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# An Assessment of Sustainable Small - Scale Farming Business and Village Savings, in Mkushi, Zambia

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**Abstract:- The study assessed the sustainability of small - scale farming as business financed by savings groups in Mkushi district in Zambia.A mixed methodinvolving quantitative and qualitative research was applied.A total sample size of 109 participants was purposively selected for the study. Data collection was through interviews using semi structured questions.A linear binary logistic regression analysis was run in SPSS to determine the predictors of the sustainability of small-scale farming while the Pearson Product Moment correlation was computed to test whether a significant correlation exist between sustainable small-scale farming as a business and village saving groups.The findings indicated that small scale farming practices before the introduction of Saving Groups did not yield sustainability, while the farming practices after formation of saving groups yielded sustainability. Further, the results revealed that factors including average payback period of the loan were associated with sustainable small-scale farming as a business served by saving groups.Finally, the findings publicised negligible negativeor no significant relationship between sustainable small-scale farming as a business and belonging to village savings. The study recommended the need for stakeholders such as Ministry of Agriculture, Ministry of finance and private sector (FSD IFAD, RUFEP, ZRDF) to scale up the setting up of village savings group throughout rural Zambia in order to provide loan facilities to small-scale farmers at affordable interest rates in order for them to sustainably produce far beyond subsistence for emerging and commercial purposes.**

**Keywords:** Sustainable, Savings, Farming, Agriculture, Practice

## I. INTRODUCTION

Small-scale farming constitutes the largest occupation or group of economically active people around the globe. Arias et al., (2013), for instance relates that 80% of the food consumed in sub-Saharan Africa is produced by small holder farmers who form the majority of workforce on the continent. The International finance corporation (2014) estimates that 525 million smallholder farms currently exist worldwide with the majority (388 million) based in Asia, 44 million in Europe and the Russian Federation, 33 million in Africa, and close to five million in the Americas. Investments in small-scale sustainable agriculture is therefore the most efficient way to reduce hunger and poverty in any given community.

Hilmi and Nærstad (2014) have argued that millions of smallholder farmers in developing countries however, lack the technical knowhow to engage in the production of high value crops and are equally unable to access or afford high-quality inputs, such as seeds and fertilizer leaving them particularly vulnerable to weather-related risk. Moreover, small scale farmers are equally faced with various challenges in accessing appropriate and adequate financial services to enable them graduate into emergent farming. In spite of these challenges, small scale farmers have positively responded to opportunities that enable them to join the global supply chains and contribute to food security, poverty reduction, and economic growth.

Small-scale farmers in various parts of Africa in general and Zambia in particular access agricultural finance to sustain their Agro -business through a number of formal and informal channels. Wichern et al. (1999) identified the main sources of agricultural finance for Zambian smallholder farmers as Zambia Co-operatives Federation Finance Services (ZCF-FS), Credit Union and Savings Association (CUSA) and Lima Bank which were issuing credit mainly in the form of short-term (seasonal) loans to smallholders.

The question of extending financial services to small-scale farmers across the country to enable them graduate into emergent farming has generated national interest. For a long time, small scale farmers have worked and lived within traditional support and power structures, but increased access to information is changing the way they organize and interact with financing groups.Social enterprises however have devised more efficient, cost-effective, and customized financial solutions to unlock credit and manage risk among scale farmers in the country including the formation of village saving groups. Limited access to technology and finances, lack of productivity enhancement inputs, low awareness about best farming practices, and weak links across the agricultural value chain constrain small scale farmers in Mkushi district.The emergence of Savings Groups (SGs) especially in remote areas across the globe tend to offer a new approach for microfinance in what may be described as the microfinance revolution era (Robinson,2001). In Africa, the promotion of SGs in the field of microfinance is a recent development and has arisen, partly because the success of Microfinance Organisations (MFOs) in providing services to the people has been rather limited. In this context Demirgüç-Kunt&Klapper (2012) observe that the uptake of MFO services is by just a few percent of the population and the challenges of reaching remoter rural areas and poorer clients remain significant.

In Mkushi district farming is seasonal and rainfall dependent and therefore in the recent past small-scale farmers have had only one opportunity in a year mainly after harvest to have an income. This meant that the period after the rain season there was no economic activity to sustain

them. Before the introduction of SGs, farming in rural Mkushi district was not taken as a business as it was meant purely for subsistence and on a small scale. The status quo led to the introduction of savings groups by various organisation including Zambian Rainbow Development Foundation (ZRDF) to foster agriculture development. ZRDF a non-government organisation has set up 144 Savings Groups across rural Mkushi targeting a total membership of 2287 small scale farmers with an average of 16 members in each group (ZRDF report, (2019).

The introduction of SGs was backed by plans to graduate small scale farmers from subsistence to emergent farming through the production of high value crops including Soya beans, Cowpeas and Groundnuts mainly grown by commercial farmers in the area. The program aimed at empowering small scale farmers with extra finances for the next farming season before the maize harvest. As per tradition after harvest most small-farmers would spend money without planning for the next farming season financially.

Tinsley and Agapitova (2018) argued that traditional financing often has not adequately addressed smallholder farmers' need for financial services, primarily due to perceived high credit risk and incompatible financial products. It is against this background that SGs have been introduced in the area to impart knowledge on the business acumen of the small-scale farmers. The introduction of SGs has been packed with programmes of financial literacy, agricultural trainings and other various business concepts to the small-scale farmers and are meant to resolve their persistent market failures. Commercialisation of small-scale farmers production and enhancement of their integration into markets and more inclusive value chains remains a challenge for most governments in sub-Saharan Africa including Zambia yet it is critical for enhanced food security and rural poverty reduction, because 80% of the food consumed in sub-Saharan Africa is produced by smallholders (Arias et al., 2013), 70% of whom are poor, living in rural areas (IFC, 2011; Making Finance Work For Africa [MFW4A], 2012) andlacking access to markets. Consequently, linking farmers to modern value chains through sustainable agriculture is one of the rural development strategies being promoted by policy makers and development agents in developing countries.

The sustainability of small-scale as a business in Mkushi district, emerging from the SGs remains unexplored. In the past decade much research has focused on the invention of Village Savings and Loan Associations (VSLA) of microfinance and the subsequent access to affordable financial services. It still remains unclear whether the small-scale farming businesses emerging from saving groups belonging in the rural parts of Mkushi area are sustainable. This study is a significant departure from others as it focuses on the sustainability of small-scale farming as a business financed by savings groups in rural set ups which most studies have overlooked. The research highlights some of the salient issues on financial viability and sustainability of small-scale farming businesses opened as a result of SGs in Mkushi district in the central region of Zambia.

### *A. Statement of the problem*

For a long time, lack of access to finance has been identified as one of the key constraints to the development of rural based businesses (Katz et al., 2014).According to (FinScope,2015) about 66% of adult Zambians are unserved by either formal or informal financial institutions In Mkushi district the emergence of savings groups by small holder farmers to provide access to financial services at lower interest rates where traditional financial service providers do not reach have been established. The Zambia Financial Diaries (2016) observed that small scale farmers are likely to borrow from their village saving groups in order support and sustain their farming business venture. However, a high-risk economic policy environment compounded by the lack of technical knowhow to engage in the production of high value crops and poor financial literacy have in the past been cited to compound the adoption of practicable and sustainable farming practices among small scale farmers. It is not clear however, whether saving group in rural Mkushi foster the adoption of sustainable farming business practices that uplift small-scale farmers' livelihoods in the district. The discourse laid out in the statement of the problem has therefore propelled the study on the sustainability of small-scale farming as business financed by savings groups and the efforts by the ZRDF in transforming rural communities in Mkushi district of Zambia from small scale farming as a subsistence entity of economic production to emergent farming as a business.

