

PROFIT AND RISK MANAGEMENT STRATEGIES IN
SELECTED AGRIBUSINESSES IN IMO STATE,
NIGERIA

BY

OKERE, NKEIRUKA ANITA OBIANUJU B. Agric. Tech. (FUTO)

REG. NO: 20114770298

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CERTIFICATION

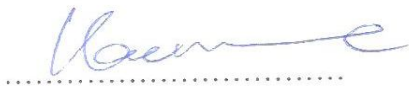
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Prof. D. O. Ohajianya
(Principal Supervisor)



Date



Prof. U. C. Ibekwe
(Co-Supervisor)



Date

.....

Prof. P. C. Obasi
(Head of Department, Agricultural Economics)

.....

Date

.....

Prof. B.O. Esonu
(Dean, SAAT)

.....

Date

.....

Prof. (Mrs) K.B. Oyoh
(Dean, Postgraduate School)

.....

Date

.....

(External Examiner)

.....

Date

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ABSTRACT

This study was designed to analyze profit and risk management strategies in selected agribusinesses in Imo, Nigeria. The methods of proportionate sampling, followed by random sampling techniques were adopted in selecting the Local Government Areas and the sample size. Data were collected with the use of questionnaire administered on 168 agribusiness entrepreneurs (87 food crops and 81 livestock entrepreneurs). The data collected were analyzed using frequency distribution, percentages, mean, variance, the ordinary least square multiple regression model and z-statistic. Results obtained indicate that the mean age of the agribusiness entrepreneurs was 47 years for food crops and 45 years for livestock, education was 9 years for food crops and 10 years for livestock and agribusiness experience was 19 years for food crops and 12 years for livestock. The net income generated by food crops and livestock entrepreneurs was ₦152195 and ₦256955 per year respectively. Production, market, financial and human risks were found to be serious risks in the study area. The major risk management strategies identified were disease control (47.4% for food crops and 66.7% for livestock agribusinesses) followed by enterprise diversification (23% food crops and 18.5% livestock). The mean variance or risk level was 23345 for food crops and 53671 for livestock agribusinesses. Results of the regression analyses showed that variables such as age, sex, household size, education, experience and farm size were significant factors influencing profit of the food crops and livestock agribusinesses. Also variables such as age, marital status, household size, education, experience and income were significant factors influencing risk level of food crops and livestock agribusinesses. The hypothesis that there is no positive relationship between the socio-economic characteristics of agribusiness entrepreneurs and the profit of the selected agribusinesses tested was rejected with respect to variables with positive coefficients, and accepted with respect to variables with negative coefficients. The hypotheses that there is no significant difference between the level of profit of food crops and livestock agribusinesses, and there is no significant difference between the risk levels of food crops and livestock agribusinesses tested were significant at 5% level which led to rejection of null hypotheses. It was concluded that both food crops and livestock agribusinesses were profitable but risky ventures and that the agribusinesses require entrepreneurs proper understanding of the risk management strategies to adopt so as to improve profit. Therefore it was recommended that government should review the system of land ownership in the State, create awareness campaign group to sensitize the citizens on the need to engage in agribusiness, provides incentives and suitable market for the agricultural products and also encourage agribusiness entrepreneurs to be educated so as to enable them adopt proper risk management strategies so that agribusiness returns can be closer to expectations.

Keywords: Profit, Agrobusiness, Risk management, Sources of risk, Risk management strategies

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Agribusiness is a generic term applied to business whose operations involve production and sale of agricultural products for profit (Ng & Siebert, 2009). According to Business Dictionary.com and Web finance (2015), agribusiness is the businesses collectively associated with the production, processing and distribution of agricultural products, which earn most or all of its revenue from agriculture. The scope of such an agribusiness can range from managing and owning farms where food crops are grown and livestock raised to producing farm tools, seed supply, food processing, packaging, and marketing, which are often associated with corporate farming (Ng & Siebert, 2009). However, for any agricultural activity to be called an agribusiness, and for that agribusiness to survive in the long run, the entrepreneur must be producing with the aim of selling and making profit. Any agribusiness that is not making profit may not be classified as viable. Profit therefore is the reward for entrepreneurship.

Agribusiness comprises of crop production; which involves production and selling of crops like cassava, maize, yam, cocoyam, plantain, millet, fruits and vegetables. Livestock production; which involves the rearing and selling of different farm animals like cow, goat, sheep, pig for their meat and other products like milk, hides and skin. Poultry keeping; which involves rearing and selling of different types of birds like chicken, turkey, guinea fowls, ducks, for their meat, eggs and feathers. Fish farming; which involves the production and selling of different types of fish like catfish, starfish, etc. There are also other examples of agribusiness that can be found in the study area, such as; Apiculture (keeping of honey bees for honey), horticulture (growing of

flowers), mushroom growing, and other agricultural support businesses which provide support services to agribusiness such as extension services and input supply for example seeds, fertilizers, drugs and machines (Stokes & Wilson, 2006).

In Nigeria, farmers and processors are among the most productive, but global supply and demand have driven prices down and evaporated profit for many commodities (Hofstrand, 2013). Also, the problem of economic efficiency in the utilization of resources has been the greatest concern of agribusiness entrepreneurs and agribusiness companies generally employ modern business strategies with the aim of earning a profit on their goods. Therefore, there is need for any agribusiness entrepreneur to address the changes in the business and improve its profit (Awoke & Okorji, 2003). Understanding the origin of risk in any agribusiness is also important to enable an entrepreneur adopt proper risk management strategies. According to Business Dictionary.com (2015), risk is a probability or threat of damage, injury, liability, loss or any other negative occurrence that is caused by external or internal vulnerability and that may be avoided through preemptive action. It is the chance or possibility that an investment's actual return will be different from that expected. Julie & wolf (2010) also defined risk as a potential negative impact to assets, investments, or profitability of investments in the agricultural industry that may arise from some present process or future events.

Risk management can be defined as choosing among alternative to reduce the effects of risk (Harwood, Heifner, Coble, Perry & Samwaru, 1999). According to the United States Department of Agriculture's Risk Management Agency, risk are categorized into; production risk (crop insurance for yield losses, pesticide purchases to control weeds and insects, and availability of water), market or price risk (variations in crop and livestock prices and costs of inputs like

fertilizer, fuel, seed, storage, transportation, labor, etc.), financial risk (interest payments on agricultural loans), legal risk (changes in government regulations and federal, state, and local taxes), and human risk (life insurance to cover impacts of death, injury, sickness, divorce, or dissolution of partnerships). Production risk occurs because agribusiness enterprise is affected by many uncontrolled events that are often related to whether, drought, physical hazard and technological failure of the firm. This risk affects the efficient conversion of input into output (Bauer & Bushe, 2003). Marketing risk is associated with the difficulties in transferring products from the farm to the market as a result of poor infrastructural facilities, and damages during the course of transportation (Aneke, *et al.*, 2007). It involves price and market uncertainty, input cost and outside forces. According to Zhang, Rockmore and Chamberlin (2007), financial risk is divided into three primary components; cost and availability of capital to finance debt and for agribusiness expansion, ability to meet cash flow needs in a timely manner and ability to maintain and grow equity. Legal risk is associated with business structure, tax and estate planning, contractual arrangements, tort liability and statutory compliance including environmental issues. Human risk is associated with personnel issues, conflict with employees, rules and regulations. Agribusiness entrepreneurs therefore need information on risk, its causes, its characteristics, its consequences on farm income and the capacity of various management strategies to reduce income risk.

Agribusiness entrepreneurs also face risk and uncertainties which can lead to unexpected decline in efficient operation of enterprise. They include; small land holding/capital, change in commodity prices, decline in crop yields or livestock production, cash flow constraints and changes in government laws and regulations. Identifying sources of uncertainties helps farmers and others to harness the most important risk management strategies such as enterprise

diversification, disease control, storage, crop insurance, contract production, credit market, informal borrowing, use of improved seeds/ breeds, savings, off-farm employment and use of new technologies for mitigating risk and aids in circumventing extreme outcome such as bankruptcy. Food crops and livestock agribusinesses are exposed to a variety of income uncertainties, both market related such as financial risk, production risk, personnel or human risk, market risk, legal risk as well as non-market related such as unstable weather patterns, pest and diseases of food crops, government policies both local and foreign (Bauer & Bushe, 2003). Hence knowledge on how agribusiness entrepreneurs make decision as well as their attitude and strategies towards risk is important in any agribusiness. This study therefore aims at analyzing profit and risk management strategies in selected agribusinesses (food crops and livestock) in Imo State.

1.2 Statement of the Problem

Agribusiness entrepreneurs face a number of difficult challenges in improving profit from food crops and livestock agribusiness in the study area. Risk which investment economists describe as the variation from expected outcome due to imperfect knowledge of investors in decision making is inherent in every form of agribusiness but more intensive in input-output relation among agribusiness productions (Kuyral, Obare, Herrero, & Waishaka, 2006). In Imo State, land holdings are small (generally less than 1ha) and often fragmented, comprising different types of land which are managed in different ways. Farm operations are being carried out manually by men, who generally are responsible for land clearing and yam cultivation, while women are responsible for most other farm operations. Livestock entrepreneurs due to inability to provide startup capital for large scale production, engage in small scale production. These problems put profit from the food crops and livestock entrepreneurs at risk.

Agribusiness entrepreneurs also deal with a significant amount of uncertainty every day. From not knowing what the weather will be like this year to wondering if market prices will increase or decrease tomorrow, agricultural producers are forced to make decisions based on imperfect information. Born out of this uncertainty is the possibility of economic loss. African agriculture is predominantly rain-fed and hence fundamentally dependent on vagaries of weather, input supply, yield, pest, diseases, weeds, seasonal change in rainfall (Obasi, Henri-Ukoha, Ukwuihe & Chidiebere-Mark, 2013). These seasonal variations affect income due to market/ commodity prices in food crops and livestock production. Food crops such as cassava (*Manihot esculenta*), yam (*Dioscorea* spp.) and maize (*Zea mays* L.) are the main crops cultivated in southeast Nigeria; other crops of importance are cocoyam, plantain, melon, and vegetables. Oil palm (*Elaeis guineensis*) has historically been an important cash crop in the area. Obasi *et al.*, (2013) identified yam, cassava, maize, vegetables and melon combination as the main crop combination practiced by farmers in Imo State. Livestock production in southeast Nigeria is limited by trypanosomiasis. The trypanotolerant West African dwarf breeds of sheep, goat and pig are the most important livestock species, both economically and numerically and they are valued as a source of meat, egg, cash and manure.

Crop destruction, seasonal variation, yield, weeds, theft, diseases, feed, housing problem, lack of veterinary care, are some problems associated with crops and livestock agribusinesses which causes decline in profit and production. Other risks such as fire outbreak, burglary or theft, kidnapping of investors/ workers for ransom, embezzlement, strike, civil commotion and change in social structure can also lead to unexpected decline in expected profit of an agribusiness. For a food crop farmer, planting seeds does not guarantee a profitable yield at the end of the crop season. Output per acre likely varies by acre and year and can be suddenly devastated due to

unforeseen weather factors such as drought, fire or frost. For example, each time a farmer plants his fields it is possible the weather will destroy his crops. Wild animals, insects and other pests can negatively affect crop production levels and weeds can choke out growing crops. Crop disease can also be a significant source of risk in crop production. These and other unpredictable factors create risk for food crop producers. Similarly, livestock and dairy producers also face risks tied to weather and wild animals or pests, for example, each time a livestock farmer purchases calves, chicks, or piglets, he can be at loss if market prices fall or disease attack, and each time a dairy producer milks cows, he risks being kicked in the face. Disease is also a very significant risk that could lead to reduced profit or, in an extreme case, the shut-down of an entire operation. Unknown or uncertain quality of inputs can also pose risks to production levels. The presence of any of these unpredictable risk factors can significantly lower profit level and lead to losses.

Agribusiness entrepreneurs face financial risks due to the cost and availability of capital to finance debt and agribusiness expansion. Poor availability of capital results from a lack of stable financial institutions, as well as weak links to capital markets and global financial systems (Zhang *et al.*, 2007). Cash flow constraints are particularly problematic because capital returns on investments can be slow and investors are often faced with a high degree of uncertainty about expected profit margins. Agriculture naturally has cash flow risks because of the seasonality of agricultural production, high upfront costs, and limited access to credit, especially among smallholder farmers who dominate Africa's agricultural sector. Lack of irrigation infrastructure and limited access to credit are commonly cited risks to smallholder farmers, however, these risks have implications for agribusiness productivity and sector development. Investors in agribusiness face financial risks due to a limited ability to maintain and grow equity.

The problems that hinder the setting up of food crops and livestock agribusinesses, especially of small ones include the unreliability of raw material supply, lack of infrastructure, poor managerial skills and not conducive policy environment for these enterprises (Robert, 2000). Food crops and livestock agribusinesses face a wide range of risks and incur several expenses in managing profitable enterprises. Helping producers manage these risks has been a stated goal of federal policymakers for decades, which has not been actualized and taxpayers spend billions of naira every year on various federal programs to this end (Julie & Wolff, 2010). This study is set out to proffer solution to many considerations of agribusiness management such as technology know-how, sources of inputs and raw materials, financing, local and international awareness of trends in agricultural market and marketing, agricultural products and by-products trends and innovations, and a degree of knowledge of policy and climate that affect the agricultural sector, since production output is the main source of revenue for agribusiness enterprises. It is therefore crucial for agribusiness entrepreneurs to analyze and adopt proper risk management strategies best suited for the food crops and livestock agribusinesses, so as to improve profit and successfully run the agribusiness.

1.3 Objectives of the Study

The broad objective of this study was to analyze the profit and risk management strategies in selected agribusinesses in Imo State, Nigeria

The specific objectives of the study were to;

- i. examine the socio-economic characteristics of food crops and livestock entrepreneurs,
- ii. identify the type of produce/ products sold by the selected agribusinesses,
- iii. determine and compare the costs and returns of the selected food and livestock agribusinesses,

- iv. determine the types of risk and the risk management strategies adopted by the agribusiness entrepreneurs,
- v. estimate the risk level associated with food crop and livestock agribusinesses,
- vi. determine the factors influencing the profit of the selected agribusinesses, and
- vii. determine the factors influencing risk levels of the selected agribusinesses.

1.4 Hypotheses of the Study

The following hypotheses were tested;

- i. There is no positive relationship between the age, sex, marital status, household size, educational level, agribusiness experience and farm size of agribusiness entrepreneurs and the profit of the selected agribusinesses
- ii. There is no significant difference between the level of profit of food crop and livestock agribusinesses
- iii. There is no significant difference between the risk levels of food crop and livestock agribusinesses.

1.5 Justification for the Study

This study on profit and risk management strategies in selected agribusinesses will bring to limelight an ever-changing landscape of weather, prices, yields, government policies, global competition and other factors that affect agribusiness financial returns and overall welfare of agribusiness entrepreneurs, since risk is an unavoidable element in the business of agriculture. It will also bring to the notice of the agribusiness entrepreneurs that Production can vary widely from year to year due to unforeseen weather and market conditions, causing wide swings in commodity prices and this risk, while inevitable, is often manageable.

The findings from this study would proffer positive suggestions for improving the financial position and equity growth rates of food crops and livestock agribusinesses by explaining some risk management strategies suitable for the agribusiness profitability. Agribusinesses generally employ modern business strategies with the aim of earning a profit on their goods. The risk management strategies will help mitigate the effects of swings in supply, demand and prices so that agribusiness returns can be closer to expectations. Agribusiness entrepreneurs' attitude towards risk can vary greatly and is a key determinant in selecting risk management strategies. A farmer with a strong aversion to risk will be willing to pay more for a given level of risk reduction than a farmer with less aversion to risk. The level of risk an individual is willing or able to bear varies with the person's financial situation, attitude toward risk, availability of other opportunities, and ease of transitioning to alternative activities. Through this study, agribusiness entrepreneurs will have knowledge on variety of strategies available to enable agricultural producers to achieve an acceptable balance between expected return and risk.

The information gathered from this study would also be useful in the formation of corporate policy, particularly, policy for safeguarding against the financial recession and also a useful reference for further research. This study shall be an addition to the body of knowledge for individuals, entrepreneurs, research institute, institutions and government who are interested in agribusiness. It will also help agribusiness entrepreneurs in decision making and in choosing appropriate risk management strategies suitable for improving profit of the agribusiness. This study will also serve as a guide to government/policy makers in taking decisions on how to boost food crops and livestock agribusinesses in the study area and Nigeria as a whole.

1.6 Plan of the Study

This study is divided into five chapters. Chapter one is introduction under which the following were discussed; Background of the study, statement of the problem, objectives of the study, hypotheses of the study, justification for the study, and plan of the study. Chapter two is literature review which comprised of the conceptual framework, theoretical literature, empirical literature and analytical framework. Under conceptual framework, the following were discussed; concept of agribusiness, profit in agribusiness, risk management in agribusiness, and sources of risk in agriculture. Under theoretical literature the following were discussed; theories of agribusiness, theories of profit and theories of risk management. Under empirical literature, the following were discussed; the entrepreneurship of agribusiness, socioeconomic characteristics of agribusiness entrepreneurs, factors affecting profit in agribusiness, factors affecting risk level of agribusiness entrepreneurs and risk management strategies. Under analytical framework, the following were discussed; measurement of profit, costs and returns, measurement of risk, regression analysis and z-statistic. Chapter three, which is the methodology, comprised information on the study area, sample selection, method of data collection, methods of data analyses, hypotheses of the study and limitations of the study. In chapter four, the result of the survey were presented and discussed, while chapter five summarized the findings, concludes the work and presented recommendations based on the findings of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Conceptual Framework

2.1.1 Concept of Agribusiness

Agribusiness can be defined as farming and the business associated with farming, such as the processing of farm products, the manufacturing of farm equipment and the supply of fertilizers (Webster's Dictionary, 2010). In other words, agribusiness refers to a chain of businesses which are directly and indirectly involved in the production, transformation and supply of agricultural products (Robert, 2003). Agribusinesses are businesses collectively associated with the production, processing, and distribution of agricultural input such as seed, feed, fertilizer, farm equipment, irrigation, livestock handling equipment and horticultural supplies. On the output side businesses involved in the post-harvest processing of vegetables, fruit, fibre, poultry and meats.. They are also farming engaged in as a large-scale business operation embracing the production, processing, and distribution of agricultural products and the manufacture of farm machinery and equipment, and supplies (Business Dictionary.com, 2015).

Agribusiness Support Fund (ASF, 2009), defines agribusiness as “all enterprises that assemble process and transform raw agricultural commodities into final products for distribution to local and international consumers”. A farm enterprise is any commercially viable agribusiness, operated primarily by individual farmers in conjunction with a bona fide agricultural, horticultural, pastoral or aqua-cultural operation and is involved in processing of raw agricultural products for human consumption or semi-processing for production of additional value added products. Activities of a farm enterprise may include secondary processing and/or retail sale of agricultural, horticultural products as well as other activities. Agribusiness integrates business management principles with the technical knowledge of the managerial challenges of the agricultural sector from actual production to consumer acceptance. As a field of study,

agribusiness is both an art and a science of managing an agricultural business enterprise (Johnson, 1990). As an art, agribusiness puts together the various skills of an individual or organization, in running a profitable venture. It is a creative undertaking that plays along with the rapid changing economic environment putting to test the risk-taking ability of an individual or an organization that engages in an agribusiness enterprise. As a science, risk-taking is backed up by an objective gathering and analysis of data and information. Current trends, production and marketing issues, human resource management and financing and accounting are logically converted into strategic business plans (Johnson, 1990). Agribusiness is a commercial activity engaged in as a means of livelihood or to earn profit. As such, like any commercial enterprise, agribusiness is expected to make money, or create desired impact; otherwise, there is no sense in getting into the business.

