

**MAKERERE**



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**(COBAMS)**

**(SCHOOL OF STATISTICS AND PLANNING)**

**THE IMPACT OF PIGGERY INDUSTRY ON THE SOCIAL-ECONOMIC  
LIVELIHOODS OF HOUSEHOLDS IN RUBAGA SOUTH DIVISION**

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**A RESEARCH REPORT SUBMITTED TO THE COLLEGE OF BUSINESS AND  
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## DECLARATION

I **JJINGO LAZ**, declare that this Research Report entitled "*The Impact of Piggery Industry on the Social-Economic Livelihoods of Households*" is my original piece of work and has not been published or submitted to any university or institution for the award of any academic qualification.

Signature.....     JL     Date.....     06/8/18    

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## APPROVAL

This Research Report by **JJINGO LAZ** titled "*The Impact of Piggery Industry on the Social-Economic Livelihoods of Households*" has been done under my supervision and is now ready for submission for further examination with my approval.

Signature.....



Date.....



**DR. TUYIRAGIZE RICHARD**

University Supervisor

## **DEDICATION**

This Research Report is dedicated to my family and friends for their continued financial support towards my academics. I also dedicate this research Report to my classmates for their effort and support towards my attainment of this Degree.

## **ACKNOWLEDGMENT**

I would like to extend my sincere gratitude and appreciation to all those who assisted me in making this study a success. Special thanks go to Dr Tuyiragize Richard for his commitment and professional advice, when supervising my work. May God reward you with whatever you may want.

My heartfelt thanks go to my parents for the financial support they provided me from time to time. I thank all the Households of Rubaga south division who participated in this study for without them the research endeavor would have been a failure.

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## **LIST OF ABBREVIATIONS**

AIDS:	Aquired Immune Defficiency Syndrome
DAPH:	Department of Animal Production and Health
FAO:	Food and Agriculture Organization
H <sub>0</sub> :	Null Hypothesis
HIV:	Human Immune Virus
HH:	Household
LPMAK:	Lembaga Pengem Bangam Masyarakat Amugmedan Kamaro
MDGs:	Millennium Development Goals
SPSS:	Statistical Package for Social Sciences
UBOS:	Uganda Bureau of Statistics

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## ABSTRACT

Piggery industry plays an important role in risk diversification and livelihood security of smallholder and poor households as they are important assets useful in generating income for school fees payment, purchase of farm inputs and covering emergency cash needs. The purpose of the study was to examine the impact of piggery industry on the social-economic livelihoods of households in Rubaga South Division. The specific objectives of the study were to establish the relationship between pig sales and employment, establish the relationship between pig sales and education, examine the relationship between pig sales and asset growth, and establish the relationship between pig sales and health of households in Rubaga South Division. The study used a cross sectional survey design in which both qualitative and quantitative research approach of data collection were used. The study targeted a population of households that were engaged in piggery farming in Rubaga south division. The study used a sample size of 68 respondents whereby 66 households were engaged in structured interviews and 2 were engaged in key informant interviews. The researcher used both structured questionnaire and interview guide in collecting primary data. The compiled data using structured questionnaire was entered and analyzed using SPSS. The study findings revealed that there exists a statistically significant relationship between pig sales/production and employment of households and community members since the p-value (0.034) was less than the 0.05 level of significance. The study findings revealed that pig sales are significantly related with education of households in Rubaga division since the p-value (0.027) was less than the 0.05 level of significance. The study results also indicated that pig sales are significantly related with health of households since the p-value (0.038) was less than the 5% level of significance. The study findings finally revealed that there is a statistically significant relationship between pig sales and asset growth of households in Rubaga division since the p-value (0.014) was less than the 5% level of significance. There is need to encourage household members in Rubaga division especially those engaged in pig farming to go for further education as this would enable them to know more about the activity they are doing and also for better planning. It is suggested that the government should work to strengthen farmers groups by encouraging farmers to form/join saving and credit associations which will enable them to access and acquire loans with low interest rates to enable them expand pig farming on large scales since the study revealed that majority were practicing pig farming on a small scale.

# CHAPTER ONE

## INTRODUCTION

### 1.0 Introduction

This chapter covers the Background of the study, Statement of the problem, Purpose of the study, Specific objectives, Hypotheses, Scope, Conceptual framework and Significance of the study.

### 1.1 Background for the study.

In recent decades there has been enormous growth in livestock production, driven by increasing demand for animal-source products among a large segment of the world's population. Globally, piggery industry is related highly with food security, people's livelihoods and economic development (FAO, 2009). According to FAO (2012), pork is the world's most widely eaten meat accounting for 40% of total meat eaten. Second to pork is chicken (29%), followed by beef (24%), turkey (2%) and others (5%).

In Philippine, different pig breeds have been adapted to the most diverse climatic conditions with a good degree of success. Production systems vary widely throughout the world, ranging from labour intensive systems to capital intensive systems. Small-scale farmers new to pig enterprises advisably commence the activity with a focus on adequate pig confinement using simple housing structures and prevalently local feed resources (FAO, 2011). Pig farming provides income for women, strengthening their role in families as well as in local communities. The sick and disabled can participate in pig farming as it does not require excessive labour and is not too complex in its management. The low start-up costs and small investments required for buildings and equipment are recovered fairly quickly as slaughter can take place at about six to eight months from farrowing (birth), pending on breed and feed availability. Pigs additionally can be considered as a store of wealth and a safety net in times of crisis (FAO, 2011).

According to Penrith et al. (2012), pig population in Africa has increased by 284% during a 20 year period (i.e. between 1980 and 1999) far more than any other livestock species in the same period and the trend continues. Meseko (2013), points out that about 18 million pigs are ascribed to Africa and Nigeria with over 6 million swine accounting for over 30% of the continents' total pig production in Africa. In African rural communities, indigenous pigs have multiple functions;

they provide disposable income during periods of food shortages, food, and manure for crops production and in some areas manure is a source of energy through biogas. Generally, an increase of up to 155% in annual pork consumption from 2000 to 2030 has been estimated in sub-Saharan Africa (Meseko, 2013).

In East Africa, pig production for meat and income in Tanzania is currently becoming popular in many parts of the country and contributes significantly to meat supplies. According to Kamaghe et al. (2014) the number of pigs in Tanzania is approaching 2 million and pig production is the fastest growing livestock sub-sector in the last two decades, this is primarily due to stimulated growth in pork consumption, especially in urban areas. About 54% of the pigs in the country are found in the Southern Highlands of Tanzania, more specifically the regions of Mbeya, Iringa, Rukwa and Ruvuma. Most pigs are kept in Mbeya, Iringa, Ruvuma, Kilimanjaro, Rukwa, Morogoro and Manyara regions (URT, 2012).

Pig production has increasingly become an important activity in Uganda especially among smallholder farmers as evidenced by a dramatic rise in pig population from 0.19 million in 1980 to 1.7 million in 2002 and 3.2 million in 2008 (Ouma et. al., 2013). This is linked to the rise in demand for pork due to preference changes among other factors. Pigs are reared in all parts of Uganda and hence have a great potential to lift communities' social and economic livelihoods if the hurdles to their production and marketing are removed. The Central Region especially Rubaga south division has the highest number of pigs estimated to be 1.3 million (41.1%), while the Karamoja zone had the least number of pigs estimated to be 0.06 million (18.3%), Districts of Masaka (236,150 pigs), Soroti (75,000), Pader (39,430) and Kibaale (153,510) have the highest number of pigs in the Central, Eastern, Northern and Western regions, respectively (UBOS, 2013).