### *B. Main Objective*

The main objective of the study was to assess the sustainability of small-scale farming as business financed by savings groups in Mkushi district.

### *C. Study Objectives*

The study sought to achieve the following specific objectives:

- To ascertain whether small-scale farming as a business financed by village saving groups in Mkushi district is sustainable
- To establish the determinants of the sustainability of small-scale farming as a business served by village saving groups in Mkushi district.
- To establish if a significant correlation exists between sustainable small-scale farming as a business and village saving groups.

### *D. Research Hypotheses*

- **$H_0$**: There is no significant relationship between between running sustainable small-scale farming as a business and belonging to village saving groups.
- $H_1$: There is a statistically significant relationship between running sustainable small-scale farming as a business and belonging to village saving groups.

### *E. Significance of the Study*

The research findings of this study would provide valuable insight to the Government of the Republic of Zambia (GRZ), policy makers and micro finance managers in relation to the application of savings group to the country's economy in order to uplift the living standards of the small scale farmers.

It also envisaged that Policy makers at both national and provincial levels might also value the insights gathered in this volume for identifying investment priorities among rural dwellers and their needs in their country.It is further presumed that the findings of this study could be valuable to the existing body of knowledge on the the sustainability of small scale farming as businesses financed by savings group members in Mkushi.Finally, the study would also help to set a benchmark for best practices in the implementation of sustainable agri-business approaches that can be integrated into the savings group models.

*F. Theoretical Framework*

The study was guided by the New Theory Agriculture (NTA) proposed by his majesty the King Bhumipol Adulyadej of Taiwan which provides a guideline of proper resource management in land and water within the agricultural circles in relation to sustainability of business prospects that small-scale farmers engage in (Royal Speech, 1994). The New Theory of Agriculture is one form of sustainable agricultural development. In developing the framework in the Royal Speech (1994) his majesty the King BhumipolAdulyadej of Taiwan pointed out that the main purpose of the theory is to help farmers become more self-reliant or sustainable and living harmoniously with nature within society through a holistic management of their land and businesses.ChutchaiSuksa-ard and Raweewan, (2011), have agreed that this theory not only remedies damaged natural resources but also helps smallholder farmers to improve quality of life; and is analogous to local food supply chain theory that is well-known in western countries.Wibulswasdi, Piboolsravut, &Pootrakool (2010) contend that this concept has three levels of development namely: household level; community level; and national level. The purpose of the first level is to create self-reliance and self-sufficient at the households' level.

In the context of this study the theory was applicable because Mkushi district is predominantly a farming area, with limited business opportunities for micro retail enterprises. Small-scale farming therefore as a business is an attractive form of business owned by the majority of the citizenry in the area.

The concepts enunciated by His Majesty in his speeches on the New Theory were incorporated by the government as national policy under the Eighth National Economic and Social Development Plan (1997-2001), which emphasized greater effort in promoting the development of sustainable agriculture by identifying certain areas for various types of sustainable agricultural development, such as mixed farming, nature farming, organic agriculture, integrated crop › livestock farming agroforestry, and New Theory Agriculture (Pookpakdi, 1992).

This NTA presented an alternative for around eight million poor farmers which enabled them to earn adequate incomes by pursuing agricultural occupations and to live in the rural areas with security at a time when the nation was suffering from economic crisis. The public and private sectors cooperated with farmers in order to make agriculture a viable alternative for the Thai society under the philosophy of economic self-sufficiency based on demographic factors, household size income levels, access to credit and the average payback period. The theory focuses on water resource management to support agricultural production aiming first for food security and family consumption, and then for increasing security by generating income, and finally for other activities. The NTA is composed of three main stages: Stage 1 aimed at securing adequate food and other things necessary for life; Stage 2 aimed at organizing farmers into groups; and Stage 3 aimed at securing financing from outside sources for agricultural development.

## II. LITERATURE REVIEW

The broader and narrow perspective of small - scale farming as a business and its various dimensions, determinants of the sustainability of small-scale farming as businesses and the relationship between sustainable small-scale farming as a business and Saving Groups was adopted in this study.

- **Global perspective**

| Title | Author | Findings | Gaps |
|---|---|---|---|
| A Practioner –Led Research for Savings Groups, A publication of the SEEP Savings-Led-Services Working Group (SLWG). | Candace and Gash (2016) | the current state of practice, however, is characterized by innovation, growth, and controversy. The key findings on household impacts showed that the availability of SGs clearly increases savings, the use of credit, and livestock ownership in some areas | Savings Groups are a new target market for banks and microfinance institutions (MFIs) and they are an increasingly important component of integrated development programs and efforts to reach the ultra-poor,. |
| Women's Use of Roscas in the Caribbean: Reassessing the Literature. Money-go-rounds: The Importance of Rotating Savings and Credit Associations for Women" Cross Cultural Perspectives On Women; 14; 263-288. | Besson (1996) | Throughout the school year, students can engage in weekly group savings in amounts starting at 500 pesos (US$0.20) to be withdrawn at the end of the school. | focused on school savings and overlooked the subject from a village saving perspective which is organized outside a formal setting such as a school. |

| | | | |
|---|---|---|---|
| Impact of Village Savings and Loans Associations: Evidence from a Cluster Randomized Trial. Journal of Development Economics,120: 70–85. | Knoll et al, (2013) | found that in Ecuador, savings and credit banks have been formulated as a kind of subsystem within the cooperative sector, promoted by the NGO Grupo Social FEPP, Ecuadorian Agricultural Services, and the Development Project for Indigenous and Afro-Ecuadorian Peoples a government programme | It is a clear example of a private company adapting an informal rotating, group savings and credit mechanism as a business strategy which many formal financial providers have not |

- **Regional perspective**

| Title | Author | Findings | Gaps |
|---|---|---|---|
| Evaluating Village Savings and Loan Associations in Malawi. | IPA (2012) | Women who were members of SGs were more likely than non-members to take a loan for business purposes | Although the study found an increase in business activity and positive outcomes such as higher business income, these businesses were not sustainable beyond the existence of savings groups. |
| Evaluating Village Savings and Loan Associations in Malawi | IPA (2012), | In Ghana The study found that the most commonly reported uses of SG share-outs were for business expenses (19%), agricultural inputs (18%), and education expenses (14%). Primary uses of SG loans were reported to be for business investments (42%) and food consumption (18%). Social fund loans were most commonly spent on healthcare (41%) and funerals (33%). | Despite these trends in spending SG funds for members, no significant impact was found at the village/Rural level as regards household assets, intra household indicators, education, housing quality, or food security |
| Las FinanzasSocialesySolidariasen el Ecuador: | Orellana (2009) | In El Salvador and in Guatemala there are 2183 community savings groups with 40286 members applying the strategies learnt in their SGs to their business. Orellana further points out that most of these groups are located in villages at the centre of the insurgency that ravaged these two countries from the 1980s through the 1990s. Increased economic activity and program participants in all the two countries increased their participation and investment in income-generating activities (IGA). | Regardless of having trainings that increased economic activities and programme participation, the study did not specifically look at agricultural trainings that can enhance economic activities despite having the study done in rural areas. |

