are to be involved effectively in the program especially after the migration to e-FSIP. If farmers are to add value in various enterprises along

the agriculture chain and contribute to food security in their community's basic level education is insufficient. Therefore, to ensure sustainability as part of the exit strategy of the program and winning off the ideal solution would be at cooperative level include a venturing entrepreneurship enterprise that would educate and integrate interested farmers into district or national level contributors to poverty reduction.

6.2 Input Distribution

This sort to answer how E-voucher mechanisms have tackled delivery time and transparency in the supply and distribution of inputs.

The study established that during the manual FISP majority of respondents complained that inputs came late. One of the beneficiaries said that they received inputs as late as November when the rain season had already begun. When the inputs came late, then planting would be late, too. Few of the respondents said that they received inputs in somewhat good time before it started raining. Regarding what inputs they received, the farmers indicated that that in manual FSIP they each received a pack consisting of 50 kg x 2 of basal fertilizer, 50 kg x 2 of top fertilizer and 10 kg of maize seed. Clearly, manual FISP lack of flexibility in input received and delay in distribution had the potential of adversely affecting the effectiveness of FISP.

The introduction of e-voucher from results shows that it offers a more flexible means of input distribution and does away with late delivery of input. Farmers can redeem whatever input they feel is adequate for them during that farming season. One of the respondents said she was pleased with the new system, because she had the liberty to pick from a variety of inputs unlike just receiving maize and fertilizer.

The findings of the current studies are in line with the challenges of late delivery of inputs in the manual system as evidenced by Mangasu. According to Mangasu (2016) the respondents in his study expressed concern that sometimes inputs were delivered very late in the farming season. They revealed in some situations the inputs had been delivered as late as January, February or March. Some respondents attributed late delivery of inputs to corruption at the distribution centers. The possible reason for this discrepancy was that rainfall in his study area (Chiawa) started late such that even though the inputs were delivered in early November they were said to not be late because the rains would not have started raining seriously.

The transparency issues in e-voucher system was tackled with ID verification before redemption of farming input. A MAL representative stated that the government of Zambia had put in

strict measures with the input sellers (agro dealers) to ensure the right beneficiaries were the ones collecting the input. This is good as this tackles transparency in redemption from government to end user (farmers). Any late purchase and application of farm inputs should be avoided at all costs. Thus, there should be 100% timely purchase of inputs.

6.3 Farm Produce and Farm Size Per Household

According to table 5, 100% of the respondent e-voucher beneficiaries were in maize crop production. Despite the other crops being in variation in terms of production, the fact that farmers are involved in one or more crop production is the basis for a farmer to qualify as a beneficiary of FISP e-voucher system as seen in figure 5, therefore, it is not surprising that everyone was involved in crop production

From literature reviewed, Machina et al., (2017) disclosed that only small-scale farmers were rightful beneficiaries. However, table 5 shows that 53% were small scale farmers, 21% were medium size and 14% were large scale farmers. This requires further investigation as to how some farmers who owned larger than the required land was selected as beneficiaries. The researcher's analysis could be that the farm size owned has no impact on the size used for cultivation hence their selection on cultivation basis. That is, someone can own a large farm size, but the actual size under cultivation is small scale and therefore qualifies as a beneficiary. future research is needed for clarification

Table 6 provides a glimpse of the kind of diversified crops farmers cultivated. Majority of them are maize and other seasonal crops, soya bean, g/nuts, wheat and tomatoes in that order. Tomato production seems to be the lowest although most farmers said it was grown throughout the year. On the positive, for those farmers that were into selling their produce the all year tomatoes farming provided them with some income all year. This is also evidence of diversification and flexibility that e-voucher provides as shown in figure 6. The flexibility to purchase input beyond seed and maize will help farmers to better meet their needs.

6.4 Budget Performance of E-voucher

The impact of E-voucher implementation in lowering the Zambian Government direct involvement and lowering treasury costs.

