

**UNIVERSITY OF EDUCATION, WINNEBA**



**CHARACTERISTICS OF SMALL-SCALE PIG FARMERS  
IN THE BINDURI DISTRICT OF UPPER EAST REGION  
OF GHANA**



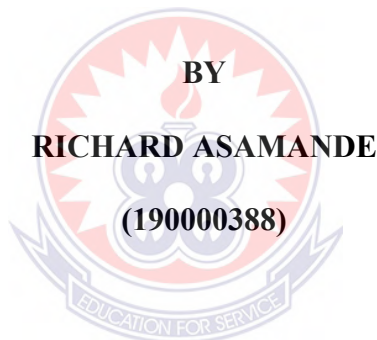
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**MASTER OF EDUCATION (M. Ed) IN AGRICULTURE**

**2022**

**UNIVERSITY OF EDUCATION, WINNEBA  
COLLEGE OF AGRICULTURE EDUCATION  
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MAMPONG ASHANTI**

**CHARACTERISTICS OF SMALL-SCALE PIG FARMERS IN THE BINDURI  
DISTRICT OF UPPER EAST REGION OF GHANA**



**A DISSERTATION IN THE DEPARTMENT OF AGRICULTURAL  
ECONOMICS AND EXTENSION EDUCATION, FACULTY OF  
AGRICULTURE EDUCATION, SUBMITTED TO THE SCHOOL OF GRADUATE  
STUDIES, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE  
AWARD OF THE DEGREE OF MASTER OF EDUCATION IN AGRICULTURE**

**MAY 2022**

## DECLARATION

I, Richard Asamande, declare that this dissertation, with the exception of quotations and references contained in published works which have all been identified and acknowledged, is entirely my own original work, and it has not been submitted, either in part or whole for another degree elsewhere.

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RICHARD ASAMANDE

(CANDIDATE)

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DATE

## SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines for supervision of dissertation as laid down by the Akenten Appiah-Menka University of Skills Training and Entrepreneurial Development.

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DR. VINCENT ABANKWAH

(SUPERVISOR)

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DATE

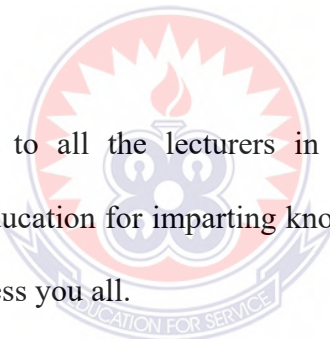
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## **DEDICATION**

To my lovely late father, Mr. Akupeilnaba Asufu and the entire family for their support throughout the duration of my study.



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## LIST OF ABBREVIATIONS

ASF:	African Swine Fever
FAO:	Food and Agriculture Organization
GDP:	Gross Domestic Product
GSS:	Ghana Statistical Service
MOFA:	Ministry of Food and Agriculture
NGO:	Non-Governmental Organization
SSPF:	Small Scale Pig Farming
ZID:	Zoonotic Infections Diseases
SARI:	Savannah Agricultural Research Institute
FAOSTAT:	Food and Agricultural Organization Statistics
SDGs:	Sustainable Development Goals



## ABSTRACT

The study seeks to examine the characteristics of small-scale pig farmers in Binduri district. Simple random sampling was used to select twenty (20) communities in the district. However, snow ball's sampling method was used to select ten (10) respondents from each community. In the district, 87.1% of small-scale pig farmers have the opinion that, their level of training on pig production practices has great negative effect on small scale pig farming. Hence, there is need for sufficient training on pig production practices especially for small-scale pig farmers in the district. This calls for government, Non-governmental Organizations (NGOs) and other stakeholders to step in to support small scale pig production in the Binduri district.

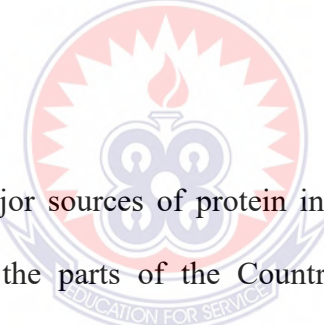


## CHAPTER ONE

### 1.0 INTRODUCTION

#### 1.1 Background to the study

According to FAO (2011) pork is the most popular meat consumed in advance countries of the world today. Forty-four percent (44%) of the world meat protein consumption is derived from pork products (FAO, 2011). In many countries, small-scale pig farming provides employment opportunities to household members that are unemployed because of mobility constraints as a result of household responsibilities (Lapa & Staal, 2010). For instance, there are an estimated 410 commercial pig farms and 4,000 smallholder pig farms in South Africa with approximately 125,000 sows (100,000 commercial farms) and employ about 10,000 workers consisting of 4,000 labourers and 6000 processing and abattoir workers Roelofse, (2013).



Pig production is one of the major sources of protein in the Ghana and it is done in the small-scale level in almost all the parts of the Country and thus economic source of livelihood for some people. Pig farmers in Ghana raise pigs to serve as a source of income and not to provide just meat for the household (Aryee *et al.*, 2017) The livestock farming sector, including piggery remains critically important for millions of people in developing countries including Ghana and developments within this sector are most important in terms of attaining the Sustainable Development Goals (SDGs) goals of no poverty (Ngueyen *et al.*, 2016).

The piggery sector which contributes to household income, is one of the fast-growing sectors of the livestock industry because of increase in pork consumption (Adzitey, 2013). piggery represents a form of cash security of the livelihood strategies of many farmers and plays central role in their socio-economic development (Banson *et al.*, 2014). The multiple

roles of pig rearing and other indigenous livestock breeds are significantly acknowledged in different farming systems of Ghana including intensive, semi-intensive and free-range systems.

The growth of Ghana's domestic piggery industry has been impeded by several constraints such as lack of improved breeding stock, limitations of land and water, rapid urbanization processes, pollution and lack of managerial skills (Adzitey, 2013). The industry is also affected by diseases such as classical swine fever (CSF) and viral diarrhea in piglets.

Pig production, therefore is an integral part of Ghana's agri-business activities and a major source of livelihood for many entrepreneurs seeking alternative source of profitable business venture (Apiiga, 2014). Local pigs' production has become attractive option on account of ease of management, prolificacy of the species has led many small-scale farmers keeping the animals (Osei – Amponsah *et al.*, 2017).

Also, observed that apart from the pig importance in the humans diet the urgency of increasing pig production in the country especially among the small-scale farmers is satisfied by factors such as stable source of revenue, value added for crop production and creation of export potential for the meat (Duniya *et al.*, 2013).

Additionally, one of the major advantage of pigs farming is ability to convert different kinds of feed even including kitchen waste to meat (Rahman *et al.*, 2018). Based on this waste convention to meat, pig farming is by far considered the most lucrative venture to some people (Gunnyi & Omoteso, 2011). This informs most livestock farmers choice of small-scale pig farming in some parts of the country. The purpose of this study is to asses factors

influencing income from small scale pig farming in the Binduri district of upper East region of Ghana

## **1.2 Problem Statement**

Pigs has high potential to increase productivity due to their fast growth rate, short generational interval, good feed, conversion efficiency and high litter sizes compared to cattle (Mbutia *et al.*, 2015). Also, there are paucity of information on the production practices of pig farming which can be useful to enhance production potentials. (Adjei *et al.*, 2015). Despite all these benefits, Pig farming has not fully developed like the ruminant and poultry enterprises because of some social factors inhibiting it's growth. Duniya *et al.* (2013). Small-scale farming in the Binduri district, are equally beset with some social factors that affects small scale pig production. These include the belief that, pigs are dirty animals and poses health problems, lack of training and education on pig production practices for small-scale pig farmers and rural people perception on small-scale pig farming. It is against this background that this study is embarked to assess how these social factors affects income generated from small scale farming. Hence the topic: characteristics of small scale pig farmers in the Binduri District of Upper East of Ghana.

