ECONOMIC ANALYSIS OF RICE PRODUCTION

IN PATEGI LOCAL GOVERNMENT

KWARA STATE, NIGERIA

BY

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BEING A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF AGRICULTURAL TECHNOLOGY, INSTITUTE OF APPLIED SCIENCE,

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CERTIFICATION

This is to certify that this research study was conducted by **ADEBAYO BOLAKALE MUHAMMED** with Matriculation Number **ND/23/AGT/FT/0108** and this work has been read and approved as meeting the requirement for the award of National Diploma (ND) in Agricultural Technology, Institute of Applied Science, Kwara State Polytechnic.

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DEDICATION

This project is dedicated to Almighty God, the creator of knowledge and the Lord of all creations. It is also dedicated to my wonderful parents, Mr. and Mrs. Adebayo Usman, May Allah continue to bless you (Amen).

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I am grateful to the Almighty God for guidance, protection, and wisdom throughout the course of my study. It was all by His power, Mercy and Grace.

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I am also grateful to the head of department and all the lecturers for the knowledge they impacted in me. It really helped in writing this project. Jazakumullahu-Khairan

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ABSTRACT

This study conducts an economic analysis of rice production in Pategi Local Government, Kwara State, Nigeria. The research aims to evaluate the costs and returns of rice production, identify factors affecting productivity and assess the challenges faced by rice farmers in the study area.

The study will employ descriptive statistics to analyze data. Key variables to be examined include labor, capital, farm size and technology adoption. The findings of this study are expected to provide insights into the economic viability of rice production in Pategi Local Government and inform policy decisions aimed at improving the productivity of rice farming in the region.

The study's result will contribute to the existing body of knowledge on agricultural economics and provide recommendations for stakeholders including farmers, policymakers and agricultural extension agents. Ultimately, this research aims to enhance the understanding of the economic dynamics of rice production in Pategi Local Government and contribute to the development of sustainable agricultural practices in the region.

Keywords: ***Economic Analysis, Rice Production, Costs and Returns, Productivity***

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Agriculture has been and is still the bedrock on which every successful, stable economy the world over is built. Agriculture contributes a lot to the economy of Nigeria. Not less than 70% of Nigerians earn their living from agriculture and it provides among others food, employment, income and foreign exchange, raw material for the manufacturing sectors (FAO, 1999). The Nigerian agricultural policy places the small scale farmers in the central focus. This is because the nation's agriculture has always been dominated by the small scale farmers, who crop less than 3 hectares, but represent a substantial proportion of the total population and produce about 90-95% of the total agricultural output in the country (Oyeyinka and Bolarinwa, 2009). These small scale farmers are the major actors in rice production.

Rice is a unique crop grown virtually all over the country, because it requires a wide range of temperature between 20 and 38°C during growth and a long period of sunshine. It can be grown over a wide range of ecological conditions. The prevalent types of rice production systems in Nigeria are the rainfed upland, rainfed lowland and irrigated lowland (Singh et al., 1997). Rice is the seed of a monocot plant, Oriza sativa. It belongs to the family Poaceae; as a cereal grain, it is the most important staple food for a larger part of the world's human population especially in Asia, the Middle East, Latin America, West Indies and Africa. It is one of the world's three most produced grains along with wheat and maize (corn) (Erebor, 1998). The crop constitutes one of the major crops produced in Nigeria. According to Babafada (2003), rice is the fourth major cereal crop in Nigeria after sorghum, millet and maize, in terms of output and cultivated land area. It is a

major staple and most popular cereal crop of high nutritional value grown and consumed in all ecological zone of the country (Ohaka et al., 2013; Omotesho et al., 2010; Raufu, 2014). Before the advent of crude oil, Nigeria produced almost enough rice for local consumption (Ohaka et al. (2013).

In Nigeria, demand for rice has been increasing at a much faster rate than in any other African country, since the mid 1970 (FAO, 2001). Furthermore, during the 1960s; Nigeria had the lowest per capita annual consumption of rice in West Africa sub region with an annual average of 3 kg. Since then, Nigeria per capita consumption levels have grown significantly at 7.3% per annum (PCU, 2002). Nigeria being the most populous country in Africa with about 200 million people in 2019, has the potential to become a beacon of hope and Africa's economic giant. However, for this potential role to be achieved, equitable and sustainable economic development in food sufficiency is a prerequisite.

However, with the discovery of petroleum in the 70's, its production declined steadily over the years in relation to consumption with the result that lately, rice importation takes away huge sums of money from country's hard earned foreign exchange. It is therefore worthy of note that there exists a demand-supply gap due to increase consumption rate of rice. According to FAO (1999), agriculture was the mainstay of the Nigerian economy beyond oil. Rice had been substantially produced in Nigeria to meet local consumption before the oil boom of the 1970s brought in huge foreign exchange, which diverted the disincentive to increase domestic production of rice (Erenstein et al. 2003). This led to acute shortage of rice and increased demand in the 1990s which contrasted with Nigeria's self-sufficiency in rice production during the 1960s (IRR, 1991). In a bid to address the demand-supply gap, government at various times has come up with different policies and programmes. It was observed that those policies were not consistent (Ogundele et al.,

2004). The erratic policies reflected the dilemma of securing cheap rice for consumers and fair price for the producers. However, in spite of all these programmes, local rice production has not kept up with domestic consumption demands.