Results in table 7 show that the manual system of FSIP consumed 31.7% of the national budget prior to 2016. The introduction of e-voucher system saw a major reduction of the Ministry of Agriculture consumption of the national budget by 21.3% in 2016. the allocations given to other costs in the ministry all reduced in 2017 by 10.5%. this is because of the successful implementation of e-voucher.

Also, a representative from MAL stated that the introduction of e-voucher saw a major reduction on costs, saving about ZMW2 billion because a lot of farmers that were on the program out of duplication had been eliminated. This is a great shift as cost saving impacts positively on the government as the funds can be diverted towards other developmental projects in the country.

6.5 Involvement of Agro dealers in FSIP E-voucher Process

The e-voucher system encourages the participation of private input supply agro-dealers, in our attempt to answer to the question of what benefit e-voucher had brought, results from the respondents indicated that almost all agro dealers were quite pleased with the e-voucher system. Some dealers indicated that their participation in input supply to the farmers under e-voucher increased their sales for different products that they sold in comparison to manual system that limited them to a sale of only two products maize and fertilizer.

From literature reviewed by Siame (2017), showed that 80% agreed, to be participating while 16% disagreed and 4% were not sure. His study concluded that an increased number of participations of agro dealers in his study area was a good indication that e-voucher was the right way to go.

Machina et. al (2017) in their study also are in line with findings of this study. In their study results revealed that for the agro dealers in their areas of study, participation in the program enhanced their revenue base, increased both direct and indirect employment, helped maintain clientele and widen customer base, broadened product line offered to farmers, saving farmers to promote agricultural diversification, as well as an opportunity for self-growth.

The number of participating agro dealers in the provision of agricultural inputs from the district has increased, positive response simply means the e-voucher system promotes competition

among agro-dealers which encourages them to improve their services. Competition promotes flexible input pricing and timely distribution.

6.6 Involvement of Other Stakeholders

The impact on private sector participation results show that the e-voucher improved participation of the private sector by including different players in the process. This promotes transparency and diversification in the agriculture sector as more role players help solve the problems that were experienced in the manual system.

The program involved participation of banks, farmers unions, on-governmental organizations as shown in figure 9. One of the representatives from the bank when asked what role they played said they facilitated the printing of the e-cards and the disbursement of funds received from the ministry of finance. The banks also worked with agro dealers in provision of POS machines and normal banking services to the agro dealers. This means that the banks play a key role in the entire program this is good as it also reduces total dependency on the Zambian Government to implement and deliver a successful program to the farmers. This has made the input sector alluring to private stakeholders, thus promoting private sector-led input distribution and marketing.

7. CONCLUSION, RECOMMENDATIONS AND RESEARCH IMPLICATIONS

The main aim of this research was to evaluate the effectiveness of the e-voucher system of the farmers input support program in Zambia that was adopted to replace the manual system due to various challenges, findings from the two areas of interest (Monze and Mazabuka) have revealed that the research has answered the research question, thereby fulfilling the study objective. The e-voucher system has performed well going by the positive responses referred to in the findings. However, the e-voucher system is still having glitches and requires more time in mitigating the challenges that have been distinguished in the discussions. It is difficult to conclude that the e-voucher system is 100% effective when some of the key players are still having problems in using the web-based platform (ZIAMIS) which is the rock of the entire program as well as insufficient ICT training for both farmers and agro dealers, late accreditation of funds by both Zambian government and farmers and finally late deliveries of inputs. Although the sample size was small for the study to generalize the findings, the study has provided the insight of what is obtaining. A larger sample size covering a broader part of the country is helpful to provide comprehensive recommendation to policy makers.