- **Local perspective**

| Title | Author | Findings | Gaps |
|---|---|---|---|
| Village Savings and Loan Associations and household welfare: Evidence from Eastern and Western Zambia. African Journal of Agricultural and Resource Economics, Volume 12 Number 1 pages 85-97. | Mwansakilwa et al (2017) | found that the development of CBFIs was aimed at improving the access of commercially active poor rural households to community-based financial services through the promotion of rural self-owned and managed institutions. To attain this overall goal, the programme contracted CBFI promoters, consisting of NGOs and MFIs, to support and facilitate the establishment of 2500 self-owned and self-managed village savings and loan associations (VSLAs), each with up to 10 to 20 active members | Estimated the impact of VSLA participation on household welfare in Eastern and Western Zambia while this study concentrated on the central part of the country were the savings group have been implemented with the support of a different organization (Zambian Rainbow Development Foundation) with a different methodology |
| Saving Groups Improve Livelihoods of Petauke Rural People. July 2018 issue. | RUFEP(2018) | Upon formation of SGs, members were trained in group dynamics, bookkeeping, financial management, networking, liquidity management, performance management as well as income generating activities the report found that small holder farmers in Kanyato area in Petauke are able to buy farming inputs without waiting for the farmers input support program (FISP) | the study by RUFEP did not look at village savings from a quantitative perspective on business sustainability which this study employs |

| | | | |
|---|---|---|---|
| | | spearheaded by the government. | |
| Agricultural Investment, Production Capacity and Productivity. FAO Corporate Document Repository, originated by: Economic and Social Development department, 2001. | Zepeda, (2001) | have shown that the low productivity in smallholder agriculture is in part, due to soil degradation, the usage of poor and unsustainable farming systems, low human capital and climatic conditions. These factors are also largely responsible for the low level of agricultural investment and financing by both public and private sectors | To overcome inefficiencies and natural resource degradation, sustainable agricultural growth amongst smallholders can be achieved by an innovationsystems approach up scaling of sustainable productivity in agriculture suggested to involve substantial investment and innovative institutional arrangements through village savings |

*A. Sustainability of small-scale farming businesses financed by savings groups.*

In order to measure the sustainability of farming practices among small scale farmers, Rigby et al (2001) developed the Indicator of Sustainable Agricultural Practice (ISAP) designed for farm level business and the need in data collection is minimized. A total of ISAP score is obtained from four criteria in sustainability, namely: (i) minimizing off-farm inputs; (ii) minimizing inputs from non-renewable sources; (iii) maximizing use of (knowledge of) natural biological processes; (iv) promoting local biodiversity or environmental quality. These criteria are developed based on SA and classified into five categories. Each category contains different farm practices, which results in different sustainability score or available scores. The maximum ISAP score possible is 14.5. Data regarding the ISAP scores among the five categories of farm practices are presented in Table 1 below.

| **Categories** | **Practices** | **Scores** | **Available points** |
|---|---|---|---|
| Seed source | Con | 0 | 0 |
| | Org | +1 | 0 to +1 |
| | Own | +1 | 0 to +1 |
| Fertilizer | Syn | -3 | -3 to 0 |
| | Nat | -2 | -2 to 0 |
| | Org | +1 | 0 to +1 |
| | Com | +2 | 0 to +2 |
| | GMa | +3 | 0 to +3 |
| Pest control | Nat | +2.5 | 0 to +2.5 |
| | Syn | -8 | -8 to 0 |
| Weed control | Her | -3.5 | -3.5 to 0 |
| | C&C | +4 | 0 to +4 |
| | CMg | +3 | 0 to +3 |
| Crop management | Rva | +3 | 0 to +3 |
| | Rot | +2 | 0 to +2 |
| | Int | +4 | 0 to +4 |

Table 1: ISAP Scores/Indicators of Sustainable Farming.

Source: Rigby, et al. (2001)

In line with table above the five categories of indicators measuring sustainable farming practices includes seed source, fertilizer type, pest control, weed control and crop management practices are elaborated below;

- Seed source consists of conventional supplier (Con), organic supplier (Org), and own farm (Own);
- Maintenance of soil fertility consists of synthetic fertilizers (Syn), natural fertilizer (Nat), organic fertilizer (Org), composted fertilizer (Com) and green manure (Gma);
- Pest/disease control consists of natural pest control (Nat), and synthetic pesticides (Syn);
- Weed control consists of chemical or hormone herbicides (Her), crop & compost control (C&C), and management of the crop (CMg);
- Crop management consists of resistant varieties (Rva), crop rotation (Rot), and Intercropping (Int).

Chutchai Suksa-ard and Raweewan, (2011), used an indicator of Sustainable Agricultural Practice (ISAP) score

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to assess sustainability of both New Theory Agriculture practice (NTA) and monocrop practice in an Inpaeng case study in Thailand. The result of assessment in this case found that that NTA yields sustainability to local food supply chain more than monocrop. NTA practice has better sustainability in all categories than Mono-cropping which is the traditional farming in the region. Monocrop yielded a negative score implying that it is unsustainable for farm practice. Hence, NTA is the alternative practice for smallholder farmers, instead of monocrop. The study however did not indicate the effect of village savings on small scale farming business sustainability. In a nutshell, considering the fact that the majority of the Sustainable Development Goals (SDGs) are linked to agriculture, without more and better investments in small-scale farming as a business and other forms of sustainable agriculture, it will prove very challenging to achieve them. The environmental problem and poverty, therefore, have been on a focus of long-term sustainability of existing food production systems (Conway & Pretty, 1991).

- **Literature review summary**

| Title | Author | Findings | Gaps |
|---|---|---|---|
| Modelling agricultural production of small-scale farmers in Sub-Saharan Africa: A case study in Western Kenya. Agricultural Economics, 14, 85.91. | Odulaja and Kiros (1996) | found that small-scale farmer's ability to produce and sell more produce in a market was highly and positively related to their education levels and continued to assert that farmers, who had attained secondary education and had combined it with informal education via village saving associations, were more likely to produce and sell more | Despite evidence of behavioural change no famer developed a sustainable small-scale farming business enterprises as a result of belonging to SGs |
| The Role of Agricultural Credit in the Development of Agricultural Sector: The Nigerian Case. African Review of Money Finance and Banking, 101-116. | Sogo-Temi and Olubiyo (2004) | found that an increase in credit made available to agricultural sector greatly enhances sustainable agricultural production activities. Households that had accessed agricultural finance were found to have a significantly ($P \leq 0.01$) involved in sustainable farming. | As established, there is no indication however of how these businesses were sustained. |
| Agricultural Investment, Production Capacity and Productivity. FAO Corporate Document Repository, originated by: Economic and Social Development department, 2001. | Zepeda,L. (2001). | shown that the low productivity in smallholder agriculture in Small scale agriculture in sub-Saharan Africa (SSA) is, in part, due to soil degradation, the usage of poor and unsustainable farming systems, low human capital and climatic conditions. These factors are also largely responsible for the low level of agricultural investment and financing by both public and private sectors | Small scale agriculture in sub-Saharan Africa (SSA), faces various challenges that include low productivity compounded by the adverse effect of climate change. |

## III. RESEARCH METHODOLOGY

This was a case study research design that adopted a mixed method of phenomenological (qualitative) and positivists approaches (quantitative). The scope of the study was Mkushi district located in central province of Zambia. A total sample size of 109 participants was selected purposively for the study out a target population of 150. Further primary and secondary data was collected through interviews and other published agriculture and business records.