According to Singh et al. (1997), disease and pests are important natural factors limiting the production of rice and in severe cases, account for about 100% crop losses. Production of rice in Nigeria is mainly in the hands of small scale farmers who are using unimproved farming techniques. Actual yields of rice differ significantly from potential yields and this has been attributed to low productivity (FMA, 2001). Large losses occur during storage, chiefly as a result of insect and rodent damage. Fungi and bacteria may reduce the quality, if the relative humidity of the air in the storage space remains too high (above 70%) or if rainwater enters the storage building. Fortunately, those losses can be individually eliminated. The cardinal rules for food storage are to allow only clean and properly dried rice to enter the storage and keep to storage building completely rain and rodent proof. The floor should be water tight, so that no moisture seeps upwards through it. The storage should also be fumigated to control insect damage (Onwueme, 1991). Rice has contributed to the socioeconomic well-being of Nigeria both as a major element in the nation's food security calculations and as a commodity for internal commercial transactions (FAO, 2000).

Rice is primarily consumed in its parboiled form which adds value to rice in the production and consumption chain. It can be used in form of pastries, noodles, puffed rice, fermented sweet rice and related forms. Rice is used in making wine, beer, spirit and vinegar. Rice wine which may contain 10 to 15% alcohol is usually made from glutinous rice. Rice extract from the bran is rich in nutrients such as vitamin E and would not cause high blood cholesterol levels. Unfortunately, the use of rice oil has lagged behind potential value (Onwueme, 1991). Glutinous (sticky) rice has

been revealed as a sweet ingredient used by ancient Chinese builders to strengthen their constructions.

1.2 Statement of Problem

Economic growth and poverty alleviation in Nigeria will depend to a large extent on the ability of the country to improve on her agriculture, paying more attention to agriculture and improving on rice production will in no small measure improve food security (Erenstein et al., 2003). Indonesia was until 2004, the world's largest importer of rice. Today, Indonesia has with the sense of patriotism surpassed all odds to become self-sufficient in the commodity. Nigeria imported rice to the tone of 1.8 million dollars in 2002 alone. The annual demand for rice in the country is estimated at 5 million tons, while production is 3 million, resulting in a deficit of 2 million tons (Chinma, 2004). According to Ogundele (2004), Africa today is described as the "most hunger ridden" continent. The result is unimaginable poverty and degradation of the very essence of human dignity. Unless there is dramatic increase in food production, especially in small scale farming, worse is likely to happen.

Recently the federal government of Nigeria had announced her plans to ban the importation of rice by 2019. According to the government, the country must be self-sufficient in rice in a manner that grows agricultural sectors to create jobs. Therefore, it was going ahead to ensure the ban on rice importation as from 2019, at which time the nation would have attained self-sufficiency in rice production in line with the rice implementation plan (Osagie, 2014). This explains why rice import accounts for approximately one third of Nigeria's rice supply (FAS, 2010). Rice import represents more than 25% of agricultural imports and over 40% of domestic consumption (FMARD, 2004, Ohaka et al., 2013). Despite the place of rice in contributing to the food supply in Nigeria, Its production is still put at 3.2 million tonnes (Babafada, 2003; Ohaka et

al., 2013). This has shown to be far below the national requirement as over 600 million dollars' worth of rice is imported annually into the country (Ohaka et al., 2013; Raufu, 2014). Therefore the need to investigate the economic analysis of rice production in the study area cannot be over emphasized. The study will provide answers to the following questions

1.3 Research Questions

1. What are the socio economic characteristics of the respondents?

2. What is the costs and returns associated with rice production?

3. What are the constrains militating against increase rice output in the study area?

4. what is the technical efficiency of rice production in the study area?

1.4 Objective of the Study

The general objective of the study is to examine the economic analysis of rice production in Pategi local government of Kwara state. The specific objectives are to:

1. Describe the socio economic characteristics of the respondents

2. Estimate the costs and returns associated with rice production

3. Highlight the constrains militating against increase rice output in the study area

4. Estimate the technical efficiency of rice production in the study area.

CHAPTER TWO

LITERATURE REVIEW

2.1 Importance of Rice in Nigeria

2.1 Rice Production Systems

Rice farming systems, according to Dey (1984), form one or more subsystems within a larger farming system, which includes the full set of crops and livestock produced in a particular ecological region by a particular socioeconomic group. Rice is a semi-aquatic plant. Its range of environmental tolerance extends to the wet parts of the landscape where other cereals fail (IRRI, 1976). Towards the dry side of such environmental conditions, rice is much less tolerance of low soil moisture than other cereals, thus strictly limiting its production to land where water is not in short supply during part or all of the growth cycle.

There are basically two types of rice farming systems, according to the availability of water, namely, upland rice and wet paddy or swamp rice. In the wet paddy system, FAO (1970) stated that rice is grown on land covered with water for most of the year. Such lands are located along the banks of rivers and streams or in low land plans covered most of the year with water from a dam (irrigation). To get good yields from wet paddy (swamp rice), the farmer must be in control of the water, ensuring the right depth of water at different stages of growth of the rice crop.