## **1.3 Objective of the Study**

The main objective of the study was to examine the characteristics of small scale pig farmers in the Binduri District of Upper East of Ghana.

### **1.3.1 Specific Objectives**

The specific objectives include:

1. to assess the characteristics of small-scale pig farmers in the Binduri district of Upper East Region of Ghana.

2. to ascertain how small-scale pig farmers perceive small scale pig farming as business in Binduri district of Upper East Region of Ghana.

#### **1.4 Justification**

The finding of this study will serve as a source of knowledge on factor affecting income from small scale pig farming in Binduri District. This will support government, NGO's and other stakeholders to come out with policy interventions to improve sustainable small scale pig production in the district. Also, the outcome of this study could be used as reference to students and researchers.

#### **1.5 Organization of the Study**

The study has been structured into five major parts. Chapter one (1) is introduction and consists of the contextual knowledge, problem statement of pig industry resulting to research question, research objectives and relevance of study. Review of relevant literature on factors influencing income from small scale pig farming and on different works done by other researchers relating to the study are presented in chapter two (2). The chapter three (3) describes the method used to answer the research questions for the study and also include the study area description. The discussion of results were presented in chapter four (4). Finally, chapter five (5) presents the summary of the major findings, conclusion and recommendation of the study.

## CHAPTER TWO

### 2.0 LITERATURE REVIEW

#### 2.1 Introduction

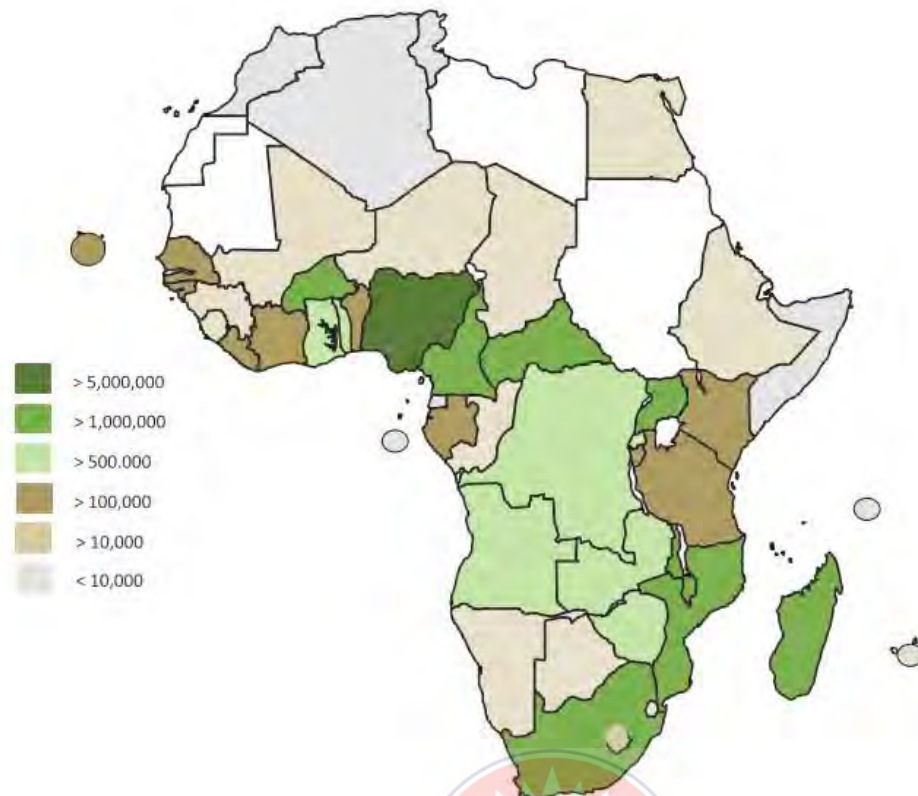
This chapter review works was taken to provide an overview to the study. It covers important areas such as pig production in Africa, small scale pig production in Ghana and factors affecting farmers income such as misconception on pig product, religious believes affecting patronage of pig products, high prevalence infection diseases, poor level of available information and lack of decentralized breeding station. It is also reviewed small scale pig farming in Binduri district and educational needs of small scale farmers in the districts.

#### 2.2 Pig Production in Africa

Africa holds only 3.1% of the world's pig population and contributes with 2% of the world pork production (FAOSTAT, 2011). Nigeria is the leader in terms of pig population in the continent while South Africa, Tanzania, Mozambique and Madagascar Island are the most representative in the southern Africa (FAOSTAT, 2011).

In relation to pork production, overall, the continent registered an increase of 5.8% from 2000 to 2011, corresponding to an increase of 1,282,900 tons. The largest pork production occurred in Southern Africa (660,300 tons), where the South Africa was leading the pork production (320,000 tons) and pork production was growing compared to the rest of the continent (10.8% from 2000 to 2011) (FAOSTAT, 2014). While the trend of pork production in Africa is of growing, in Mozambique the opposite scenario was happening, where for 2000 to 2011 was registered a drop of 2%. In Mozambique the pig population dropped from 1,677,000 animals in 1999 to 1,266,000 in 2008 (FAOSTAT, 2014).





**Figure 2.1 Pig population in African countries**

Source: FAOSTAT, 2011

The unshaded countries and the Comoros Islands have been reported to having no pigs FAOSTAT (2011).

### 2.3 Small-scale Pig Production in Ghana

According to Aryee *et al.* (2019) revealed that, in most parts of Ghana small-scale pig farming were owned and managed by women who engage in mixed framing, this indicates the eminent role women play in livestock production. This is in the agreement with FAO reports that women play an important role in subsistence farming including livestock production and food processing (FAO, 20018).

The small-scale pigs farming resort to indiscriminate crossing of local breeds with exotic breeds in a quest to improve the productive of the local breeds, Osei-Amposah *et al.* (2017). This however leads to inbreeding and consequently low production, reproduction, poor health and dilution of adaptive traits needed for sustainable local pig production. Adjei *et al.* (2019) however, the practice has been encouraged over the years as Ministry of Food and Agriculture import exotic breeds and supply to farmers for breed improvement (MOFA, 2013). Aryee *et al.* (2019) indicated that future interventions must be carefully planned to maintain the adaptive traits needed for local pig production in Ghana. The pigs are commonly kept in traditional free- and semi-scavenging systems and herd sizes are generally small, each farmer keeping 2-3sows (Mutua *et al.*, 2011). Most of the pigs reared in these systems are indigenous. This system can be affected by many constraints that may impact animal performance and welfare. Studies recommended education of farmers as a strategy for improvement (Thomas *et al.*, 2013). There are reports indicating that farmers spent less than 1 hour a day for pig management (Chittavong *et al.*, 2012). The other limitations for smallholder pig productivity include the scarcity of feed resources, the low feed quality and diseases (Mutua *et al.*, 2011).