The existence of gaps established in the e-voucher system shows that trying to improve effectiveness without addressing the root cause may not produce the desired outcomes. The researcher therefore recommends in the interest of policy makers and stakeholders that the following measures could be considered in order to improve the efficiency and effectiveness of e-FISP and promote private sector development;

Firstly, ensure that all beneficiaries are well informed in appropriate time for them to prepare themselves with all procedures, this is important because all farmers would have prepared themselves enough with the contribution money for activation of their cards. This would also eliminate any other interests or political factors from affecting the program implementation. Secondly, there is need for appropriate farmer sensitization. This could be easily done within the village communities by trained implementors such as the cooperative leaders, it is also important that these training are to be translated in a local language that the farmers easily understand because when conducting the study, the researcher noted the challenge of some farmers having little or no education for them to understand the program and participate efficiently. On the Other hand, stakeholders could also be sensitized through social media, TV and newspapers in order to reach the masses in far flung areas.

Thirdly, sufficient ICT training for agro dealers as well as strict measures on the process of redemption of the farming inputs by farmers and adherence to the code of conduct. There is also a need for the local banks to work hand in hand with the agro dealers on funds accreditation to eliminate the elongated process of funds settlements in the agro dealers accounts because unity between the two players allows for business continuity. Finally, as a long term measure the Zambian government should allow continued monitoring of the system through private researchers in the districts and later the country as a whole.

7.1 Considerations and Lessons Learnt from The Research

Conducting research with communities or individuals with little exposure to research presents a number of challenges and lessons. Our study was conducted in the village communities of Monze and Mazabuka districts to better understand the views of the farmers and agro dealers pertaining to the effectiveness of the newly adopted FISP electronic voucher system. The first challenge experienced was that despite the researcher's flexibility with the timing of meetings, it was challenging to access all the farmers at the same time this is due to the bad road network in the covered districts. Additionally, some stakeholder respondents could not be reached in time as most would be busy or reschedule meetings. This meant that it slowed down the completion time of my research work. Another challenge was the difficulty in explaining the questionnaire to the less educated farmers especially the ones that have no education. It was really frustrating to make them understand the questions and how to answer them. In addition, some members of the village groupings (younger members and women) did not participate actively because some questionnaires were coming back with little or no information perhaps due to different educational levels and the Zambian cultural norms around showing respect to elders and males. Other challenges experienced included; cultural norms regarding gender roles in farming, language issues, and the role of village group leaders.

Despite the challenges, the researcher learned that there is a co-relation between level of education and farmer productivity, most farmers from the interviews revealed that they were unaware of even basic use of ICT equipment's which made it difficult for them to even use their e-cards for redemption of inputs through swiping with agro dealers this implies that production is delayed. Secondly, the researcher learned that involving cooperative leaders through the DA-COs office

was key in data collection. The cooperative leaders helped with data collection in the far-flung areas which would have been impossible for the researcher to do independently. Furthermore, the cooperative leaders together with the group leaders had characteristics and skills that were important for data collection. For example, they were respected members of the village communities, had strong community ties which helped to gather the farmers in the groupings and finally they were fluent in Tonga (a local language spoken in the districts) which helped with translation of the questionnaires from English to help those farmer respondents who had little or no education. It is important to engage key community players early in a research process as this helps in building trust and promotes community participation especially in a community-based type of research.

Finally learning is a continuous process and I have learned more about myself as a student and have understood various ways of conducting research, I have learned a great deal from formulating questionnaires, and data compilation and analysis. More so, I had a firsthand experience of meeting some of the local farmers and to know what they pass through during the farming seasons. The research work has increased my academic confidence and skills. I am hopeful that the lessons learned from my experiences in ensuring the successful completion of this research can be used as a guiding tool to other researchers on methodological and practical issues in conducting future research with the Monze or Mazabuka districts and possibly similar communities.

7.2 Ethical Issues

The first ethical issue the researcher was aware of was plagiarism. In this research, the researcher ensured that all ideas that were borrowed from other sources were correctly cited and where direct quoting from source material was done, quotation marks were provided. Secondly ethical consideration in research is protecting the confidentiality and anonymity of the participants (Flick, 2007). This research asked permission from Musika Business Initiative before conducting the research. Considering the locations of the study areas and sticking to the ethics of respect for traditional leadership in communities, permission had to be taken from the head men to conduct research in their villages. Permission also had to be taken from MAL to access their records for data collection. A non-disclosure agreement had to be signed between the respondents from the banks and the researcher. Finally, before the interviews, a go-ahead

was granted from all the interviewees. Therefore, participation in the study was purely voluntary and no participant was forced to participate in the survey against his or her will. Information in the questionnaires was clearly explained to all participants especially to those that had little or no education.