*A. Study Sample Size*

The study applied the Yamane (1967:886) which provides a simplified formula to calculate sample sizes. The formula was used to calculate the sample size at 95% confidence level (p=0.05). The formula is presented below:

$$n = \frac{N}{1+N(e)}2$$

Where n is the sample size, N is the population size, and e is the level of precision. A population of selected village groupings of 150 at 95% confidence level yielded the following:

$$n = \frac{N}{1+N(e)}2$$

$$n = \frac{150}{1+150(0.05)}2$$

$$n = \underline{109}$$

The study sample therefore arrived at was 109 respondents and was therefore representative of the needed population and large enough to perform some statistical inferences.

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*B. Data Analysis*

The data was analysed using Statistical Package for Social Sciences (SPSS) Version 21.0 software for analysis. Descriptive statistics in form of frequencies tables, mode and charts were generated using the software. Data was coded into themes and sub-themes that emerged and was therefore analysed thematically.

- A response to research question one, regarding the sustainability of small-scale farming as a business financed by savings groups in Mkushi district was generated by the Indicator of Sustainable Agricultural Practice (ISAP), constructed by Rigby et al (2001).
- A linear binary logistic regression was used to determine the predictors of sustainability of small scale farming as a business in Mkushi district (research question two). Hair et al (1995) points out that regression analysis is a statistical technique used to analyze the relationship between a dependent and one or more independent variables. The general equation of the linear multiple regression analysis is as follows.
- Yi =α +β1X1 +β 2X2 + β3X3+… +βnXn
- Where Yi is the predicted value of the dependent variable, α is the value of the dependent variable, when all the independent variables are zero. That the Y intercept. β represents the regression coefficient, and the Xs are the independent variables. The intercepts and the regression coefficients are constants during the examination of a particular sample. But the different values for the dependent variable are predicted for each case by substituting the corresponding values for independent variables (Hair et al., 1995).
- A response to research question three that, does a significant correlation exist between sustainable small-scale farming as a business and village savings, was tested by computing a Pearson Product. Moment correlation.

Zar (1999) observed that Pearson's r is a measure of the liner relationship between two interval or ratio variables and can have a value between -1 and + 1. Pearson's r measures the strength, direction and probability of the linear association between two interval or ratio variables.

In terms of strength association Zar (1999) contends that the absolute value of the Pearson coefficient determines the strength of the correlation. Using Cohen's (1988) guidelines for interpreting strength of association $0.1 \leq r \leq 0.3$ a small positive correlation,$0.3 \leq r \leq 0.5$, a moderate positive correlation and $0.6 \leq r \leq 1.0$ a strong positive correlation. From $-0.1 \leq r \leq -0.3$ a small negative correlation, $-0.3 \leq r \leq -0.5$, a moderate negative correlation and $-0.6 \leq r \leq -1.0$ a strong negative correlation. The results of this analysis show a strong negative relationship.

*C. Validity and Reliability of Results*

Issues of validity and reliability were thoroughly addressed throughout the study process. Validity of an instrument refers to the degree to which an instrument measures what it is intended to measure. Validity in this regard entails the extent to which an instrument fairly and comprehensively represents the factors under study (Cohen et al., 2008). Validity therefore "…is concerned with the integrity of the conclusions that are generated from a piece of research" (Bryman, 2008:3). Reliability is concerned with the consistency of the results obtained from a measuring instrument.

*D. Validity of Research Instruments*

The concepts of validity and reliability were thoroughly addressed throughout the study process. Validity of an instrument means the degree to which an instrument measures what it is intended to measure. Hair et al (1995) define the concept of reliability as the extent to which a scale is free from random errors and this yields consistent results. Mugenda and Mugenda (2008) note that Validity is the degree to which the sample of the test item represent the content that is designed to measure, this means the instrument measures the characteristics or trait that is intended to measure. The research ensured content validity was adhered to which refers to the extent to which a measuring instrument provides adequate coverage of the topic under study. To achieve content validity, the questionnaire was subjected to an evaluation of three experts who provided their comments and relevance of each item of the instruments and the experts indicated whether the item was relevant or not. The content validity formula by Yin (2003) presented below was used in this study.

$$\textit{Content Validity} = \frac{\textit{no of judges declaring item vaild}}{\textit{Total no. of items}}$$

No of judges =3 Total no of items =1

$$\textit{Content Validity} = \frac{3}{1} = 3$$

It is recommended that instruments used in research should have Content Validity Index (CVI) of about 0.78 or higher and three or more experts could be considered evidence of good content validity (Yin, 2003).

*E. Reliability of Research Instruments*

Reliability represents the extent to which a research instrument yields findings that are consistent each time it is administered to the same subjects (Mugenda&Mugenda, 2003). Kumar (2000) argues that the measurement of reliability provides consistency in the measurement variables. The study employed Cronbach's reliability analysis to test the reliability of the measurement variables. According to Kim & Cha (2002), Cronbach alpha is the basic formula for determining the reliability based on internal consistency. The standard minimum value of alpha of 0.7 is recommended as the minimum level for item loadings (Gupta, 2003). Higher alpha coefficient values mean there is consistency among the items in measuring the concept of interest. The Cronbach alpha formula that was used is presented below. The measurement variables scored 0 .76.

$$\alpha = \frac{K}{K-1}\left(1 - \frac{\sum_{i=1}^{K} \sigma_{Y_i}^2}{\sigma_X^2}\right)$$

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Where k are the sample items. $\sigma_{Y_i}^2$

Where the variance component for the current sample of persons.

Where is $\sigma_X^2$ the variance for all the total scores

*F. Variable Construction*

Based on the conceptual framework and empirical evidence from relevant literature, eight potential predictors of sustainable small-scale farming as a business were identified. The researcher conducted a search for various published work in the existing literature. On the basis of this review the researcher identified valid and reliable measures for some of the research constructs that were necessary for the study.

In this study sustainable small-scale business is the outcome measure (dependent variable) whilethe exposure (predictors) or independent variables used in the analysis included age of participant, interest at borrowing, Average payback period, Annual crop output (per 50 kg), Number of children in school, Household size, Total Annual Income and Distance to the market. A questionnaire was used as the instrument for primary data collection. The questionnaire included two types of questions including the use of the variable and ranking questions. The use of categorical variables helped to categorize the variables in order to have a better perspective of small-scale farming as a business and the factors affecting it as a business in the agriculture sector (Neuman, 2007).