Agribusinesses are businesses whose operations involve production and sale of agricultural products for profits. An example of agribusiness include food crop, livestock, piggery and poultry farms etc., and those who provide support services and inputs like agricultural extension services. However, for any agricultural activity to be called an agribusiness, it must be producing with the aim of selling and making profit. The scale or size of operations of agribusinesses is very wide. A village youth who grows tomatoes for sale in the nearby market is practicing agribusiness. On the other hand, a large tea plantation that covers a very big area and employs very many workers is also in agribusiness. Furthermore, a zero grazing farmer who keeps one or two cows producing milk for sale and a farmer with many dairy cows are all in agribusiness. In essence, agribusiness consists of all industries of food production; ultimate end-user is the consumer, with marketing as the driving force behind all profitable activities.

2.1.2 Profit in Agribusiness

Profit is the primary goal of all business ventures. Without profit, a business will not survive in the long run. Profit is one of the most important measurements in determining the health and success of a business. Profit is a financial benefit that is realized when the amount of revenue gained from a business activity exceeds the expenses, costs and taxes needs to sustain the activity. It is calculated by total revenue minus total expenses. According to Odii (1998), Profit is the naira value which is found calculating net farm income. Oxford advanced learner's dictionary (2015), defined profit as a financial gain, especially the difference between the amount earned and the amount spent in buying, operating or producing something. In economics, however, the term has a precise meaning. Profit may be defined as the net income of a business after all the other costs; rent, wages and interest etc., have been deducted from the total income (Tushar, 2015). Profits are, therefore, uncertain and vary from person to person and from firm to firm. They may become zero, when costs are equal to income, and if the costs are higher, profits may actually be converted into loss. If we deduct from gross profits the above items, we shall get pure or net profits. Pure profit is the reward of entrepreneurial functions. It is what an entrepreneur gets purely as an entrepreneur. What he gets as a landlord, manager or capitalist is deducted from the total profits. Hence, pure profit is an amount which accrues to the entrepreneur for assuming the risk inseparable from business. It is a reward for assuming the final responsibility, a responsibility which cannot be shifted to anybody else. The entrepreneur is entitled to the following different kinds of payments which form a part of his net profits.

a) Reward for risk-taking: Every business faces some risk of loss, but the risk of loss from market-fluctuations has to be borne by the entrepreneur himself, and he will shoulder it only when he has hopes to be paid for it.

b) Reward due to a monopolistic position: A particular entrepreneur may earn extra income due to his control in the market over the entire supply of the commodity he produces.

c) Reward for better bargaining: If a business man is skillful in making bargains, he earns more.

d) Windfalls: A sudden change in market conditions may bring in a large gain just by chance.

Any business entity that is involved in agriculture directly or indirectly for the purpose of making profit can be termed agribusiness. In other words, the meaning of agribusiness is the production of agricultural products (crops and livestock), processing of agricultural products and rendering of agricultural services since a business can exist as either the production of goods or rendering of services with the sole aim of making and maximizing profit. Profitability measures how well agribusiness enterprise is making use of its capital by investing in resources that make goods and services that generate profit. It is measured with income statement, which is made up of income and expenses of the enterprise in a year. Income refers to money generated from the activities of the business while expenses are the cost of resources used up or consumed by the activities of the business. Income statement is essentially a listing of income and expenses during a period of time (usually a year) for the entire business activity (Hofstrand, 2013). Every agribusiness is most concerned with its profit. One of the most frequently used tools of financial ratio analysis is profitability ratio which is used to determine the business bottom line and its return to its investors. The profitability analysis makes use of the income statement to compute the profit and loss of the farm by looking at the returns of various resources used.

2.1.3 Sources of Risk in Agriculture

The United State Department of Agriculture's Risk Management Agency (USDARMA) has defined five primary categories of risk in a publication entitle "An introduction to Risk Management", as production risk, marketing risk, financial risk, legal risk and human risk. According to Sarah (2009), of the department of applied economics, Utah State University in a publication entitle "Understanding Agricultural Risk" also states that agricultural risk can be separated into five general risk categories namely; Production risk, Marketing risk, Financial risk, Legal risk, and Human risk. The first step to successfully managing risk is to understand and recognize the sources of risk.

a) Production Risk: Agricultural production implies an expected outcome or yield. Variability in expected outcome affects or poses risks to the ability to achieve expected financial goals. The yield of crops and livestock vary from season to season, due largely to natural factors over which the factor often has little control (Harwood *et al.*, 1999). Such variations are often marked with vagaries of the climate. Agricultural producers are in the business of production, which is taking certain inputs and transforming them into outputs (these outputs are hopefully worth more than the sum-value of the inputs), (Sarah, 2009). Some manufacturing companies have the luxury of knowing exactly how many outputs can be produced with a specific number of inputs. Farmers do not have that luxury. In agriculture, production is riddled with risks that can negatively affect production levels and lead to significant losses.

The major sources of production risks are weather, pest, insect damage, weed competition, disease and interaction of new technology with other farm and management characteristics, genetics, machinery efficiency, and the quality of inputs (Baloyi, 2010). Natural factors also cause variation in inputs from season to season such as labour and machinery use on arable farms. Other inputs such as fertilizers, sprays and supplementary foods for gracing livestock also

vary. For a crop farmer, planting seeds does not guarantee a profitable yield at the end of the crop season. Output per acre likely varies by acre and year and can be suddenly devastated due to unforeseen weather factors such as drought, fire or frost. Wild animals, insects and other pests can negatively affect crop production levels and weeds can choke out growing crops. Crop disease can also be a significant source of risk in crop production. These and other unpredictable factors create a very real risk for crop producers. Similarly, livestock and dairy producers must face risks tied to weather and wild animals or pests. Disease is also a very significant risk that could lead to reduced production or, in an extreme case, the shut-down of an entire operation. Unknown or uncertain quality of inputs can also pose risks to production levels (Sarah, 2009). The presence of any of these unpredictable risk factors can significantly lower production levels and lead to losses. Since production output is the main source of revenue for agricultural operations, it is crucial for agribusiness entrepreneurs to recognize and manage production risk.

b) Marketing Risk: Closely tied to production risk is marketing risk. Marketing risk which could also be referred to as price risk, deals with uncertainty about commodity prices and the possibility of a change in prices that would adversely affect the farmer, (Sarah, 2009). Marketing is that part of a farm business that transforms production activities into financial success. Agricultural producers have little control over the market forces that drive commodity prices. Marketing risk is the difficulties in transferring products from the farm to the market as a result of poor infrastructural facilities and damages during the course of transportation. It involves price market uncertainty, input cost and outside forces. Outside forces that affect prices and market risk are; weather, action of foreign government, farm programs, regulation, embargoes trade tariffs. Unanticipated forces such as weather or government action can lead to dramatic changes in crop or livestock prices. As agriculture moves towards a more global market, these

forces are understood; they can become important considerations for the skilled marketer. Production levels and market supply and demand changes can cause large and unforeseen swings in prices. Furthermore, increasing global interaction in commodity markets and governmental influences add to the uncertainty surrounding market prices. Changes in consumer incomes, the strength of the economy, government trade and energy policies and exchange rates all affect demand for commodities and, by extension, commodity prices. These and other unpredictable factors make price forecasting a difficult and volatile practice. Since input prices translate to costs for farmers and output prices translate to revenues for farmer, unfavorable prices on either side can be devastating to an agricultural operation. It is therefore imperative for farmers to manage marketing risk both on the input and the output side in order to maintain long-term profitability.

c) Financial Risk: The increased use of borrowed capital leaves the operator vulnerable to not having enough cash to meet obligations or not having access to credit. Financial risk develops from regular business activity which include; cost and availability of debt capital, ability to meet cash flow needs, capability of operating additional equity (Miller, 2008). Other financial risk can be attributed to poor planning, failure to maintain, control of operation, lack of financial understanding, the possibility of losing lease on land and the ultimate disaster which is bankruptcy. Typical financial obligations include; production expenses such as cash input costs, cash lease payments, debt payments, property taxes, insurance and family living expenses. Zhang *et al.* (2007) categorized financial risk for agricultural investors into three primary components; firstly, investors face financial risk due to the cost and availability of capital to finance debt and business expansion. The low availability of capital results from a lack of stable financial institutions as well as weak links to capital markets and global financial system. Secondly, due

to the ability to meet cash flow needs in a timely manner, agribusiness investors face risk related to the uncertainty of investment to returns and unreliable cash flow. Cash flow constraints are particularly problematic because capital returns from investments can be slow and investors are often faced with high degree of uncertainty about expected profit margins. Further, agriculture naturally has cash flow risks because of seasonality of agricultural production, high upfront costs and limited access to credit, especially among small holder farmers. However, these risks have implications for agribusiness productivity and sector development. Thirdly, investors in agribusiness face financial risks due to a limited ability to maintain and grow equity. Production and marketing risk also contribute to financial risk, relating directly to cash flows and the ability to secure and repay loans necessary for operation. Since production levels and commodity prices produce the revenue with which farmers can meet financial obligations, it is significant to recognize how interrelated these different types of risks are, and to make managing these risks an important priority.

d) Legal Risk: Many of the day-to-day activities of agribusiness involve commitments that have legal implications. Production practices must conform to environmental laws and noncompliance could result in significant penalties or a law suit. Understanding these issues can lead to better risk management decisions. The legal issues most commonly associated with agriculture fall into four broad categories: appropriate legal business structure and tax and estate planning, contractual arrangements, tort liability and statutory compliance including environment issues. Business structures have many forms which are; corporations, limited partnership, limited liability companies, partnership, sole proprietorship and trusts (Johnson, 1990). They all have an effect on income and property taxes, estate planning and transfers. Structural issues which are the first legal issues that many agribusiness firm encounters include the nature of the entity under

which the business is to be operated and often through lack of attention, sole proprietorship is automatically chosen. Income and property tax consequences at local, state and federal levels vary significantly, depending upon the legal entity chosen. Some structures lend themselves to the avoidance of estate tax and the ease of administration during probate. Contract arrangements in agriculture take many forms and are part of day-to-day management of most agricultural businesses. A contract is any agreement (written or verbal) where the parties exchange mutual promises in return for some sort of consideration or benefit (Ng & Siebert, 2009). The five types of contracts that can affect the legal risk are; financial agreements, such as promissory notes and mortgages, lease and crop share arrangements, federal program agreement, insurance instruments and labour. Tort Liability arises from the negligence or intentional infliction of damage to a person or to property, to farm injury and farm discharges, non-intentionally known farmstead hazards. Tort liability law is primarily concerned with compensation to someone injured or damaged by a wrongful act or omission. Damage done to person or property of tort liability is commonly insured under a general liability insurance policy. The simplest type of tort liability arises where someone is injured on a farm which can seriously cause negative personal financial and emotional results.

In recent years, tort liability has broadened significantly, to include what may be classified as employment torts, such as wrongful discharge. Statutory obligations or compliance is defined as meeting regulations imposed by government agencies on business operation. Statutory compliance risk arises from the failure to follow regulations governing the operation of your business. It involves tax reporting and payment obligations, wage and workers safety, non-discrimination, pesticide/herbicide use regulations, federal programme compliance. Although many in agriculture are not fully aware of their legal obligations, failure to comply may have

serious consequences in terms of fines, penalties and abatement. In environmental liability, pollution laws are a major concern for farmers. The pollution policies that are available contain unique characteristics that are unfamiliar to farmers. Beyond having the proper liability coverage as protection, farmers must be prepared to deal with possible criminal prosecution by state and federal agencies for environment events. Managing these legal risks, as well as the other types of risks, is vitally important to the success and longevity of agricultural operations and should be of high priority to agricultural producers.

e) Human Risk: Human Risk may arise when business activities require working with other people. Workers who understand why and how decisions are made and exactly what their responsibilities are will see opportunities for the organization and for themselves inside the organization. Human resource management is best viewed as a process. Seven functions describe that process. They are; job analysis and job description, hiring, orientation and training, employer/employee interaction, performance appraisal, compensation and discipline. Whenever people are involved with any type of business, significant risks are introduced (Sarah, 2009) and agricultural operations are no exceptions. The possibility of death or disability of an owner, manager, or employee can easily threaten the survival of a farming enterprise. Divorce can also have a significant negative effect on the continued existence and profitability of an operation. Additionally, finding and training new employees and keeping good ones is a significant source of human risk for agricultural producers.

Sickness and injury can considerably hamper farm production and profitability. Similarly, the interaction of employees with each other, managers, and owners introduces another significant level of human risk in farming operations. While not as obvious as other types of risks, these human risks cannot be ignored and must be recognized and managed if the farm enterprise is to

be successful (Bauer & Bushe, 2003). Formalizing planning and management can improve safety performance and reduce legal risks arising from employee relationships. These would but are not limited to personnel issues, such as; hiring and/or firing employee, injury, illness or death, changing personal or operational objectives and marital statute. The labour risk one should become familiar with include; work that is not done, work done poorly or not on time, hire indirect labour costs can be incurred, potential conflict with employees, laws and regulations. Every manager's job description should have explicit risk management duties and delegations of power and authority to manage those risks. Identifying risks and strategies for managing those risks, is an important part of business planning which can give employee confidence in their own long term future with the agribusiness.

2.1.4 Risk Management in Agribusiness

Risk can be defined as the chance of loss or an unfavorable outcome associated with an action. Uncertainty being that one does not knowing what will happen in the future, the greater the uncertainty, the greater the risk. For an individual farm manager, risk management involves optimizing expected returns subject to the risks involved and risk tolerance. Risk is what makes it possible to make a profit. If there was no risk, there would be no return (Baloyi, 2010). Risk which investment economists describe as the variation from expected outcomes due to imperfect knowledge of investor in decision making is inherent in every form of enterprise but is more intensive in input-output relation among agribusiness producers (Kuyrah et al., 2006). Risk is an unavoidable element in the business of agricultural production which can vary widely from year to year due to unforeseen weather and market conditions, causing wide swings in commodity prices, but risk while inevitable is often manageable (Jack, 2000).

Management is a built-in function of agribusiness. Management is essentially a decision-making process based on information and experience, in order to achieve desired goals and objectives. Agribusiness management therefore is a dynamic decision-making process revolving around an agricultural business. Whether the business is a farm with family operation or an enterprise with hundreds of employees, agribusiness takes into consideration an individual's or organization's ability to receive and process information in order to devise competitive strategies that would lead to a profitable and sustainable undertaking, amidst the rapid changes in the economic environment. Risk management in agribusiness involves choosing among alternatives for reducing risks that threaten the economic success of a farm business. The responsibility to manage risks has been placed with the agricultural producers and is truly the producer's freedom to farm or fail (Harwood et al., 1999). Risk management is the process of measuring or assessing risk and then developing strategies to manage the risk. The array of risk management strategies available to farm operators include crop diversification, controlling cash flow, production contracting, forward pricing and acquiring crop, revenue insurance, market development and access, irrigation and intensification of farming, and development of financial and social capital (Miller, 2008). Risk management is in general, finding the combination of activities most preferred by an individual farmer to achieve the desired level of returns and an acceptable level of risk (Jack, 2000). Using risk management does not necessarily avoid risk altogether but instead balances risk and return consistent with a farm operator's capacity to withstand a wide range of outcome. In risk management, it is important to understand; risk event(s), risk exposure and the cause(s) of the risk. Then the risk mitigation strategies that can be taken are; to accept the risk, avoid or eliminate the risk, transfer the risk to another party or control the risk. Risk that is not understood or properly assessed hinders or squanders an investment opportunity, which

has been a weakness in rural investment (Sarah, 2009). Addressing problems of risk and vulnerability within an agricultural production and marketing system requires an agribusiness entrepreneur understanding of the cross-cutting issues and multiple approaches to managing risk.

2.2 Theoretical Literature

2.2.1 Theories of Agribusiness

In 1957, John Davis and Ray Goldberg, two Harvard Economists, coined the term “Agribusiness”. They believed that the concept of agriculture as industry had, in 1957, already existed for over 150 years when a typical family would not only grow and raise food but also produce and use the means necessary for this production i.e., draft animals, tools, fertilizers, processing and retailing. In other words, agribusiness encompasses all enterprises that take place inside and outside the farm gate, bringing products from the field to the consumers. Agribusiness consisted not only of food production by itself, but included other processes such as generation or acquisition of production inputs, use of farm produce in different forms through processing and trading of farm products. Hence, there began a “specialization” into different aspects of the agricultural industry process. However, each of these parts relies on the entire process, such that, one cannot function without the rest. Goldberg and Davis defined agribusiness in 1957 as "the sum total of all operations involved in the manufacture and distribution of farm supplies; production operations on the farm, the storage, processing and distribution of farm commodities and items made from them. Agribusiness, therefore, literally includes all enterprises derived “from and around” agricultural production. The emphasis on the phrase “from and around” connotes a whole range of possibilities from the production of farm inputs (including farm equipment and machineries), until commodities in their various forms, reach the end consumers.

Agribusiness encompasses many aspects of the economy, including food crops and livestock producers, businesses that provide supplies and services to the producers, businesses that add value to agricultural products (processors), and those that facilitate the marketing of agricultural products. Agribusiness management research draws on a wide range of disciplines, which is consistent with the applied nature of the field and the diversity of levels of analysis and problems that are of interest to the profession. Goldberg's Agribusiness Commodity System approach is an example of the multidisciplinary nature of the profession. For him, no problem at any functional level of the value added food and fiber chain could be understood, evaluated, researched, or acted upon without looking at the total agribusiness system. A complementary view of the multi-theoretical nature of the problems that our profession is required to address was offered by Cook and Chaddad who explained about the diversity of theories required for getting all the levels of the Agri-food system right. They concluded that the competence and governance literature underpin agribusiness management research. The three behavioural theories used in agribusiness research are;

a) Theory of Reasoned Action (TRA): Fishbein and Ajzen (1975, p. 511) argued that attitude and subjective norm indicate intention, all of which are said to be “the primary determinants of behaviour”. The TRA therefore posits that intention is the mediating variable between attitude and subjective norm to predict any given behaviour of an individual. The theory takes its name from a critical assumption the authors make, that is, “human beings are usually quite rational and make systematic use of information available to them.” It also needs to be explained that this theory is based on determining the influences on an individual, and that a person acts with thoughtfulness and rational motives.

b) Theory of Planned Behaviour (TPB): The addition of this new construct was borne from criticism that the TRA failed to account for behaviours associated with incomplete volitional control (Ajzen 1991, Madden, Ellen & Ajzen 1992). In essence, the theory uses knowledge of attitudes, subjective norms and perceived behavioural control to understand beliefs and thus predict behaviour. It is important to note that the TPB uses perceived behavioural control to predict behaviour in two ways: through motivational factors and the intention to perform the behaviour via the 'Intention' construct and also through actual control via the direct link between the 'Perceived behavioural control' and 'Behaviour' constructs which is not mediated by intention.

c) Diffusion of Innovations: Diffusion is defined by Rogers (1995, p. 5) as “the process by which an innovation is communicated through certain channels over time among members of a social system.” It has successfully been applied in rural contexts since the 1940s with the focus being on the uptake of agricultural innovations such as herbicides, hybrid seed and fertilizers (Rogers, 1995). Diffusion differs from adoption in that it is the process by which new technologies are spread among users whereas adoption is said to be an individual, internal decision. Rogers (1958 & 1995) and Fliegel (1993) refer to the seminal research by Ryan and Gross (1943) who studied the diffusion of sowing hybrid corn by Iowa farmers in the USA. It was this research that provided the fundamental characteristics of the theory: the classic “diffusion of innovations” paradigm. This study promoted the significance of communication as a construct in the diffusion model and provided the generic bell-shaped and sigmoid curves of adoption on which a plethora of rural sociology research has been based.