#### **2.4 Housing in Small-scale Pig Farming.**

Unlike in commercial pig farming where permanent housing facilities are built to provide shelter for pigs, in small-scale pig farming system pigs are raised under sheds yards, stalls or shades (Adjei *et al.*, 2019). This may be due to how cheap, how accessible materials are and how easy it is to construct sheds, yards and stalls than constructing permanent housing facilities (Kamuah *et al.*, 2018).

## 2.5 Feeding in Small Scale Pig Farming

According to Osei - Amponsah *et al.* (2019), high cost of and availability of feed is a challenge most farmers face in pig production and small-scale pig farmers feed their pigs with kitchen waste and other agricultural by products. The feed used to feed local pigs explains the low income of small-scale pig farmers. Feed is noted to be the major section of the cost of producing pigs and it is therefore a major part of the livestock value chain and requires critical attention. It implies that the inability for the pigs to efficiently use the feed will lead to production losses.

Like any other feeding system or feed preparation, pigs may be fed with single nutritive material or be fed with mixture. Economically and geographically, these vary depending on the production culture of the community or the availability of feed resources, In Ghana, there has been significant number of researches into possible feed inputs for pigs. It all aims at yielding economic benefit for the farmer or for increased productivity of individual pigs. A notable one is the recent work by Bumbie (2017) which recommends corn cobs as substitute in diet preparation for Ghana pig producers and therefore, globally, available cobs, can be added up to one-fourth in feed preparation without any adverse health implication to pigs.

Due to high cost of commercial pig feed, small scale pig farmers usually prepared their own feed. even though that meant slow rate of growth for individual animals. The prepared feed includes leftovers from home and food joints. Other feed ingredients are soybean, maize, rice bran, among others. They prepared this feed according to their formulations and fed their live pigs with it. Certain farmers sometimes fed their pigs with plant residues (Osei-Sekyere and Adu, 2015). Additionally, pigs are given feed twice

every day and due to the gluttonous nature. The farm size depends on the farmers' capacity to provide feed. The Ghana pig industry is recognized to be much promising. Governments have the opportunity to provide feed subsidies and credit to support internal food production and also help stabilize the market prices through appropriate regulations to develop the industry, and create employment opportunities (Osei-Sekyere and Adu, 2015).

## **2.6 Source of Breeding Stock in Small-Scale Pig Farming**

Small-scale pig farmers get their breed stock from family members, friend and inheritance which result in indiscriminate cross breeding which facilitate the spread of disease (Aryee *et al.*, 2019).

## **2.7 Medication in Small-Scale Pig Farming**

Many pig establishments, especially commercial farms unlike small scale pig farming provide multivitamin for pigs that express signs of weakness or loss of appetite. Consequently, dewormers like ivermectin and/or levamisole were occasionally used for the fighting of internal and on-skin parasite infestations. Many kinds of antibacterial medicines were stored for the handling of numerous pig sicknesses apart from Africa Swine Fever. Medications were dispensed by keepers or their friends who had experience. Veterinarians are called in on special occasions (Osei-Sekyere and Adu, 2015).

## **2.8 Factors Affecting Pig Farmers' Income**

### ***2.8.1 Misconception on pig products***

A major misconception among many Ghanaians on pigs' production is the belief that their products are full of fat, endoparasites and diseases. This view, directly or indirectly, has anti-marketing effect on the pig product and hinders the progress of the entire industry. This challenge leading to low patronage and profit has made many investors opt rather for the poultry industry over the pig industry (Osei, 2013).

### ***2.8.2 Religious beliefs affecting patronage of pig products***

The pig industry which contributes to Ghanaian microeconomics, is a rapidly growing segment of the livestock industry as result of rise in pork consumption (Banson and Josephine, 2014; Adzitey, 2013). Meanwhile, according to Okai *et al.* (2011), faith groups in Ghana that prohibit the keeping and consumption of pork on religious grounds, possesses negative effect on the industry. This is as a result of the lack of patronage and dislike of pig products.

### ***2.8.3 High Prevalence Infection Diseases***

The outbreak of human pathogenic diseases on the world front continues to rise and Zoonotic Infection Diseases (ZIDS) accounts for the greatest portion (about 60%) of infectious diseases recorded and 75 % of infection diseases that are emerging (WHO, 2011). Additionally, these zoonotic diseases are of agro-economic concerns as they diminish pigs health, minimise availability of farm products (Ayim-Akonor 2020). The loss of revenue as a result of trade restriction, low consumer patronage and high cost of

marketing may affect negatively national economic growth where zoonotic infections disease outbreak are frequent (Hillida *et al.*, 2015).

#### ***2.8.4 Scarce and High Cost of Feed and Nutritional Provision***

Osei-Sekyere and Adu (2015) established that among other factors such as endemic diseases outbreak a major problem that affects farmers who are into small scale pig production include unavailable feed and high feeds cost. These factors can bring about low pig productivity. This can cause small scale pigs farmers to become discourage and exit pig farming completely.

#### ***2.8.5 Increased Financial Cost***

In pursuit of evaluating strength and weakness of Ghana pig industry and influencing factors affecting the pig production, Osei-Sekyere and Adu (2015) studied one hundred and ten (110) piggeries in five Ashanti region district which is the pig hub of the nation on factors that increases financial burden of pig farmers.

Factor	Increased pressure on land	Poor marketing	Threats by diseases
	77.27%	87.27%	91.82%

**Source:** Osei-Sekyere and Adu (2015)

#### ***2.8.6 Poor Level of Available Information***

Data on local pig production practices is scarce which otherwise is essentials for building breeding- oriented programmes to improve production capacities (Ayizanga *et al.*, 2018). Reviewed Journals have insufficient data on pig farming in Ghana; researches and studies on pig production have basically concentrated on nutritional and fail to provide

elaborate conditions of its recent status (Okari and Boateng, 2010). Also, research on cause of production decline is insufficient, leading to difficulty in organisations implementing appropriate intervention (Osei-Sekyere and Adu, 2015).

### ***2.8.7 Lack of Decentralised Breeding Station***

Unavailable decentralised pig breeding station in the country has cause small scale pigs farmers to obtain their breeding stock from friends and relatives. The breeds are further circulated to other relatives or friends by mating them with other traditional breeds in their communities. As a result, unregulated crossbreeding is common in many communities in Ghana and this lower pig's productivity (Dodua *et al.*, 2019).

### ***2.8.8 Small-Scale Pig Farming in Binduri District***

The importance of small-scale farming in all parts of Binduri district lies in the fact that majority of the people earn their living through farming and livestock rearing according to Eze Oti and Odigbo (2016). The small-scale pig farmers in the Binduri district allow pigs to scavenge around the vicinities with minimal attention for their live (Ezeibi, 2014). Also, the negative social beliefs in most parts of the Binduri district that pigs are dirty and poses health hazards to the people negatively affects income level of small-scale pig farmers in the district. Besides, small-scale pig farmers are challenged with limited education and training and other problems of small-scale pig farmers in Binduri district includes:

- Inbreeding (Petrus *et al.*, 2011)
- Inconsistent product because of unstructured pig rearing method (International Livestock Research Institute, 2011).

- The small-scale pig farmers hardly know how much their pigs really worth and this leads to exploitation (International Livestock Research Institute, 2011) district.