Therefore, it is against this background that the researcher assessed the impact of Piggery industry on the social-economic livelihoods of households in Rubaga south division.

## **1.2 Statement of the problem**

Piggery industry plays an important role in risk diversification and livelihood security of smallholder and poor households as they are important assets useful in generating income for school fees payment, purchase of farm inputs and covering emergency cash needs (Muhanguzi et al., 2012). According to Nambowa (2015), pig production in some parts of Rubaga south division is characterized by extensive production system whereby pigs are allowed to scavenge at backyard and garbage dumping sites. Most of the pig keepers in Rubaga south division are subsistence producers and their productivity is generally low leading to unemployment among youth, poor access to education and health services, and also rising poverty among people. The major factors contributing to this low productivity include, poor nutrition, health care, poor husbandry and diseases, all these lead to low birth and growth rates, high mortality, and no or low market prices (UBOS, 2014). However, no concerted study has been made to address the above issues despite the importance of piggery industry to the household's livelihoods. Therefore, this study examined the impact of piggery industry on the social-economic livelihoods of households in Rubaga south division.

## **1.3 Purpose of the Study**

The purpose of this study was to examine the impact of piggery industry on the social-economic livelihoods of households in Rubaga South Division.

## **1.4 Specific Objectives**

- i. To establish the relationship between pig sales and employment of the households in Rubaga South Division
- ii. To establish the relationship between pig sales and education of households in Rubaga South Division
- iii. To examine the relationship between pig sales and asset growth of the households in Rubaga South Division
- iv. To establish the relationship between pig sales and health of households in Rubaga South Division

## **1.5 Hypotheses of the study**

**H<sub>01</sub>:** There is no significant relationship between pig sales and employment of the households in Rubaga South Division

**H<sub>02</sub>:** There is no significant relationship between pig sales and education of the households in Rubaga South Division

**H<sub>03</sub>:** There is no significant relationship between pig sales and asset growth of the households in Rubaga South Division

**H<sub>04</sub>:** There is no significant relationship between pig sales and health of the households in Rubaga South Division

## **1.6 Scope of the Study**

This area presents the content, time, and geographical scope of the study.

### **1.6.1 Content Scope**

The study examined the impact of piggery industry on the social-economic livelihoods of households in Rubaga South Division. The study considered piggery industry as the independent variable and social-economic livelihoods as the dependent variable.

### **1.6.2 Time Scope**

The content of the information that was reviewed was from 2015 up to 2018 and this enabled the researcher to examine the impact of piggery industry on the social-economic livelihoods of households in Rubaga South Division.

### **1.6.3 Geographical scope of the study area**

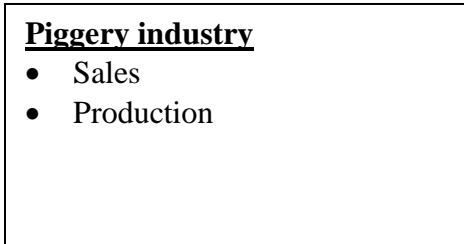
The study was carried out in Rubaga South Division. Rubaga Division lies in the western part of the city, bordering Wakiso District to the west and south of the division. The eastern boundary of the division is Kampala Central Division. Kawempe Division lies to the north of Rubaga Division. The coordinates of the division are 00 18N, 32 33E (Latitude: 0.3029; Longitude: 32.5529). Neighborhoods in the division include Mutundwe, Nateete, Ndeeba, Lungujja, Busega, Lubaga, Mengo, Namungoona, Lubyaa, Lugala, Bukesa, Namirembe, Naakulabye, Kasubi, and Kawaala.



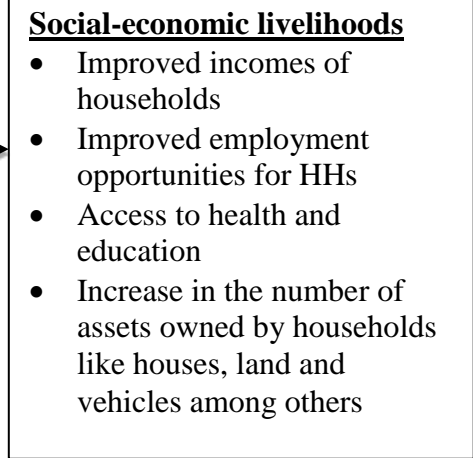
## 1.7 Conceptual Frame work

The framework looked at piggery industry as the independent variable and social-economic livelihoods as the dependent variable

### Independent variable (IV)



### Dependent Variable (DV)



*Source: Developed by the Researcher*

When there is an increase in pig sales/production, it is believed that there would be an improvement in incomes, creation of employment opportunities, access to health services and education and improvement in asset ownership by the households.

## 1.8 Significance of the study

The study findings may bridge the knowledge gap on indigenous pig husbandry in Rubaga division with a poor improved keeping system, diseases control, and marketing to include agro-processing industry.

The findings from this study may add on to the existing body of literature on piggery farming in Uganda as well as to bridge the gap in information pertaining to piggery farming.

The study may act as a bench mark for other researchers who may want to conduct research in the same field.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0 Introduction

This section presents the empirical literature on the relationship between piggery sales and employment levels, the relationship between piggery sales and education levels, relationship between piggery sales and asset growth, and the relationship between piggery sales and health of households.

#### 2.1 Piggery industry/pig farming

Pig farming refers to the branch of agriculture concerned with the care and breeding of pigs. Pig farming is the practice of raising pigs for food and other products, such as leather, bacon, ham and sausages. Pig farming comes in a range of styles. Some pig farms are huge and factory-like, others are small and intimate. Each type of pig farming has different impacts on the pigs, the environment, pig farm workers, pork consumers and the public at large (Irekhore, 2012).

According to Okello et al. (2015) pig productivity is measured by reproduction and growth performance and these are influenced by genetic factors, feeding, environmental conditions and management practices such as lactation length, weaning age and parasites control. In addition, Okello et al. (2015) productivity in breeding herds is measured by piglets weaned per female per year (PWFY), and is determined by indices such as litters per female per year (LFY), farrowing rate (FRATE), culling rate (CULLR), Interfarrowing interval (IFI), weaning-to-service interval (WTSI), number of piglets born alive (PBA) and pre-weaning piglet's mortality (PWM). In finishing herds, productivity is measured in average daily weight gain (DWG), and weight: age ratio (WT/AGE).

#### 2.2 Livelihoods

Different authors have tried to define the term livelihood. According to Ellis (2000), livelihood is defined as assets, activities and access that determine living gained by an individual or household. Chambers and Conway (1992) cited by Ahmed and Lipton (1997) define livelihood as the ways in which people satisfy their needs or gain a living. According to Ahmed and Lipton, livelihood should be seen as a set of flows of income, from hired employment, self-employment,

remittances (usually in developing rural areas) or from a seasonally and annually variable combination of all these. Generally, a livelihood should be able to assist those involved to avoid poverty, and preferably, increase well-being of the concerned person and his/her dependents.

Ellis (2000) defines a livelihoods composition of activities that generate the means of a household's survival. According to Ellis a household's choice of a particular livelihood strategy depends on many factors, which may include social influences, exogenous trends or shocks. Individuals in rural areas diversify by involving themselves in livestock keeping, crop production, and non-farm activities that may include trade. According to Morris et al. (2001), livelihood strategies refer to the combination of activities that people choose to undertake in order to achieve their livelihood goals. They include productive activities, investment strategies and reproductive choices. Livelihood approaches try to understand the strategies pursued and the factors behind people's decisions and to reinforce the positive aspects of these strategies and militate against constraints. The choice of strategies is a dynamic process in which people combine activities to meet their changing needs. For example, in farming households, activities are not necessarily confined to agriculture but often include non-farm activities in order to diversify income and meet household needs.