2.2.2 Theories of Profit

Several theories have been put forward by way of explanation of profit, they includes;

a) Hawley's risk theory of profit: F. B. Hawley offered his "risk theory of profit" in 1893. According to Hawley, risk in business arose from product obsolescence, a sudden fall in prices, superior substitutes, natural calamities or scarcity of certain crucial materials. Risk taking was an inevitable component of dynamic production and those who took risk in business had a right to a separate reward known as "profit". According to Hawley, profit is the price paid by society for assuming business risk. A businessman would not take a risk without expecting compensation in excess of actuarial value i.e., a premium on calculable risk. The reason that expected profit must be more than actuarial risk is the assumption that risk gives rise to dis-utilities of various kinds. Therefore, assuming risk gives the entrepreneur a claim to a reward in excess of the actuarial value of the risk. Hawley stated that profit was composed of two parts: one part represents compensation for average loss incidental to the various causes of risk and the other part represents an inducement to suffer the consequences of being exposed to the risk. Hawley believed that profits arose from factor ownership as long as the ownership included risk. If the entrepreneur avoided risk by insuring against it, he ceased to be an entrepreneur and should not receive profits. According to Hawley profit arose out of uninsured risk. The uncertainty ends with sale of the entrepreneur's product. Profit thus is a residue. Hawley's theory is also known as the "residual theory of profit"(Rjwilmsi, 2012). Most people do worry about the risk which makes them hesitate to take a plunge in business. The greater the risk, the higher must be the expected gain in order to induce them to start the business. All businesses are more or less speculative, and unless the risk-taker is going to be amply rewarded, business will not be started. As risk acts as a great deterrent, the supply of entrepreneurs is kept down, and those who do take the risk earn much more than the normal return on capital. Hence profits are regarded as a reward for risk-taking or risk-bearing.

The theory of profit is associated with F. B. Hawley's name. He says, profit is the reward for risks and responsibilities that the undertaker subjects himself to. Drucker mentions four kinds of risks: replacement, risk proper, uncertainty and obsolescence. Replacement, generally known as depreciation, is calculable and is counted as a cost. Obsolescence is the least calculable but is also an item in the costs. Risk proper (i.e., risk of marketability of the product) and uncertainty are not costs in the conventional sense, but are charges against profits: They may be called costs of staying in business. Physical risks like fire accident, etc., can be provided against by insurance, and are, therefore, included in costs. There are, however, risks that cannot be foreseen, and hence cannot be provided against. It is for undertaking these risks that an entrepreneur is rewarded. According to Prof. Knight, it is uncertainty-bearing rather than risk-taking which is the special function of the entrepreneur and leads to profit. The term 'risk' is applied to those dangers which can be known and foreseen. The entrepreneur gets remuneration for bearing uncertainties (unforeseeable risks) and nothing for the risks which have been foreseen, the incidence of which is on insurance companies. Just as waiting (capital) is a factor of production, uncertainty-bearing has also been given the status of a factor of production. Like other factors of production, uncertainty-bearing has a supply price, i.e., unless a certain return is expected, no entrepreneur will be induced to face the uncertainty. Profit is necessary to induce the businessman to take risks rather than play safe, no sane person would think of investing in a manufacturing industry for a return of 6 percent if he can get that return on a government security. He would expect a much higher rate because of the greater risk of a possible loss. The greater the risk, the higher must be the expected gain in order to induce an entrepreneur. However, it is not every risk that can account for the emergence of profit. According to Prof. Frank H. Knight, risks inherent in any business are of two types; insurable and non-insurable

risks. Those risks which can be calculated statistically and, thus, insured with an insurance firm are of two kinds: Risks of loss of property due to earthquakes, fire, flood and other natural calamities, and Risks of dishonesty such as loss due to theft, robbery, burglary, etc. These insurable risks are not the responsibility and worry of the organizer, because by paying insurance premium he is relieved of this worry. Thus, insurance premium becomes a definite part of the entrepreneur's cost of production and, hence, enters into price.

However, there are certain non-insurable risks of modern business which are not capable of being reduced to statistical measurement and are not borne by insurance companies. These risks must necessarily be borne by the entrepreneur himself, if he has to carry on production. These non-insurable risks are; Risks of competition which arise when more rivals enter the industry or because of development of some new and competitive products. Technological risks which arise from the possibility of newly installed machinery becoming obsolete due to the discovery of new and economical processes of production. Business cycle risks which arise because of the occurrence of business depressions when prices fall much more than costs and the risks which arise from government action such as price control, tax policy, import and export restrictions, etc., which may result in profits or losses. The above risks mentioned are not insurable with any insurance company because there is no way of calculating the probability of particular events, occurring, and hence, are undertaken by the entrepreneurs themselves. These non-insurable risks are called "uncertainties" by Prof. Frank Knight. In his opinion the term risks should be applied only for those risks which are known and foreseen and, in principle, insurable. Profit is an award for undertaking and managing uncertainties of business. Knight has advanced the well-known theory that pure economic profit (whether positive or negative) is related to uncertainty. The

investor who outguesses the market makes a profit with certainty. Another investor might make a loss because his guess turned out to be worse than that of the market.

b) Rent Theory of Profit: The Rent Theory of Profit was propounded by an American economist F.A. Walker. He was the first to introduce a distinction between a capitalist and an entrepreneur into English economic theory. An entrepreneur need not be a capitalist. He is a person who may undertake a business without using any of his own capital. Walker regards profit as rent of ability. Just as there are different grades of land, there are different grades of entrepreneurs. The least efficient entrepreneur, who must remain in the field of production to meet the current demand, just recovers his cost of production and nothing besides. Above him are entrepreneurs of superior ability. Just as rent arises because of the differential advantage enjoyed by superior land over the marginal land, similarly profit also is the reward for differential ability of the entrepreneur over the marginal entrepreneur or the no profit entrepreneur. Profit is thus like rent and, like rent it does not enter into price. Wages of management are not profit. The marginal employer only earns the wages of management, and no more. With a slight unfavorable turn of prices or costs, he would prefer to work as an employee rather than as an employer. Wages of management thus must be paid to keep up the given supply of entrepreneurs. Such wages thus enter into price.

c) Dynamic Theory: This theory is associated with the name of J. B. Clark, who is of the opinion that there can be no profit in the static world where size and composition of the population, the number and variety of human tastes and desires, techniques of production, technical knowledge, commercial organization, etc. remain constant. In a world like this, everything is known and can be accurately foreseen. There is no risk, and hence no profit. Costs and selling price are always equal, and there can be no profit beyond wages for the routine work of supervision, but we are

not living in a stationary state. Ours is a dynamic world and some changes are constantly taking place. The clever entrepreneur foresees these changes, he is a pioneer. Somehow by invention or otherwise, he lowers the cost of production and makes profits. The changing world offers limitless opportunities to the far-sighted, daring and clever entrepreneurs to make profits by turning the facts of the situation in their favour. It is only because the world is dynamic that it is possible for them to keep the lead and reap the profits. In a static state, profits will disappear, and the entrepreneurs will only earn wages of management.

d.) Innovations Theory: It is the dynamic changes which give rise to profits according to the dynamic theory of profits. American economist Joseph Schumpeter has singled out for special treatment played by innovations. The daring and the dynamic entrepreneurs continue to hit at one innovation or another, keeping their business ahead of others and thus making handsome profits. Innovation refers broadly to any purposeful change in production methods or consumer tastes that increases national output more than it increases costs. The increase in net output is the profit that comes from innovation. It includes not only new products such as synthetic fibers but also new organizations, new markets, new promotion and new raw materials. It may also include a new way of doing old things or a different combination of existing methods to accomplish new things. To an important degree, innovation has been built into the competitive system with research laboratories and advertising staff. There is an important distinction to be made between invention and innovation. Invention is the creation of something new whereas innovation is the application of an invention to business use. Many inventions never become innovations. The innovation theory of profit is associated with Schumpeter.

The innovator is one who turns a new idea or invention into a commercial proposition. Many try to do this, but only a few succeed. Those who do earn high profits by bringing their new,

revolutionary product into the market, do so because the public is attracted by the new and apparently superior product and is willing to pay the innovator a high price for it. Thus, the innovator reaps the profits of innovation. According to Schumpeter, the function of the entrepreneur is to create innovations, and profit is a reward for performing this important function. Schumpeter has given the term 'innovation' very wide meaning. Discovery of a new material or a new technique of production resulting in a lowering of the cost of production or improving the quality of the product is an innovation. Any new measure or new policy initiated by the entrepreneur comes under innovation in the sense in which Schumpeter uses. The term "Innovations" may be of two types; those which change the production function and reduce the cost of production, and those innovations which stimulate the demand for the product, i.e., which change the demand or utility function. In the first type are included the introduction of new machinery, improved production techniques or processes, exploitation of a new source of raw material or a new and better organizational pattern for the firm. The second type of innovations are those which are calculated to increase the demand for the product by introducing a new product or a new variety of an old product, new and more effective mode of advertisement, discovery of new markets, etc. Success of any of these innovations brings a handsome increase in profits.

The monopolist is able to control output so that the price is not allowed to fall to the level of cost, as is the case under competition. By restricting entry of new firms into business by means of agreements and through the use of patent rights and similar devices, monopolists are able to reap monopoly profits. The most common source of monopoly profit lies in monopolistic competition or product differentiation. Where a firm possesses monopoly power, it can restrict output and obtain a higher profit than what it could under competitive conditions. Profit is the

result of contrived scarcity. It can exist only in an imperfect market where output is, for various reasons, restricted and the consumers are deprived of the opportunity of alternative sources of supply. Sources of such power are usually found in legal restrictions, sole ownership of raw-materials or sole access to particular markets. Even some degree of uniqueness in a firm's product confers some monopoly power. Contrived scarcity must be distinguished from natural scarcity. Natural scarcity exists in the supply of central urban building sites or high grade farm lands (Smriti, 2015). These earn rents rather than monopoly profits, since practically nothing can be done to alter their supply. An element of monopoly profit is traced in what have been called innovation profit or pioneering profit. A firm which produces a new product, or is able to discover a new material or a cheap process or a new market, will always be able to make extra gains, till its rivals make an inroad into its business. The ability of the monopolist to enjoy monopoly power and make profit depends ultimately on the restrictions they are able to impose on the entry of the new firms (Smriti, 2015).

No one of these theories is necessarily correct. All are in some sense complementary, since uncertainty, innovation and monopoly are factors which affect every business in its profit earning capacity and hence in its policy decisions. To a businessman, knowledge of profit theories is quite useful because they throw light on the three important factors giving rise to profits and, thus, enable the phenomenon and quantum of profits in a firm to be examined in a proper perspective. In practice, as pointed out by Peter Drucker, profit serves three main purposes:

1) Measure of performance: It measures the net effectiveness, and soundness of a business effort. A higher profit is an indicator that the business is being run successfully and effectively. It is true that profit is far from being a perfect measure of business efficiency but it is probably

the best indicator of the general efficiency of a firm. It is certainly the only one which allows quick and easy comparison of performance between firms.

2) Premium to cover costs of staying in business: Profit is the premium that covers the costs of staying in business, replacement, obsolescence, market and technical risk and uncertainty. Seen from this point of view, it may be argued that there is no such thing as profit; there are only the costs of being and staying in business. The management of business has to provide adequately for these costs by generating sufficient profit.

3) Ensuring supply of future capital: Profit ensures the supply of future capital for innovation and expansion, either directly, by providing the means of self-financing out of retained profits, or indirectly, through providing sufficient inducement for new external capital which will optimize the company's capital structure and minimize its cost of capital. Profiteering has to be understood as distinct from profit-earning. Where the amount of profit is made to exceed a socially acceptable limit by questionable methods, it is a case of profiteering. Profiteering is often done by creation of artificial shortages through hoarding or curtailing production.

2.2.3 Theories of Risk Management

As the field of agribusiness operates largely within the domain of agricultural economics, examination of associated risk management theories can provide a reference point to help shape dialogue about the boundaries of agribusiness management research. Some of these risk management theories includes;

a) Financial Economics Approach: Financial economics approach to corporate risk management has so far been the most prolific in terms of both theoretical model extensions and empirical research. This approach builds upon classic Modigliani-Miller paradigm (Miller and Modigliani, 1958) which states conditions for irrelevance of financial structure for corporate

value. This paradigm was later extended to the field of risk management. This approach stipulates that hedging leads to lower volatility of cash flow and therefore lower volatility of firm value. Rationales for corporate risk management were deduced from the irrelevance conditions and included; higher debt capacity, progressive tax rates, lower expected costs of bankruptcy, securing internal financing, information asymmetries and comparative advantage in information (Klimczak, 2007). The ultimate result of hedging, if it indeed is beneficial to the firm, should be higher value - a hedging premium. Evidence to support the predictions of financial economics theory approach to risk management is poor. Although risk management does lead to lower variability of corporate value which is the main prerequisite for all other effects, there seems to be little proof of this being linked with benefits specified by the theory. More recently Jin and Jorion (2006) provide strong evidence of lack of value relevance of hedging, although some previous studies have identified a hedging premium. Lower volatility of earnings may also result in lower average tax charges if the tax curve is concave. Hedging facilitates this by lowering risk of default and allowing higher debt capacity. Firms that begin hedging, raise their debt equity ratio subsequently. The final hypothesis of financial economics is linked to securing internal financing for important strategic projects and lowering costs of financial distress. These incentives should be more important to companies with high development expenditure or other growth options.

b) Agency theory: Agency theory extends the analysis of the firm to include separation of ownership and control, and managerial motivation. An agency relationship can be described as a contract under which one or more persons (the principal) engage another person (the agent) to perform some service on their behalf which involve delegating some decision making authority to the agent. Risk-aversion contributes to this goal, as the agent is considered to be more risk-

averse than the principal (Williamson, 1998). The theory also explains a possible mismatch of interest between shareholders, management and debt holders due to asymmetries in earning distribution, which can result in the firm taking too much risk or not engaging in positive net value projects. Consequently, agency theory implies that defined hedging policies can have important influence on firm value (Fite & Pfleiderer, 1995). Agency theory provides strong support for hedging as a response to mismatch between managerial incentives and shareholder interests.

c) New Institutional Economics: A different perspective on risk management is offered by new institutional economics. The focus is shifted here to governance processes and socio-economic institutions that guide these processes, as explained by Williamson (1998). Although no empirical studies of new institutional economics approach to risk management have been carried out so far, the theory offers an alternative explanation of corporate behavior. Namely, it predicts that risk management practices may be determined by institutions or accepted practice within a market or industry. Moreover, the theory links security with specific assets purchase, which implies that risk management can be important in contracts which bind two sides without allowing diversification, such as large financing contract or close cooperation within a supply chain.

d) Stakeholder theory: Stakeholder theory, developed originally by Freeman (1984) as a managerial instrument, has since evolved into a theory of the firm with high explanatory potential. Stakeholder theory focuses explicitly on equilibrium of stakeholder interests as the main determinant of corporate policy. The most promising contribution to risk management is the extension of implicit contracts theory from employment to other contracts, including sales and financing (Klimczak, 2007). In certain industries, particularly high-tech and services,

consumer trust in the company being able to continue offering its services in the future can substantially contribute to company value. However, the value of these implicit claims is highly sensitive to expected costs of financial distress and bankruptcy. Since corporate risk management practices lead to a decrease in these expected costs, company value rises (Klimczak, 2005). Therefore stakeholder theory provides a new insight into possible rationale for risk management.

2.3 Empirical Literature

2.3.1 The Entrepreneurship of Agribusiness

Olurounbi (2014) examines the entrepreneurship potential in the agriculture sector. According to him, there have been many talks about agribusiness in Nigeria. He reasoned that rather than focusing on granting aids to the country to develop the sector, the EU countries should look into the possibilities of forging more partnerships with local farmers, saying doing this would develop the value chain, as well as grow the nation's economy. The minister was quoted to have said agric. sector attracted \$8bn private sector investment in two years. "In the last two years, we have been able to attract eight billion dollars of private investment commitment in to agriculture sector in Nigeria and four billion dollars is being implemented. Agribusiness, experts believe, is the next big thing in the world's future, most especially that of Nigeria's. Much had equally been written on how to succeed in this type of industry. Some reports said a potential agribusiness owners need to create their "distinctive market" and "give room for varieties", among others, but how much business opportunities are in this industry? What are those specific opportunities entrepreneurs can maximize in this sort of business? It is on record that agriculture sector contributes about 40 per cent to Nigeria's Gross Domestic Product (GDP) and employs over 70 per cent of over 150 million people. Yet, there is a gap to be filled in this industry (Olurounbi, 2014). If entrepreneurs would seek to close the gap, there's no imagining the economic returns,

Seyi Gbadamosi, an agriculture entrepreneur, said. The opportunities in this industry, according to him, “are enormous”. Aside farming and fishing businesses that many people were aware of, intensive production technology for fresh vegetables for instance, is one area an agropreneur can look to do business in. Now with the growth of modern supermarkets in Africa, coupled with urbanization and a rising middle class, according to an online report, there is a high demand for quality vegetables that can be obtained using intensive production technologies.

Aquaculture, another agribusiness opportunity, is an area UNDP report encourages young people to invest in. According to the report, “Nigeria alone imports over US\$900 million worth of fish annually”. Almost every country in West Africa is embarking on aquaculture and incentives packages have been designed to attract investment. CHI Limited, for instance, has started with a large aquaculture project in Ibadan, but experts are saying that this project only accounts for less than two per cent of the country’s total demand. Equipment leasing, an area filled with potential in agribusiness, as those dealing in this field testify, guarantees investment opportunities. This is another area entrepreneurs could tap into. Fertilizer production and distribution, seeds and pesticides, are among business opportunities that can be found in agriculture industry.

2.3.2 Socio-economic Characteristics of Agribusiness Entrepreneurs

Agribusiness is a sector in which most of the rural SMEs operate in and includes all participants in a commodity vertical structure, from suppliers, farmers, assemblers, processors and distributors to ultimate domestic and international consumer (Olatomide & Omowumi, 2015). Food crops and Livestock production constitute an integrated economic activity which contributes 5-6% of the Gross Domestic product (GDP) and 20% of the agricultural component of the Gross Domestic product and therefore play major role in the socio-economic development of the nation. The sale of food crops and livestock products provide the major source of cash

income for the purchase of consumer goods and improve the living standard of the entrepreneurs. An analysis carried out by Onubuogu, Esiobu, Nwosu and Okereke, (2014) revealed that majority of the small holder cassava farmers fell within the age bracket of 41-50 years, which signify that they are young farmers who are likely to adopt new innovation faster than the older ones. Olatomide and Omowumi, (2015) reported that male agribusiness entrepreneurs were found to be more 73.3% than female 26.7%, buttressing the usual male dominance in the world of business. The marital status showed that more than three-quarters (71.67%) were married. This contributed ideas in the growth of the business. Large household size of 6-10 persons ensures availability of family labour to address labour challenges. These household members provided cheap labour for the household business activities. Married farmers tend to have easy access to production variables such as land. Large family size which are traditionally owned are provided by household heads (husbands) as family labour to enhance production, reduce cost of hired labour and resource use efficiency of the household farmers (Onubuogu *et al.*, 2014). The analysis carried out by Onwumere and Ukpebor-Elodimuo, (2013) revealed that the age of the piggery entrepreneurs shows that the majority (50%) of the piggery entrepreneurs are in the age range of 40-49 year. This implies that the entrepreneurs are vibrant and energetic given this age bracket which provided enthusiasm and vigor for the business.