## **2.9 Educational Needs of Small-scale Pig Farmers in Binduri District**

The most of the small-scale pig farmers Binduri District require information on production practices and training to improve their income level. According Adjei *et al.* (2015), there is need for more information on pig production practices for local farmers in order to increase productivity.

Ayizanga *et al.* (2018) also indicate, that there is paucity of information on the production practices of local pig farmers which can be useful in the establishment of breeding programmes to enhance pigs' production potentials. Hence if the small-scale pig farmers are given the appropriate training and information on pig production practices it will enhance the alleviation of poverty in the district.



## CHAPTER THREE

### 3.0 RESEARCH METHODOLOGY

#### 3.1 Study Area

The Binduri District is one of the three (3) new districts in the Upper East Region of Ghana created in 2012. It was carved out of the Bawku Municipality and established by Legislative Instrument (L.I. 2146) making it one of the 13 districts in the Upper East Region.

Binduri District is located approximately between latitudes  $11^{\circ} 11'$  and  $10^{\circ} 40'$  N and longitudes  $0^{\circ} 18'$  W and  $0^{\circ} 6'$  E in the north-eastern corner of the Upper East Region. It shares boundaries with Burkina Faso to the north, Garu-Tempene District to the south, Bawku Municipality to the east and Bawku West District to the west. The district covers a total land area of 391.91 square kilometers. With a total population of 61,576, the district has a population density of 157.1 persons per square kilometers.

#### 3.1.1 Climatic Conditions

The climate of the district is characterized by two main seasons; dry and wet, which are influenced by the North-East Trade Winds and the South-West Monsoon Winds respectively. The dry season (late November to early March), is influenced by the cold, dry and dusty harmattan air mass from the Sahara Desert, and is characterized by little rainfall due to low relative humidity, which rarely exceeds 20 percent and low vapor pressure less than 10 mb. Day temperatures can reach as high as  $42^{\circ}$  Celsius (especially during February and March) while night temperatures can be as low as  $18^{\circ}$  Celsius. The period from May to October is the wet season. During this period, the entire district comes under the influence of the Tropical Maritime Air Mass. This air mass, together

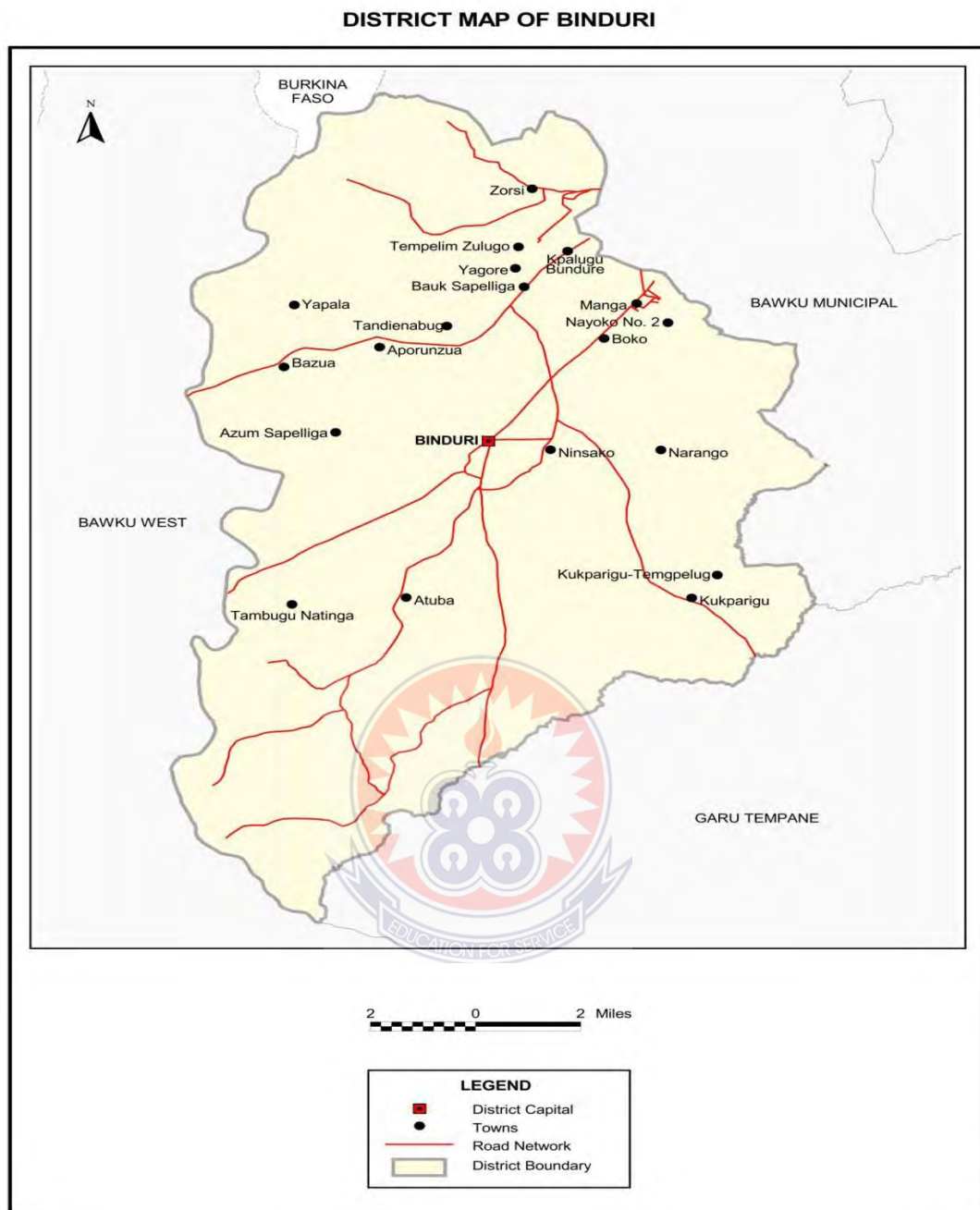
with rising convectional currents provides the district with rains. The average amount of rainfall recorded in the district is 800 mm per annum.

### ***3.1.2 Relief and Drainage***

The relief is generally low and undulating with heights of about 120 to 150 meters above sea level. However, a few parts of the district consist of series of plateaus with an average height of 400 meters. The district has its highest point located on the Zawse Hills peaking beyond 430 meters. This also marks the highest point in the Upper East Region. The district is mainly drained by the White Volta River. A few streams, dams and dug-outs can also be found in low surface land areas. Most parts of the district are not well drained especially during the wet season. The district becomes inaccessible from the regional capital and other settlements almost on an annual basis due to flooding. The opening of the Bagri Dam in neighboring Burkina Faso and the consequent overflow of the banks of the White Volta River and some of its tributaries aggravates the flooding situation in the district.

### ***3.1.3 Vegetation***

The vegetation of the district is mainly the Sahel Savannah type with scattered shrubs, short grasses and trees. Pockets of the savannah woodland vegetation can also be found in the district. The most common tree species include shea nut, dawadawa, baobab, mango and neem. The forested areas in the district can only be found along the White Volta River where the trees are protected.