7.3 Discussion of Reliability

In this study considering the level of education of majority of respondents, ambiguous questions were omitted. In the literature, it is suggested that words that are common sense for the researcher may mean something different to others. For this reason, the researcher had to think about the meaning of the questions for different people. “Double barrel” questions (which ask for one answer yet include two issues) were avoided (Bell 1993).

“Validity means that the researcher's conclusion is true or correct and that it corresponds to the actual state of the world” (McBurney 1994, 119). Further, it should produce answers that correspond to what they are intended to measure (Fowler 1993).

For this research, the researcher subjected the questionnaire designed to a validation process for face and content validity. Face and content validity have been defined by (McBurney 1994, 123) as:

- “Face validity is the idea that a test should appear superficially to test what it is supposed to test and not something else”
- “Content validity is the notion that a test should sample the range of behavior represented by the theoretical concept being tested”.

Copies of the questionnaire were given to some district agriculture coordinators and leaders of cooperatives in the VGs to go through carefully to ascertain the suitability and competence of the instrument. Suggestions were made to adjust some of the questions due to ambiguity of the English and some questions to which some farmers would not like to respond. The researcher was able to understand the ambiguity of some items and so had to modify it to the required level of the questionnaire.

Additionally, the secondary data and all relevant information needed for this research was carefully selected and the sources were confirmed to be trustworthy for instance the information on total population of Monze and Mazabuka from Central statistics of Zambia (2016), total

number of registered farmer beneficiaries etc. I invested a lot of time and effort on primary data collected from the questionnaires and interviews. Interviews were designed for the participating stakeholders and questionnaires for the target groups (farmers) of the two districts. The target group matched the frame of FISIP which enhanced the reliability and validity of the study. The topic also provides easy means to reliably find information relating to Agricultural subsidies in Zambia and Africa as whole which have been widely researched.

Finally, to successfully achieve optimum results I compared different theories from various secondary sources as seen in the literature review that support the study and increase the integrity of the research work. On the other hand, online sources were carefully selected by focusing on finding the connection between internet sources and reliable books.

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5. What is the size of your farm? (a) Less than a hectare (b) 1-2 hectares
 (c) 3-5 hectares (d) above 5 hectares

6. What type of crops do you grow?

7. What inputs did you receive in the previous FISP?.....

SECTION C: CHALLENGES OF MANUAL FISP

8. Where you a beneficiary of the previous FISP? (a) Yes (No)

9. If your answer to Q8 is yes, what challenges did u experience in the old FISP?

SECTION D: BENEFITS OF NEW E-VOUCHER SYSTEM

10. Are you a current beneficiary of FISP e-voucher? (a) Yes (b) No

11. Are you able to acquire a range of inputs using the e-voucher? (a) Yes (b) No

(c) Not sure

12. What benefits do u feel e-voucher has brought to you as a farmer? Kindly explain

Interview with Ministry of Agriculture representative

Much obliged to you for having consented to take this interview. My name is Nancy Minyoi Mulozi I am a student studying for Master of Information Technology Degree Program at Satakunta University of Applied Science in Finland and this interview is part of generating data for my thesis. The data I will get from you is only for academic purposes and won't be utilized for different reasons. As we go on in the interview I will be asking some questions and Where you need to give some clarification I will request that you do so. I will be taking notes as we interact so that I can revert to them when I begin composing the thesis. Kindly feel free to indicate were you are uncomfortable to comment or respond.

Date of interview.....

Place of interview.....