Educational level of piggery entrepreneurs revealed that majority (60%) had primary education qualification, and that was followed by those who had secondary education (20%) and (20%) of the entrepreneurs had tertiary education qualification. This states of education among the entrepreneurs indicated poor status. Also, the study revealed that majority (60%) of piggery entrepreneurs had years of business experience ranging from 11-20 years. This would immensely contribute positively to their business output due to the wealth of experience acquired in the

running of the business over the years. According to Ohajianya *et al.*, (2013), average poultry farmer spent about 9 years on formal education, had 8 persons in their household, acquired 13.6 years in experience, had 727 birds and was aged about 45 years old. Also 86.4% of them were married. This result implies that most of the poultry farmers are literate enough to understand improved poultry production technologies that can improve their farm income. The mean age of the farmers indicated that they are at their active stage of life to undertake the level of operations involved in the poultry production. The large household size could be an advantage to the poultry farmers in the area of provision of household labour. The mean farming experience indicated that the poultry farmers are experience enough in poultry production to understand the rudiments of poultry farming. The mean farm size indicated that most of the poultry farmers are operating at small scale. The poultry farmers received poor extension contact which could lead to low adoption of poultry production technologies. Onubuogu and Onyeneke, (2012) reported that farmers with more experience would be more efficient and also have better knowledge of climate condition, better knowledge of efficient allocation of resources and market situation and are thus expected to run a more efficient and profitable enterprise.

2.3.3 Factors Affecting Profit in Agribusiness

The factors affecting profit in agribusiness are as follows;

a) Human Resource Management: The root cause of agribusiness poor performance is almost invariably a lack of management attention to strategic issues such as human resource management. In addition, the management of people (human resource management) is particularly important as it includes not only the personnel issues of dealing with employees, but also of managing people outside of the organization who are also critical to its success, such as key customers, suppliers, banks and investors (Stokes & Wilson, 2006).

b) Marketing: According to Shafeek (2009), marketing is the one and only functional area that links the products or services of a business to its customers. It is vitally important to ensure that this function is properly performed. The common weakness lies in the failure to understand the key marketing issues like “what markets are we targeting, with what products”. Stokes and Wilson (2006) is of the belief that product or service concepts and standards often reflect only the perceptions of the owner which may not be mirrored in the market place. Minor fluctuations in markets can topple a newly established agribusiness firms particularly where it is reliant on a small number of customers.

c) Lack of Capital: According to Fatoki and Garwe (2010), lack of capital seems to be the primary reason for business failure and is considered to be the greatest problem facing agribusiness enterprise owners. This was supported by Shafeek (2009), who noted from a business view point that without adequate financing the business will be unable to maintain and acquire facilities, attract and retain capable staff, produce and market a product or do the other things necessary to run a successful operation. Stokes and Wilson (2006) stress that financial difficulty is caused by inability to raise sufficient funds to properly capitalize the business, or a mismanagement of the funds that do exist or a combination of both. Some agribusiness managers are notorious for their lack of proper financial controls and information.

d) Lack of Technical Skills in Operation: Most agribusiness enterprises fail due to a lot of technical inefficiencies involved in their production/ operations. This is seen as main challenge to be overcome to promote conducive business climates for agribusiness. Agribusiness enterprise is said to be technically efficient when it produces as much output as possible with a given amount of inputs or produces a given output with the minimum possible quantity of inputs. Thus, the more agribusiness firm strive towards the maximum possible level of outputs obtainable from

a given set of inputs in its operations given a range of alternative technologies available, the higher the chances of the firm's survival and growth (Bidzakin ,2009).

e) Personal Characteristics: The level of education and the attendance of management training courses is an important aspect in terms of agribusiness survival. According to Clover and Darroch (2005), education is thought to increase intrinsic motivation and energizes behaviours and the more enterprise education an individual receives, the greater the possibility of the agribusiness success. An increased management/ professional experience improve the quality of entrepreneur, hence increasing the chances of the agribusiness profit, survival and growth.

f) Information Technology: Technological innovation has long been a chief contributor to progress in agribusiness and will continue to influence the profit, growth and survival of the agribusiness (Baloyi, 2010). It is lack of access to information technology that bears a negative effect on agribusiness firm's ability to generate profit, survive and grow (Progress & Chikungwa, 2013). The agribusiness sector which comprises the collective business activities performed from farm to fork is an important generator of employment and income worldwide. Modernization of food systems and globalization of their downstream segments, including processing and retailing has led to substantial changes in the organization and performance of agrifood chains, particularly in the developing world. As observed by Vorley, Fearne and Ray (2007), such changes affect smallholder agriculture and rural livelihoods globally, challenging farmers and policy makers to adapt to the new demands that food processors and retailers are making on their supply chains.

g) Business Plan: According to Nieman and Nieuwenhuizen (2009), a business plan is a written presentation that carefully explains the business, its management team, its products/ services and its goals together with strategies for reaching goals. It is a living document that forms part of the

formal planning done by firms, and serves as a tool for reducing the risk of venture failure, a bench mark for a firm's internal performance as well as a tool for accessing fund, (Progress & Chikungwa, 2013). Agribusiness by nature avoids formal planning and as such do not have proper business plans. This in turn makes them not to be able to assess the enterprise internal performance, fail to access funds such as loans and also be exposed to the higher risk of venture failure. A business plan as a living document needs to be constantly updated in order to increase the agribusiness chances of growing and surviving in the market.

2.3.4 Factors Affecting Risk Level of Agribusiness Entrepreneurs

In agriculture, production is riddled with risks that can negatively affect production levels and lead to significant losses. Agribusiness entrepreneurs face many different types of risk including price risk (e.g., the risk that the price that they receive for their output will be higher or lower than average in a given year), yield risk (e.g., the risk that a pest infestation or drought will cause yields to be lower than average), input supply risk (e.g., the risk of a water shortage or a labor shortage at a critical point in the production process) and other types of risks (e.g., the risk of a family member getting sick or a tractor breaking down) (Mcnamara & Weiss, 2005). Production levels and market supply and demand changes can cause large and unforeseen swings in prices. Furthermore, increasing global interaction in commodity markets and governmental influences add to the uncertainty surrounding market prices. Changes in consumer incomes, the strength of the economy, government trade and energy policies and exchange rates all affect demand for commodities and, by extension, commodity prices. These and other unpredictable factors make price forecasting a difficult and volatile practice. Many of these types of risk (e.g., price risk, yield risk) contribute directly to profit risk, which is ultimately most important to the producer (Sarah, 2009).

Farmers and their families can respond to risks in many ways, and can respond *ex ante* (before the event) in precautionary ways, or *ex post* (after the event) to try and minimize their losses. Diversification of crops that the farmer produces may be an effective tool to help farmers deal with several types of risk including price and yield risk, risk in input markets (e.g., in labor markets), and other output market risks (i.e., the risk that you might not be able to find a buyer for your product). In the case of price risk, because the markets for different crops are characterized by different degrees of risk (in the simplest treatment of price risk, each price for each crop is characterized by a different mean and variance), the farmer can use what he knows about the means and variances of the prices for each crop to choose a mix of crops that have a low correlation of profitability (Coyle, 1992). If the price risks for two crops are poorly-correlated, the farmer can use diversification and choose an optimal portfolio of crops to help insure against drops in profit or utility that occur if the price for one crop is lower than average in a given year (Bromley & Chavas, 1989). Farmers' cropping choices, degree of diversification, and allocation of land amongst different crops will be direct reflections of their weighting these diverse risks (Dorjee, Broca & Pingali, 2007). According to Miller (2008), risk factors affecting agribusiness include the following;

a) Systemic Risk: Rural incomes, especially among agriculturalists, are highly susceptible to similar risks at the same time. Out of these highly inter-related covariate risks, weather is the most uncontrollable and often devastating risk but disease and plagues are similarly important production risks. Failures in agriculture affect not only the farmer households, the production and marketing linkages but also the rural non-farm economies that revolve around and depend upon those income flows. In all countries and especially in developing countries, there are both cyclical and seasonal price fluctuations of agricultural products, not only due to local production

variation but also affected by outside forces. These forces include prices fixed for political reasons, import or export restrictions, exchange controls, subsidies and globalization.

b) Credit Risk: Collateral, especially mortgage, is a missing element in most rural finance hence increasing the risk of the lender. The lack of usable collateral or substitutes due to often ill-defined property and land-use rights, costly or lengthy registration procedures, and social constraints to foreclosure are costly. Other support services and information networks such as credit bureaus are often not available to help lower the risk. For longer term lending, a financial gap risk between sources and uses of funds poses another risk constraint. For borrowers, social stigma risk of loss, as can be the case with peer lending, as well as financial capacity risk to be able to repay loans when losses occur are major constraints.

c) Investment Returns and Capital Flows: Rural capital revolves slowly, with often one, or less frequently two, crops per year. For investment capital, the returns are even slower and in spite of that entrepreneurs are often faced with very low profit margins. Hence, the margins for error are much less and risks higher than, for example, in commerce or most microfinance which tend to have high returns per unit of funds invested and higher profit levels. Equally problematic for lenders is the seasonality of agricultural production (crop production in particular) which leads to significant cash flow challenges and a lag between investment needs and expected revenues which can cause liquidity management difficulties.

d) Low Investment and Assets: The relative poverty in rural areas is caused by low investment due to the lack of asset. Any loss of expected income through sickness or production causes a significant impact on the agribusiness. In compensation, close linkage to traditional socio-economic and family networks and production risk minimization becomes more important than

profit maximization. The small asset base also reduces savings and borrowing capacity, thus constraining economies of scale in the use or provision of services.

e) Geographical Dispersion: Rural areas are characterized by low density of population and high dispersion with often small sizes of individual transactions which leads to high costs of agribusiness operation for both production and marketing. The remoteness and heterogeneity among communities and farms similarly creates high information/transaction costs for financial service providers who serve rural clients.

2.3.5 Risk Management Strategies in Agribusiness

Most producers use a combination of strategies and tools because they address different elements of risk or the same risk in a different way. Risk management strategies can help mitigate the effects of swings in supply, demand and prices so that farm business returns can be closer to expectations. Risk management strategies reduce risk within the farming operation, transfer a share of risk outside the farm or build the farm's capacity to bear risk (Harwood *et al.*, 1999). The process of managing risk is based on the individual analysis of three fundamental activities, which are taken in sequence and subsequent synthesis of the result into a programme of movement action. The three activities are;

- a) Identification of risk or discovering the source from which a potential risk may arise.
- b) Measuring risk or evaluating the impact on an individual and
- c) Managing and controlling risk or selecting the most effective methods to deal with a potential risk.

Once the risk has been identified and assessed, various strategies can be used to reduce income risk and improve profit in agribusiness. The various risk management strategies are;

1) Production Risk Management Strategy: under production risk management strategy, we have the following strategies;

a) Enterprise Diversification: Diversification is an effective way of reducing income variability in production. It is the combining of different production process. For instance, combination of different crops, combination of crops and livestock, different end points in the same production process (such as different selling weights), or different types of the same crop (such as yellow, white, waxy or high protein corns). Diversification can also be achieved through different income sources, such as off-farm employment for smaller farms. Diversification of crops and/or livestock production implies that a favourable result in one enterprise may help to cope with a loss in another enterprise. Diversification reduces the overall risk in agribusiness. It also reduces farmers' dependants on agriculture as the only source of income (Sarah, 2009). Diversification can be in the form of entrepreneurial activity on behalf of the farmer such as processing, agro-tourism, sports or recreation, etc. It can also include off-farm employment which can be considered as a strategy but also as a need while agricultural income can easily be too small to a whole family. Off-farm employment can also increase the probability of stopping the farming activity. It can also be in the form of farm specialization with other specialized neighbor farms, with the aim of building up a cooperative in which the total production cost, the yield and price risks are shared.

The types of risk and constraints agribusiness entrepreneur faces are not just macroeconomic; they often take the form of limited availability of inputs, such as fertilizer, water, labor or capital. Using diversification, farmers can respond to input-related risks by choosing to farm a combination of crops with different characteristics (i.e., crops that are more or less drought-resistant, or crops that are harvested in different seasons to mitigate labor risks). One of the most

important types of input constraints and risks the farmer may face is labor or capital constraints and risks associated with harvesting. The labor and capital requirements for many agricultural crops vary seasonally and are often far higher at the time of harvest than at any other point in time during production. In the case where farmers are labor constrained and rely mainly on family labor, or require timely availability of costly, hired labor, farmers may diversify and grow several different crops for which the labor requirements peak at different points throughout the year so as to not leave fruit rotting on the tree or vegetables withering on the stalk (Musser & Patrick, 2002).

Biological constraints or risks to production are also important drivers of diversification, and can contribute to both input and output risk. Limited water or nutrient availability may cause farmers to plant a mix of crops that minimize surface water runoff or that take advantage of the nitrogen fixing abilities of particular crops in order to restore the soil nutrient balance through practices such as crop rotation (e.g., corn and soybean rotations). Crop rotation also plays a major role in pest and disease control. In a similar way to crop rotation, integrated crop-with-livestock systems can harness biological synergies by meeting feed input needs for livestock (through crop silage) at the same time as the livestock provide necessary nutrients to crop agriculture (through farmyard manure).

b) Crop Insurance: This is the management of yield or price risk through the purchase of crop insurance which transfers risk from you to others for a price which is stated as an insurance premium. Crop insurance is an example of a risk management tool that not only protects against losses but also offers the opportunity for more consistent gains (Miller, 2008). When used with a sound marketing program, crop insurance can stabilize revenues and potentially increase average annual profits. Crop insurance provides two important benefits. It ensures a reliable level

of cash flow and allows more flexibility in the marketing plans. For example, if you can insure some part of your expected production, that level of production can be forward-priced with greater certainty, creating a more predictable level of revenue, (Aneke, *et al.*, 2007). With the elimination of adhoc disaster payments and deficiency payments, crop producers will no longer receive government aid during low price years. Crop insurance provides partial replacement for the federal safety net.

c) Contract Production: this is normally associated with vertical integration, where an agribusiness firm coordinates all aspects or many aspects of a product from production to the consumer's table. Through production contracts, the agribusiness firm commits the producer to deliver a specific quality and quantity of final product. The producer must comply with the firm's quality specifications and must manage yield risk with sound management practices and often insurance. From a risk perspective, a major advantage for the producer is that a market for the output and an acceptable price and hence predictable cash flow is guaranteed. A disadvantage is that the producer loses the opportunity of benefiting from upside price potential since the sale of the product is fixed by the conditions of the contract, (Miller, 2008). A vertically integrated firm retains ownership control of a commodity across two or more levels of activity. It helps to reduce risk associated with a variation in quantity and quality of input. Contract production is common in poultry and livestock production. The agribusiness firm provides feed and other inputs to the producer, who manages the grow-out process. Before one agree on contract production, the trade-offs is considered. The loss of flexibility and profit opportunities that an entrepreneur faces is the cost of receiving a predictable cash flow. The challenge associated with contract production is to find contracts that are consistent with the producer's goals and risk tolerance and engaging

in contracts such as those that ensure that the farmer will have a buyer for his product at the end of the season at a set price (Goodhue & Hoffmann, 2006).

d) Evaluating New Technologies: The challenge of evaluating new technologies is best illustrated by the two newest crop technologies, genetically altered seeds and precision farming. For instance, some seeds are being genetically altered to provide instance to specific herbicides, thereby permitting improved resistance to diseases or insects. Precision farming controls the rate of application of crop inputs such as seed, fertilizer and pesticides on each acre of a field. By contrast, the conventional approach applies the same rate across an entire field. Precision farming allows yields to be measured for each acre so that output can be strictly measured against crop inputs. As with all new technologies, farmers who adopt these new innovations try to capture a range of potential benefits, including lower input costs and environmental quality. Benefit can include higher crop yields due to improved pest control and more cost-effective use of crop inputs and adopting risk-reducing technologies such as seed varieties with properties such as drought or herbicide resistance that emerged during the green revolution (Feder & Zilberman, 1985). Adopting these new technologies reduces the effect of risk, thereby increasing profit.

2) Marketing Risk Management Strategy: To be successful, one should take an informed and balanced approach in making marketing decisions that is, focusing on long-term profitability, not short-term wind falls. Academic studies indicate that marketing strategies which depend on price chasing or speculation have not been shown to be consistently profitable. Also, those strategies that do not consider financial and production risks will likely prove to be poor. Marketing agricultural products involves information objectivity, attitude and skill. The three important considerations in developing a marketing plan and strategies are;

- a) Know what level of risk one is comfortable with; marketing involves understanding of one's level of risk tolerance. It also involves a good understanding of your current financial position.
- b) Being willing to increase the number of skills in your marketing tool box. Successful marketers are continually updating their abilities to learning new skills. You may need to pay for professional help in developing your marketing plan.
- c) Developing an integrated management approach to your business. They should be planned according to the impact they will have on the production, financial, legal and human resource aspects of the business.

Marketing decisions often involve contractual agreements that have important legal consequences. These contracts can significantly affect financial plans. Selecting the right marketing tool to use at the right time will not only reduce risk, but can increase one's profit. According to Miller (2008), the following are a basic overview of more commonly used pricing strategies and guidelines for determining when to use each.

a) Storage: Storage is a way of avoiding seasonally low prices even though it has no price risk safety. When prices are below the level anticipated in the marketing plan, storage may be justified, assuming that you have adequate financial resources. Storage may be warranted when there is a realistic expectation of a market price increase.

b) Cash Sale: When prices are favourable and at levels anticipated in the marketing plan, a direct cash sale is warranted.

c) Fixed Price Contract for Deferred Delivery: This contract allows producers to establish a price for later delivery. A fixed price contract, also known as a cash forward contract, may also allow the schedule of deliveries at the time of the year that better fit with labor availability, grain quality, and logistics. Having an adequate amount of crop insurance allows you to comfortably

contract the insured portion of your crop. These contracts often work well when crops are large, when storage is tight, or when the market price reaches the objective in the marketing plan.

d) Basis Contract: Basis is the difference between the local cash price and a futures contract price. Basis is typically more stable and predictable than either the underlying futures contract or the local cash price. However, basis does change in response to local supply and demand factors. A basis contract allows you to fix the basis, but allows the final cash selling price to be determined at a later date by subtracting the fixed basis from the futures price. This strategy works well when the basis is strong (cash prices are high relative to futures) and there is some potential for an increase in futures prices.

e) Deferred or Delayed Price Contract: A deferred or delayed price contract transfers title of a crop to the buyer at delivery, but allows the seller to set the price later. It is commonly used when storage is tight. At these times, the local elevator wants to move more grain into the marketing channel, but the seller may not be satisfied with current prices.

f) Minimum Price Contract: A minimum price contract establishes a floor price for the duration of the contract. The floor price is typically several percent below the cash price at the beginning of the contract. A producer could have net price less with a minimum price contract than with a fixed price contract if prices fall, but will benefit from a rise in market prices. This contract eliminates much downside price risk.

g) Hedge-To-Arrive (HTA) Contract: This contract has risk management properties similar to a short futures market position. It is the opposite of a basis contract. It permits the seller to set the futures price level by the delivery date, but the basis is determined later. The seller is responsible for delivering the contracted amount on the delivery date.

h) Short Futures Hedge: Selling futures contracts to protect the value of grain or livestock in inventory or the value of expected production is a short futures hedge. A short futures hedge reduces downside price risk. On the other hand, it also reduces the ability to capture upside price movements.

i) Put Option Purchase: This tool is similar to a minimum price contract. It sets a floor on the crop or livestock price throughout the life of the contract. If prices rise during the period, the seller can capture upside price gains.