**Figure 3.1: Map of Binduri District**

(Gice, 2021)

### **3.1.4 Soils**

Soils in the district are generally of the Savannah Ochrosol type. Detailed soil classification by the Savanna Agricultural Research Institute (SARI), Manga reveals four different soil series. The Varempare Series are mainly sandy loams associated with

hornblende and granites. They are quite permeable with some good level of water retention and are suitable for the cultivation of cereals and legumes. This type of soil series is found in the eastern part of the district. The Tafali Series, which have similar characteristics as the Varempare Series, are found around Binduri and its environs. The Gule and Brenyasi Series, located mostly in the valleys, are clay loams and suitable for the cultivation of rice, sorghum (naga red) and dry season vegetable cultivation (Onions and Tomatoes).

### ***3.1.5 Economy***

There are three main active sectors of the district economy namely; agriculture, forestry and fishing; wholesale and retail, and manufacturing.

### ***3.1.6 Agriculture***

Agriculture, forestry and fishing are the main-stay of the local economy accounting for about 83.9% of the economically active population. The major food crops grown are millet, sorghum, maize, rice, sweet potato, groundnuts, leafy vegetables, pepper, water melon and onion. Livestock such as cattle, sheep, goats, donkeys are also kept. Some food crops serve as cash crops and these include onions, tomatoes, and water melon. These are largely cultivated in the dry season.

## **3.2 Data Types and Sources**

The primary data was obtained and used towards achievement of objectives of this research. The primary data was obtained by administering structured questionnaire as well as interviews.

### 3.2.1 Sampling Procedure and Sample Size

The research population was small-scale pig farmers in the Binduri District, simple random sampling was used to select ten [20] communities in each district. However, snow ball's sampling method was employed to select ten [10] respondents from each community. The sample population size formula was used to selected two hundred [200] respondents to represent the sample population of small-scale pig farmers in the study area.

$$\text{Sample size} = [z^2 \times P(1-p)] / e^2 / I + [z^2 \times p(1-p)] / e^2 \times N$$

Where N= population size = 408

$$Z = Z \text{ score} = 1.96$$

$$e = \text{margin error} = 0.05$$

$$P = \text{standard deviation} = 0.5$$

$$\begin{aligned} \text{Sample size} &= [z^2 \times p(1-p)] / e^2 / 1 + [Z^2 \times P(1-P)] / e^2 \times N \\ &= [1.96^2 \times 0.5(1-0.5) / 0.005^2 / 1 + [1.96^2 \times 0.5(1-0.5)] / 0.05^2 \times 408 \\ &= 3.842 \times 0.26 / 0.0025 / 1 + [3.84 \times 0.25] / 0.0025 \times 408 \\ &= [0.961 / 0.0025] / (1 + 0.961 / 0.0025 \times 408) \\ &= 384.4 / 1.961 / 1.02 \\ &= 384.4 / 1.92 \end{aligned}$$

Sample Population Size = 200

### 3.3 Method of Data Analysis

The data were presented in Likert 5–points scale. Also, ordinal logistic regression was also used to perform logistic regression on the data. This was used in the data analysis since ordinal response variables were used in the data collection. These Ordinal variables

were categorical variables having five ordering levels, such as strongly disagreed SD, disagreed D, Undecided UD, agreed A, and strongly agreed SA.



## CHAPTER FOUR

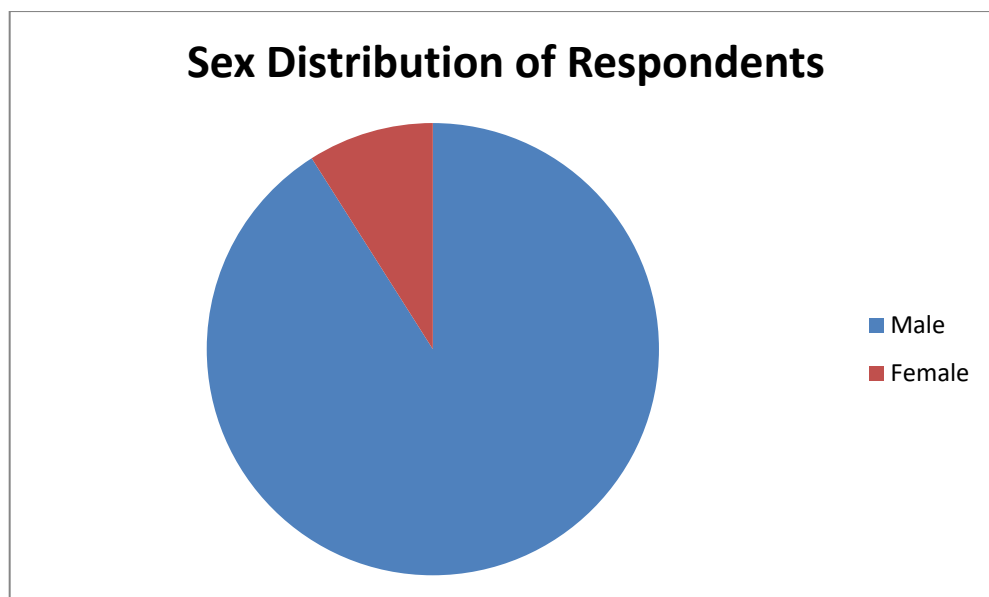
### 4.0 RESULTS AND DISCUSSION

This chapter represents and discusses the results of the analysis of the data collected from the field survey. The discussion and interpretation of the outcome of the various analysis are presented using tables and graphs.

#### 4.1 Demographics of Binduri District Small Scale Pig Farmers

##### *4.1.1 Sex Distribution of Respondents*

Out of two hundred farmers interviewed, one hundred and eighty-two (182) were males while the remaining eighteen (18), were females representing 91% and 9% respectively. This shows that quite a few females in Binduri District are engaged in small-scale pig farming. The larger number of males involved in small-scale pig farming may be due to the fact that men are heads of households and may assume ownership of most of family assets. This accounts for the reasons males are dominating over their female counterparts who are engaged in small scale pig farming in Binduri district. On the other hand, animals owned by either women or children are usually under the custody of the household family head who are mainly males. This further explains why males are far more than females who engaged in small scale farming in Binduri district