The field operation carried out in wet paddy, according to WARDA (1981), include nursery preparations, which consists of tillage, leveling and broadcasting of the seeds. The next operation, which is transplanting, is done 30 days after planting the nursery, according to FAO (1970). Maintenance of the permanent field include weeding, fertilizer application, bird scaring and finally at maturity, harvesting.

Upland rice refers to rice grown on both flat and sloping fields that are not bonded, that are prepared and seeded under dry conditions, and that depend on rainfall for moisture (IRRI, 1975). The seeds are sown directly to the field.

According to FAO (1970), the field is better cleared and filled at the beginning of the rainy season so that the soil holds the water. It further recommended that sowing should be done using selected seeds that were disinfected and advised farmers to sow in rows. Weed, which is a major problem in rice cultivation, should according to FAO (1970), be removed whenever they have grown. Other practices include fertilizer application, bird scaring and harvesting when the panicle has ripened.

2.2 Rice Processing, Storage and Marketing

2.2.1 Rice Processing

According to Imo (1990), processing involves the transformation of the row food into other foods which can be eaten or stored. In improves the acceptability, palatability and digestibility of the products. Rice processing is limited to the three stages, via, parboiling, drying and milling (Oni and Ikpi, (1981). Parboiling is carried out mostly in old 20 litre oil drums cut in half, using firewood and water. After steaming for about 30 minutes, the paddy is removed from the drum and spread out on woven mats in the sun to dry (Grist, 1959).

The entire paddy processed in the rice mill is parboiled before milling.Oni and Ikpi (1981) indicated that before the introduction of rice mills, rice processing consisted of parboiling, drying and pounding with pestle in a mortar to dehusk the paddy. This traditional system of processing rice paddy is still used by some village rice farmers in Nigeria. Olayemi (1984) estimated that in 1972 about 10 percent of Nigeria’s rice was processed through this system.

The final stage of this traditional system is winnowing. A major feature of the traditional system, according to Oni and Ikpi (1981), is that it is very slow and labour intensive. Furthermore, the final product obtained often contains a high percentage of broken grains and occasionally, some foreign bodies. Based on these limitations this system is becoming less and less popular with the Nigeria rice farmers.

By the end of the 1950's, rice mill was introduced to replace mortar and pestle. The small rice mills are the most predominant of the three processing systems (Oni and Ikpi, 1981). Their field survey indicated that about 85 percent of Nigerian rice was now processed through the small milling units with an average capacity of 0.2 tons per hour. Each small mill was driven by a diesel engine of about 1.6 horse-power. The average milling capacity of each mill was about 400 tons per annum. It was the usual practice to parboil the paddy before delivering it to the mill site for milling. The small milling unit performed both hulling and milling operations. Usually milling was done for a fee and the mills were usually located in the major rice producing areas of the country.

According to Okorji (1983), the engine powered mill enabled larger quantities of paddy to be processed at a time, as well as produced better quality rice. Some rice mills that were first introduced were still in use, though with slight modifications. There are, however, modern rice processing methods involving parboiling, drying milling and destoning operations in a single process. In Nigeria these mills are owned by the Government or quasi-government parastatals, such as, the state Agricultural Development Corporation. The Pattegi, Uzo-Uwani and Agbade Rice mills are typical examples of large-scale mills in Nigeria (Oni and Ikpi 1981). These mills have milling capacities of over 0.7 tons per hour, with rice polishing devices.

Incidentally, the sophistication and cost of such modern rice processing machines are beyond the reach of the small-scale rice processors. This is because of the amount of capital investment required. Large mills are not popular with Nigerian farmers, nevertheless, it is hoped that with recent cooperative activities of Nigerian rice farmers, coupled with the pace of technological advancement in the country, this system of rice processing will find greater usage by Nigerian farmers in no distant time.

2.2.2 Rice Storage

An inherent characteristic of agricultural production is that it is seasonal while the demand is generally all year round, hence, storage allows a smooth and, as far as possible, uninterrupted flow of product into the market (Crawford, 1997). Storage can be carried out by the farmers, the traders, marketing board or the consumer. However, this is only viable when produce can be sold after storage at a price higher than the pre-storage price, with the difference fully covering the cost of storage, as well as offering an incentive to take the risks that a loss may result.

According to Olukosi and Isitor (1990), storage cost is an important component of marketing costs. They are costs incurred in the storage and preservation of farm products until the time when they are needed. Olayemi (1974) noted that the seasonal price fluctuations and other market price disparities and deficiencies can be linked with problems of inadequate storage and marketing of staple food stuff if carried out efficiently would be a major contribution to the solution of world hunger.

Anthonio (1971) observed that one of the most serious problems in the marketing of staple food crops in Africa was lack of efficient and adequate storage facilities. Similarly, Momoh et al. (1968) and Onita (1986) reported the pathetic situation in Nigeria’s markets where several farm products

were seen rotting away. The regrettable situation is the result of lack of processing and storage facilities and techniques.