| Variables | Description | Measurement |
|---|---|---|
| **Dependent variable** | | |
| Sustainable Small-scale farming as a business | Refers to is small scale farming describes a farming method using very little land (usually around 1-10 acres) and often using very little to no expensive technologies which considers the management and conservation of the natural resource base, in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations. (FAO, 1989). | A binary indicator created showing whether a participant runs small scale farming as a business or not. Distinguishing between **"Yes"** for adopting small scale farming as a business and **"No"** for not adopting small scale farming as a business. |
| **Independent variables** | | |
| Distance to market | Refers to the number of kilometres covered in order to make sales. | An ordinal variable distinguishing whether a small-scale farmer covers a long distance or not categorized as,<br>1= Near<br>2= Far |
| Age of participant | Refers to the age of the participant at last birthday | ordinal variable categorized as<br>1= 21-30<br>2= 31-40<br>3= 41-50<br>4= 51-60<br>5= 60+ |
| Interest at borrowing | Refers to an amount calculated as a percentage of a loan (or deposit) balance, paid to the lender periodically for the privilege of using their money. | ordinal variable that was classified as<br>1= High<br>2= Low |
| Average payback period | Refers to the period estimation on how long it will take for the borrowed money to be paid back. It looks at the value of the initial investment compared to the projected net cash flow. | . Ordinal variable that was categorized as<br>1= >3 months<br>2 = 3 - 6 months |
| Annual crop output | Refers to the annual production of crop in terms of bags. | Ordinal variable that was categorized as<br>1= >200 bags<br>2= 201 - 400 bags<br>3= 400+ bags |
| Number of children in school | Refers to number of children the | An ordinal variable that was categorized as<br>1= >5<br>2= 6 – 9<br>3= 10+ |
| Household size | Refers to the introduction of new things or methods. | An ordinal variable that was categorized as<br>1= > 5 people<br>2= 5 -10 people<br>3= 10+ people |

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| | | |
|---|---|---|
| Total annual income | Refers to the annual amount of money that a small scale farmer | An ordinal variable that was categorised as<br>1= >2500<br>2= K2500 -K5000<br>3= K5000+ |

Table 2: Description and Measurement of Variables for Data Collection and Analysis

*G. Regression analysis*

Hair et al., (1995) points out that regression analysis is a statistical technique used to analyse the relationship between a dependent and one or more independent variables. The general equation of the linear multiple regression analysis is as follows.

$$Yi = \alpha + \beta 1X1 + \beta\ 2X2 + \beta 3X3 + \ldots + \beta nXn$$

Where Yi is the predicted value of the dependent variable, α is the value of the dependent variable, when all the independent variables are zero. That the Y intercept β represents the regression coefficient, and the Xs are the independent variables. The intercepts and the regression coefficients are constants during the examination of a particular sample. But the different values for the dependent variable are predicted for each case by substituting the corresponding values for independent variables (Hair et al., 1995). To aid the interpretation of data, descriptive statistics in form of frequency tables and percentages were used.

*H. Model*

In this study a logistic regression model was fitted. Logistic regression estimates the odds of an event occurring and it was used to predict the sustainability of small -scale farming as a business. The rationale for using binary logistic regression stems from the fact that the dependent variable is binary or dichotomous (Hosmer and Lemeshow, 2000) for which the outcome was dichotomised as "Yes or No". The dependent variable noted „1" if the small-scale farmer practiced sustainable small-scale farming and „0" if the small-scale farmer did not. The general form of a logistic regression equation is as follows;

$$\text{Log}\ (p\ /1-\ p) - b0 + b1\ x1 + b2\ x\ 2 + \ldots\ldots + bkxk$$

Where b0 is constant, b1, b2……..bk are the coefficients of x1 x2…….. xk. p is the estimated probability of any measures of the sustainability of small-scale farming as a business. In this study, representation of odds ratios is as follows. Estimated odds ratios equal to 1 indicate that the sustainability of small-scale farming is no different from the reference category. Estimated odds ratio >1, means the likelihood of achieving sustainable small scale farming as a business is higher relative to the reference category whereas the estimated odds ratio < 1, means the probability of achieving sustainable small scale farming as a business is lower relative to the reference category. All odds ratios were rounded to three decimal places.

## IV. PRESENTING OFRESEARCH FINDINGS

The preceding chapter presented the methodology that was employed for the collection and analysis of data in the study. Data were collected from members of Saving Groups that were established under the tutelage of the Zambian Rainbow Development Foundation (ZRDF) in Mkushi district. This chapter presents the results on the sustainability of small scale farming as business financed by savings groups in Mkushi district of the Central province of Zambia.The purpose of this study was to explore the sustenance of small scale farming as business financed by saving groups in Mkushi District of Zambia.The results are organised using the thematic approach in line with the three objectives set out in the first chapter of this dissertation as outlined below;

- To ascertain whether small-scale farming as a business financed by village saving groups in Mkushi district is sustainable
- To determine the determinants of the sustainability of small-scale farming as a business served by village saving groups in Mkushi district.
- To establish if a significant correlation exists between sustainable small-scale farming as a business and village saving groups.
- In this chapter, presentation of the social and demographic characteristics of the participants in the study were presented first. Thereafter, under each theme derived from the three objectives above, the presentation of quantitative results followed using statistical tables, frequency counts and charts. The results are carefully presented without any attempt to discuss them.

*A. Social and Demographic Characteristics of Respondents*

Prior to the results of the study a brief demographic overview was provided in order to give a sense of the characteristics of the sample. This section therefore describes social and demographic characteristics of the respondents. Background characteristics are foundational aspects influencing analysis and interpretation of various variables in any study. Some of the background information contained in this section include among others, gender, age and highest academic qualifications of respondents.

a) Percentage distribution of Gender of Respondents

From Figure 3 below, this study had a total number of 109 respondents. These included five (4.6 %) key informants and 104 (95.4 %) small scale farmers. With regard to gender composition of sample respondents the findings of the study indicated that 40 (37 %) were male and while 69 (63 %) were female. From this data, it can clearly be understood that the majority of respondents were females. The findings are consistent with the number of small holder farmers involved in informal savings group

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membership across the country characterised by a female dominion.

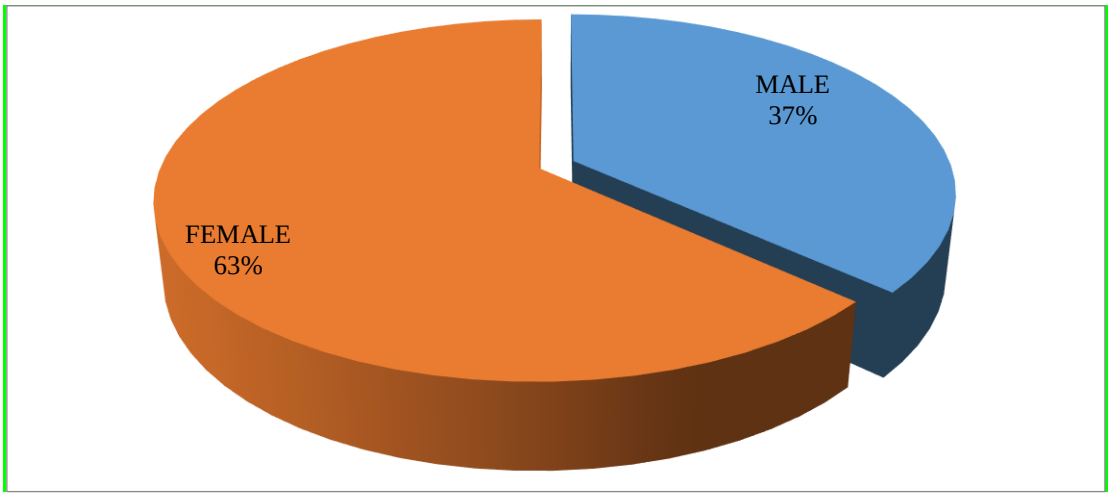


Fig. 1: Percentage distribution of Gender of Respondents

Key: Orange= Female 63%, Blue = Males 37%

**Source: Field Data 2019**

b) Age and Highest Academic Qualifications of Respondents

As can be seen from the data in the table below, 1 (9.0 %) did not receive any education, 13 (11.9 %) went as far as grade 12, 12 (11.0%) went up to form 5, while 83 (76.1%) went to school but did not reach grade 12 or form 5 level. Hence from this data, one can simply observe that the majority of respondents have an educational status of at least secondary education. Further, it can also be said that sample respondents are more qualified to express their views on the sustainability of business enterprises owned by Savings Groups (SGs) members in Mkushi district. In general, the findings show that education attainment was inversely related to age; at all levels which included; no education, grade 12, form 5 and less than grade 12. This means the older the respondent was, the lower the level of education attainment.