### **2.3 The relationship between pig sales and employment**

According to Novak (2012), pig sales/production has been among the sources of employment in the United State of America. Employment, wages and establishments have increased steadily in the United States particularly in North Carolina at the aggregate level of the hog farming value chain over the last two decades. In 1992, the U.S.A pig farming industry employed 281 231 people in 7 838 establishments. By 2012 this number increased to 327 350 workers in 8 031 establishments, an increase of 14.1% and 2.5% respectively over the last two decades (1992-2012). Family members participate in the enterprise and this provides more employment opportunities for the farm family. On-farm processing also enables new skills and knowledge to be learnt and provides for more varied products to be sold and further employment opportunities for the farm family in both developed and developing countries (FAO, 2011).

According to FAO (2010), pig sales are positively related with income and employment for farmers, it strengthens their role in families as well as in local communities. Income is earned from the sale of animals and importantly from their products. Income from pig farming as a

result of employment can be used to invest in farm assets, pay for school fees and health services. Furthermore, FAO (2010), reports that in poor rural areas and peri-urban areas, pig production often functions as a banking system where the animal is a source of employment and wealth that can be accessed when additional income is needed. This might be the case when school fees need to be paid, household members seek medical assistance or cash is needed for further investments. Pigs provide income for women, strengthening their role in families as well as in local communities. Pigs can additionally be considered as a store of wealth and a safety net in times of crisis.

Green (2012) reported that small-scale pig sales have become increasingly attractive to small-scale farmers in the highland areas in Tanzania because of contextual changes in the wider economy changes that have restructured the demand for pork. According to Green (2012), most farmers in Ulanga Morogoro have shifted from keeping cattle to pig keeping as a source of income and employment.

Smallholder pig sales/farming contributes positively to the livelihood in many ways like creation of employment, income from products, insurance against drought, emergency cash requirements, household nutrition, manure for crops etc. besides direct and indirect employment potential to the farmers in the world (Lemke and Valle, 2008). About 56% of the world's pigs originate from such system, each producing 2-5 head per year (Riedel et al., 2012).

Small-scale pig farming/production is positively related to the livelihood of many rural farm families in developing countries among many where pig farming contributes at different levels but in many ways to rural livelihood particularly in employment creation, income generation and household food security. Pig populations in Vietnam and Sri Lanka are 27 million (FAO, 2011) and 82 030 (DAPH, 2011), respectively. Vietnam possesses the largest pig herd in South East Asia and among the top five countries that raise pigs in the world (Dang-Nguyen et al., 2010). Hence, it is inevitable that a large proportion of the population (42%) of farm households own pigs and pork accounts for about 74% of all livestock products (Duong and Giao, 2012). In contrast, Sri Lanka possesses one of the smallest populations among the pig producing countries of the region where it contributes only 4% to the total meat production of the country

(Dematawewa et al., 2009). Similarly, the level of pork consumption also varies in two countries; 34.9 kg in Vietnam (Duong and Giao, 2012) and 0.309 kg/year (DAPH, 2011) in Sri Lanka.

Currently, smallholders (or households with less than 10 heads of pigs) account for at least 85% of pig production in Vietnam. Smallholder pig production/sales generate employment (about 4 million fulltime jobs along the pork supply chain). Household labour constitutes the main labour inputs in household based pig production; Women labour accounts for 1.5 times the labour use in household based pig production (Madzimore et al., 2013).

Improvement and promotion of pig production among the youth and other active group will provide employment and engagement thereby reducing the spread of HIV/AIDS. The formation of pig-keeping groups will also provide a forum for sharing experiences and strategies to reverse the spread of HIV/AIDS (FAO, 2012).

#### **2.4 The relationship between pig sales and education**

Pig production under subsistence farming provides much more than meat to the farmers. Although smallholder pig farming cannot be considered a business venture (Ocampo et al., 2005), pigs are generally reared with an objective to provide good access to education of the households and improve on incomes (Kagira, 2010; Mutua et al., 2010). They may thus be sold at any age or size (Lemke et al., 2007) depending on the financial demands of the family, such as the need for funds to pay for school fees of the children, food and field labour or even school fees, medical treatments or small investments (FAO, 2014). Even the manure of pigs is used as fertilizer for crop production (Mutua et al., 2010). Because there is little or no initial financial input to rear pigs and because they are generally kept in small herds and most of the time left to scavenge their own food, any monetary income from these systems is of great value for the overall household income. Pigs therefore constitute an important source of income for many families. In the remote areas of Northern Lao PDR, income from pigs accounts for more than 50% of the total family income. Income from Pig sales is important for farmer's education and poverty alleviation (Mutua et al., 2010).

A study on the role of women in the pig sector in kailali established that income from the sales of pigs was used for household expenses, children's education and healthcare. Besides these, some women indicated purchasing a bicycle, small machines (water boring pump, sewing machine),

fertilizers and also renting land to grow crops; whereas some men indicated buying piglets which was their first priority, agricultural needs and other things depending upon the situation (Niraula, 2015).

Apart from pigs being an essential source of protein to humans, income from sale of pigs in rural areas assist with provision of education to the children. It was also reported that women benefit from the additional income received from sale of pigs, which in turn is used for household goods, school fees and settling other obligations. The consumption of pork in the rural areas however, is influenced by some taboos, which range from human health, religion to cultural beliefs (Madzimore et al., 2013).

Government can invest in improved pig production to eradicate extreme poverty. Money from sale of pigs is also used for paying school fees and buying uniforms. Pig production can contribute to the achievement of the second MDGs – achieving universal primary education. Pig production can also contribute to the third MDGs as women manage and feed the pigs. They can be empowered through initiatives and policies in pig production. Establishing these new principles and practices will contribute to the achievement of MDGs four and five. It is necessary to involve women more in the marketing of pigs to achieve these goals (FAO, 2012).

## **2.5 The relationship between pig sales and access to health services**

According to Australian Center for International Agricultural Research (2010), Pigs play an important role in the household economy of Laos, and pig production is a typical activity of smallholders throughout the country especially in the northern mountainous region and is an important component of these people's livelihoods. In rural areas, women traditionally have performed the majority of pig-rearing chores; they spend much time and labor each day collecting and preparing feed for their pigs. In Sopchia, pigs are sold when a need for cash arises, such as for school fees, medical expenses, or agricultural improvements.

Implementation of CBSLSP successfully led to increases in livestock production and the capabilities of educational staff members. Improvements in livestock production particularly pig production led to increases in the family health of farmers in the target villages. In parallel with these benefits to farmers, the target staff members have been certified to carry out the same responsibilities as part of new projects (Keonouchanh, 2010).

Over the past two decades, pig production has become an increasingly important activity in Uganda. In the last 30 years the pig population has increased from 0.19 to 2.3 million, and there are more than 1 million households raising pigs. In 2011, Uganda had the highest per capita consumption of pork in sub-Saharan Africa (3.4 kg/person per year). The majority of pigs are kept by women in smallholder households and it has enabled them to get access to health services through improved sales (Global Education Magazine, 2017).