Nweze (1997) reported that current obstacles to the marketing of stored food produced in Nigeria included inadequate infrastructure, organizational problems, inefficiency of storage systems and distribution channels, and lack of market information and credit.

Although rice can be stored in both paddy and milled forms, paddy is more common among small-scale farmers. Rice in this form is one of the few food crops that can be stored safely with simple practices in the tropics (Emil, 1964). Furthermore, if the paddy is adequately dried immediately after threshing and is kept in a dry, rodent-free place, it can safely be stored for up to one year without substantial loss in germination and for longer periods for consumption purposes. After the paddy has been milled or even after parboiling, it is subject to insect and weevil attacks. In parboiled paddy form however, toughness and thickness of the outer glume make it quite free from such damages (Emeribe, 1991).

The grains can be stored in different types of soils, dryer and bags in warehouses and therefore require less handling. However, the higher capital investment and operational costs may make some techniques (soils, dryers etc) inappropriate for individual small-scale farmers, although it may be appropriate for groups of farmers or co-operatives (FAO, 1982).

Farmers produce enough food that can last throughout the planting season but the problem is simply their inability to cope with food storage facilities. About 50 percent of agricultural output of every planning season is lost (Nwora, 1984). Adegeye and Dittoh (1985) opined that efficient marketing ensures that supplies of food that are seasonal become available throughout the year with little variation in price that can be attributed to the cost of storage.

2.2.3 Rice Marketing

Rice marketing, as in the case of other agricultural products, can be considered under the forms in which rice is sold and the categories of buyers and markets used. Rice is mainly marketed in paddy and milled forms. Most rice producers, however, sell a greater proportion of their rice in paddy than in processed form (Okorji, 1983). Paddy rice is sold in jute bags which weigh between 70 and 120kg. The size varies by locality. Price per jute bag varies depending mainly on the season, rice variety and locality.

Milled rice is usually sold in bushels containing, on the average, 23kg of milled rice. Price per bushel also varies with season and variety. Locality in this case plays little or no role in price determination since the rice mill industry is located at a given place. Rice is sold to wholesalers, retailers and consumersalike (Nwokolo, 1990).

2.3 Concept of Farm Productivity

Productivity denotes the efficiency with which various input are converted into product. It signifies the relationship between output and input. Agricultural productivity is the index of the ratio of the value of total farm output to the value of the total input used in farm production (Olayide and Heady, 1982). Productivity measures are sub-divided into partial and total measures. Partial measures are the amount of output per unit of the particular input. Commonly used partial measures are yield (output per unit of land), labour productivity (output per economically active person or xxiv per agricultural person - hour). Yield is commonly used to assess the success of new production practices or technology. Labour productivity is often used as a means of comparing the productivity of sectors within or across economies. It is also used as an indicator of rural welfare or living standards since it reflect the ability to acquire income through sale of agricultural goods

or agricultural production (Block, 1995). Also partial productivity includes capital and management productivity which is the ratio of total output to inputs of capital and management respectively. The total measures of productivity, which is often the total factor productivity (TFP), is the ratio of an index of agricultural output to an index of agricultural inputs, the index of agricultural output is a value –weighted sum of conventional agricultural inputs. These generally include land, labour, physical capital, livestock, chemical fertilizer and pesticides.

2.4 The Concept of Farm Efficiency

Efficiency is concerned with the relative performance of the process used in transforming given inputs into outputs. Economic theory identifies at least three types of efficiency, these are; technical, allocative and economic efficiencies. Technical efficiency shows the ability of these inputs to employ the best practice in an industry, so that no more than the necessary amount of a given set of inputs is used in producing the best level of outputs.

Technical efficiency is a major component of productivity being used in measuring farm performance. It is used to measure the ability of a farm performance. It is used to obtain maximum output from a given set of inputs (Rahman, 2013). A technically efficient farm operates on the production frontier while a technical inefficient farm operates below the frontier and could be made efficient by increasing its output with the same input level or using fewer inputs to produce the same level of outputs. As such, the closer a farm gets to the frontier, the more technically efficient it becomes (Rahman, 2013).

Allocative efficiency refers to the choice of an optimum combination of inputs consistent with the relative factor price. Allocative efficiency reflects the ability of the farm to use input in optimal proportion given their respective prices and the production technology. Under competitive

conditions, a farm is said to be allocative efficient if the marginal returns of factor input equal the market price of output. Allocative efficiency deals with the extent to which farmers make efficient decision by using inputs up to the level at which their marginal contribution to production value is equal to the factor cost (Rahman, 2013).

Economic efficiency is derived as the product of the technical and allocative efficiencies (that is, technical efficiency multiply by allocative efficiency) (Rahman, 2013). Economic efficiency is concerned with the utilization of maximum output in monetary term with the minimum available resources. It occurs when a farm chooses resources and enterprises in such a way to attain economic optimum. A farm that is economically efficient should, by definition, be both technically and allocatively efficient. However, this is not always the case, as pointed out. It is possible for a farm to have either technical or allocative efficiency without having economic efficiency. The reason may be that the famer in this case is unable to make efficient decisions as far as the use of inputs is concerned (Rahman, 2013).