**Figure 4.1: Sex distribution of respondents**

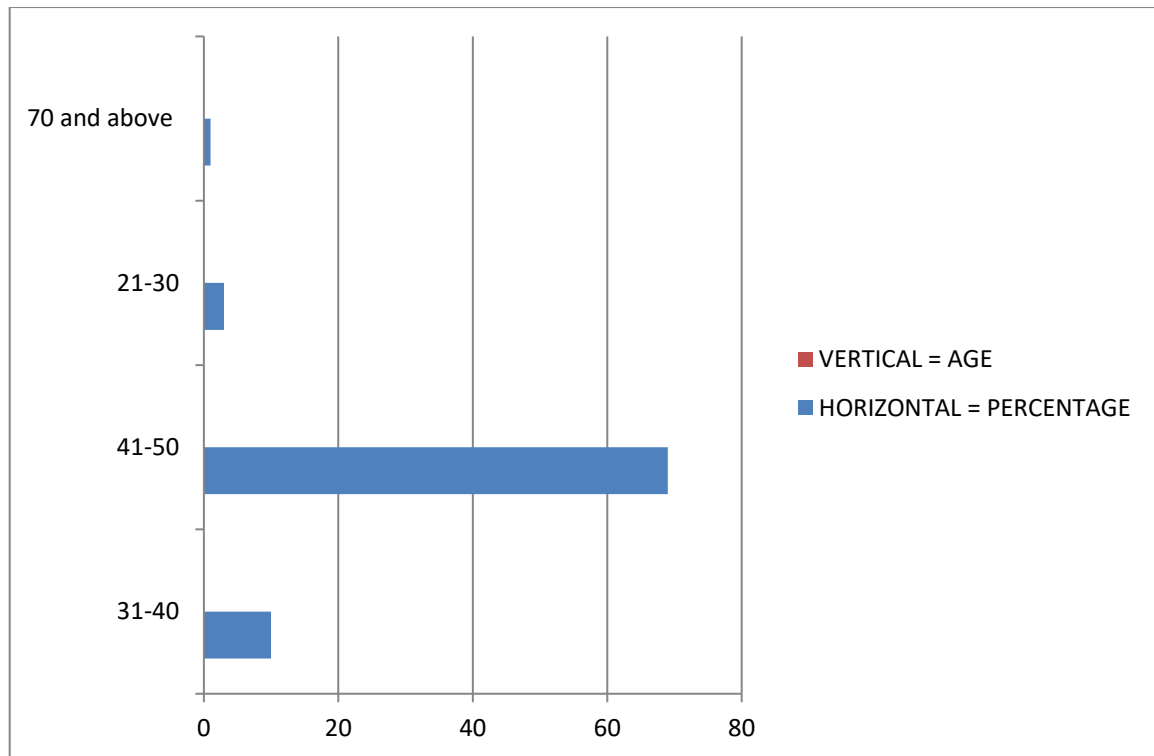
Source: Field Survey, 2021

#### ***4.1.2 Age Distribution of Respondents***

The age group (31-40) years constitutes 10% of the total number of small-scale pig farmers interviewed. Also, (41-50) years constituted 69%, (21-30) years was 3% and 70 years and above formed 1%. This indicates that the youth within the age group of (20-40) years were not actively involved small-scale pig farming in Binduri District. Policy makers and agricultural development experts worldwide have expressed worry that young people have less interest in taking up farming in rural communities (FAO, 2014).

This is of great significance because young people can contribute immensely to agricultural development in rural communities. However, the less active youth ranging from 41-50 years were into small scale pig farming in Binduri district than the more active group (20-40 years). This will affect the future development of small scale pig industries in the district negatively.



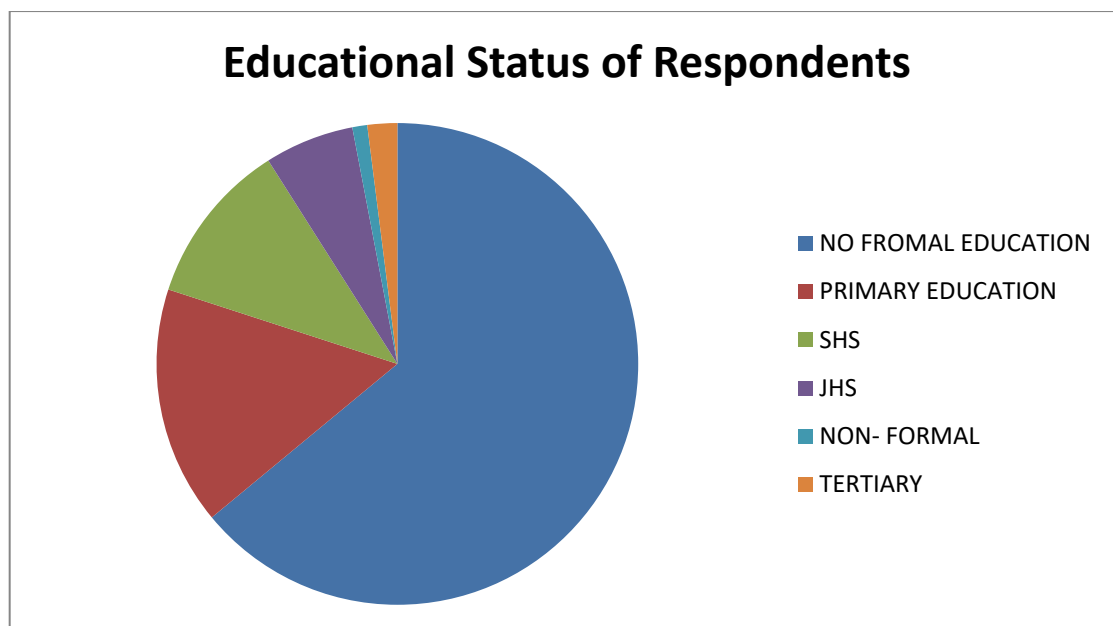


**Figure 4.2: Age distribution of respondents**

Source: Field survey, 2021

#### ***4.1.3 Educational Status of Respondents***

From the two hundred (200) farmers interviewed, 64% had no formal education, 16% had primary education, 11% and 6% completed Senior High and Junior High Schools respectively and 1% had non-formal education while 2% had Tertiary education. This implies that majority of the small-scale pig farmers in Binduri district had no formal education, hence there is need to for information on pig production practices to be made available to small scale pig farmers in their local language to improve production of pigs in the district. This agrees with Adjei et al (2015), who indicated in his study that there is the need for more information on pig production practices of local pig farmers in order to make improvement to increase productivity.

**Figure 4.3: Educational status of respondents**

Source: Field survey, 2021

#### 4.2 Farmers perception on pig production

Farmers perception on pig production is presented in Table 4.1.

**Table 4.1: Presentation of Data on Five Point Likert Scale**

S/N	QUESTIONS	SD	D	UD	A	SA	MEAN	DECISION
1	Does your level of education have significant effect on your pig production	10 (10)	30 (60)	0 (0)	66 (264)	90 (450)	3.92	Agreed
2	Does the level of training on pig farming affect production and income	0 (0)	8 (16)	8 (24)	82 (328)	100 (500)	4.34	Agreed
3	There is relationship between your pig training skills and income	30 (30)	30 (60)	20 (60)	8 (32)	90 (450)	3.16	Agreed
<b>Grand total</b>							3.81	Agreed

Source: Field survey 2021

Results displayed in Table 4.1 shows that with a mean score of 3.92 which is  $> 3.50$ , the respondents have perception that their level of education has significant impact on their production levels, with a mean score of 4.36 which is  $> 3.50$ , they also agreed that their level of training on pig farming affects pig production and income level. Then with a mean score of 3.16 which is  $> 3.50$ , the respondent agreed that there is a relationship between their pig farming skills and income they generate. All these have a grand mean of 3.81,  $> 3.50$ , thus acceptance of alternative hypothesis which states that, limited education and pig production training has significant effect on the small-scale pig farmer's income in the Binduri District of Upper East of Ghana.

**Table 4.2: Results on Religious Beliefs and Income of Pig Farming**

S/N	QUESTIONS	SD	D	UD	A	SA	MEAN	DECISION
1	Some religious beliefs have significant effect on income of small-scale pig farming	22 (22)	30 (60)	8 (24)	60 (240)	80 (400)	3.73	Agreed
2	Some religious beliefs against pork consumption have significant effect on income of small-scale pig farming.	20 (10)	40 (80)	0 (0)	80 (320)	60 (300)	3.55	Agreed
Grand mean							3.64	

**Source:** Field Survey, 2021

Data on Table 4.2 shows that with a mean score of 3.73 which is  $> 3.50$ , the respondent agreed that some religious beliefs against pigs have significant effect on pig farmer's income generation capacity in the Binduri District of Upper East Region of Ghana. With a mean score of 3.55 which is  $> 3.50$ , they also agreed that some social beliefs against pork consumption have significant effects on pig farmer's income generation in the Binduri District. All these has grand mean of  $3.64 > 3.50$ , thus, a rejection of the null hypothesis and acceptance of the alternative which states that some religious beliefs against pigs have significant effect on small-scale pig farmer's income generation capacities in the Binduri District.