3) Financial Risk Management Strategy: Financial risk has three basic components: the cost and availability of debt capital, the ability to meet cash flow needs in a timely manner and the ability to maintain and grow equity. Sustainable financial institutions with continuous sources of renewable capital (i.e., not politically linked development banks) such as savings can best address these issues. Links to capital markets and global financial systems can also assist in meeting the cash flow requirements of a financial intermediary and its clients. Cash flow management especially is risk-prone for agricultural lenders due both to seasonality and unpredictability of harvests and commodity prices. Seasonality is mitigated through investing in and financing non-agriculture as well as agriculture and ensuring heterogeneity of portfolio investments and geographical diversity and scope. Financing of agribusiness and the use of syndicated finance for joint financing are other options for reducing the cash flow management risks inherent with agricultural producers and market traders, (Miller,2008).

Financial risk management is effectively carried out through sound planning and financial control. To do this, one should continually monitor the ability to bear financial risk. A set of well-maintained financial records is an absolute necessity to maintaining financial control of an agribusiness. The flow of information is critical in evaluating past performance and in planning

for future accomplishments. Essential financial statements include the balance sheet and statement of owner's equity, income statement and projected and actual cash flow. Cash flows are especially important because of the variety of on-going farm obligations, such as cash input costs, cash lease payments, tax payment, debt repayment and family living expenses. These records provide a history of your business and the data you need to calculate its financial performance measures. Even small agribusiness firm need a basic level of record keeping. As the size and complexity of operation grow, so does the need for financial records. Ratios such as debt-to-asset, debt-to-equity, and asset turnover are important in monitoring overall financial performance. Other measures like liquidity, solvency, profitability, financial efficiency and repayment capacity of the business can be used to monitor the financial status of the business and provide guideline for future decisions. Adequate liquidity is essential to ensure a sufficient cash flow. Also adequate liquid reserves can facilitate contingency plans for production disasters and poor market conditions. However, excess liquidity typically generates lower rates of return than fixed assets. Improving liquidity to ensure adequate cash flows can include reducing family living expenditure, using resources efficiently, leasing assets and utilizing appropriate insurance programmes. The financial planning process includes;

- a) Determine current financial situation
- b) Develop financial goals
- c) Identify alternatives i.e. consider life situation, personal value and economic factors, assess risk and time value of money (opportunity cost)
- e) Create and implement the financial plan
- f) Review and revise the financial plan.

Strategies for coping with risk also include finding off-farm employment, (Mcnamara & Weiss, 2005; Ito & Kurosaki, 2009), saving or using credit markets, informal borrowing (e.g., loans between family members), etc.

4) Legal Risk Management Strategies: Managing legal risks, as well as the other types of risks, are vitally important to the success and longevity of agricultural operations and should be of high priority to agricultural producers, (Sarah, 2009). The policy and legislations of any government at national or federal, state and local level have significant impacts on the management and control of risk in agriculture. Some of these impacts do not arise through actions diverted towards associated or competing industries, such as tourism or recreation. Government can control risk through policy, legislation and production of information. Government policy can be done through the use of instruments such as incentives, grants, loans, subsidies, fiscal incentives and exemption from tax and provision of services for marketing, research and development, education training, extension and technical information, Physical infrastructure for the industry (utilities, transportation and coastal development), and institutional support (such as state farms, state hatcheries and market organizations). A government manages and controls agriculture through legislation on resource utilization and resource management and legislation dealing with farm management. For effective and economic resource utilization and management, government has to be aware of the needs of food crop production such as improved seeds, fertilizers, machineries and markets. All government accept the responsibility of providing information services to the agricultural sector, particular national statistics and data relevant to economic development planning. The guidance of government supported research should come from the farmer who could indicate where they are almost exposed to risks of losing their crops and hence their profitability and livelihood.

5) Human Resource Risk Management Strategy: Human resource calamities can hamper even the most carefully made and appropriate risk management decisions. Those calamities include; divorce, chronic illness and accidental death. Risk management plan should anticipate the likelihood of human resource calamities. Remember that risk management strategies are implemented through people. Every manager's job description should have explicit risk management duties and delegations of power and authority to manage risk, (Bauer & Bushe, 2003). Identifying risks and strategies for managing these risks under human resource is an important part of business planning which can give employees confidence in their own long-term future with the enterprise human resource team. Family, managers from outside the business, consultants and external advisory committees can also be part of the team. It is important that everyone on the management team understands the risk management tools to be able to manage the agribusiness risk effectively.

2.4 Analytical Framework

2.4.1 Measurement of Profit

Profit of any agribusiness is measured with an income statement which is made up of income and expenses of the enterprise in a year. Income is money generated from the activities of the agribusiness while expenses are the cost of resources used up or consumed by the activities of the agribusiness. Income statement is essentially a listing of income and expenses during a period of time (usually a year) for the entire business (Hofstrand, 2013). So measuring current and past profit and projecting future profitability is very important because a business that is not profitable cannot survive. Conversely, a business that is highly profitable has the ability to reward its owners with a large return on their investments. Analysis of the net farm income and other farm financial ratios derived from income statement and balance sheet is used to measure profitability

(Odii, 1998). Therefore, profitability measures how well agribusiness enterprise is making use of its capital by investing in resources that make goods and services that generate profit (Odii, 1998). According to the Farm Financial Standards Council (FFSC), the four measures of profitability suggested are; rate of return on farm assets (ROA), rate of return on farm equity (ROE), operating profit margin ratio (OPM), and net farm income, accrual-adjusted (NFI).

a) Rate of Return on Farm Assets (ROA): ROA measures a business' pre-tax returns to the entire business, and is calculated as:

$$\text{ROA} = \frac{\text{NIFO} + \text{Interest} - \text{Withdrawals}}{\text{Average Farm Assets}} \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad 2.1$$

NIFO is Net Income from farm operations while withdrawals are withdrawals for family living. ROA compares a business' normally recurring income to the asset base of the business. The components of true earnings from the farm are first reflected in NIFO. Then interest expense is added to this number because it is a cost of borrowing money and is actually a return to the borrowed portion of capital. Finally, withdrawals are used as a proxy for salary expense, so they are subtracted from farm earnings. The higher the ROA the more profitable is the farming operation. Taken as an industry, agriculture has a low ROA, the average ROA for farms in the US is between 4- 6%. ROA in agriculture is limited by high capital requirements (land and machinery) and market values that usually exceed the original cost (Todd, 2012).

There is an important distinction between NIFO and NFI. NIFO measures normally recurring income generated from the farming operation, while NFI includes events that do not occur as often such as the sale of machinery or a tract of land. While both are a measure of returns to the operation, NIFO is used in most of the following calculations because it more accurately represents true, normally recurring farm earnings and because taxes can vary significantly from one farm to another. Both of these measures ignore the impact of taxes in an operation.

$$\text{ROE} = \frac{\text{NIFO} - \text{Withdrawals}}{\text{Average Farm Equity}} \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad 2.2$$

c) Operating Profit Margin Ratio (OPM): OPM measures a business' pre-tax returns relative to its level of sales, and is calculated as:

$$\text{OPM} = \frac{\text{NIFO + Interest - WD}}{\text{Gross Revenues}} \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad 2.3$$

d) Net Farm Income (NFI): NFI is computed on the income statement, and is a good measure for analysis of a farm operation because it includes operating activity before the impact of income taxes. There is no benchmark or rule-of-thumb for this measure as it varies widely from year-to-year as well as from farm-to-farm. This measure of profit is not standardized (it's unique to each farm). Agribusiness can also rely on additional measures of profitability to inter-farm comparison. However it is still a good idea to monitor the trends in net farm income for farm operations over a number of years. Johnson (1982) and Kay (1986) recommended the use of net farm income in ascertaining the profitability of farmers. NFI according to them is derived after

obtaining the Gross Margin (GM). GM is the amount of money realized after deducting variable cost from the total sales or income. NFI is obtained by adjusting net cash farm income for total depreciation, net inventory changes and value of products consumed at home (Anthony, Janet & Anthonia, 2012). NFI according to Kay (1986) is the only true measure of profit for the accounting period since it includes the above adjustment which could be quite large. NFI is the profit from the year's operation and it represents the return to the farm owner for personal and family labour, management and equity capital used in the farm.

Profit is an indicator of success in business. Measurement of profit is the main concern of all interested parties i.e. creditors, investors, owners and management of the business. The profitability analysis makes use of the income statement to compute the profit and loss of the farm by looking at the returns of various resources used. The best way to think about net income is in terms of profits. It's the money left over after all the expenses of the company have been subtracted from revenues, (Money-Zine.com, 2014). The price paid by customers for the goods or services sold by a company are known as revenues. When a company sells these goods or services to a customer, they receive money in the form of cash or book credit sales to accounts receivable, which is money to be collected in the near future. The revenues for any period of time are equal to the inflow of cash plus the increase in accounts receivable. Revenues have a positive effect on net income. The costs necessary to produce and deliver the goods or services to customers are known as expenses. It is the money expended by the company to obtain revenues; typically referred to as the cost of doing business. Examples of expenses include employee salaries, advertising, raw materials, shipping, warehousing, income taxes, as well as the decrease in the value of certain assets through depreciation. Expenses have a negative effect on net income. The expenses reported for any period of time should be those incurred to produce

the revenues associated with that same period of time. Net Income model is therefore specified as;

$$NI = TR - TC \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad 2.4$$

$$TC = TFC + TVC \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad 2.5$$

Where; NI = Net Income, TR = Total Revenue, TC = Total Cost, TFC = Total Fixed Cost and TVC = Total Variable Cost.

2.4.2 Costs and Returns

Cost is an amount paid or required in payment for a purchase while return is yield generated by an investment, expressed usually as a percentage of the amount invested (Business Dictionary.com 2015). According to Jhingan (2009), Costs are the total money expenses incurred by a firm in producing a commodity. Cost concepts are of profound importance in farm business since they enable us to make choice among present alternatives. In agriculture, costs as compared with market prices, determine what will be produced, how and for whom. In business, cost is usually a monetary valuation of effort, material, resources, time and utilities consumed, risks incurred, and opportunity forgone in production and delivery of a good or service. All expenses are costs, but not all costs (such as those incurred in acquisition of an income-generating asset) are expenses. Costs comprises of fixed and variable. Fixed costs do not vary with the level of production. Rents, insurances, the salaries of administrative staff and depreciation on capital equipment are all examples of expenditures which do not directly vary with the level of production. If the production of an organization in a given time period were zero, these costs still have to be met. In contrast, variable costs are those expenditures which vary in direct relation to volumes of production. Examples of this class of cost include raw material costs, hourly labour rates and packaging costs.

The enterprise costs determine its supply and supply along with demand determines price. Total costs of an enterprise are the total expenses incurred by that enterprise in producing a given quantity or a commodity. They include payments for rent, interest, wages, taxes and expenses on raw materials, electricity, water, advertising, etc. The total costs of production of a firm are divided into total variable cost and total fixed cost. Total fixed costs are those costs of production that do not change with output. They are independent of the level of output. They include payments for renting land and buildings, tractors, plants and equipment, breeding stock, interest on borrowed money, insurance charges, property tax, depreciation, maintenance expenditure, wages and salaries of the permanent staff etc. They are also called overhead costs. That is the inputs of factors of production whose quantity hence cost is fixed irrespective of the level of production (Odii, 1998). Total variable costs are those costs of production that changes directly with the change in the output. They rise when output increases, and fall when output declines. They include expenses on raw materials, power, fertilizer, water, taxes, hiring of labour, advertising, etc. They are also known as direct costs. Larger output requires larger inputs of labour, raw materials, power, fuel, etc., which increase the expenses of production. When output is reduced, variable costs also diminish. They cease when production stops altogether, (Hardesty & Leff, 2010). For firms to make profit, they need to consider their costs when making pricing decisions (Crawford, 1997). Production costs and efficiency are primarily determined by the prices of inputs including time, labour, capital and technological advances.

2.4.3 Measurement of Risk

Risk reflects the chance that the actual returns on an investment may be very different than the expected return. Risk is a situation in which there is a possibility that actual cash flows (returns) will be less than forecasted cash flows and can be neutralized through pre-planned action. Risk

measurement is evaluation of the likelihood and extent (magnitude) of a risk (Web finance, 2014). Anything that has random outcome where some of the outcomes are preferred to others is risky. Thus, risk is the probability of adverse outcomes associated with an action or decision. Risk is measured using two statistical tools, variance and standard deviation, both of which are computed using the expected value of the outcomes.

One way to measure risk is to calculate the variance and standard deviation of the distribution of returns (Mark, 2012). Expected value (Ev) is the sum of the probabilities that different outcomes will occur multiplied by the resulting payoffs (Grinols, 1994; Baye, 2000). Formally, if the possible outcomes of the random variable are X_1, X_2, \dots, X_n , and the corresponding probabilities of the outcomes are P_1, P_2, \dots, P_n , then the expected value is given by;

$$Ev = P_1 X_1 + P_2 X_2 + P_n X_n \quad \dots \quad 2.6$$

$$\text{Where; } P_1 + P_2 + \dots + P_n = 1 \quad \dots \quad 2.7$$

The symbol P_1 is the probability of outcome X_1 , and X_1 is the value of the first outcome. Similarly, P_2 is the probability of outcome X_2 and X_2 is the value of the second outcome etc. Using this method, one can compute the expected value for alternative investment decision or actions. Thus, the mean or expected value of a random variable collapses information about the likelihood of different outcomes into single statistics. This is a very convenient way of economizing on the amount of information needed to make decision. There is need to caution, however, that the expected value only provides information about the average value of a random variable but does not indicate the degree of risk associated with the random variable. It is the variance and standard deviation that provides such information (Baye, 2000).

a) Variance

The variance of a set of random numbers is computed by squaring their deviations from the expected values, multiplying each by the probability and then summing the outcome (Grinols, 1994). Formally, if the value of investment or cost given a state of nature i are $X_1, X_2 \dots X_n$ and the probabilities of state of nature i occurring are $P_1, P_2 \dots P_n$ and the expected value is given by Ev , the variance (σ^2) is computed as follows;

$$\sigma^2 = P_1(X_1 - Ev)^2 + P_2(X_2 - Ev)^2 + \dots + P_n(X_n - Ev)^2 \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad 2.8$$

$$= \sum_{j=1}^n P_j (X_j - Ev)^2$$

Where; σ^2 = variance

P_1, P_2, \dots, P_n = the probability of state of nature i occurring

X_1, X_2, \dots, X_n = the value of investment or cost given a state of nature i

Ev = the expected value (weighted mean) of the value of investment or cost

b) Standard Deviation

The standard deviation (σ) of a set of random numbers is the square root of their variance. It measures variability around an expected value the amount by which a group of numbers is above or below its expected value. Standard deviation is computed as follows;

$$\sigma = \sqrt{\sigma^2} = \sqrt{P_1(X_1 - Ev)^2 + P_2(X_2 - Ev)^2 + \dots + P_n(X_n - Ev)^2} \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad 2.9$$

$$= \sqrt{\sum_{j=1}^n P_j (X_j - Ev)^2}$$

Where;

σ = Standard deviation of the earnings

P_j = Probability of state of nature i occurring

X_j = value of investment or cost given a state of nature i

EV = the expected value (weighted mean) of the value of investment or cost

In comparing investment alternatives, the investment with a higher variance or standard deviation is considered riskier than one with a lower variance or standard deviation. If the standard deviation of an investment is zero, it is a non-risky investment with a sure outcome. An investment with a zero expected value also has a zero variance and zero standard deviation, implying non-risky investment. Although variance and standard deviation are not synonymous with risk, they are reasonably good summary measures of the degree of variability, emphasizing the large deviation that most entrepreneurs want to avoid (Grinols, 1994).

2.4.4 Likert-Type Scale

The five primary categories of risk, according to the United State Department of Agriculture's Risk Management Agency (USDARMA) which include production risk, marketing risk, financial risk, legal risk and human risk in agribusiness can be analyzed using the likert-type scale to determine the seriousness of any of the risk on investment. The formular for computing the likert-type scale is as follows;

$$\bar{X} = \Sigma X/N$$

Where; \bar{X} = mean

X = nominal value assigned to scaling statements

N = number of the values

Σ = sum of the nominal values

Thus, nominal numbers are assigned to the different scaling statement according to its seriousness. A cut-off points are established by finding the mean of the nominal values assigned to the scaling statements, for example using very serious as 3, serious as 2 and not serious as 1, giving a total number of 6. Using this therefore, the cut-off point is derived as $6/3 = 2.0$. An

interval scale of 0.5 is used, thus the upper limit of the cut-off point is $2.0 + 0.5 = 2.5$, while the lower limit is $2.0 - 0.5 = 1.5$. The 1.5 obtained can be used as the cut-off point. This means that any mean score above 1.5 is taken as serious, any one below 1.5 is taken as not serious, while any one that falls above 2.5 is taken as very serious problem. Based on this, remarks are made by concluding that a problem is serious, not serious or very serious. This remark is derived by multiplying the total number that was identified by the respondent (X) with the nominal numbers assigned to each scaling statement and adding all to give the ΣX , i.e. $(X \times 3) + (X \times 2) + (X \times 1) = \Sigma X$. Then divide with the number of the values N (i.e., 6). Then one can conclude that a problem is serious based on the cut-off points obtained.

2.4.5 Regression Analysis

In statistics, regression analysis is a statistical process for estimating the relationships among variables. It includes many techniques for modeling and analyzing several variables, when the focus is on the relationship between a dependent variable and one or more independent variables. Multiple regression was first used by Pearson in 1908 to learn about the relationship between several independent or predictor variables and dependent or criterion variable. Regression analysis is used to understand which among the independent variables are related to the dependent variable, and to explore the forms of these relationships. Many techniques for carrying out regression analysis have been developed. Familiar methods such as linear regression and ordinary least squares regression are parametric, in that the regression function is defined in terms of a finite number of unknown parameters that are estimated from the data. Nonparametric regression refers to techniques that allow the regression function to lie in a specified set of functions, which may be infinite-dimensional. Regression model involve the following variables; The unknown parameters, denoted as β , which may represent a scalar or a vector, the

independent variables X, the dependent variable Y. A regression model relates Y to a function of X and β . The approximation is usually formalized as $E(Y | X) = f(X, \beta)$.

The explicit forms of the multiple regression model are specified as follows;

- 1) Linear form

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + \dots + b_7X_7 + e \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad 2.10$$
- 2) Semi-log form

$$Y = b_0 + b_1\ln X_1 + b_2\ln X_2 + b_3\ln X_3 + b_4\ln X_4 + \dots + b_7\ln X_7 + e \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad 2.11$$
- 3) Double-log form

$$\ln Y = b_0 + b_1\ln X_1 + b_2\ln X_2 + b_3\ln X_3 + b_4\ln X_4 + \dots + b_7\ln X_7 + e \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad 2.12$$
- 4) Exponential form

$$\ln Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + \dots + b_7X_7 + e \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad 2.13$$

Y is the dependent variable with $x_1, x_2, x_3, x_4, \dots, x_7$ as the independent or explanatory variables. The $b_0, b_1, b_2, b_3, b_4, \dots, b_7$ are regression coefficients or parameters that were estimated and tested for significance and e is the error term. Once a regression model has been constructed, it is important to confirm the goodness of fit of the model and the statistical significance of the estimated parameters. Commonly used checks of goodness of fit include the R-squared, pattern of residuals and hypothesis testing. Statistical significance can be checked by an F-test of the overall fit, followed by Z-tests of individual parameters (Scott, 2012).