2.5 Profitability in Farm Production.

Profitability is the primary goal of all business ventures without which the business will not survive in the long run. It is the ratio of revenue to cost, which is measured with income and xxvi expenses. Income is money generated from the activities of the farm business. Expenses are the cost of resources used up or consumed by the activities of the farm business.

2.5.1 Gross margin analysis

The gross margin analysis involves evaluating the efficiency of an individual enterprise (or farm plan) so that comparison can be made between enterprises or different farm plans. It is a very useful planning tool in situations where fixed capital is a negligible portion of the farming

enterprise, as is the case in subsistence agriculture. Gross margin is the difference between the gross income (GI) and total variable cost (TVC). Gross Margin (GM) = GI – TVC. Where: GM = Gross labour, capital and managerial capability is represented as: margin (Naira/hectare) GI = Gross Income (Naira /hectare) TVC= Total Variable Cost (Naira/hectare)

2.5.2 Net farm income

The net farm income (NFI) measures the return to unpaid family labour, operator's land, Net Farm Income = Gross Receipts – Total cost of production. Although the income can be withdrawn from the business without affecting its scale of operation, it is generally advisable to plough it back into the farm business. Profitability in some farm business exists because they are managed more efficiently than others. The reward for doing the job better is usually profit. The prospect of earning and maintaining profitability serves as the incentive for creativity and efficiency among farmers. Therefore, profitability stimulates risky ventures and drives farmers to develop ways of cutting cost and improving technology always in an effort to satisfy consumer's interest.

2.6 Empirical studies

Udoh and Etim (2007) used the stochastic frontier production function in estimating farm level technical efficiency of fluted pumpkin production in Uyo, Nigeria. The result showed that land, labour, inorganic fertilizer and planting material were significantly related with output of fluted pumpkin at 1%, 5% and 10% levels of probability, respectively. The technical efficiencies ranged between 0.01 and 0.96 with a mean technical efficiency of 0.86. The determinants of technical inefficiency in fluted pumpkin production result showed that extension contact and farming experience were the significant determinants of technical inefficiency at 5% and 1% levels of probability respectively.

Tanko and Opara (2010) used stochastic frontier production function in the measurement of technical efficiency in maize production in Bosso Local Government Area of Niger State of Nigeria. Farm size, labour and fertilizer were found to be significantly related with maize output at 1% levels of probability. The mean technical efficiency is 0.873 which implies that on the average the respondents are able to obtain a little over 87.3% of potential output from a given mix of production inputs, suggesting a wider scope for the farmers to increase their level of technical efficiency by allocating existing resources more optimally. The summary of the results indicated that the best farm has technical efficiency of 0.983 (98.3%) while the worst farm has a technical efficiency of 0.434 (43.3%) implying that some of the farmers are operating far away from the frontier region. The results of the determinants of technical inefficiency in maize production showed that education, farming experience, and credit were significantly related with technical efficiency at 1% levels.

Rahmanet al. (2005) used the stochastic frontier production function in estimating the technical efficiency in sorghum-based cropping systems in Soba area of Kaduna state of Nigeria. For sole sorghum production, land, fertilizer and labour were significantly related with output at 5% level of probability, with an average technical efficiency of 0.62. For sorghum-cowpea production, land and labour were reported to be statistically significant at 5% level with an average technical efficiency of 0.74. For sorghum-groundnut production, land and labour were statistically significant at 5% level with an average technical efficiency of 0.64. For sorghum-soya bean production, land and labour were statistically significant at 5% with an average technical efficiency of 0.71 (71%). For sorghum- millet production, land and labour were statistically significant at 5% level with an average technical efficiency of 0.58 (58%). The overall technical efficiencies achieved in the sorghum-based cropping system ranged between 58 to 74 percent.

Kadurumbaet al, (2009) used translog stochastic frontier production function to measure the level of technical efficiency and its determinants in traditional palm oil processing in Imo State of Nigeria. From the result, oil palm fruit (kg), water used, amount of loan borrowed, petrol/diesel energy were statistically significant at 5% and 10% levels respectively and were positively related with technical efficiency. While labour, labour2 and water used2 were statistically significant at 1%, 5% and 10% levels respectively and negatively related with technical efficiency. Result of the determinants of technical efficiency in traditional palm oil processing showed that age, educational level and net processing income were negatively xxix related with palm oil processing but significant at 5%, 1% and 10% level respectively. Depreciation on fixed assets, litre of petrol/diesel energy, cooperative membership, credit availability, interest on loan, mill membership and mechanization energy were statistically significant at 1%, 5% and 10% level respectively. The frequency distribution of technical efficiency indices showed the maximum technical efficiency (0.97), minimum technical efficiency (0.16) and the mean technical efficiency (0.86).

Muhammad-Lawalet al. (2009) used Cobb-Douglas frontier production function model to estimate technical efficiency of youths participating in agricultural programs in Ondo State, South-Western Nigeria. The estimated individual technical efficiencies ranges between 32.62% and 96.25%, with a mean technical efficiency of 85.23%.The result showed that 86% of the respondents were operating at 80% level of technical efficiency. The determinants of technical efficiency were years of participation in agricultural programme, household size, usage of extension service and education.