#### ***4.2.1 Farmers perception on the Effect of some Religious Beliefs on Small-Scale Pig Production in Binduri District***

The coefficient of -0.0197280 for the effect of some religious beliefs on income of small-scale pig farming is the estimated change in the logit of the cumulative decision probability. Since the p-value for estimated coefficient is 0.00, indicates that some religious beliefs have significant effect on income of small-scale pig in Binduri district. Also, since the coefficient is negative, but the 0.98 odd ratio indicates that the effect of some religious beliefs tends to be more associated with pig production in the district.

Also, from the analysis above, 71.8% of pairs are concordant (71.8% pair of observations are in the same direction), 28.2% are discordant (28.2% pair of observations are in opposite directions). This suggest that 71.8% of the respondents have opinion that religious beliefs have negative effect on the income of small-scale pig farmers in Binduri district.

#### ***4.2.2 Farmers Perception on Small Scale Pig Production (SSPF) as Business in Binduri District***

Out of the two hundred farmers interviewed based on perception of SSPF as business in the Binduri Districts. 31% of respondents disagreed that SSPF is a business and 36% treated SSPF as business. From table below, 36%, 5% and 14% indicated respondents who strongly disagreed, strongly agreed and undecided respectively. Majority of the farmers representing 67% indicated that they did not consider SSPF as business rather they only rear pigs to supplement family income or give either live pigs or meat to people who assist on their crop farms.

**Table 4.3: Farmer's perception on Small Scale Pig Farming (SSPF) as business**

<b>Perception of respondent</b>	<b>Frequency</b>	<b>Percentage</b>
Strongly disagreed on SSPF as business.	72	36
Disagreed on SSPF as business.	62	31
Undecided on SSPF as business.	28	14
Agreed on SSPF as business.	10	5
Strongly agreed on SSPF as business.	28	14
Total	200	100

**Source:** Field survey, 2021

From the analysis, the farmer's perception on SSPF is the estimated change in the logit of the cumulative decision probability. Since the p-value for estimated coefficient is 0.00, show that farmer's perceptions have significant effect on income of small-scale pig farming. Though, the coefficient is negative, but the 0.99 odd ratio indicates that farmer's perceptions is also strongly associated with pig production. From the G statistic,  $G = 0.214$  and  $P\text{-Value} = 0.644$  there is sufficient evidence to conclude that at least one of the estimated coefficients is different from zero.

From the analysis above, 57.2% of pairs are concordant (57.2% pair of observations are in the same direction), 37.5% are discordant (37.5% pair of observations are in opposite directions). This suggest that 57.2% of the small-scale pig farmers in Binduri district indicated that they did not consider SSPF as business rather they only rear pigs to supplement family income or give either live pigs or meat to people who assist on their crop farms. As a result, the small-scale pig farmers give less or no care to the pigs in the district. This is in agreement with the study that reported that pigs are raised homestead animals to provide just food for household (Ganaba *et al.*, 2011).

## CHAPTER FIVE

### 5.0 SUMMARY, CONCLUSION AND RECOMMENDATION

#### 5.1 Summary

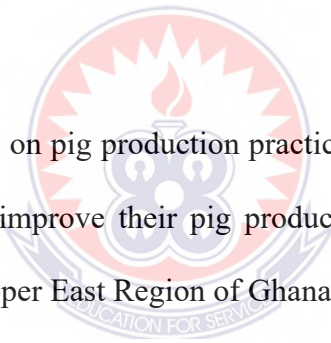
The limited education and pig production training has adverse effect on the small-scale pig farmer's income in Binduri District of Upper East Region of Ghana. From the study since the ratio of level of training (0.97) is greater than that of level of education (0.94), this shows level of training is strongly affects pig production than level of education in Binduri district. Thus, level of training is more crucial to small scale pig farmers in the district. Roelofse (2013) emphasized that, for livelihood of the small-scale pig farmers to improve, there is need for sufficient agricultural extension support and accessible credit facilities for small-scale pig farmers. Hence the need for more training on pig production practices in order to make improvement in pigs production (Ajei *et al.*, 2015). The social and religious beliefs against pigs have significant negative effect on small-scale pig farmer's income in the Binduri District. This suggest that 84.3% of the respondents in Binduri district have the views that the effect of some religious beliefs on pork consumption affect pig production. This is why pig production in the district is low compared to other livestock. Small-scale pig farming can play a major role in livelihood improvement of rural people however 57.2% of the respondents in Binduri district do not accept small scale pig farming as business. As a result, pigs are left to scavenge for food with little or no care given to the pigs which eventually affects the productivity pigs and income of small-scale pig farmers in the district. This agrees with Ezeibe (2014) who observed, that in most cases pigs are left to scavenge around vicinities with minimal attention for their lives. This system is characterized by, high mortality rate, absence or minimal healthcare, improper feeding, low meat yield and poor income to pig farmers.

## **5.2 Conclusion**

The level of training on pig production practices was the major factor that had serious negative impact on small scale pig farming and income generated from small scale pig production in Binduri district. Due to no or poor training on pig production practices offered to small scale pig farmers, had resulted to poor pig productivity and low income generated. This does not support the creation of job opportunities for the youth in the district. Hence there is need for sufficient training on pig production practices especially for small scale pig farmers in the district. This call for government, non-governmental organisation and other stakeholders develops policy interventions to improve small scale pig production in Binduri district.

## **5.3 Recommendation**

- a) Educational programs on pig production practices should be organized for small-scale pig farmers to improve their pig production skills and knowledge in the Binduri District of Upper East Region of Ghana.





## REFERENCES

- Adetunji, M.O and Adeyomo, K.E. (2012). Economic deficiency of pig production in Oyo state, Nigeria: A stochastic Production Frontier Approach, *American Journal of Experimental Agriculture* 2(3): 382-394.
- Adzitey, F. (2018). Animal and Meat production in Ghana – An overview. *J. world's poultr. Res*, 3,1-4
- Apiiga, S.Y. (2014). *Ghana: Genetic livestock improvement in Africa*; the Chronicle; Accra, Ghana
- Ayim –Akonor M. Krumakamp R, May J. Mertens E. (2020) Understanding attitude, Practices and Knowledge of zoonotic infections diseases risk among poultry farmers in Ghana,
- Ayizanga, R.. A. Kayang B.B. Adomanko, K., Asamoah, L. (2018). Rural pig production systems and breeding preferences of pig farmers in Northern Ghana. *Ghanaian Journal of Animals Science* 9(1):49-57.
- Babantunde, G.M. and Fetuga B.L. (1990). Pig production in Nigeria, possibilities and problems proceeding of Business dictionary.com (2015). What is the financial analysis? Definition and meaning.
- Banso K.E. Josephine, N.T. (2014). Economic rearing and pork production in Ghana.
- Banson, K.E Nguyen, N.C., O.J.A (2016). Systems thinking approach to the structure, conduct and performance of Agriculture sector I shame *Syst. Res. Behave. Sci.* 2016, 39-57.
- Banson, K.E., Josephine, N.T. (2014) Economic and Market analysis of swine rearing and pork production in Ghana. *J. Life sci.* 2014,8.