Pig farm development is highly potential to alleviate poverty with strategy and planning based on demand, where local livestock need could become priority program of Regional Government and LPMMAK to support poverty alleviation, since through pig sales/farming it could reduce poor access to health services, unemployment, alleviate poverty along with more expensive price on livestock it would create an employment for farmer and his family and also improve access to medical services. Poverty alleviation through pig farming involved in community empowerment program for 7 ethnic group has low number of poor farmer, where poor farmer was known when their income only able to meet their basic needs and unable to meet other needs (Ahmadi, 2012).

## **2.6 The relationship between pig sales and asset growth of the people in the activity**

In all production types, pig-keeping plays an important role in household income. The pig's short breeding cycle leads many farmers to take the view that smallholder pig-keeping is the livestock equivalent to cash crops and has potential to improve rural livelihoods. From the pig sales, small holders have been in position to acquire physical assets like land, build houses, buy cars, bicycles, and motorcycles (FAO, 2012).

According to Kagira (2010), in the traditional free range system, the sale of piglets or finished pig provides money needed to buy land and vehicles, pay school fees and hospital bills, buy clothes and food, and build better houses. The pig acts as the farmers' bank. Improved marketing through forming farmer groups such as KENPFA, providing access to credit, and equipping farmers with basic knowledge about pig farming present opportunities for profitable pig production under this system.

In the commercial system, pig production plays a major role as farmers keep the pigs wholly to obtain income for acquiring assets like good houses and land. The profits are used to meet other expenses in the homestead, including business development and investment. Improvement in the

sector is desired and possible. One of the major constraints singled out by commercial farmers is the erratic market. Sometimes the pigs are ready for market but the market is not ready to receive the pigs. Investment in value-added processing facilities in rural areas would offer alternative outlets for the finished pig (Ngurare, 2014).

In the free range pig production systems of Western Kenya and Nyanza, where men are rarely at home, women play an important role in the management of pigs although men take charge of selling the family pig to get assets like houses and land. It is said that women care for the pigs and men sell the pigs, reflecting the cultural expectation that men are the decision-makers in most rural families (Nelson and Mukundi, 2015).

With improving and new market opportunities, pig sales can eradicate extreme poverty and hunger. As reported in several areas, money from the sales of pigs is used to buy foodstuffs, land, vehicles, and commodities, and construct houses for households. Government can invest in improved pig production to eradicate extreme poverty. Money from sale of pigs is also used for paying school fees and buying uniforms. Pig production can contribute to the achievement of the second MDGs – achieving universal primary education. Pig production can also contribute to the third MDGs as women manage and feed the pigs. They can be empowered through initiatives and policies in pig production. Establishing these new principles and practices will contribute to the achievement of MDGs four and five. It is necessary to involve women more in the marketing of pigs to achieve these goals (FAO, 2012).

Although pig farming has not really picked up in Liberia like other parts of Africa, the number of small-scale pig farmers is, however, increasing despite inadequate extension services and the low percentage of agriculture investment. Augustine Moore, a pig farmer in Gborfehla in Margibi County, is an example of a farmer who is increasing pig production and sales. He joyfully told the Daily Observer recently on his farm that he has no worries about being employed because raising pigs gives him enormous profits and he has been able to build himself a house and a farm motorcycle (Vida, 2016).



## CHAPTER THREE

### METHODOLOGY

#### 3.1 Introduction

This chapter presents the methodology that was followed in the course of conducting the research. It highlights research design, study population, sample size, sampling procedure, data collection procedure, data collection tools, data types and sources, and data processing and analysis.

#### 3.2 Research design

The study used a cross sectional survey design in which both qualitative and quantitative research approach of data collection were used. The quantitative method was used due to the desire of establishing the magnitude of the problems using statistical data and evidence. The qualitative method was of particular importance to this research because of its ability to penetrate into the different expressions and experiences of respondents to the subject matter.

#### 3.3 Study Population

The study targeted a population of households that were engaged in piggery farming in Rubaga south division. In addition, local officials were also involved during the in-depth interviews to supplement on the information collected.

#### 3.4. Sample size

The study used Cochran's (1963) formula that scientifically provides a reasonable sample size for unknown population size as shown below;

$$n = \frac{z^2 pq}{e^2}, q = (1-p)$$

Where;

n is the sample size required for the study,

$z_\alpha$  is the standard normal value,

$\alpha$  is the level of significance which is 0.1 at 90% confidence level ( $z_\alpha = 1.645$ ),

p is the proportion of individuals with characteristics of interest ( $p=0.5$ ),

q is the proportion of individuals without characteristics of interest ( $q=0.5$ ), and

e is the permissible error ( $e=0.1$ ).

$$n = \frac{1.645^2 * 0.5 * 0.5}{0.1^2} \quad n = 68 \text{ respondents}$$

Therefore, the study used a sample size of 68 respondents.

### 3.5 Sampling procedure

The study used both simple random and purposive sampling procedures. Purposive Sampling was used as a fundamental method in this research, where the sample population is predetermined due to their significance and knowledge about the phenomenon being investigated in order to get firsthand information from the key informants. Simple random sampling method was preferred because it gives equal chances to all the units of the population to be involved in the study sample. The study used simple random sampling method to select households that were engaged in piggery farming for closed ended interviews and purposive sampling method was used to select knowledgeable and experienced piggery farmers for key informant interviews. The sampling process was guided by the table below.

**Table showing Sampling Procedures**

S/N	Category	Sample	Sampling Procedure
1.	Households engaged in piggery farming	66	Simple Random Sampling
2	Key informants	2	Purposive sampling
	<b>Total</b>	<b>68</b>	

### 3.6 Data collection procedure

The researcher obtained an introductory letter from Makerere University. This letter introduced the researcher to the respondents. Informed consent was obtained from all the respondents before including them in the study. Confidentiality was promised and kept. The respondents were informed about the nature and purpose of the study and their right to participate or not to participate. The semi structured interview lasted for about 45 minutes while as structured interviews lasted for 25 minutes. During interviews, the researcher used a digital recorder to record the information that was provided by the respondents and for structured interviews, closed

ended questionnaires were administered to the respondents with predetermined questions and answers.

### **3.7 Data collection tools**

#### **3.7.1 Questionnaire**

Questionnaire was used to collect quantitative data from respondents and involved closed ended questions with predetermined answers. It was administered to households that were participating in piggery farming in Rubaga division.

#### **3.7.2 Interview guide**

The interview guide was used during key informant interviews with the experienced piggery farmers. It involved open ended questions to the key informants and this enabled the researcher to explore and also get an in-depth view about piggery farming and its impact on the social-economic livelihoods of HHs.

### **3.8 Data types and sources**

The study relied on both primary and secondary data.

#### **3.8.1 Primary data**

Primary data refers to data collected by the researcher for a particular need as encapsulated in the research objectives. The study was conducted using the case study method of research. Self-administered questionnaires and key informant interviews were the techniques used in gathering data.

#### **3.8.2 Secondary data**

Documentary review was also used to understand substantive content of the variables under investigation and this illuminated deeper meanings and hence made critical observation and confirmation for theory of deductions. The researcher reviewed documents like published research reports, professional publications, broad sheet newspapers and articles, books, procedural documents like minutes of meetings and used to enrich the body of literature relevant to the subject of study.

### 3.9 Data Processing and Analysis

The researcher analyzed the quantitative data using SPSS version 21. Raw qualitative information from the interviews was transcribed and written as narratives.