Chukwuji (2010) studied the technical efficiency in cassava-based food crop production systems in Delta State by using stochastic frontier function. The result showed that 71% and 67% of the variations in output is attributable to difference in technical inefficiencies. Mean technical

efficiencies for mixed crop and mono-crop farmers were 80 and 71 percent respectively. The determinants of technical inefficiency are Level of formal education, contact with extension agents, farming experience and capital to labour ratio and credit to total cost ratio.

2.7 Constraints to Rice Production in Nigeria

The most important constraints farmers face in rice farming as pointed out by research include lack of farm tools, low soil fertility, lack of financial resources to purchase inputs and high prices of the inputs (especially fertilizers and seed, and low technical know-how. Others are pests and diseases, vagaries of weather, unavailability of inputs, lack of access to credit facilities and agricultural extension services, and poor marketing of both inputs and outputs.

Oyelade and Awanane (2013) indicated that a major limitation to ricee production in Nigeria is the declining soil fertility which is exacerbated by the high cost and/or unavailability of chemical fertilizer. Low soil fertility, especially of Nitrogen and Phosphorus, is the prime factor limiting rice growth which subsequently affects grain yield. The production constraints associated with maize production include drought, shortage of rainfall, and pest and diseases (Oyelade and Awanane, 2013). Other constraints relate to crop management, the non-availability of good seed, as well as soil fertility depletion (Badu-Aprakuet al., 2012). Research by scholars have shown that, low capitalization, price fluctuation, diseases and pests, poor storage facilities, and inefficiency of resources utilization are the identified problems in maize production in Nigeria.

Valencia et al., (1999) reported Sasakawa Global 2000, research on irrigated rice production, identified farmers majors constraints to increase maize production under irrigation to include land scarcity, fluctuations in supply of irrigation water, inadequate credit facilities, high water table, exorbitant prices of fertilizers and other inputs, lack of improve seeds and weed infestation. Also

an important limitation to maize production identified by researchers is lack or inadequate use and application of improved seeds varieties.

Abdoulayeet al., (2009) reported that the shortfall in seed supply over sowing requirement is attributed partly to institutional problems related to the establishment of a seed production unit, seed production and processing, seed marketing and distribution, seed demand at the farm level and the operational environment of seed production and distribution. Another major constraint to the development of the seed sector also includes the low adoption of improved varieties in some areas (IITA, 2009).

Baffouret al., (2011) reported that maize production in West and Central Africa has been greatly constrained by many biotic and abiotic stresses often too formidable for individual National Agricultural Research System to combat alone. The report reveals that, most of these constraints cut across countries with similar agro ecological zones, and the most important being drought, low soil fertility, striga infestation, stem borers and maize streak virus. The report also revealed that farmers face a variety of policy and institutional constraints, such as undeveloped markets, high cost or unavailability of farm inputs, high labour requirements for land preparation and weeding, and difficult access to credit, all of which inhibit increases in maize yields and production. xxxv In 1998 the West and Central Africa Rice Collaborative Research Network (WECAMAN) in a workshop of national maize scientists in collaboration with farmers, identified maize production constraints, although varying in relative importance among countries and agro ecological zones, to include the need for improved crop varieties, appropriate natural resources and crop management, plant health, postharvest technologies, socioeconomic practices and conditions, as well as the need to improve human capacity (Baffouret al., 2011).

CHAPTER THREE

METHODOLOGY

3.1 The study Area

The study was conducted in Pategi Local Government area, Kwara state, Nigeria. Ilorin is located on latitude 8.4799°N, longitude 4.5418°E in North Central, Nigeria and situated 320meters above the sea level. (Abiodun et al 2021)

3.2 Population of the Study

The population of the study compose of the rice farmers in Pategi local government of Kwara state.

3.3 Sampling procedure and Sampling Size

Multistage sampling procedure was employed for the study. The first stage will involve the purposive selection of three out of 10 cells in the local government due to their rurality. The second stage involved random selection of two villages from each of the cells selected making a total of six villages. The third stage involved proportionate sampling of 15 respondents from each of the six villages, making a total of 90 respondents for the study.

3.4 Data Collection

Data was collected from primary source. This was accomplished with the aid of well-structured questionnaire..

3.5 Method of Data Analysis

Descriptive statistics (tables, frequency, mean, percentage, etc) was used for objectives 1, 3. Below is the analysis of the statistical tool that will be used in capturing the different objective of the study.