2.4.6 Z-Statistic

A Z-test is any statistical test for which the distribution of the test statistic under the null hypothesis can be approximated by a normal distribution. For each significance level, the Z-test has a single critical value (for example, 1.96 for 5% two tailed) which makes it more convenient than the Student's t-test which has separate critical values for each sample size. Therefore, many statistical tests can be conveniently performed as approximate Z-tests if the sample size is large

or the population variance known. If the population variance is unknown (and therefore has to be estimated from the sample itself), and the sample size is not large ($n < 30$), the Student's t-test may be more appropriate, (Sprinthall, 2011). The term "Z-test" is often used to refer specifically to the one-sample location test comparing the mean of a set of measurements to a given constant. For the Z-test to be applicable, certain conditions must be met. Nuisance parameters should be known, or estimated with high accuracy (an example of a nuisance parameter would be the standard deviation in a one-sample location test). Z-tests focus on a single parameter, and treat all other unknown parameters as being fixed at their true values. The test statistic should follow a normal distribution. Generally, one appeals to the central limit theorem to justify assuming that a test statistic varies normally. There is a great deal of statistical research on the question of when a test statistic varies normally. If the variation of the test statistic is strongly non-normal, a Z-test should not be used.

2.4.7 Tests of Significance

Once sample data has been gathered through an observational study or experiment, statistical inference allows analysts to assess evidence in favor or some claim about the population from which the sample has been drawn. The methods of inference used to support or reject claims based on sample data are known as tests of significance (Freedman, 2009). Every test of significance begins with a null hypothesis H_0 . This represents a theory that has been put forward, either because it is believed to be true or because it is to be used as a basis for argument, but has not been proved. The alternative hypothesis, H_a , is a statement of what a statistical hypothesis test is set up to establish. The final conclusion once the test has been carried out is always given in terms of the null hypothesis. We either reject H_0 in favor of H_a or do not reject H_0 . If we conclude "do not reject H_0 ", this does not necessarily mean that the null hypothesis is true, it

only suggests that there is not sufficient evidence against H_0 in favor of H_a ; rejecting the null hypothesis then, suggests that the alternative hypothesis may be true.

CHAPTER THREE

METHODOLOGY

3.1 Study Area

This study was carried out in Imo State, Nigeria. Imo State is one of the 36 States of Nigeria and is located in the South Eastern Zone of Nigeria with Owerri as its capital and the largest city. The State lies within Latitude $4^{\circ}45'N$ and $7^{\circ}15'N$ and Longitude $6^{\circ}50'E$ and $7^{\circ}25'E$. It occupies the area between the lower River Niger and the upper and middle Imo River. Imo State is bounded on the east by Akwa Ibom State, on the west by the River Niger and Delta State; and on the north by Anambra State, while Rivers State lies to the south. Imo State covers an area of about 5,100sq km. The estimated population is 3,934,899 people comprising of 1,902,613 males and 2,032,286 females and the population density varies from 230-1,400 people per square kilometer (National Population Commission, 2006). It's population makeup 2.8% of Nigeria's total population. Imo State is predominantly Igbo speaking State with Ibo people constituting a majority of 98%. Administratively, Imo State is made up of twenty seven (27) Local Government Areas (LGAs). The State is further divided into three (3) main agricultural zones, namely Owerri, Okigwe and Orlu. Owerri zone has 11 Local Government Areas (i.e., Aboh-Mbaise, Ahiazu-Mbaise, Ezinihitte, Ikeduru, Mbaitolu, Ngor-Okpala, Ohaji/Egbema, Oguta, Owerri Municipal, Owerri North, and Owerri West), Okigwe zone has 6 Local Government Areas (i.e., Ehime-Mbano, Ihitte-Uboma, Isiala-Mbano, Obowo Okigwe, and Unuimo), while Orlu has 10 Local Government Areas (i.e., Ideato North, Ideato South, Isu, Njaba, Nwangele, Nkwere, Orlu, Orsu, Oru East, and Oru West) (Imo ADP, 1996).

The State lies within the tropical rainforest ecological zone. The rainy season begins in March and lasts till October or early November with peaks in July and September and a two week break in August. Rainfall is often at its maximum at night and during the early morning hours. However, variations occur in rainfall amount from year to year. Annual rainfall varies from 1,990mm to 2,200mm. Temperatures are similar all over the state. The hottest months are January to March, with the mean annual temperature above 20°C. The influence of the harmattan lasts for about nine weeks (i.e. from late December to late February). Imo State has an average annual relative humidity of 75% which is highest during the rainy season, when it rises to about 90%. The high temperature and humidity experienced in the state favour luxuriant plant growth, which ideally should produce the climax vegetation of the tropical rain forest (Imo State ICT Unit, 2012). Agriculture is the major economic activity of the people of Imo State. The state has numerous agribusiness enterprises, some of which have either formal or informal status. The main crops grown in the area include cassava, cocoyam, yam, maize, melon and vegetables (green, fluted pumpkin, water-leaf, bitter leaf, etc). The livestock reared include; sheep, goats, fishes, pigs and poultry.

3.2 Sample Selection

The methods of proportionate sampling, followed by random sampling techniques were adopted in selecting the Local Government Areas and the sample size. The proportionate sampling method is considered appropriate because the three (3) agricultural zones in the State do not have equal number of local government areas (LGA's). Therefore six (6) local government areas were randomly selected from the Owerri agricultural zone. From each of these selected LGAs, 3 communities were randomly chosen, thus giving a total of eighteen (18) communities in the LGAs. Furthermore, four (4) agribusinesses (two from food crops and two from livestock) were

purposively selected from each of these selected communities. The purposive selection of four agribusinesses is to ensure that only food crop and livestock enterprises are selected. This gave a sample size of seventy two (72) agribusiness entrepreneur from the Owerri agricultural zone.

The same procedure was adopted in selecting sample from Okigwe agricultural zone. Three (3) local government areas were randomly selected. From each of these selected LGAs, three (3) communities were randomly chosen, thus giving a total of nine (9) communities in the LGAs. Then from each of these nine (9) communities, four (4) agribusinesses (two from food crops and two from livestock) were purposively selected to give a total number of thirty six (36) agribusiness entrepreneurs from the Okigwe agricultural zone.

Similarly, five (5) local government areas were randomly selected from Orlu agricultural zone. From these selected LGAs, three (3) communities were randomly chosen, thus giving a total of fifteen (15) communities in the LGAs. Then finally from each of these 15 communities, four (4) agribusinesses (two from food crops and two from livestock) were purposively selected to give a total of sixty (60) agribusiness entrepreneurs from Orlu agricultural zone. Thus eighty seven (87) food crops and eighty one (81) livestock enterprises were randomly chosen to give a total sample size of one hundred and sixty eight (168) agribusiness entrepreneurs for the study. The sampling frame comprised of the list of agribusiness entrepreneurs of the selected agribusinesses in the selected LGAs, collected through the assistance of Imo State Agricultural Development Programme (ADP) Zonal Extension Officer.

3.3 Data Collection

Data for this study were obtained from primary sources. The primary data were collected with the use of structured questionnaire administered to agribusiness entrepreneurs in the selected agribusinesses, alongside personal observation. The range of data collected were variables such as the socioeconomic characteristics of the agribusiness entrepreneurs, agribusiness experience, farm size, type of produce/ products sold, costs and returns, the types of risk and risk management strategies adopted, factors influencing the profit and risk level of the food crops and livestock agribusinesses.

3.4 Data Analyses

In analyzing the data gathered from this study various tools were employed. Descriptive statistical tools such as frequency distribution, percentages and mean were used to achieve objectives (i), (ii) and (iv) which were to; examine the socio-economic characteristics of food crops and livestock entrepreneurs, identify the type of produce/ products sold by the selected agribusinesses, and determine the type of risk and risk management strategies adopted by the agribusiness entrepreneurs. Objective (iii) was achieved using the net income model, which was to determine and compare the costs and return of the selected food crops and livestock agribusinesses. Objective (v) was achieved using variance to estimate the risk level associated with the selected food crops and livestock agribusinesses. Also objectives (vi) and (vii) were achieved using the ordinary least square multiple regression model (OLS), which were to determine the factors influencing the profit of the selected agribusinesses, and to determine the factors influencing risk levels of the selected agribusiness entrepreneurs.

3.4.1 Net Income Model

This was specified as;

$$\text{Net Income} = \text{TR} - \text{TC} \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad 3.1$$

$$(\text{TC} = \text{TFC} + \text{TVC})$$

Where;

TR = Total Revenue

TC = Total Cost

TFC = Total Fixed Cost

TVC = Total Variable Cost

3.4.2 Variance

Variance was computed as follows;

$$\sigma^2 = P_1(X_1 - Ev)^2 + P_2(X_2 - Ev)^2 + \dots + P_n(X_n - Ev)^2 \quad - \quad - \quad - \quad - \quad 3.2$$

$$\sigma^2 = \sum_{j=1}^n P_j (X_j - Ev)^2 \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad 3.3$$

Where;

σ^2 = variance

P_1, P_2, \dots, P_n = the probability of state of nature i occurring (two states of nature can occur, i.e. favourable and non favourable farming weather, for eg. Favourable - adequate rainfall, temperature and Non favourable - drought, flood, pest & diseases, frost)

X_1, X_2, \dots, X_n = the value of investment or cost given a state of nature i

Ev = the expected value (weighted mean) of the value of investment or cost

3.4.3 Multiple Regression Model

The implicit form of the model is specified as;

$$a) \quad Y_i = F(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, e) \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad 3.4$$

Where;

Y = Net income (₦)

i = 1 and 2, for food crop and livestock entrepreneurs respectively

X_1 = Age of entrepreneurs (years)

X_2 = Sex of entrepreneurs (male = 1, female = 0)

X_3 = Marital status (married = 1, single = 0)

X_4 = Household size (number of persons)

X_5 = Educational level (number of years spent in school)

X_6 = Agribusiness experience (years)

X_7 = Farm size (Hectare for food crop and number of birds/animals for livestock)

e = Error term

A Priori Expectation

The coefficient of $X_1, X_4, < 0$; $X_2, X_3, X_5, X_6, X_7, > 0$

The regression coefficients of age of entrepreneurs (X_1), household size (X_4), are expected to be negative while sex of entrepreneurs (X_2), marital status (X_3), educational level (X_5) business experience (X_6), and farm size (X_7), are expected to be positive.

$$b) \quad Y_i = F(X_1, X_2, X_3, X_4, X_5, X_6, X_7, e) \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad - \quad 3.5$$

Where;

Y = Risk level (measured with variance result obtained)

i = 1 and 2, for food crop and livestock entrepreneurs respectively

X_1 = Age of entrepreneurs (years)

X_2 = Sex of entrepreneurs (male = 1, female = 0)

X_3 = Marital status (married = 1, single = 0)

X_4 = Household size (number of persons)

X_5 = Educational level (number of years spent in school)

X_6 = Agribusiness experience (years)

X_7 = Income (₦)

e = Error term

A Priori Expectation

The coefficient of $X_3, X_5, < 0$; $X_1, X_2, X_4, X_6, X_7, > 0$

The regression coefficients of marital status (X_3), educational level (X_5) are expected to be negative, while those of age of entrepreneurs (X_1), Sex of entrepreneurs (X_2), household size (X_4), Agribusiness experience, (X_6), and income (X_7) are expected to be positive.

Equations 3.4 and 3.5 were fitted to data on the four functional forms of Linear, Semi-log, Double-log and Exponential. The lead equation was chosen based on the magnitude of R^2 , statistical significance of the coefficients and a priori theoretical consideration. Therefore, the equation with the highest magnitude of R^2 and highest number of significant variables was chosen for discussion and further analysis.

3.5 Hypotheses of the Study

i) Hypothesis 1 was tested using the result of the multiple regression analysis performed to achieve objective 6. The multiple regression analysis produced regression coefficients whose signs were compared with statement of the hypothesis to test it.

ii) Hypothesis 2 was tested using the Z-statistic. The model is specified as follows;

$$Z_{cal} = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}} \quad - - - - - 3.6$$

Where;

Z_{cal} = the value by which statistical significance of the mean difference was judged

\bar{X}_1 = Mean profit level of food crops agribusiness

\bar{X}_2 = Mean profit level of livestock agribusiness

S_1^2 = Variance from level of profit of food crops agribusiness

S_2^2 = Variance from level of profit of livestock agribusiness

n_1 = Sample size of food crops agribusiness

n_2 = Sample size of livestock agribusiness

Decision Rule:

If $Z_{cal} > Z_{tab}$ the null hypothesis will be rejected, otherwise the null hypothesis will be accepted.

iii) Hypothesis 3 was tested using the Z-statistic. The model is specified as follows;

$$Z_{cal} = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}} \quad \text{--- -- -- -- -- 3.7}$$

Where;

Z_{cal} = the value by which statistical significance of the mean difference was judged

\bar{X}_1 = Mean risk level of food crops agribusiness

\bar{X}_2 = Mean risk level of livestock agribusiness

S_1^2 = Variance from risk level of food crops agribusiness

S_2^2 = Variance from risk level of livestock agribusiness

n_1 = Sample size of food crops agribusiness

n_2 = Sample size of livestock agribusiness

Decision Rule:

If $Z_{cal} > Z_{tab}$ the null hypothesis will be rejected, otherwise the null hypothesis will be accepted.

3.6 Limitations of the Study

In the process of collecting the data for this study, the following problems were encountered;

1. The study area was vast and since random sampling of communities was adopted, traveling from one selected community to another to collect data from the selected agribusiness entrepreneurs attracted more time and cost.
2. It was very difficult getting information from entrepreneurs. They were suspicious of the researcher; as a result some were reluctant to give out some of their socio-economic information especially their age for security reasons.
3. During the data collection process, some of the food crops and livestock farmers/entrepreneurs could not respond accurately to the questions. At times, a combined procedure of oral explanation and translation into Igbo was used in administering the questionnaires.
4. Most of the entrepreneurs do not keep records of their farming/business activities as a result, information were given from memory recall.
5. Finally, the uncooperative attitude of the agribusiness entrepreneurs towards strangers coupled with limited period of time covered posed a challenge to the researcher. However, all these limitations did not affect the outcome of the field work from the results obtained.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Socio-economic Characteristics of Entrepreneurs of the Selected Agribusinesses

The socio-economic characteristics of both food crops and livestock entrepreneurs comprised of; Age of farmers, gender, marital status, household size, educational level, agribusiness experience and farm size.

4.1.1 Age of Agribusiness Entrepreneurs

The distribution of food crops and livestock entrepreneurs according to their age is presented in table 4.1

Table 4.1: Distribution of Agribusiness Entrepreneurs by Age

Age (Years)	Food crops Entrepreneurs		Livestock Entrepreneurs	
	Frequency	%	Frequency	%
30 – 34	6	6.9	7	8.6
35 – 39	10	11.5	12	14.8
40 – 44	16	18.4	23	28.4
45 – 49	25	28.7	18	22.2
50 – 54	14	16.1	10	12.4
55 – 59	8	9.2	6	7.4
60 – 64	5	5.7	3	3.7
65 – 69	3	3.5	2	2.5
Total	87	100	81	100
Mean	47 years		45 years	

Source: Field Survey Data, 2015.

The Table 4.1 shows that majority (28.7%) of food crops entrepreneurs and 28.4% of livestock entrepreneurs fell within the age bracket of 45 - 49 years and 40 - 44 years with mean age of 47 years and 45 years respectively, which are often regarded as the middle age group. It also shows that 5.7%, 3.5% food crops and 3.7%, 2.5% livestock entrepreneurs fell within the age range of 60 - 69 years. This result reflects the situations in our economy today where young, active and productive entrepreneurs can successfully run an agribusiness. This finding is in agreement with Onwumere and Ukpebor-Eleodinmuo, (2013); and Onubuogu *et al.*, (2014) that the majority of agribusiness entrepreneurs within the age range of 40-49 years are still in their active age, vibrant and energetic which provided enthusiasm and vigor for the food crops and livestock agribusiness.

4.1.2 Sex of Agribusiness Entrepreneurs

The distribution of food crops and livestock entrepreneurs according to their sex are presented in table 4.2

Table 4.2: Distribution of Agribusiness Entrepreneurs by Sex

Sex	Food Crops Entrepreneurs		Livestock Entrepreneurs	
	Frequency	%	Frequency	%
Male	47	54	56	69
Female	40	46	25	31
Total	87	100	81	100

Source: Field Survey Data, 2015.

The table shows that the majority (54%) of the food crops entrepreneurs were male while 46% were females. For livestock entrepreneurs, majority (69%) were male while 31% were female.

This result indicates that both the males and the females were involve in food crops and livestock business in Imo State but male agribusiness entrepreneurs were found to be more than the female agribusiness entrepreneurs. This agrees with the findings of Onubuogu *et al.* (2014); Olatomide and Omowumi, (2015) that both men and women were into agribusiness and the high percentage of male agribusiness entrepreneurs than female buttress the usual male dominance in the world business.

4.1.3 Marital Status of Agribusiness Entrepreneurs

The distribution of food crops and livestock entrepreneurs according to their marital status are shown in table 4.3

Table 4.3: Distribution of Agribusiness Entrepreneurs by Marital Status

Marital Status	Food Crops Entrepreneurs		Livestock Entrepreneurs	
	Frequency	%	Frequency	%
Single	3	3.4	9	11
Married	84	96.6	72	89
Total	87	100	81	100

Source: Field Survey Data, 2015.

Table 4.3 shows that the majority (96.6%) of food crops entrepreneurs were married while 3.4% were single. For livestock entrepreneurs, majority (89%) were married while 11% were single. This result indicates clearly that a high proportion of the agribusiness entrepreneurs are married individuals who are seen to be responsible according to societal standards. This finding supports the result of Udoh (2005), Oluwatayo *et al.* (2008) and Onubuogu *et al.* (2014) that married farmers tend to have easy access to production variables like land and large family size which

are traditionally owned and provided by household heads (husbands) to compliment family labour to enhance production, reduce cost of hired labour and resource use efficiency of the household farmers. Food crops and livestock business require more hands which can be provided by the wife or children to reduce labour cost and increase the profit of the business.

4.1.4 Household Size of the Agribusiness Entrepreneurs

The distribution of household size of the food crops and livestock entrepreneurs are presented in table 4.4.

Table 4.4: Distribution of Agribusiness Entrepreneurs by Household size

Household Size (No. of Person)	Food crops Entrepreneurs		Livestock Entrepreneurs	
	Frequency	%	Frequency	%
1 – 4	17	19.5	26	32.1
5 – 8	51	58.6	45	55.6
9 – 12	19	21.8	10	12.3
Total	87	100	81	100
Mean	7 persons		6 persons	

Source: Field Survey Data, 2015.

The table shows that majority (58.6%) of food crops entrepreneurs and 55.6% of livestock entrepreneurs have household size bracket of 5 - 8 persons, with a mean of 7 persons and 6 persons respectively. This implies that entrepreneurs in the study area have large household size provides cheap labour to the entrepreneurs which help to reduce the cost of production. This cost when saved enhances the entrepreneurs' performances in loan repayment. This finding agrees with Obasi *et al.* (2013), Ohajianya *et al.* (2013) and Onubuogu *et al.* (2014) that agribusiness entrepreneurs in the study area have large household size with mean household size of 6 and 8

persons which could be an advantage to the entrepreneurs in the provision of household labour. Large household size compliment labour to enhance production and reduce the cost of hired labour. Household can be seen to be all people who live under one roof and who make or are subject to others making for them joint financial decision. It comprises the head, the wife/wives, children and other dependents that live in the same house.

4.1.5 Educational Level of Agribusiness Entrepreneurs

The distribution of food crops and livestock entrepreneurs by their level of education is presented in table 4.5

Table 4.5: Distribution of Agribusiness Entrepreneurs by Level of Education

Level of Education (No. of Years)	Food crops Entrepreneurs		Livestock Entrepreneurs	
	Frequency	%	Frequency	%
1 – 6	28	32.2	25	30.9
7 – 12	35	40.2	26	32.1
13 – 18	24	27.6	30	37.0
Total	87	100	81	100
Mean	9 years		10 years	

Source: Field Survey Data, 2015.