#### Univariate analysis

This was used to analyze single variables through presenting them using frequency counts, means, and percentages. The variables that were analyzed using univariate analysis included gender, age category, marital status, education level, religion, and main occupation of the HHs among others.

#### Bivariate analysis

Bivariate analysis provided answers to all hypotheses and was examined through bivariate data analysis and variables were cross tabulated to look at their impact on one another. A chi-square test was carried out to establish the relationship between categorical variables like sales and employment, sales and education, sales and asset growth, and sales and health of HHs considering the expected values ( $D_{ij}$ ) and observed values ( $O_{ij}$ ). Therefore, conclusions were drawn basing on the p-value results as explained; if  $p > 0.05$ , then there is no significant relationship between the two variables for example if the p value between the two variables is above 0.05, then a conclusion is drawn that the two variables are statistically insignificant, where as if  $p < 0.05$ , then we conclude that there is a significant relationship between the two variables. The chi-square formula that was used is presented below;

$$X^2 = \sum_{i=1}^r \sum_{j=1}^c \frac{(O_{ij} - D_{ij})^2}{D_{ij}}$$

Where:

$X^2$  Is the chi-square test

$D_{ij}$  Is the number of expected frequencies

$O_{ij}$  Is the total number of expected frequencies

$c$  Is the number of columns

$r$  Is the number of rows

## CHAPTER FOUR

### DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

#### 4.0 Introduction

The findings presented in this chapter are related to the demographic characteristics of respondents that participated in the study and the specific objectives of the study.

#### 4.1 Demographic characteristics of respondents

Demographic characteristics were important because they comprised of respondents of both sex but of different Age, marital status, education level, religion, main Occupation, and household size.

**Table 1: Sex of respondents**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Male	30	45.5	45.5	45.5
Valid Female	36	54.5	54.5	100.0
<b>Total</b>	<b>66</b>	<b>100.0</b>	<b>100.0</b>	

*Source: Primary data, 2018*

Findings from table 1 above indicate that majority of the respondents (55%) were females and the rest were males. This implies that piggery farming in Rubaga south division is dominated by females compared to males.

**Table 2: Age category of respondents**

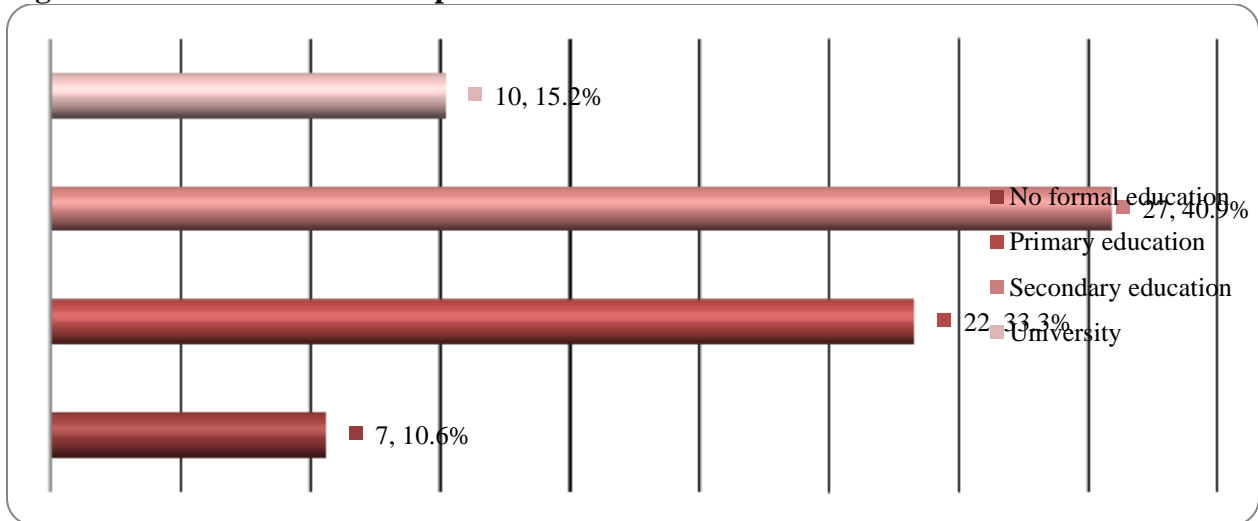
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 25-31 years	19	28.8	28.8	28.8
Valid 32-38 years	20	30.3	30.3	59.1
Valid 39-45 years	8	12.1	12.1	71.2
Valid 46 years and above	19	28.8	28.8	100.0
<b>Total</b>	<b>66</b>	<b>100.0</b>	<b>100.0</b>	

*Source: Primary data, 2018*

The study findings from table 2 revealed that the highest proportion of respondents (30%) was aged between 32 and 38 years and the least percentage (12%) were aged between 39 and 45

years. This indicates that most of the households in Rubaga south division that are engaged in piggery farming are aged between 32 and 38 years which is believed to be the productive age for farmers.

**Figure 1: Education level of respondents**



*Source: Primary data, 2018*

It is evident from figure 1 that the highest percentage of the respondents (41%) had secondary education and the few respondents (11%) had no formal education. This means that majority of the households that are engaged in piggery farming in Rubaga division ended in secondary schools and this is an advantage to them because they could read and write and even attend seminars about piggery farming. This level of education enables the households to know the market value of their pigs and the ways in which they should be fed.

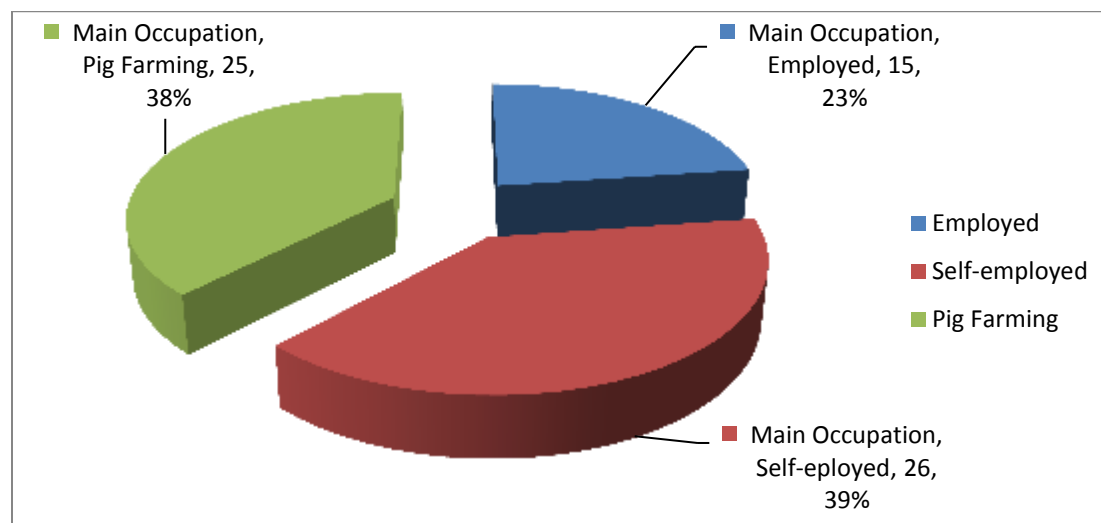
**Table 3: Religious affiliation of respondents**

	Frequency	Percent	Valid Percent	Cumulative Percent
Catholic	29	43.9	43.9	43.9
Anglican	27	40.9	40.9	84.8
Born again	10	15.2	15.2	100.0
<b>Total</b>	<b>66</b>	<b>100.0</b>	<b>100.0</b>	

*Source: Primary data, 2018*

The results from table 3 show the most respondents (41%) were Anglican and the few respondents (15%) were born again.