Questions:

1. What is your Name and what position do you hold in the Ministry?
2. When did the program (FISP) begin in Monze/Mazabuka?
3. What is your role regarding FISP?
4. What inputs have they been distributing under FSIP Manual system?
5. What are the challenges that the ministry experienced during manual FISP that necessitated the introduction of e-voucher?
6. Do you think the e-voucher is performing well so far?
7. How do u ensure that the right beneficiaries are the ones redeeming the input under this new e-system?
8. How has e-voucher system reduced the direct role of government distribution of inputs?
9. What are the benefits that e-system has brought to the ministry in terms of costs?

Interview with Banks

I am much obliged to you for having consented to take this interview. My name is Nancy Minyoi Mulozi. I am a student studying for Master of Information Technology Degree Program at Satakunta University of Applied Science in Finland and this interview is part of generating data for my thesis. The data I will get from you is only for academic purposes and won't be utilized for different reasons. As we go on in the interview I will be asking some questions and where you need to give some clarification I will request that you do so. I will be taking notes as we interact so that I can revert to them when I begin composing thesis. Kindly feel to indicate where you are uncomfortable to comment or respond

Date of interview.....

Place of interview.....

Questions:

1. What is your name and what is your role in your organization?
2. How long have you been in this position?
3. Is your bank participating in FISP e-voucher program?
4. What role is your bank playing in the e-voucher process?
5. What are some of the challenges your bank has faced during the pilot of this e-system?
6. Do you think that the e-voucher will be a success?

Interview with Musika Business Initiative

I am much obliged to you for having consented to take this interview. My name is Nancy Minyoi Mulozi. I am a student studying for Master of Information Technology Degree Program at Satakunta University of Applied Science in Finland and this interview is part of generating data for my thesis. The data I will get from you is only for academic purposes and won't be utilized for different reasons. As we go on in the interview I will be asking some questions and where you need to give some clarification I will request that you do so. I will be taking notes as we interact so that I can revert to them when I begin composing thesis. Kindly feel free to indicate where you are uncomfortable to comment or respond.

Date of interview.....

Place of interview.....

Questions:

1. What is your name and what is your role in your organization?
2. How long have you been in this position?
3. Is your organization taking part in FISP?
4. What is your role as an organization in the e-voucher process?
5. Are there any challenges that you have experienced since the e-voucher roll-out?
6. Do you think that e-voucher will be a success?

Interview Guide with ZNFU Representative.

I am much obliged to you for having consented to take this interview. My name is Nancy Minyoi Mulozi. I am a student studying for Master of Information Technology Degree Program at Satakunta University of Applied Science in Finland and this interview is part of generating data for my thesis. The data I will get from you is only for academic purposes and won't be utilized for different reasons. As we go on in the interview I will be asking some questions and where you need to give some clarification I will request that you do so. I will be taking notes as we interact so that I can revert to them when I begin composing thesis. Kindly feel to indicate where you are uncomfortable to comment or respond.

Date of interview.....

Place of interview.....

Questions:

1. What is your name and what is your role in your organization?
2. How long have you been in this position?
3. Is your organization taking part in FISP?
4. What is your role as an organization in the e-voucher process?
5. Are there any challenges that you have experienced since the e-voucher roll-out?
6. Do you think that e-voucher will be a success?

Interview Guide with Agro Dealers.

I am much obliged to you for having consented to take this interview. My name is Nancy Minyoi Mulozi. I am a student studying for Master of Information Technology Degree Program at Satakunta University of Applied Science in Finland and this interview is part of generating data for my thesis. The data I will get from you is only for academic purposes and won't be utilized for different reasons. As we go on in the interview I will be asking some questions and where you need to give some clarification I will request that you do so. I will be taking notes as we interact so that I can revert to them when I begin composing thesis. Kindly feel to indicate where you are uncomfortable to comment or respond.

Date of interview.....

Place of interview.....

Questions:

1. What is your name and what is your role in your Company?
2. How long has the business been running ?
3. Are you an approved dealer in e-FISP?
4. What type of inputs do you stock?
5. How has the new e-voucher system affected your business?
6. Are there any challenges that you are facing with the system?
7. Do you think that e-voucher will be a success?