- Duniya, K. P.; Akpoko J. G. Oyakhilomen O. and Nandi, J. A. (2013). Measurement of pig production profitability in ZangonKataf and Jema'a Local Government areas of Kaduna state, Nigeria. *British Journal of applied & technology* 3(4): 1455-1463.
- Eze Flex John; Oti Peter A. & Odigbo Ben E. (2016). Post-ebola financial analysis of the economic fortunes of the tourism / hospitality sub-sector in cross river state, Nigeria.
- Ezeibe, A. B. C. (2014). Profitability analysis of pig production under intensive management system In Nsukka Local Government Area of Enugu State Nigeria. *Centre for Entrepreneurship and Development research university of Nigeria, Nsukka. Journal of world's poultry Research* 3(1).
- Kagira, J. M., Kanyari, P. W., Maingi, N., Githigia, S. M., Ng ' A, J. C. and & Karuga, J. W., (2010). Characteristics of smallholder free-range pig production system in Western Kenya. *Tropical Animal Health and Production*, volume 42, pp. 865-873.
- Lapar, L. & Staal, S. (2010). Competitiveness of smallholder pig production in Vietnam, improving the competitiveness of pig producers in Vietnam, Nairobi, Kenya. International livestock research institute.
- MOFA (2016) pig production. Available on line: <http://moa.gov.gh.site/?Page-id=14067>. Accessed 112/7/2021.
- Odigbo, B. E., Ogbidi, J. B. & Ewa, E. A. (2015). A situational analysis study of yam distribution strategies of farmers In Boki Local Government Area of Cross River State, Nigeria in 2015. *Journal economics and sustainable development vol.6, no. 14, p. 190-201*.

- Ogbeh, A. (2015). Nigeria releases census on goats sheep, pigs and other livestock in the country. <http://www.premiumtimesng.com/news/top-news/204577-nigeria-releases-census-goats-sheeps-pigs-livestocks-country.html>. Accessed 6/5/2021.
- Ogunbiyi, L. T. & Omotoso, O.A. (2011). Economic analysis of swine production in Nigeria: A case Study of Ibadan Zone of Oyo State. *Journal of Human Ecology*, 35(2), 137- 142.
- Okai D. B. and Boateng, M. (2011). pig Nutrition in Ghana – some Achievements, prospects and Challenges. *Vet Med. Sci*, 2020; 00:1-8. <https://doi.org/10.1002/vns.257>.
- Osei J. (2013). Epidemiology of Enterobacteriaceae Resistance and prevailing condition in pig farms in Ashanti Region of Ghana.
- Osei- Sekyere, J. and Adu, F. (2015). Current state of pig farms and factors influencing their commercialization in Ghana. A case study of Ashanti Region.
- Osho, Sulaiman A. (2011). ‘The uniqueness of African means of communication in contemporary world’ A, <http://www.africanoutlookonline.com/index.php>?Accessed 3/4/20221.
- Oti, P. A., Eze, F. J. & Bassey, A. (2016). Impact of public relations expenditure on corporate performance of commercial Banks in Nigeria. *International Journal of Innovative Research & Development*, p.65-72.
- Petrus, N. Mpofo, P., Schneider, M. B. & Nepembe, M. (2011). The constraints and potentials of pig production among communal farmers in Etayi constituency of Namibia. *Livestock research for rural development*, 23(7).

- Phengsavanh, P., Ogle, B., Stur, W., Frankow-Lindberg, B. E. & Lindberg, J. E. (2011). Smallholder pig rearing system in northern Lao PDR. *Asian-Australia Journal of Animal Science*, 24(6) pp. 867-874.
- Roelofse, J. J. (2013), Economic Feasibility study of the establishment of smallholder pig farmers for the commercial market: Empowering case study. Thesis presented in partial fulfillment of the requirements for the degree master of science in engineering (Engineering management) at the University of Stellenbosch.
- Tisdell, C., 2010. Economic Theory, Application and Issues-An economic Study of Small Pig-holders in Vietnam: Some Insights Gained and the Scope for Further Research, Australia.

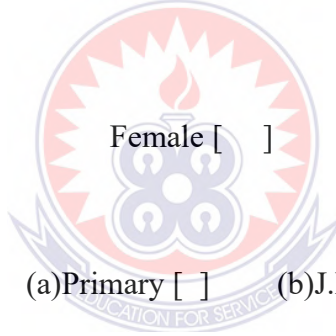


**APPENDIX**

**ASSESSMENT OF FACTORS INFLUENCING INCOME FROM SMALL-  
SCALE PIG FARMING IN THE BINDURI DISTRICT OF UPPER EAST  
REGION OF GHANA**

**QUESTIONNAIRE (FOR FARMERS)**

1. **Name of District** .....
2. **Community**.....
3. **Name of Respondent**.....
4. **Sex:** Male [  ] Female [  ]
5. **Educational Status:** (a)Primary [  ] (b)J.H. S[  ](c)S.H.S[  ](d)  
Tertiary[  ]  
(e) Others specify.....
6. **Marital Status:** (a)Single (b)Married (c)Divorced  
(d)Widow
7. **Age**..... Years.
8. **Religion**.....



**9. The level of education has effect on your pig production income.**

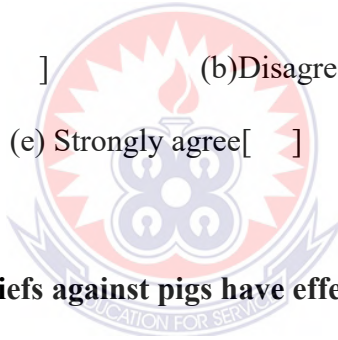
- (a) Strongly Disagree [ ]                      (b) Disagree [ ] (c) Neither [ ]  
(d) Agree [ ]                      (e) Strongly Agree [ ]

**10. The level of training on pig farming affects and income.**

- (a) Strongly Disagree [ ]                      (b) Disagree [ ] (c) Neither [ ]  
(d) Agree [ ]                      (e) Strongly Agree [ ]

**11. There is relationship between your pig training skills and income.**

- (a) Strongly Disagree [ ]                      (b) Disagree [ ] (c) Neither [ ]  
(d) Agree [ ]                      (e) Strongly agree [ ]



**12. Social and religious beliefs against pigs have effects on pig farmers' income.**

- (a) Strongly disagree [ ]                      (b) Disagree [ ] (c) Neither [ ]  
(d) Agree [ ]                      (e) strongly agree [ ]

**13. Social and religious beliefs against the consumption of pork have effects on small-scale pig farmers' income**

- (a) Strongly disagree [ ]                      (b) Disagree [ ] (c) Neither [ ]  
(d) Agree [ ]                      (e) Strongly agree [ ]

**14. Small-scale pig farming is business.**

- (a) Strongly disagree [  ]                      (b) Disagree [  ] (c) Neither [  ]  
(d) Agree [  ]                      (e) Strongly Agree [  ]

**15. Small-scale pig farming is the source of family income.**

- (a) Strongly Disagree [  ]                      (b) Disagree [  ] (c) Neither [  ]  
(d) Agree [  ]                      (e) Strongly Agree [  ]