Objective 1: Descriptive statistics

Objective 2: Gross Margin

Objective 3: Descriptive statistics

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Socioeconomic Characteristics of Respondents

The distribution of respondents by age revealed that 8.99% were less than equal to 30 years, 46.67% were between 31-40 and 22.22% were 41-50 years, and between 51 and 60 years. This implies that the respondents are quite young and should be able to be productive in their farming activities

Table 1: Percentage distribution of respondents by Age

Age	Frequency	Percentage
<30	8	8.99
31-40	42	46.67
41-50	20	22.22
51-60	20	22.22
Total	90	100.00

Sex of respondents

The distribution of respondents by sex revealed that 84.44% were male while 15.56% were female. The results implies that the majority of the respondents were male

Table 2: Percentage distribution of respondents by Sex

Sex	Frequency	Percentage
Male	76	84.44
Female	14	15.56
Total	90	100.00

Marital Status

The distribution of respondents by marital status revealed that majority (60.00%) were married, 8.89% were divorced, and separated 17.78% were widowed while 4.44% were divorced. The results implies that majority of the respondents were married which is an indication that there would be supply of family labour for their farming activities

Table 3: Percentage distribution of respondents by marital status

Marital status	**Frequency**	**Percentage**
Single	4	4.44
Married	54	60.00
Divorced	8	8.89
Separated	8	8.89

Widow	16	17.78

Household Size

The result revealed that 61.11% of the respondents had between 2-4 household members while 38.89% had above 5 household members. The results implies that the respondents had a moderately large family size.

Table 4: Percentage distribution of respondents by Household Size

Household Size	Frequency	Percentage
2-4	55	61.11
Above 5	35	38.89

Religion

The distribution of respondents by religion revealed that 51.11% were Christians, 40.00% were Muslims while 8.89% were traditional religion worshippers. The result implies that Christianity and Islam were the dominant religion among the respondents

Table 5: Percentage distribution of respondents by Religion

Religion	Frequency	Percentage
Christianity	46	51.11
Islamic	36	40.00
Traditional	8	8.89

Educational level Attainment

The distribution of respondents by educational level revealed that 14.44% had non formal education, 16.67% had primary education, 43.33% had secondary education while 25.56% had tertiary education.

Table 6: Percentage distribution of respondents by Educational level Attainment

Marital status	**Frequency**	**Percentage**
No formal Education	13	14.44
Primary Education	15	16.67
Secondary education	39	43.33
Tertiary education	23	25.56
	90	100.00

Primary Occupation

The distribution of respondents by primary occupation revealed that 67.78% were farmers, 17.78% were traders, 12.22% were civil servants, 17.00 % were artisans. The results implies that majority of respondents were farmers.

Table 7: Percentage distribution of respondents by Primary Occupation

Primary Occupation	Frequency	Percentage
Farming	61	67.78
Trading	16	17.78
Civil servant	11	12.22
Artisans	19	19.22
Total	90	100

Field Survey, 2025

Years of Experience in Farming

The distribution of respondents by farming experience revealed that 15.56% had between 1-10years of farming experience, 52.22% had between 11 and 20 years of farming experience, 32.22% had above 21 years of farming experience. The results implies that respondents had many years of farming experience which will definitely have positive effects in their rice production

Table 8: Percentage distribution of respondents by Years of Experience in Farming

Years of Experience	Frequency	Percentage
1-10	14	15.56

11-20	47	52.22
21-above	29	32.22
Total	90	100.00

Field Survey, 2025

Farm Size

The distribution of respondents by farm size revealed that 41.11% of respondents cultivated less than an hectare, 53.89% cultivated above an hectare. The results indicates that the respondents are small-holder who cultivates at subsistence level.

Table 9: Percentage distribution of respondents by Farm Size

Farm Size	**Frequency**	**Percentage**
< 1 hectare	37	41.11
Above 1 hectare	53	53.89
Total	100	100.00

Field Survey, 2025

Sources of Labour

The distribution of respondents by sources of labour revealed that 3.33% used family labour, 56.67% used hired labour, while 40.00% of respondents utilized the services of both the family and the hired labour.

Table 10: Percentage distribution of respondents by Sources of Labour

Sources of Labour	**Frequency**	**Percentage**
Family	3	3.33

Hired	51	56.67
Both	36	40.00
Total	90	100.00

Field Survey, 2025

Membership of social Organization

The distribution of respondents by membership of social organization revealed that 66.67% were members of social organization while 33.335 were not.

Table 11:Percentage distribution of respondents by Membership of social Organization

Membership of Social Organization	**Frequency**	**Percentage**
Yes	60	66.67
No	30	33.33
Total	90	100.00

Field Survey, 2025

Sources of Capital

The distribution of respondents by sources of capital revealed that 25.56% used personal savings, 27.78% used cooperative society, 10.00% used private money lenders, 4.44% got money through family and friends, 8.89% accessed credit through thrift while 23.33% got money through commercial bank

Table 12: Percentage distribution of respondents by sources of Capital

Sources of capital	Frequency	Percentage
Personal savings	23	25.56
Cooperative Society	25	27.78
Private money lenders	9	10.00
Relative and friends	4	4.44
Thrifts	8	8.89
Commercial banks	21	23.33
Total	90	100.00

Field Survey, 2025

4.2 Cost, Returns and Profitability of rice Production

The cost and returns associated with rice production was carried out to determine the profitability of rice production. Gross margin was used to determine the cost and returns of rice production in the study area using budgetary technique. The farm budgetary analysis helps to determine the total cost and total revenue that accrued to the enterprise within a specific production period. Total Revenue (TR and Gross margin incurred from rice production which in pure economic sense represents the profit. The results in table 13 shows the average total revenue of #459677.78, average gross margin (profit) is #11,632.32. The result indicates that rice production is profitable in the study area.