In addition to this the data, 35 (32.1 %) were aged between 21-30 years, 40 (36.7 %) were aged between 31-40, 22 (20.2 %) were aged between 41-50, 8 (7.3 %) were aged between 51- 60 while 4 (3.7%) were aged 60+. Taken as a whole, the sample is youthful (40 years and downward constituted close to 75 % of the sample), which is consistent with the overall age structure of the Zambian population. Data regarding the age structure and highest academic qualifications of the respondents are presented in Table 3 below.

Count

| | | HIGHEST ACADEMIC QUALIFICATION | | | | |
|---|---|---|---|---|---|---|
| | | NO EDUCATION | GRADE 12 | FORM 5 | >GRADE 12 | Total |
| AGE LAST BIRTHDAY | 21-30 | 0 | 3 | 0 | 32 | 35 |
| | 31-40 | 0 | 6 | 0 | 34 | 40 |
| | 41-50 | 0 | 4 | 1 | 17 | 22 |
| | 51-60 | 1 | 0 | 7 | 0 | 8 |
| | 60+ | 0 | 0 | 4 | 0 | 4 |
| Total | | 1 | 13 | 12 | 83 | 109 |

Table 3: Age and Highest Academic Qualifications of Respondents

Source: Field Survey (2019)

c) Sustainability of small-scale farming businesses financed by savings groups.

The first of the three objectives of the study sought to establish the sustainability of small-scale farming businesses financed by savings groups in Mkushi district. This objective was guided by the research question: Is small-scale farming as a business financed by savings groups in Mkushi district sustainable? The Indicator of Sustainable Agricultural Practice (ISAP) score (Rigby et al, 2001) was employed to measure sustainability of small-scale farming as a business in order to address the first research question. The study therefore gathered the perspectives of 109 participants from the

10 (ten) saving groups composed of fifteen members each. Each individual score was then added and divided by the number of participants in the study.

The sustainability of small-scale farming as businesses financed by savings groups was assessed using ISAP score from two perspectives. Before and after the formation of the saving groups. The ISAP (Rigby et al, 2001) score benchmarks for sustainability of farming focuses on the following:

- Seed source which consists of conventional supplier (Con), organic supplier (Org), and own farm (Own);
- Maintenance of soil fertility which consists of synthetic fertilizers (Syn), natural fertilizer (Nat), organic fertilizer (Org), composted fertilizer (Com) and green manure (Gma);
- Pest/disease control which consists of natural pest control (Nat), and synthetic pesticides (Syn);
- Weed control consisting of chemical or hormone herbicides (Her), crop & compost control (C&C), and management of the crop (CMg);
- Crop management consisting of resistant varieties (Rva), crop rotation (Rot), and Intercropping (Int)

The study findings revealed that before the introduction of saving groups the small-scale farmers relied on unsustainable farming practices to enhance the business. Adding the maximum score value in each category, the study findings revealed a total score of -14 (-96.55%) for small scale farming practices in Mkushi before saving group formation for each individual participant.

-14 x 109 = -1526/109 = **-14**

Data regarding the ISAP scores of small- scale farming practices in Mkushi before saving group formation is depicted in figure 4 below.

| Categories | Practices | Weight (kg) | Scores | Total |
|---|---|---|---|---|
| Seed source | Conventional supplier | 50 | 0 | |
| Seed source | Own farm | 50 | 0.5 | +0.5 |
| Fertilizer | Synthetic fertilizers | 100 | -3 | -3 |
| Pest control | Synthetic pesticides | 100 | -8 | -8 |
| Weed control | Herbicides | 100 | -3.5 | -3.5 |
| Crop management | None | 0 | 0 | 0 |
| **Grand total** | | | | **-14** |

Table 4: ISAP Scores of Small-Scale Farming Practices in Mkushi Before Saving Group Formation

Source: Field Survey (2019)

Similarly, adding the maximum score value in each category together, the study findings also revealed a total score of 12.5(86.2%) for each individual participant for small scale farming practices in Mkushi after the formation of saving group under the tutelage of ZRDF a non - governmental organization formed to transform rural communities ' lives in terms of practising sustainable agriculture though the growth of high valued crops, with a higher profit margin including soya beans, cowpeas and groundnuts in the district.

12.5 x 109 = 1362.5/109 = **12.5**

Data regarding the ISAP Scores of small scale farming practices in Mkushi after savings group formation is depicted in figure 5 below**.**

| Categories | Practices | Weight (kg) | Scores | Total |
|---|---|---|---|---|
| Seed source | Org | 50 | +0.5 | |
| | Own | 50 | +0.5 | +1 |
| Fertilizer | Org | 100 | +1 | +1 |
| Pest control | Nat | 100 | +2.5 | +2.5 |
| Weed control | C&C | 100 | +4 | +4 |
| Crop management | Intercropping | 100 | +4 | +4 |
| **Grand total** | | | | **12.5** |

Table 5: ISAP Scores of Small-Scale Farming Practices as Businesses in Mkushi After Saving Group Formation

Source: Field Survey (2019)

This result implies that small-scale farming practices as businesses in Mkushi after the formation of saving groups are more sustainable scoring 12.5(86.2%) compared to small scale farming practices before saving group formation which scored -14 (-96.55%). Since, the maximum ISAP score possible is 14.5, the result implies that small scale farming practices in Mkushi before the introduction of Saving Groups does not yield sustainability as it yields a negative value.

d) Summary of findings from research question one
In summary, according to the ISAP test, the results indicated the sustainability of small-scale farming practices as businesses supported by saving groups in Mkushi district coinciding with the formation of saving groups scoring 12.5 (86.2%) in comparison to farming practices adopted before saving group formation which scored -14 (-96.55%). Following, the maximum ISAP score possible of 14.5, the result

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implies that small scale farming practices in Mkushi before the introduction of Saving Groups did not yield sustainability as it yields a negative value while the practices after formation of SGs yielded sustainability.

*B. Determinants of the sustainability of small-scale farming as businesses served by saving groups*

The second research objective sought to identify the determinants of the sustainability of small-scale farming as business served by saving groups. This objective was guided by the research question: What are the determinants of the sustainability of small -scale farming as a business in Mkushi district? A Logistic regression analysis was performed to ascertain the effects of the following variables; Age of participant, Interest at borrowing from saving groups, Average payback period, Annual crop output (per 50 kg), Number of children in school, Household size, Total Annual Income, Distance to the market against Sustainable small-scale farming. All the categorical predictor variables were dummy coded with the lowest category as the reference. In all the analyses, 1.0 was the proportional odds ratio for the reference group Table 4.6 contains results of the final model (only includes factors that are significant using the enter method of regression).

a) Bivariate relationships between determinants of small-scale farming and sustainable small-scale farming served by saving groups.