**Figure 2: Main occupation of the respondent**



*Source: Primary data, 2018*

The results from figure 2 indicate that the highest proportion of the respondents (39%) were self employed, followed by 38% that were engaged in pig farming and the least proportion of respondents (23%) were employed by government. This implies that the main occupation of the majority of the households that are engaged in pig farming in Rubaga division is self employment.

**Table 4: Household size**

	Frequency	Percent	Valid Percent	Cumulative Percent
1-4 members	27	40.9	40.9	40.9
5-8 members	32	48.5	48.5	89.4
Valid 9-12 members	6	9.1	9.1	98.5
13-16 members	1	1.5	1.5	100.0
<b>Total</b>	<b>66</b>	<b>100.0</b>	<b>100.0</b>	

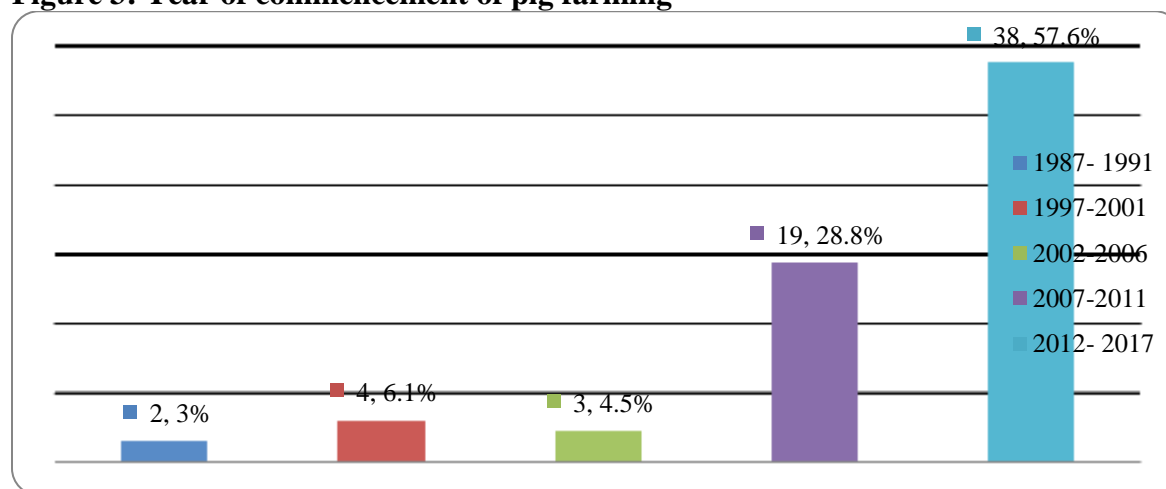
*Source: Primary data, 2018*

The study findings from table 4 revealed that the highest percentage of the households (49%) had between 5 and 8 members the least percentage of households (2%) had between 13 and 16 members.

## 4.2 Information on pig farming

The researcher sought to obtain the information about pig farming among households in Rubaga division and the findings are presented below;

**Figure 3: Year of commencement of pig farming**



*Source: Primary data, 2018*

The findings from figure 3 above show that majority of the respondents (58%) started pig farming between 2012 and 2017, and the least proportion (3%) started between 1987 and 1991. This implies that most of the households that are engaged in big farming in Rubaga division started the activity between 2012 and 2017.

**Table 5: Pig breeds kept by respondents**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Indigenous	2	3.0	3.0	3.0
Valid Exotic	47	71.2	71.2	74.2
Valid Crossbreed	17	25.8	25.8	100.0
Total	<b>66</b>	<b>100.0</b>	<b>100.0</b>	

*Source: Primary data, 2018*

It was found out from the study that majority of the respondents (71%) were keeping exotic breeds of pigs, followed by 26% who were rearing crossbreeds and the few respondents (3%) were keeping indigenous breeds. This clearly shows that most of the households in Rubaga



division are keeping exotic breeds of pigs and this breed is believed to be productive since it grows very fast and also demanded highly in market.

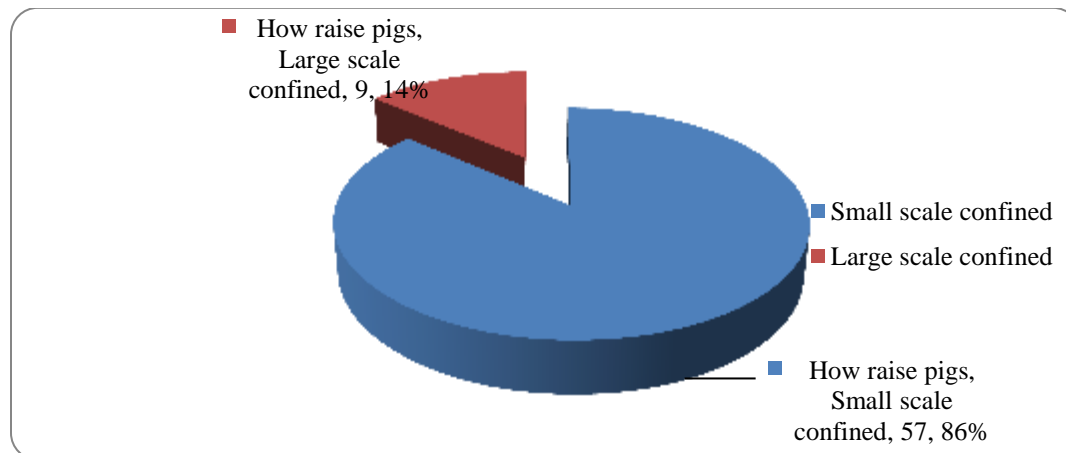
**Table 6: Summary of statistics on the number of Pigs kept by each HH in Rubaga division**

	N	Minimum	Maximum	Mean	Std. Deviation
Number of pigs owned by each HH	66	2	20	7.21	4.436
Valid N (listwise)	66				

*Source: Primary data, 2018*

The findings from table 6 show that the highest household had 20 pigs and the least household had 2 pigs. It was observed that on average, every household was keeping 7 pigs and this significantly indicates that most of the households in Rubaga division have endured to engage in pig farming.

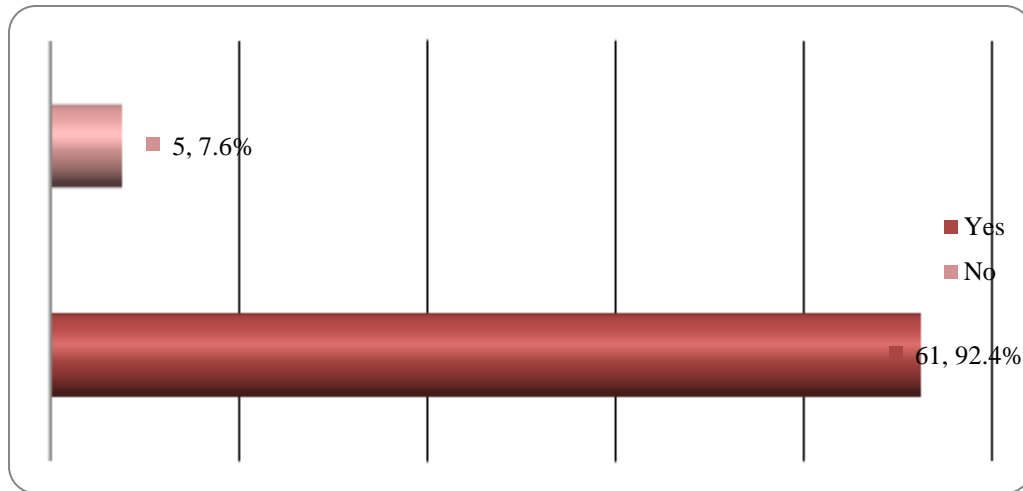
**Figure 4: How pigs are raised**



*Source: Primary data, 2018*

It is evident from figure 4 that the majority of the respondents (86%) were raising pigs using small scale confined system where as the minority (14%) were using large scale confined system. This implies that most of the households are practicing pig farming on a small scale since the study established that majority were raising pigs using small scale confined system.