The table shows that 40.2% (majority) of the food crops entrepreneurs attained secondary, while 27.6% attained tertiary education respectively. Also, 37.0% (majority) of the livestock entrepreneurs attained tertiary, while 30.9% attained primary education. The mean level of education was found to be 9 years for food crops entrepreneurs and 10 years for livestock entrepreneurs. This indicates that the state of education among the entrepreneurs is poor. This finding agrees with that of Onwumere and Ukpebor-Elodinmuo, (2013) who reported on the

poor education status among piggery entrepreneurs in Imo State. Education and training enhances farmer’s productivity and market oriented production objectives (Onubuogu & Onyeneke, 2012).

4.1.6 Agribusiness Experience of the Entrepreneurs

The distribution of food crops and livestock entrepreneurs according to their experience in agribusiness is shown in table 4.6

Table 4.6: Distribution of Agribusiness Entrepreneurs by their Level of Agribusiness Experience

Experience (Years)	Food crops Entrepreneurs		Livestock Entrepreneurs	
	Frequency	%	Frequency	%
1 – 10	16	18.4	22	27.2
11 – 20	37	42.5	48	59.3
21 – 30	19	21.8	9	11
31 – 40	15	17.2	2	2.5
Total		87	100	81
100				

87

100

81

100

Mean	19 years	12 years
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Source: Field Survey Data, 2015.

The table 4.6 indicates that majority of the farmers are experienced. The results showed that 42.5% of the food crops farmers and 59.3% of livestock farmers had years of business experience ranging from 11 - 20years, with average mean of 19 and 12 years respectively. This result may have contributed positively to their agribusiness output due to the wealth of experience acquired in the running of the agribusiness over the years. According to Onyeneka and Iruo, (2011); Onubuogu and Onyeneke, (2012), experience in business enhances output performance. Experience when combined with education can greatly improve the profit of the agribusiness entrepreneurs. Farmers with more experience would be more efficient, have better knowledge of climate conditions and market situations.

4.1.7 Farm Size of the Agribusiness Entrepreneurs

The distribution of food crops and livestock agribusiness according to their farm size is presented in table 4.7.

Table 4.7: Distribution of Agribusiness Entrepreneurs by Farm Size

Farm Size (Hectares)	Food crops		Farm Size (No. of birds/animal)	Livestock	
	Frequency	%		Frequency	%
0.5 – 0.9	44	50.6	25 – 375	67	82.7
1.0 – 1.4	22	25.3	376 – 726	7	8.6
1.5 – 1.9	11	12.6	727 – 1077	3	6.2
2.0 – 2.5	10	11.5	1078 – 1500	2	2.5
Total	87	100		81	100

Mean	0.7 hectares	301 birds/ animal
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Source: Field Survey Data, 2015.

The table shows that majority (50.6%) of food crops entrepreneurs operated within the bracket of 0.5 - 0.9 hectares while 11.5% operated on 2.0 – 2.5 hectares of land. the average farm size of food crops entrepreneurs were found to be 0.7 hectares. Also, the majority (82.7%) of livestock entrepreneurs were found to have farm size within the bracket of 25 - 375 birds/animals, while 2.5% had farm size bracket of 1078 - 1500 birds/animals. The average farm size of livestock entrepreneurs was found to be 301birds/animals. This result clearly shows that the food crops and livestock entrepreneurs in Imo State are small scale business men operating on small farm size and as such do not produce in large quantities. This finding agrees with Ohajianya *et al.* (2013) who reported that most of the poultry farmers are operating at small scale. Farm size is supposed to correlate positively to market orientation in that those with large farm size will have more produce for sale (Onubuogu & Onyeneke, 2012).

4.2 Farm Produce of the Food crops and livestock Agribusinesses

The distribution of farm produce of food crops and livestock agribusinesses are presented in tables 4.8 and 4.9.

Table 4.8: Distribution of Farm Produce of the Food crops Agribusiness

Produce Identified	No. of Entrepreneurs	Percentages (%)
Yam	9	10.3
Cassava	8	9.2
Cassava/ stem	11	12.6
Cassava/ yam	5	5.8
Plantain/ Cassava/ Stem	12	13.8
Yam/ Cassava /plantain	6	6.9
Yam/ cassava/ melon/ Maize	15	17.2

Cassava /cocoyam	4	4.6
Yam/ Cassava/ Maize	7	8.1
Vegetable/ okro	10	11.5
Total	87	100

Source: Field Survey Data, 2015.

The result from table 4.8 shows that majority (17.2%) of food crops entrepreneurs produced and sold yam/ cassava/ melon/ maize, while 4.6% produced and sold cassava/ cocoyam. This indicates that majority of the food crops entrepreneurs produced and sold combination of crops which encourages enterprise diversification of different crops. This finding agrees with Obasi *et al.*, (2013) who reported that most of the farmers in Imo State combined different production to complement their earnings and mixed cropping is the common cropping system practiced in the state. This finding is also in line with the reports from Musser and Patrick, (2002) that through diversification, farmers can respond to input-related risks by choosing to farm a combination of crops with different characteristics.

Table 4.9: Distribution of Farm produce of Livestock Agribusiness

Produce/ Products identified	No. of Entrepreneurs	Percentage (%)
Meat	18	22.2
Eggs	5	6.2
Meat/ Eggs	22	27.2
Meat/Dung	10	12.4
Meat/ Egg/Dung	26	32.1
Total	81	100

Source: Field survey data, 2015.

Table 4.9 shows that majority (32.1%) of livestock entrepreneurs produced and sold meat/ egg/ dung, while 6.2% produced and sold eggs only, 27.2% produced and sold meat and eggs, 12.4% produced and sold meat and dung, 32.1% produced and sold meat, eggs and dung. This result

shows that majority of livestock entrepreneurs diversified their operations by combining more than one livestock products which is an effective way of reducing income variability in production (Sarah, 2009).

4.3 Costs and Returns of the Agribusinesses

The distribution of costs and returns for food crops and livestock agribusinesses are presented in table 4.10 and 4.11.

Table 4.10: Costs and Returns of Food crops Agribusiness

Item	Quantity	Unit price (₦)	Value (₦) / Production Cycle
a) Variable Cost			
Cost of planting materials			47,108
Labour cost	46	1,500/person	68,509
Fertilizer cost	11	4500/bag	51,107
Agro chemical cost			14,309
Transport cost			11,566
Total Variable Cost			182,559
b) Fixed Cost			
Land rent		2000/year	8,902
Depreciation of equipment			12,536
Interest on loan		10%	13,927
Total Fixed Cost			35,365
Total Cost			217,924

c) Revenue

Sale of cassava	23	3200/100kg	74,509
Sale of plantain	128	800/head	102,118
Sale of yam	746	120/tuber	89,526
Sale of cassava stem	57	500/bundle	28,447
Sale of maize	7	5000/ton	36,302
Sale of vegetable	384	50/kg	39,217
Total Revenue			370,119
Net Revenue/Income			152,195
Return on Investment			69.8%

Computed from Field Survey Data, 2015.

Table 4.10 shows the costs and returns made by 87 food crops entrepreneurs at the end of the production cycle. The result indicates that total variable cost was ₦182,559 and total fixed cost was ₦35,365 which gave a total cost of ₦217,924. Total revenue gave ₦370,119. Total revenue minus Total cost gave Net income of ₦152,195. This result signifies that food crops agribusiness is a profitable venture.

Table 4.11: Costs and Returns of Livestock Agribusiness

Item	Quantity	Unit Price (₦)	Value (₦)/Production Cycle
a) Variable Cost			
Purchase of chicks	185	100/chick	18,500
Purchase of goats	9	1,500	13,250
Purchase of sheep	11	1,500	16,145
Purchase of piglet	14	3,000	42,500
Feed cost			129,450
Labour cost	25	1,500	37,125
Medication			8,037
Transport			11,450
Utilities			6,525
Total Variable Cost			282,982
b) Fixed Cost			
Depreciation of l/stock house			28,255
Depreciation of equipment			14,837

Interest on loan			9,420
Total Fixed Cost		10%	52,512
Total Cost			335,494
c) Revenue			
Sale of poultry	138	1,500	207,102
Sale of egg	162	650/crate	105,000
Sale of goat	9	8,000	69,308
Sale of sheep	13	6,000	76,413
Sale of pig	15	8,000	120,319
Sale of manure	57	250/bag	14,305
Total Revenue			592,447
Net Revenue/ Income			256,953
Return on Investment			76.6%

Computed from Field Survey Data, 2015.

Table 4.11 shows the costs and returns made by 81 livestock entrepreneurs at the end of the production cycle. This result indicates that total variable cost was ₦282,982 and total fixed cost was ₦52,512 which gave a total cost of ₦335,492. Total revenue was ₦592,447. Total revenue minus total cost gave a net income of ₦256,955. This result signifies that livestock entrepreneurs made profit at the end of the production cycle indicating that the agribusiness is a profitable venture.

4.4 Types of Risk and Risk Management Measures Adopted by the Agribusiness Entrepreneurs

The types of risk and the risk management measures adopted by the agribusiness entrepreneurs to guide against loss in their agribusinesses were investigated.

Tables 4.12 and 4.13 show the distribution of agribusiness entrepreneurs according to the different types of risk identified in food crops and livestock agribusinesses, and Table 4.14 shows the distribution of food crops and livestock agribusinesses according to the various risk management measures adopted.

Table 4.12: Distribution of Types of Risk for Food Crops Agribusiness

Types	No. of	Very Serious	Serious	Not Serious	Mean	Remarks
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of Risk	Entrepr.	No.	%	No.	%	No.	%	\bar{X}	
Production	87	33	37.9	48	55.2	6	6.9	2.3	Serious
Marketing	87	33	37.9	52	59.8	2	2.3	2.4	Serious
Financial	87	46	52.9	31	35.6	10	11.5	2.4	Serious
Human	87	22	25.3	42	48.3	23	26.4	2.0	Serious
Legal	87	3	3.5	9	10.3	75	86.2	1.2	Not Serious

Source: Field Survey Data, 2015.

Table 4.12 shows that production, marketing, financial and human risks had mean score above 1.5 cut-off point, thus showing that production, market, financial and human risks are all serious risks militating against food crops agribusiness in Imo State. According to Harwood *et al.* (1999), the yield of crops varies from season to season, due largely to natural factors which can negatively affect production levels and lead to significant losses.

Table 4.13: Distribution of Types of Risk for Livestock Agribusiness

Types of Risk	No. of Entrepr.	Very Serious		Serious		Not Serious		Mean \bar{X}	Remark
		No.	%	No.	%	No.	%		
Production	81	20	24.7	45	55.6	16	19.8	2.1	Serious
Marketing	81	24	29.6	40	49.4	17	21	2.1	Serious
Financial	81	28	34.6	37	45.7	16	19.8	2.2	Serious
Human	81	22	27.2	42	51.9	17	21	2.1	Serious
Legal	81	3	3.7	7	8.6	71	87.7	1.2	Not Serious

Source: Field Survey Data, 2015.

Table 4.13 shows that production, market, financial and human risks had mean score of above 1.5 cut-off point, thus showing that production, market, financial and human risks are all serious risks militating against livestock agribusiness in Imo State. This finding is in line with Sarah (2009) that in agriculture, production is riddled with risks that can negatively affect production levels and lead to significant losses and that production levels, market supply and demand changes can cause large and unforeseen swings in price.

Table 4.14: Distribution of Food Crops and Livestock Entrepreneurs According Risk Management Strategies Adopted

Risk Management Measures adopted	Food Crops Enterprise		Livestock Enterprise	
	Frequency	%	Frequency	%
Enterprise diversification	20	23	15	18.5
Disease control	43	47.4	54	66.7
Storage	15	17.2	2	2.5
Contract Production	6	7	5	6.2
Credit Market	3	3.4	4	4.9
Informal borrowing	1	1.2	2	2.5
Use of Improved variety	13	14.9	3	3.7
Off-farm employment	8	9.2	6	7.4
Use of new technology	11	12.6	4	4.9

*Multiple responses were recorded

Source: Field Survey Data, 2015.

The table 4.14 shows that disease control which is closely followed by enterprise diversification are the major risk management measures employed by the agribusiness entrepreneurs as reported by 47.4% and 23% for food crops agribusiness and 66.7% and 18.5% for livestock

agribusiness respectively. Bauer and Bushe (2003) identified pest and diseases as one of the risks commonly associated with agricultural production and entrepreneurs tend to diversify their product to generate more profit and reduce income variability in production.

The table also shows that informal borrowing (1.2%), credit market (3.4%) for food crops agribusiness and storage (2.5%), informal borrowing (2.5%) for livestock agribusiness, were the other minor risk management strategies adopted by the food crops and livestock entrepreneurs to ensure risk aversion and profit maximization.

4.5 Risk Level Associated with the Agribusinesses

The results of analysis of risk levels of food crops and livestock agribusinesses are presented in table 4.15 and 4.16.

Table 4.15: Distribution of Food Crops Agribusiness According to Riskiness of Investment.

Variance (‘000)	Frequency	Percentage (%)
9 - 15	16	18.4
16 - 22	32	36.8
23 - 29	21	24.1
30 - 36	8	9.2
37 - 43	7	8.0
44 - 50	3	3.5
Total	87	100
Mean variance or risk level		23345

Computed from Field Survey Data, 2015.

The results from Table 4.15 shows that the majority 36.8% of food crop entrepreneurs fell within the bracket of 16 - 22 with mean variance or risk level of 23345. This result signifies that food

crops have high risk level. According to Grinols (1994), investment with higher variance is considered riskier than one with a lower variance. If the variance of an investment is zero, it means it is a non-risky investment with a sure outcome. The higher the risk in an investment, the more profit the entrepreneur is likely to make.

Table 4.16: Distribution of Livestock Agribusiness According to Riskiness of Investment

Variance (‘000)	Frequency	Percentage (%)
23 – 31	7	8.6
32 – 40	12	14.8
41 – 49	19	23.5
50 – 58	6	7.4
58 – 67	15	18.5
68 – 76	22	27.2
Total	81	100
Mean variance or risk level		53671

Computed from Field Survey Data, 2015.

The results from Table 4.16 shows that the majority (27.2%) of livestock entrepreneurs fell within the bracket of 68 - 76 with mean variance or risk level of 53671. This result signifies that livestock enterprises have high risk levels. According to Grinols (1994), investment with higher variance is considered riskier than one with a lower variance. If the variance of an investment is zero, it means it is a non-risky investment with a sure outcome. The higher the risk in an investment, the more profit the entrepreneur is likely to make.

4.6 Factors Influencing the Profit of the Selected Agribusinesses

Tables 4.17 and 4.18 present the results of the multiple regression analysis on the factors influencing the profit of both food crops and livestock agribusinesses respectively. The effect of the seven variables were estimated namely; Age (X_1), Sex (X_2), Marital status (X_3), Household size (X_4), Education attainment (X_5), Agribusiness experience (X_6), and Farm size (X_7). Four functional forms of the multiple regression model were estimated; they are Linear, Semi-log, Double-log, and Exponential.

From the results, the double-log function was chosen as the lead equation based on their highest number of significant variables, the value of coefficient of multiple determination (R^2), F-value and conformity to *a priori* expectations. The double-log function produced an R^2 of 0.7483 for food crops and 0.7803 for livestock enterprises, F-value of 33.4063 for food crops and 37.0337 for livestock which were significant at 1% level of probability, indicating that the double-log function gave a good fit to the data. Therefore, the results of the double-log function were used for discussion.

Table 4.17: Estimated Factors Influencing Profit of the Food Crops Agribusiness

Variables	Functional Forms			
	Linear	Semi-Log	Double-Log	Exponential
Age (X ₁)	-16.064 (-1.0634)	-4.8712 (-1.5267)	-0.0883 (-4.1262)*	-0.0049 (-1.5806)
Sex (X ₂)	13.0691 (1.0797)	5.9215 (2.9513)*	0.0317 (1.5167)	0.0083 3.1923)*
M/Status (X ₃)	19.5354 (4.0495)*	3.8813 (1.3304)	0.0665 (1.3065)	0.0047 (1.5161)
H/H size (X ₄)	-16.5064 (1.1068)	2.5903 (-3.6931)*	-0.0824 (-2.5912)**	-0.0064 (-3.0476)*
Education (X ₅)	17.3391 (4.9308)*	2.1169 (1.0525)	0.0902 (2.8726)*	0.0059 (1.4391)
Experience (X ₆)	13.069 (1.0653)	3.5021 (1.2088)	0.0831 (3.8295)*	0.0066 (2.3571)**
Farm size (X ₇)	16.0341 (1.0607)	2.1066 (1.063)	0.0718 (3.5196)*	0.0088 (3.1429)*
Constant	269.5643	68.4528	134.0518	88.4037
R-square	0.4346	0.4528	0.7483	0.6247
F-value	12.9443	9.3747	33.4063	18.5923

* = Significant at 1%

** = Significant at 5%

Source: Field Survey Data, 2015.

The regression analysis result shows that age (X_1) has a negative coefficient and it is statistically significant at 1%. This is an inverse relationship indicating that the net income of the food crops entrepreneurs decreases with age. This implies that as food crops entrepreneurs advances in age, their ability to generate more profit is reduced. The coefficient of household size (X_4) has a negative sign as expected and is statistically significant at 5%. This indicates that an increase in number of household size decreases the net income of food crops entrepreneurs.

The education (X_5) has a positive coefficient and it is statistically significant at 1%. This implies that the higher the food crops entrepreneurs attain in level of education, the better the training and increase in their net income. The coefficient of agribusiness experience has a positive sign and is statistically significant at 1%. Implying that increase in the years of experience in food crop business increases the net income. This is an indication that as the food crops entrepreneurs' year of experience increases; they are able to manage the business successfully. The coefficient of farm size also has a positive sign and is statistically significant at 1%. It also indicates that increase farm size increases the net income of the agribusiness. Therefore the factors influencing profit of the food crops entrepreneurs were age, household size, education, agribusiness experience, and farm size.

Table 4.18: Estimated Factors Influencing Profit of Livestock Agribusiness

Variables	Functional Forms			
	Linear	Semi-Log	Double-Log	Exponential
Age (X ₁)	-15.9104 (-1.2161)	-3.1168 (1.2431)	-0.0821 (-2.6569)*	-0.0075 (1.1364)
Sex (X ₂)	19.1043 (3.80890*)	2.7133 (1.2988)	0.0531 (2.3289)**	0.0071 (2.4483)**
M/Status (X ₃)	14.3091 (1.1861)	1.6399 (1.5547)	0.0713 (1.1372)	0.0089 (1.2535)
H/H size (X ₄)	-12.0013 (-1.1332)	-3.0529 (-1.4058)	-0.1067 (-3.3448)*	-0.0069 (-2.5556)*
Education (X ₅)	16.0911 (1.0593)	3.3404 (1.1542)	0.0928 (3.0228)*	0.0058 (2.0714)**
Experience (X ₆)	13.1304 (2.4811)**	1.5291 (3.0916)*	0.0591 (2.8413)*	0.0067 (1.1754)
Farm size (X ₇)	14.2103 (1.0855)	3.0126 (1.0021)	0.0924 (2.9333)*	0.0091 (1.0964)
Constant	344.0828	263.4814	235.0696	211.0682
R-square	0.4826	0.4238	0.7803	0.5983
F-value	9.7103	7.6637	37.0337	15.5403

* = Significant at 1%

** = Significant at 5%

Source: Field Survey Data, 2015.