Determinants of sustainable small- scale farming are first presented at bivariate level to check for the association between the dependent and independent variables. Those that were significantly associated with sustainable small-scale farming at $p < 0.05$ were advanced for analysis at multivariate level. The bivariate analysis was run to establish the effect of each single independent variable on sustainable small-scale farming. Table 4.6 below, presents the results of the odds of sustainable small scale as a business with p-values among the participants in the study. The participants' proportional percentage (%), the p-values for multi-variate analysis, odds ratios (OR) and 95 % confidence intervals are presented. The binary logistic regression analysis, detected a significant association between sustainable small - scale farming and the following factors at $p < 0.05$: Household size, ($p = 0.023$), Average loan payback period to the savings group ($p = 0.032$) and Interest at borrowing the loan from the savings group ($p = 0.022$).On the other hand, the bi-variate analysis did not detect a significant association between Age of participant ($p = 0.527$), Annual crop output per 50 kg ($p < 0.575$), Number of children ($p < 0.576$), Total annual income from the farming business ($p < 0.437$), distance to the market ($p < 0.795$) and sustainable small scale - farming .

b) Multivariate relationships between various factors and Sustainable small-scale farming as a business

This section presents results of the multi-variate analysis for those variables were significant at bi-variate level. Data regarding results of the multi-variate analysis are summarized in Table 4.6 below. The participant's proportional percentage (%), the p - values for multi-variate analysis, odds ratios (OR) and 95 % confidence intervals are presented. The binary logistic regression analysis at multi-variate analysis, detected a significant association between sustainable small-scale farming as a business and the following factors at $p < 0.05$: Household size of less than five children, Average loan payback period to the savings group ($p= 0.19$) and interest of loan at borrowing from the savings group ($p = 0.032$).

On the other hand, the bi-variate analysis did not detect a significant association between Household size of between 5 - 10 children ($p = 0.110$) and household size of 10 and more children ($p = 0.336$) and sustainable small scale -farming. As shown in Table 4.6, a Logistic regression analysis was performed to ascertain the effects of loan average pay back period, household size and Interest at borrowing loan from the savings group against small-scale sustainable farming as a business served by village saving groups. In the final model three factors were associated with sustainable small-scale farming as a business served by saving groups namely Average loan payback period, household size, and Interest at borrowing loan from the savings group.

For the predictor Average loan payback period to the saving group (OR = 2.8, 95% CI: 1.187-6.517) ,the odds ratios indicate that while holding all other variables constant, in Mkushi a small scale farmer who perceives the average payback period of the loans obtained from village savings groups to be long enough(3-6months) has three times the odds of engaging in sustainable small scale farming than is a small scale farmer who perceives the average payback period to be short(less than 3 months) and this difference is statistically significant at $p < 0.05$.

The predictor variable Household size (OR = 0.4. 95% CI:0.163 – 1.204) indicates that whilst holding all other variables constant, a small-- scale farmer with a household of less than 5 members are more likely to engage in sustainable small scale farming as a business served by village saving groups than is a small scale farmer with 5 children or more and the result is statistically significant at $p < 0.05$.

The predictor variable Interest at borrowing from the saving group indicates that those perceive the loan interest to be high (OR = 0.297, 95% CI: 0.098 – 0.902) are less likely to engage in sustainable small scale farming as a business than those who perceive the interest rate at borrowing to be low and this difference is statistically significant at $p < 0.05$. Data regarding Bivariate and multivariate logistic regression of factors associated with sustainable small-scale farming as business in Mkushi district are tabulated in table 6 below.

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| Variable | Category | Farmer involved in Small-scale farming as a business | | 95% CI for OR | | p-value |
|---|---|---|---|---|---|---|
| | | Yes (%) | No (%) | Bivariate | Multivariate | |
| Age last birthday | 21-30 | 15(13.7%) | 20(18.3%) | 1.0 | Not significant at bi-variate | p = 0.527 |
| | 31-40 | 24(22.0%) | 16(14.7%) | 1.3 [.168 -10.579] | | |
| | 41-50 | 14(12.8%) | 8(7.3%) | 0.7 [.085 - 5.228] | | |
| | 51-60 | 4(3.7%) | 4(3.7%) | 0.6 [.067 - 4.875] | | |
| | 60+ | 2(1.8%) | 2(1.8%) | 1.0 [.091- 11.028] | | |
| Interest at borrowing | High | 52(47.7%) | 35(32.1%) | 1.0 | 1.0 | p = 0.032 |
| | Low | 7(6.4%) | 15(13.7%) | 0.3 [.116 -0.849] | .03 [.098 - 0.902] | |
| Average payback period | >3 months | 28(25.7%) | 34(31.2%) | 1.0 | 1.0 | p = 0.019 |
| | 3 - 6 months | 31(28.4%) | 16(14.7%) | 2.3 [1.074 - 5.151] | 2.8 [1.187- 6.517] | |
| Annual crop output per (50kg) | >200 bags | 47(43.1%) | 42(38.5%) | 1.0 | Not significant at bi-variate | p = 0.575 |
| | 201- 400 bags | 5(4.6%) | 5(29.4%) | 0.9 [.303 -4.137] | | |
| | 400 +bags | 7(6.4%) | 3(2.8%) | 1.1 [.116 - 1.974] | | |
| Number of children | > 5 | 24(20.2%) | 23(21.1%) | 1.0 | Not significant at bi-variate | p = 0.576 |
| | 5 & Above | 35(29.4%) | 27(24.8%) | 1.2 [.580 - 2.659] | | |
| Household size | >5 | 28(25.7%) | 11(10.1%) | 1.0 | 1.0 | p =0.047 |
| | 5-10 | 11(10.1%) | 16(14.8%) | 0.3 [.136 - .857] | 0.3 [.163 -1.204] | |
| | 10+ | 20(18.3%) | 23(21.1%) | 1.3 [.478 - 3.349] | 1.1 [.584 - 4.839] | |
| Total annual income | >2500 | 23(21.1%) | 15(13.8%) | 1.0 | Not significant at bi-variate | p = 0.437 |
| | K2500 - K5000 | 19(17.4%) | 15(13.8%) | 0.5 [.222 - 1.387] | | |
| | K5000+ | 17(15.6%) | 20(18.3%) | 0.6 [.263 - 1.711] | | |
| Distance to the market | Yes | 46(42.2%) | 40(36.7%) | 1.0 | Not significant at bi-variate | p = 0.795 |
| | No | 13(11.9%) | 10(9.1%) | 1.7 [.151-19.542] | | |

Table 6: Bivariate and multivariate logistic regression of factors associated with sustainable small-scale farming as business in Mkushidistrict ($n$ = 109).
Source: Field Survey (2019)

Table 7 below shows the SPPS output of factors that were significantly associated with sustainable small scale farming in Mkushi at bi-variate level and were therefore advanced for analysis at multivariate level.

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) | 95% C.I.for EXP(B) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Lower | Upper |
| Step 1[a] | Q20(1) | -1.213 | .566 | 4.588 | 1 | .032 | .297 | .098 | .902 |
| | Q21(1) | 1.023 | .435 | 5.540 | 1 | .019 | 2.781 | 1.187 | 6.517 |
| | Q24 | | | 6.129 | 2 | .047 | | | |
| | Q24(1) | -.814 | .510 | 2.548 | 1 | .110 | .443 | .163 | 1.204 |
| | Q24(2) | .519 | .540 | .926 | 1 | .336 | 1.681 | .584 | 4.839 |
| | Constant | .356 | .524 | .461 | 1 | .497 | 1.428 | | |

Table 7: Factors influencing the sustainability of small-scale farming as businesses served by saving groups.
Source: Field Survey (2019)

a. Variable(s) entered on step 1: Q20, Q21, and Q24.