**Figure 5: Availability of extension and veterinary services in Rubaga division**



*Source: Primary data, 2018*

The researcher made an assessment to establish the whether the extension and veterinary services are available in Rubaga division and it was revealed from the study that 92% of the respondents agreed that the services are available. This means that the piggery extension and veterinary services are readily available to the households that are engaged in pig farming in Rubaga division and this is believed to reduce on the incidence of mortality among the pigs.

**Table 7: Assessment on Record keeping**

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	39	59.1	59.1	59.1
Valid No	27	40.9	40.9	100.0
<b>Total</b>	<b>66</b>	<b>100.0</b>	<b>100.0</b>	

*Source: Primary data, 2018*

The findings from table 7 revealed that majority of the respondents (59%) agreed that they keep records about their pigs and few disagreed. This indicates that most of the households in Rubaga division keep records about their pigs and this is believed to be important for proper planning, accountability and allocation of resources.

**Table 8: Summary statistics on the annual sales (UGX) from the pigs**

	N	Minimum	Maximum	Mean	Std. Deviation
Sales (UGX)	66	1440000	8200000	3932272.73	1658859.474
Valid N (listwise)	66				

*Source: Primary data, 2018*

The results from table 8 show that on average, every respondent was selling pigs worth 3,932,272.73 shillings per year. The highest respondent was selling pigs worth 8,200,000 shillings per year and the least respondent was selling pigs equivalent to 1,440,000 shillings.

### **4.3 Findings on the specific objectives of the study**

This section presents the findings on the relationship between pig sales and employment, relationship between pig sales and education, relationship between pig sales and asset growth, and the relationship between pig sales and health of households in Rubaga South Division

#### **4.3.1 The relationship between pig sales and employment of the households**

The researcher performed a chi square test to establish whether there exist a significant relationship between pig sales and employment and the findings are presented in the table below;

**Table 9: The Relationship between pig sales and employment opportunities to the people**  
**Chi-Square Test**

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.386	7	.034
Likelihood Ratio	5.923	7	.049
Linear-by-Linear Association	3.211	1	.003
<b>N of Valid Cases</b>	<b>66</b>		

*Source: Primary data, 2018*

The findings from the chi test in table 9 above show that the p-value (0.034) was less than the 0.05 level of significance and this indicates that we reject the null hypothesis and conclude that there exist a significant relationship between pig sales/production and provision of employment opportunities to the people. This indicates that pig sales/production has led to the creation of employment opportunities to the households and other people in Rubaga division including the

youth and women. Meanwhile, the findings are also supported by that of Novak (2012) who established that pig sales/production has been among the sources of employment in the United State of America. Employment, wages and establishments have increased steadily in the United States particularly in North Carolina at the aggregate level of the hog farming value chain over the last two decades. In 1992, the U.S.A pig farming industry employed 281 231 people in 7 838 establishments.

#### 4.3.2 Relationship between pig sales and education of households

The researcher also sought to establish whether there is a significant relationship between pig sales and access to education by households and the findings are shown below;

**Table 10: Relationship between pig sales and education of households**

<b>Chi-Square Tests</b>			
	<b>Value</b>	<b>Df</b>	<b>Asymp. Sig. (2-sided)</b>
Pearson Chi-Square	8.692	7	.027
Likelihood Ratio	11.788	7	.018
Linear-by-Linear Association	3.673	1	.045
<b>N of Valid Cases</b>	<b>66</b>		

*Source: Primary data, 2018*

The results from table 10 above indicate that there is a significant relationship between pig sales and access to education by HH since the p-value (0.027) was less than the 0.05 level of significance and therefore the null hypothesis was rejected. This implies that pig sales/production significantly impacts on the access to education by households in Rubaga division. It means that money generated from pig sales plays a significant role towards improved access to education by household members especially the children of school going age. The findings are also in agreement with that of Madzimure et al. (2013) who established that apart from pigs being an essential source of protein to humans, income from sale of pigs in rural areas assists with provision of education to the children. The results are also supported by that of Niraula (2015) from a study on the role of women in the pig sector in kailali who established that income from the sales of pigs was used for household expenses, children's education and healthcare.

However, the researcher conducted key informant interviews to get the views of pig farming and its contribution to access to education by households and the responses are presented below;

*“This business has greatly contributed to education of children, especially for single mothers and low earning households. Me personally I use some of the income obtained from pig sales to top up on my children’s fees and even buy them scholastics. I have a friend who has worked in this business for over 30 years and she says that she has been able to educate her 2 children up to finishing university. And even meet other needs,” a resident of Busega Parish added.*

#### 4.3.3 The relationship between pig sales and health of households

The study made an investigation to find out if the pig sales are significantly related with the health of the households and the results are presented in the table below;

**Table 11: The relationship between pig sales and health of households**

<b>Chi-Square Tests</b>			
	<b>Value</b>	<b>Df</b>	<b>Asymp. Sig. (2-sided)</b>
Pearson Chi-Square	8.288	7	.038
Likelihood Ratio	11.435	7	.012
Linear-by-Linear Association	3.673	1	.005
<b>N of Valid Cases</b>	<b>66</b>		

*Source: Primary data, 2018*

The study findings from the chi square test presented in tale 11 above revealed that there is a significant relationship between pig sales and access to health care by the households in Rubaga division since the p-value (0.038) was less than the 5% level of significance and this made the researcher to reject the null hypothesis. It is a clear indication that when there is growth in sales/ production of pigs, there would be an improvement in access to health services by households since they would use the money generated from the sales and pay for health services. The findings are also in line with that of Keonouchanh (2010) who found out that Implementation of CBSLSP successfully led to increases in livestock production and the capabilities of educational staff members Improvements in livestock production particularly pig production led to increases in the family health of farmers in the target villages.

#### 4.3.4 Relationship between pig sales and asset growth of households

The researcher further performed a chi square test to examine whether there exist a significant relationship between pig sales and growth of assets of the households in Rubaga division and the findings are presented in the table below;

**Table 12: Relationship between pig sales and asset growth  
Chi-Square Tests**

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.798	7	.014
Likelihood Ratio	11.540	7	.011
Linear-by-Linear Association	6.804	1	.009
<b>N of Valid Cases</b>	<b>66</b>		

*Source: Primary data, 2018*

The findings from table 12 indicate that the chi square value was 10.798 and the probability value was 0.014. This means that we reject the null hypothesis and conclude that there is a statistically significant relationship between pig sales and asset growth since the p-value (0.014) was less than the 0.05 level of significance. This is an implication that pig sales have led to the accumulation of assets to the households that are engaged in the activity. It was observed that households that are engaged in pig farming have built houses, bought land, bought motorcycles, and purchased home equipment like TVs, radios among others. This shows that pig sales/production have contributed significantly towards the asset growth of the households in Rubaga division. The findings are also supported by that of Kagira (2010) who established that in the traditional free range system, the sale of piglets or finished pig provides money needed to buy land and vehicles, pay school fees and hospital bills, buy clothes and food, and build better houses.