The regression analysis result reported on Table 4.18 shows that age (X_1) of livestock entrepreneurs has a negative coefficient and it is statistically significant at 1%. This is an inverse relationship implying that as the age of livestock entrepreneurs increases, their net income decreases. The coefficient of sex (X_2) has a positive sign and is statistically significant at 5%. This is an indication that profit of livestock agribusiness is determined by the sex of the entrepreneur. Household size (X_4) has a negative coefficient and it is statistically significant at 1%. This is indications that increase in household size of livestock entrepreneurs decreases their net income.

The coefficients of education (X_5), agribusiness experience (X_6), and farm size (X_7) were positive and statistically significant at 1%. This is an indication that the more education the livestock entrepreneurs acquire, the better their performance in agribusiness. The higher the experience, the greater the profit, and also the bigger the farm size, the bigger the net income obtained. Therefore the factors influencing profit of the livestock entrepreneurs were age, sex, household size, education level, agribusiness experience, and farm size.

4.7 Factors Influencing the Risk Level of the selected agribusinesses

Tables 4.19 and 4.20 present the results of the multiple regression analysis on the factors influencing the risk level of both food crops and livestock enterprises. The effect of the seven variables were estimated namely; age (X_1), sex (X_2), marital status (X_3), household size (X_4), education attainment (X_5), agribusiness experience (X_6), and income (X_7). Four functional forms of the regression model were estimated; they are Linear, Semi-log, Double-log, and Exponential.

From the results, the exponential function was chosen as the lead equation based on their highest number of significant variables, the value of coefficient of multiple determination (R^2), F-value and conformity to a priori expectations. The exponential function produced an R^2 of 0.7842 for food crops and 0.8214 for livestock enterprises, F-value of 41.4921 for food crops and 47.8951 for livestock which were significant at 1% level of probability, indicating that the exponential function gave a good fit to the data. Therefore, the results of the exponential function were used for discussion.

Table 4.19: Estimated Factors Influencing Risk Level of Food Crops Agribusiness

Variables	Functional Forms			
	Linear	Semi-Log	Double-Log	Exponential
Age (X_1)	16.1064 (3.2748)*	1.0829 (1.0589)	0.0583 (1.4254)	0.0095 (3.0645)*
Sex (X_2)	13.9304 (1.1225)	3.5166 (1.3161)	0.0911 (2.9578)*	0.0087 (1.1153)
M/Status (X_3)	-18.0339 (-1.0281)	-2.5041 (-1.1705)	-0.0859 (-1.2048)	-0.0065 (1.1206)
H/H Size (X_4)	17.5913 (1.0999)	3.9143 (1.2871)	0.0717 (3.4306)*	0.0094 (2.4103)**
Education (X_5)	-11.0351 (-1.1169)	-5.8826 (-1.2206)	-0.0883 (-1.2367)	0.0062 (-2.1379)**
Experience (X_6)	17.2219 (2.6388*)	1.5597 (2.2241)**	0.0794 (2.5367)**	0.0081 (2.8929)*
Income (X_7)	15.2065 (1.0841)	2.5703 (1.2349)	0.0665 (3.0505)*	0.0087 (3.1071)*
Constant	88.4126	245.5107	188.5517	139.0922
R-square	0.4908	0.4029	0.6945	0.7842

F-value	10.8704	7.5733	25.4396	41.4721
* = Significant at 1%				
** = Significant at 5%				
Source: Field Survey Data, 2015.				

The regression analysis result reported on Table 4.19 shows that the coefficient of age (X_1) was positive and is statistically significant at 1%, meaning that risk level increased with age. This is an indication that the older the food crops entrepreneurs get, the more mature they are to handle risk in the agribusiness. Household size (X_4) has a positive coefficient and it is statistically significant at 5%. This is indications that increase in the number of household size increases the risk level of the food crops agribusiness. The coefficient of education (X_5) was negative and is statistically significant at 5%. This implies that the higher the level of education attainment, the lower the risk effect on agribusiness.

The coefficient of agribusiness experience (X_6) was positive and is statistically significant at 1%. This is an indication that the higher the agribusiness experience, the higher the risk bearing capacity. The more experience an entrepreneur has, the better his risk management strategies. The coefficient of income (X_7) was positive and statistically significant at 1%. This is an indication that as the income of food crops entrepreneurs' increases, the more their risk level increases. Food crops entrepreneurs take more risk as their income increases, to expand their business. Therefore, the factors influencing risk level of food crops entrepreneurs were age, household size, education level, agribusiness experience, and income.

Table 4.20: Estimated Factors Influencing Risk Level of Livestock Agribusiness

Variables	Functional Forms			
	Linear	Semi-Log	Double-Log	Exponential
Age (X ₁)	17.2216 (1.0738)	1.3391 (1.2613)	0.0665 (1.2963)	0.0059 (3.2778)*
Sex (X ₂)	14.1904 (1.0889)	2.7046 (1.2786)	0.0829 (1.6351)	0.0083 (1.1216)
M/Status (X ₃)	-10.2291 (-1.1228)	-2.8146 (-1.2822)	-0.0513 (-4.7064)	0.0077 (-3.6667)*
H/H size (X ₄)	16.4502 (1.0957)	3.9914 (4.5637)*	0.0318 (2.9719)*	0.0081 (2.6129)**
Education (X ₅)	-14.3014 (-4.4825)*	-3.1792 (-3.4921)*	-0.0694 (-3.3689)*	0.0049 (-3.7692)*
Experience (X ₆)	17.9122 (4.4539)*	1.8742 (1.0939)	0.0743 (1.2101)	0.0085 (3.6957)*
Income (X ₇)	15.0314 (1.0648)	2.0981 (1.0966)	0.0937 (4.3991)*	0.0069 (3.2857)*
Constant	288.4167	266.5103	183.4517	104.2919
R-square	0.49988	0.4525	0.6609	0.8214
F-value	10.3271	8.6191	20.3041	47.8951

* = Significant at 1%

** = Significant at 5%

Source: Field Survey Data, 2015.

The regression analysis result reported on Table 4.20 shows that the coefficient of age (X_1) has a positive sign and is statistically significant at 1%. This implies that as the age of livestock entrepreneurs increases, the risk level increases. The older the entrepreneur gets, the higher his ability to manage risk. The coefficient for marital status (X_3) was negative and is statistically significant at 1%. This indicates that marital status decreases the risk level. The coefficient of household size (X_4) was positive and is statistically significant at 1%. This implies that as household size of livestock entrepreneur increases, the risk level increases. The bigger the household size, the more available hands to manage risks as two heads are better than one.

Education (X_5) has a negative coefficient and it is statistically significant at 1%. This implies that increase in education reduces the effect of risk. The more educated an entrepreneur is, the better the risk management strategies to adopt. The coefficient of agribusiness experience (X_6) was positive and is statistically significant at 1% level of risk. The higher the agribusiness experience, the better the risk management. The coefficient of income (X_7) was positive and is statistically significant at 1%. This implies that the higher the profit made the more risk an agribusiness entrepreneur is willing to take. Therefore, the factor influencing risk level of livestock entrepreneurs were age, marital status, household size, education level, agribusiness experience, and income.

4.8 Test of Hypotheses

4.8.1 Test of Hypothesis One

This hypothesis stated that, there is no positive relationship between the socio-economic characteristics of agribusiness entrepreneurs and the profit of selected agribusinesses.

This hypothesis was tested with results of the multiple regression analyses performed to achieve objective 6. The multiple regression analyses results were presented in Tables 4.17 and 4.18 for food crops and livestock enterprises respectively. From the Tables, the coefficients of sex (X_2), marital status (X_3), education level (X_5), agribusiness experience (X_6), and farm size (X_7), were positive, while the coefficients of age (X_1), and household size (X_4), were negative. Therefore, hypothesis one was rejected with respect to variables with positive coefficients, and it was concluded that there was a positive relationship between the socio-economic characteristics of agribusiness entrepreneurs and the profit of selected agribusinesses.

4.8.2 Test of Hypothesis Two

This hypothesis stated that, there is no significant difference between the level of profit of food crops and livestock agribusinesses in the study area. Table 4.22 shows the Z-test result of significance difference between level of profit of food crops and livestock agribusinesses.

Table 4.21: Z-test of Significant Difference between the Level of Profit of Food crops and Livestock Agribusinesses

Group of Sample	Sample Size	Sample Mean	Variance	Z-cal	Z-tab
Food Crops	87	152195	4754.3	122.6*	1.96
Livestock	81	256955	6211.6		

*Z-cal significant at 5% level

Computed from Survey Data, 2015.

The result of the Z-test in Table 4.22 shows that the $Z_{cal} > Z_{tab}$ at 5% level. The null hypothesis was therefore rejected, and it was concluded that there was a significant difference between the level of profit of food crops and livestock agribusinesses.

4.8.3 Test of Hypothesis Three

This hypothesis stated that, there is no significant difference between the risk levels of food crops and livestock agribusinesses in the study area. Table 4.23 shows the Z-test result of significant difference between the risk levels of food crops and livestock agribusinesses.

Table 4.22: Z-test of Significant Difference between the Risk levels of Food Crops and Livestock Agribusinesses

Group of Sample	Sample Size	Sample Mean	Variance	Z-cal	Z-tab
Food Crops	87	23345	152.76	998.22*	1.96
Livestock	81	53671	231.67		

*Z-cal significant at 5% level

Computed from Survey Data, 2015.

The result of the Z-test in Table 4.23 shows that the $Z_{cal} > Z_{tab}$ at 5% level. The null hypothesis was therefore rejected, and it was concluded that there was a significant difference between the risk levels of food crops and livestock agribusinesses.

CHAPTER FIVE

SUMARRY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

This study was designed to analyze Profit and Risk Management Strategies in Selected Agribusinesses in Imo State, Nigeria. The specific objectives were to; examine the socio-economic characteristics of the food crops and livestock entrepreneurs, identify the type of produce/ products sold by the selected agribusinesses, determine the costs and returns of the selected agribusinesses, determine the type of risk and risk management strategies adopted by the agribusiness entrepreneurs, estimate the risk level associated with the selected agribusinesses, determine the factors influencing the profit of the selected agribusinesses and to determine the factors influencing risk levels of the selected agribusinesses. The following hypotheses were tested; there is no positive relationship between the socio-economic characteristics of agribusiness entrepreneurs and the profit of the selected agribusinesses, there is no significant difference between the level of profit of food crops and livestock agribusinesses, there is no significant difference between the risk levels of food crops and livestock agribusinesses. Data for this study were collected with the aid of structured questionnaire

administered on 87 food crops and 81 livestock entrepreneurs which were randomly selected from the three agricultural zones in Imo state, making a total of 168 agribusiness entrepreneurs.

The data collected were analyzed using frequency distributions, percentages, means, net income model, variance and ordinary least square multiple regression model. Hypotheses were tested using signs of regression coefficients produced by multiple regression analyses and Z-statistic. From the result of the socio-economic characteristics of the entrepreneurs in the study area, majority of the entrepreneurs, 28.7% (food crops) and 28.4% (livestock) fell within the age bracket of 45 - 49 years and 40 - 44 years with mean age of 47 years and 45 years respectively. 54% and 46% of food crops were male and female respectively while 69% and 31% of livestock were male and female respectively. Majority of the food crops (96.6%) and livestock (89%) entrepreneurs were married and have household size of about 6 - 7 persons. The education level of the agribusiness entrepreneurs showed that 40.2% (majority) of the food crops entrepreneurs and 37.0% (majority) of the livestock entrepreneurs attained secondary and tertiary level education respectively. The average mean of agribusiness experience for both food crops and livestock entrepreneurs were found to be 19 years and 12 years respectively. The mean farm size was 0.7 hectares for food crops agribusiness and 301 birds/animals for livestock agribusiness. The various farm produce/ products sold by food crops and livestock entrepreneurs were; yam tuber, cassava tuber, cassava, cassava stem, maize, okro, plantain, cocoyam, vegetables, chicken, goat, pig, sheep, meat, eggs and droppings/dung. The net income generated by food crops and livestock entrepreneurs were ₦152,195 and ₦256,953 respectively. Out of the five (5) risk management strategies identified by food crops and livestock entrepreneurs, production risk, marketing risk, financial risk and human risk were found to be serious risk and the major risk management strategies adopted were disease control and enterprise diversification. Other risk

management strategies adopted were contract production, credit market, informal borrowing, use of improved variety, off-farm employment, storage and use of new technology.

Food crops agribusiness had mean variance of 23345 and livestock agribusiness had 53671. The results of the regression analyses showed that variables; age (x_1), sex (x_2), household size (x_4), education (x_5), experience (x_6) and farm size (x_7) were found to be significant factors influencing the profit of the agribusiness entrepreneurs. Also variables; age (x_1), marital status (x_3), household size (x_4), Education (x_5), experience (x_6) and income (x_7) were found to be significant factors influencing risk levels of food crops and livestock enterprises. The result of hypothesis one showed that the coefficients of sex (X_2), marital status (X_3), education level (X_5), agribusiness experience (X_6), and farm size (X_7) were positive, while the coefficient of age (X_1), and household size (X_4) were negative. Therefore, hypothesis one was rejected with respect to variables with positive coefficients and was concluded that there is positive relationship between the socioeconomic characteristics of agribusiness entrepreneurs and the profit of the selected agribusinesses. The results of hypotheses two and three showed that $Z_{cal} > Z_{tab}$ at 5% level, therefore, the null hypotheses were therefore rejected, and it was concluded that; there was a significant difference, between the level of profit of food crops and livestock agribusinesses and also, between the risk levels of food crops and livestock agribusinesses.

5.2 Conclusion

This study on profit and risk management strategies in selected agribusinesses in Imo State, Nigeria has shown based on the analyses carried out that food crops and livestock agribusinesses are profitable but risky ventures. The entrepreneurs of the selected agribusinesses are active, energetic, experienced, married farmers with large household size. The large number of

household size served as a source of cheap labour for the entrepreneurs. Small farm size which was identified by food crops and livestock entrepreneurs made them operate on small scale farming. Since education and training enhances farmers' productivity, the issue of poor education status and farm size needs to be addressed. There is need for the agribusiness entrepreneurs to be educated to enable them adopt proper risk management measures which will help them manage the agribusinesses effectively and obtain returns which are closer to expectations.

The knowledge of the agribusiness entrepreneurs towards the various types of risk identified by them, such as financial risk, market risk, production risk, and human risk as serious risks associated with food crops and livestock agribusinesses in this study, helped the entrepreneurs to adopt proper risk management strategies such as disease control and enterprise diversification to increase their profit. The agribusiness entrepreneurs understanding of the cross-cutting issues and multiple approaches to managing risk will also help in the successful running of these selected agribusinesses. The risk level of food crops and livestock in this study are high showing that the high risk level also contributed to the profit made. Without profit a business venture will not survive in a long run, therefore knowledge of this will help an agribusiness entrepreneur to accept risk in agribusiness and also adopt proper risk management measures so as to increase the profit of the agribusiness.

5.3 Recommendations

The recommendations suggested based on the findings of this study are as follows;

- 1) Considering the viability of agribusiness and how it contributes immensely to the well-being of agribusiness entrepreneurs, government should review the system of land

ownership in the State to encourage the expansion of land available and to ensure profit maximization which is the major aim of any business venture.

- 2) The government through the ADPs extension agents should encourage prospective agribusiness entrepreneurs by creating awareness campaign group to sensitize the citizens on the need to engage in food crops and livestock agribusinesses because they are profitable ventures.
- 3) To support the effort of food crops and livestock entrepreneurs, federal government should provide farming incentives like fertilizer, pest/disease control vaccine and other tools to enhance the agribusiness productivity and profit.
- 4) There is need for government to create suitable market for agribusiness operation, provide adequate infrastructure and other facilities in order to alleviate social problems.
- 5) As education combined with experience improves profit, prospective agribusiness entrepreneurs should be educated to enable them run the agribusiness successfully. If not they should be chased away.
- 6) Agribusiness entrepreneurs should adopt proper risk management strategies that can help mitigate the effects of swing in supply, demand and prices so that farm business returns can be closer to expectations.
- 7) Agribusiness entrepreneurs should form a cooperative society to help them solve some of their immediate problems such as formal and informal borrowing, high cost of labour and other farm issues that they might encounter in the course of the agricultural production.

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APPENDIX

FEDERAL UNIVERSITY OF TECHNOLOGY OWERRI

SCHOOL OF POSTGRADUATE STUDIES

DEPARTMENT OF AGRICULTURAL ECONOMICS

QUESTIONNAIRE ON: PROFIT AND RISK MANAGEMENT STRATEGIES IN SELECTED AGRIBUSINESSES IN IMO STATE

Dear Respondent,

This questionnaire is designed for the purpose of a research study by Okere Nkeiruka A.O with Registration Number 20114770298 in the above named university. In view of this, you are kindly requested to provide accurate answers to the following questions listed below.

Thanks for your cooperation.

- 1) Name of agricultural zone:
- 2) Name of local government area:
- 3) Type of farmer: a) Livestock ☐ b) Food crop ☐
- 4) Age of farmer:
- 5) Sex of farmer: a) Male ☐ b) Female ☐
- 6) Marital status: a) Single ☐ b) Married ☐
- 7) Household size:
- 8) Level of education (specify number of years spent in school):
- 9) Years of agribusiness experience:
- 10) Farm size (no of birds/animals for livestock and hectare for food crop):

11) What type of livestock/food crop(s) agribusiness do you sell?

12) What type of risk is inherent in this type of agribusiness?

13) If livestock, do you sell its product too? a) Yes ☐ b) No ☐

14) Please indicate the livestock, or livestock and product(s) cost if you sell both.

15)

Livestock / Product(s)	Quantity	Unit Price	Total Amount

If

food crop(s), how much does each cost?

Type of Food Crop(s)	Quantity	Unit Price	Total Amount

16) What are your fixed cost items (fill according to your type of agribusiness)

Fixed Cost Items	Quantity	Unit Price	Life Span (yrs)	Total Value
Land				
Building				
Breeding Stock				
Tractor				
Wheel barrow				
Matchet				
Hoe				
Shovel				
Frying Pan				
Drinkers				
Others (specify)				

17) What are your variable cost items (fill according to your type of agribusiness)

Variable Cost Items	Quantity	Unit Price	Total Value
a) Labour			
b) Fertilizer			
c) Feed			
d) Seed			
e) Others (specify)			

18) What quantity of output do you produce?

Revenue Items	Quantity	Price(₦)/Unit(kg)	Total Value
No of animals/birds			
Qty of food crops			
Others (specify)			

19) How much did you spend on transportation? (₦).....

20) What is your farm income per year (both consumed& give away):

21) What is your expenditure (both labour and others):

22) If you borrowed money, how much did you borrow? (₦).....

23) How much did you pay as interest? (₦).....

24) What type of risk(s) do you encounter in the agribusiness?(tick as agribusiness is affected)

Risks	3 Very Serious	2 Serious	1 Not Serious
Production			
Market/price			
Financial			
Human			
Legal			

25) How does this risk(s) chosen affect the agribusiness?

26) Does seasonal variation, pest and diseases affect your output?

27) What other difficulties/challenges do you encounter in the agribusiness?

28) How do you manage or face the challenges?

29) What risk management measure(s) do you adopt in the agribusiness?

a) Enterprise diversification ☐ b) Disease control ☐ c) Storage ☐

d) Crop insurance ☐ e) Contract production ☐ f) Credit market ☐

g) Informal borrowing ☐ h) Use of improved seeds ☐ i) Savings ☐

j) Off-farm employment ☐ k) Use of new technologies ☐ l) Others ☐

(specify).....

30) What factors influence the profitability of the agribusiness?

a) Human resource management ☐ b) Marketing ☐ c) Lack of capital ☐

d) Lack of technical skills ☐ e) Personal characteristics ☐

f) Information technology ☐ g) Business plan ☐ h) others ☐

(specify).....