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c) Summary Of Findings From Research Question Two
In the final model, the results revealed that three factors including average payback period of the loan, a small household size, and interest at borrowing the loan from saving groups, were associated with sustainable small-scale farming as a business served by saving groups, while the rest that included the age of participant ,the annual crop output per 50 kg bag, the number of children in schools, the total annual income from the farming business and distance to the market were not associated with sustainable small-scale farming as a business in Mkushi district.

*C. Relationship between sustainable small-scale farming as a business and village savings*

The third objective sought to establish the relationship between sustainable small-scale farming as a business and village savings. This objective was guided by the research hypothesis that**$H_0$**: There is no significant relationship between between running sustainable small-scale farming as a business and belonging to Saving groups in Mkushi district. To address this hypothesis, the participants were targeted for responses via the questionnaire.In performing the analysis, the Pearson Product Moment Correlation Coefficient was computed using the statistical package for social sciences (SPSS). The variables sustainable small-scale farming as a business and village savings belonging were computed by adding the responses of all the participants in the analysis. The results showed that there was a negligible negative (r = -.042) linear or practically no significant relationship between sustainable small-scale farming as a business and belonging to village savings ($r$ = -.042, $n$ = 109, $p$ = .662).

Even though the value of zero is on negative side, the researcher confidently concluded there was no relationship between sustainable small-scale farming as a business and village savings in Mkushi district. Because p > 0.05, the researcher accepted the null hypothesis of no relationship and concluded that relationship between sustainable small-scale farming as a business and village savings is not statistically significant. The result implies that the establishment of savings group among small scale farmers had practically no bearing on the establishment of sustainable small-scale farming as a business. Figure 4.8 below depicts results of the Pearson product moment correlation test of the relationship between small-scale farming as a business and savings group.

Correlations

| | | FARMER BELONGS TO VILLAGE SAVING GROUPS | FARMER RUNS SUSTAINABLE SMALL- SCALE FARMING AS S BUSINESS |
|---|---|---|---|
| FARMER BELONGS TO VILLAGE SAVING GROUPS | Pearson Correlation | 1 | -.042 |
| | Sig. (2-tailed) | | .662 |
| | N | 109 | 109 |
| FARMER RUNS SUSTAINABLE SMALL- SCALE FARMING AS S BUSINESS | Pearson Correlation | -.042 | 1 |
| | Sig. (2-tailed) | .662 | |
| | N | 109 | 109 |

Table 8 Relationship between Sustainable Small-scale Farming and Village Savings

Source: Field Survey (2019)

a) Summary of findings from research question three
In summary a Pearson product-moment correlation was run to determine the relationship betweensustainable small-scale farming as a business and village savings.Due to the fact that the value of p > 0.05, it was concluded that there was a negligible negative (r = -.042) or no significant relationship between sustainable small-scale farming as a business and belonging to village savings ($r$ = -.042, $n$ = 109, $p$ = .662).

## V. CONCLUSION

The study on the sustainability of small-scale farming as business financed by savings groups in Mkushi district yielded the following findings:

The ISAP test, results indicated the sustainability of small-scale farming practices as businesses in Mkushi district coinciding with the formation of saving groups scoring 12.5 (86.2%) in comparison to farming practices adopted before saving group formation which scored -14 (-96.55%). Following, the maximum ISAP score possible of 14.5, the result implies that small scale farming practices in Mkushi before the introduction of Saving Groups did not yield sustainability as it yields a negative value while the practices after formation of SGs yielded sustainability.

Further, the results revealed three factors including average payback period of the loan, a small household size, and interest at borrowing the loan from saving groups, were associated with sustainable small-scale farming as a business served by saving groups, while the rest that included the age of participant ,the annual crop output per 50 kg bag, the number of children in schools, the total annual income from the farming business and distance to the market were not associated with sustainable small-scale farming as a business in Mkushi district.

Finally, the findings showed that due to the fact that the value of p > 0.05, it was concluded that there was a negligible negative (r = -.042) or no significant relationship

between sustainable small-scale farming as a business and belonging to village savings ($r$ = -.042, $n$ = 109, $p$ = .662).

Based on these findings the following conclusions were drawn:

Though the commercialisation of small-scale farming production and enhancing its integration in markets and more inclusive value chains remains a challenge in Zambia, the introduction of saving groups in Mkushi district has fostered the emergency of sustainable small scale farming as a business through the sale of high valued crops including Soya-beans Cowpeas and Groundnuts.

Factors including average payback period of loans obtained from village saving groups, small household size, and small-scale famers with a perception that interest rates are higher in Mkushi district are key policy variables that can be adopted by various village savings groups across Mkushi as they are some of the key factors determining the sustainability of small-scale farming as businesses served by village savings groups.

The relationship between sustainable small- scale farming as a business and savings group is not as strong as anticipated in Mkushi as a result of various factors or intervening variables that have distorted the relationship.

## VI. RECOMMENDATIONS

In light of the findings of the research carried out to assess the Sustainability of small- scale Farming as a business financed by savings groups in Mkushi district the following were the recommendations that the researcher proposed:

- The government and private sector need to scale up the setting up of village savings group throughout rural Zambia in order to provide loan facilities to small-scale farmers at affordable interest rates in order for them to sustainably produce far beyond subsistence for commercial purposes.
- There is need for effective training of personnel at the Ministry of Finance so that village saving groups programs and agendas can be well organised, coordinated and uniformly regulated and guided throughout the country in line with sustainable small-scale farmer's business acumen.
- There is need for coordinated effort from various stakeholders including the government and the private sector to encourage national and multi-national organisations to encourage the implementation of village savings so as to expand financial access to the small -scale farming communities in order graduate from small scale-to emergent farming to sustain their businesses.
- There is need for the government to provide a fertile ground through suitable key policies for the continuous business growth and survival for the majority of small-scale farming micro enterprises in Zambia that takes into account of the average loan payback period obtained from saving groups, smaller household sizes, and interest at borrowing the loan from saving groups.
- There is need for the organisers of village saving groups among small-scale farmers to intensify further, the use of the groups as a platform for learning sound farming methods for sustainable business development interventions so that the relationship between sustainable small-scale farming as a business and village savings can be well established in Mkushi district.
- The productivity of smallholder farmers is limited to their access to quality input and information. Therefore, the result would have been significantly been different if the assumption in the hypothesis had not included their benefit from services from ZRDF. Therefore, it would be cardinal for small-holder farmers to be supported with programmes that directly strengthen their proposed agriculture value chain. The study shows the positive correlation between introduction of savings groups and sustainable farming practices.
- The study showed that the direct correlation between age and farming instability as this related to the underlying literacy levels. The older one was the less education they seemed to have. Therefore, the researcher recommends the continued educational support even simple literacy and numeracy lessons to be included to programmes directed at smallholder farmers with the continued financial literacy training at the savings group intersection level.

## VII. RECOMMENDED AREA FOR FUTURE RESEARCH

Since the current study was completed using a concurrent and mixed method design involving quantitative research from a cross section point of view, a similar study should be planned within the district that would be longitudinal in nature to determine the ssustainability of small - scale farming as business financed by Savings Groups in Mkushi over time.

The researcher recommends the continued study of the target group in order to learn and adopt best practise model of behaviour change. The study shows that the continues exposure to savings groups resulted in increased knowledge that were transferred into improving farming deliverables.

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