Meanwhile, the key officials that were engaged in open interviews also gave their views as indicated below;

*“Concerning the asset growth many farmers have obtained a lot of assets from this business me personally I bought a motorcycle, I pay rent, and meet other needs. But I have heard of my fellows who have bought land, vehicles, tanks, TVs, bicycles, radios etc even building houses,” a resident of Busega Parish added.*

## CHAPTER FIVE

### SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

#### 5.0 Introduction

This chapter provides the summary of findings, conclusion and recommendations of the study. The summary of findings, conclusions and recommendations are derived from the findings of the study which are presented in chapter four.

#### 5.1 Summary of Findings

The findings from the study indicate that there exists a statistically significant relationship between pig sales and creation of employment opportunities to the households and community members since the p-value (0.034) was less than the 0.05 level of significance. This indicates that pig farming in Rubaga division has led to the creation of employment opportunities the community and household members.

The study findings also revealed that pig sales are significantly related with education of households in Rubaga division since the p-value (0.027) was less than the 0.05 level of significance. This implies that pig production has enabled the households to get access to education services since they would be in position to meet the education demands. The results from open ended interviews revealed that pig farming has enabled the single mothers to meet the education requirements of their children.

The study results also indicate that pig sales are significantly related with health of households since the p-value (0.038) was less than the 5% level of significance. This means that pig farming has enabled the households in Rubaga division to get access to health care services since they use the income generated from the sales to meet the medical bills.

The study findings finally revealed that there is a statistically significant relationship between pig sales and asset growth of households in Rubaga division since the p-value (0.014) was less than the 5% level of significance. This is an indication that pig farming has contributed significantly towards the accumulation of wealth among households in Rubaga division. It was revealed from

the open ended interviews that households have been able to buy land, motorcycles, vehicles, TVs, and radios among others.

## **5.2 Conclusion**

It is concluded that piggery industry has contributed significantly towards the improvement on the social and economic livelihoods of the people in Rubaga division. It was revealed that pig production/ sales has significantly led to the creation of employment opportunities to the HH and community members, improved access to education by household members, improved access to health services and accumulation of assets by households.

## **5.3 Recommendations**

It is recommended that education on pig production should be extended to all pig keepers so as to improve pig keeping husbandry and pig keepers livelihood outcomes in general.

There is need to encourage household members in Rubaga division especially those engaged in pig farming to go for further education as this would enable them to know more about the activity they are doing and also for better planning since the study found out that most of the households had secondary education.

It is suggested that the government should work to strengthen farmers groups by encouraging farmers to form/join saving and credit associations which will enable them to access and acquire loans with low interest rates to enable them expand pig farming on large scales since the study revealed that majority were practicing pig farming on a small scale.

It suggested that there should more sensitization among the youth to encourage them to join pig farming because the study established that the activity has given some jobs to some youth in Rubaga division and they benefited significantly.

There is also need to strengthen security in Rubaga division to curb on the robbery of pigs for the community members since it was established from open interviews that the place is facing a lot of insecurity.



#### **5.4 Suggested Areas for Further Research**

In this study, women are the ones found at home most of the time providing much of the labour required in pig keeping. The women are also involved in daily cleaning, provision of feeds and water and any other chores related to pig keeping. Since women are the major source of the labour used to take care of pigs though men are the ones involved in sales and dictate the use of income earned, there is a need for a gendered study to determine how the different household members benefit from pig farming in Rubaga division.

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## APPENDICES

### APPENDIX I: HOUSEHOLD QUESTIONNAIRE

Dear respondent,

My name is **JJINGO LAZ**, a student of Makerere University pursuing a Bachelor's degree in Business statistics. The purpose of this study is to investigate the Impact of piggery industry on the Social-economic Livelihoods of Households in Rubaga south division. As a household who is engaged in pig farming, you have been selected to participate in the research by completing the questionnaire as per the instruction at the beginning of a given section. You are kindly requested to freely fill in the questionnaire. All your responses will be kept confidential and for academic purpose only. Please endeavor to fill the questionnaire and return it to the researcher.

**Instructions: Tick/circle one of the options provided but not all. You can also write in the space provided where necessary**

<b>PART (A) Background data</b>		
<b>No.</b>	<b>Question</b>	<b>Coding categories</b>
1	What is your gender?	01= Male 02= Female
2	In which age group are you?	01=(25-31)years 02=(32-38)years 03=(39- 45) years 04=46 years and above
3	What is your marital status?	01= Married 02= Single 03=Divorced 04=Widowed/widower
4	What is your highest level of education?	01=No formal education 02= Primary education 03= Secondary education 04= University 05= Post graduate

5	What is your religious affiliation?	01=Catholic 02=Anglican 03=Muslim 04=seventh day 05=Born again
6	What is your main occupation?	01=Employed 02=Self-employed 03=Pig Farming
7	What is the size of your household? (HH number)	.....
<b>PART (B) Information on pig farming</b>		
8	When did your household start keeping pigs? (Indicate year)	.....
9	Why do you keep pigs?	01=For income 02=For food 03=Manure production 04=Others (Specify).....
10	What pig breeds do you keep?	01=Indigenous 02=Exotic 03=Crossbreed 04=Others (Specify).....
11	What number of pigs do you have?	.....
12	How do you raise your pigs?	01=Free range/scavenging 02=Small scale confined 03=Large scale confined 04=Large scale out door
13	Are the livestock extension and veterinary services available and accessible in your area?	01= Yes 02=N0
14	Do you keep records in your pig keeping?	01=Yes 02=No
<b>PART (C) Information on Pig sales</b>		
15	On average, how many pigs do you sale every year?	.....

16	What is your annual average income from the sale of pigs?	..... UG shillings
<b>PART (D) Information on the Social-Economic livelihoods of Households</b>		
17	Has your engagement in pig farming created employment opportunities for others?	01=Yes 02=No
18	Has your engagement in pig farming increased Household's ability to pay for health services	01=Yes 02=No
19	Ever since you started rearing pigs, has your Household increased the ability to meet children's education costs	01=Yes 02=No
20	Do you own any physical asset out of pig farming?	01=Yes 02=No
20.1	If yes, what type of asset do you own?	01=House 02=Land 03=Vehicle 04=Others specify.....

*Thanks for your time*



## APPENDIX II: KEY INFORMANT GUIDE

Dear respondent,

My name is **JJINGO LAZ**, a student of Makerere University pursuing a Bachelor's degree in Business statistics. The purpose of this study is to investigate the Impact of piggery industry on the Social-economic Livelihoods of Households in Rubaga south division. You have been chosen as a key resource personnel and your contribution, opinion and experience will be highly appreciated. All your responses will be kept confidential and for academic purpose only. Thank you very much for your time and co-operation. I request you to kindly respond to the questions below. Is it okay to proceed? Yes..... No.....

Signature.....

### **Questions**

1. What is your general view of pig keeping in Rubaga south division?
2. What are the major pig breeds kept in your area?
3. What are the requirements for keeping pigs in your area?
4. Does pig keeping in your area have the potential of creating employment opportunities, improving access to good health and education, and increasing the growth of assets of the households?

### **Recommendations**

What can be done to improve/raise pig productivity in Rubaga south division?