Table 13: Cost and returns of rice production

Parameters	Cost (at average)
Total Variable Cost	
Rice seedlings	#47, 855.56

Fertilizers	#61,588.89
Land Preparations	#29.000.00
Planting	#56,700.00
Weeding	#55,255.56
Fertilizer application	#26,511.11
Harvesting	#47,966.67
Threshing	#48,200.00
Transportation	#53,966.67
Total Cost (TVC+TFC	#418,044.46
Profit (TR-TVC)	#11,633.32

Field Survey, 2025

4.3 Constraints to Rice Production

The distribution of respondents by constraints to rice farming revealed lack of skill constituted the greatest constraint with Weighted mean score (WMS) of 2.51. This was closely followed by inaccessibility of land with WMS of 2.45. Next is lack of credit facilities with WMS of 2.08. Others are in the following order: Soil fertility management (WMS=2.05), postharvest handling and Nutrient imbalance and soil constraints (WMS=2.03), Processing and Marketing (WMS=1.95), Irrigation and water (WMS=1.92), Climatic factor (WMS=1.75), Lack of resistant rice varieties (WMS=1.63), Pest and diseases (WMS=1.32). The result implies that lack of skill and inaccessibility of land constituted the greatest constraint to the rice production among the respondents.

Table 14: Distribution of Respondents by Constraints to Rice Production

Constraints	**Major constraint**	**Minor Constraint**	**Not a constraint**	**WMS**	**Ranking**
Pest and diseases	2(2.22)	25(27.78)	63(70.00)	1.32	11th
Inadequate knowledge on the use of herbicide and pesticide	17(18.89)	51(56.67)	22(24.44)	1.94	7th
Postharvest handling	17(18.89)	67(74.44)	6(6.67)	2.03	5th
Processing and Marketing	15(16.67)	63(70.00)	12(13.33)	1.95	6th
Soil fertility management	9(10.00)	77(85.56)	4(4.44)	2.05	4th
Irrigation and water	28(31.11)	27(30.00)	35(38.89)	1.92	8th
Harvesting skills	53(58.89)	30(33.33)	7(7.78)	2.51	1st
Lack of resistant rice varieties	7(7.78)	43(47.78)	40(44.44)	1.63	10th
Climate factors	4(4.44)	66(73.33)	20(22.22)	1.75	9th
Nutrient imbalance and soil constraints	7(7.78)	79(87.78)	4(4.44)	2.03	5th
Inaccessibility of land	46(51.11)	39(43.33)	5(5.56)	2.45	2nd
Lack of credit facilities	26(28.89)	46(51.11)	18(20.00)	2.08	3rd

Field Survey, 2025

CHAPTER FIVE

SUMMARY CONCLUSION AND RECOMMENDATION

5.1 Summary

The general objective of the study is to examine the economic analysis of rice production in Pategi local government of Kwara state. The specifically, the study described the socio economic characteristics of the respondents estimated the costs and returns associated with rice production and highlighted the constrains militating against increase rice output in the study area

The study was carried out in Pategi local government area of Kwara state. Southwestern Nigeria. The population of the study comprised of the rice farmers in Pategi local government of Kwara state. Multistage sampling procedure was employed for the study. The first stage involved the purposive selection of three out of 10 cells in the local government due to their rurality. The second stage involved random selection of two villages from each of the cells selected making a total of six villages. The third stage involved proportionate sampling of 15 respondents from each of the six villages, making a total of 90 respondents for the study. Data was collected from primary source. This was accomplished with the aid of well-structured questionnaire. Descriptive statistics (tables, frequency, mean, percentage, etc) was used for objectives 1, and 3 and while Gross Margin Was used for objective 2

The results revealed that 8.99% were less than equal to 30 years, 46.67% were between 31-40 and 22.22% were 41-50 years, and between 51 and 60 years. 84.44% were male while 15.56% were female, majority (60.00%) were married, 8.89% were divorced, and separated 17.78% were widowed while 4.44% were divorced. that 61.11% of the respondents had between 2-4 household members while 38.89% had above 5 household members. 14.44% had non formal

education, 16.67% had primary education, 43.33% had secondary education while 25.56% had tertiary education. 67.78% were farmers, 17.78% were traders, 12.22% were civil servants, 17.00 % were artisans. 15.56% had between 1-10years of farming experience, 52.22% had between 11 and 20 years of farming experience, 32.22% had above 21 years of farming experience. 41.11% of respondents cultivated less than an hectare, 53.89% cultivated above an hectare.

Total Revenue (TR and Gross margin incurred from rice production which in pure economic sense represents the profit. The results in table 13 shows the average total revenue of #459677.78, average gross margin (profit) is #11,632.32. The result indicates that rice production is profitable in the study area.

The distribution of respondents by constraints to rice farming revealed lack of skill constituted the greatest constraint with Weighted mean score (WMS) of 2.51. This was closely followed by inaccessibility of land with WMS of 2.45. Next is lack of credit facilities with WMS of 2.08. Others are in the following order: Soil fertility management (WMS=2.05), postharvest handling and Nutrient imbalance and soil constraints (WMS=2.03), Processing and Marketing (WMS=1.95), Irrigation and water (WMS=1.92), Climatic factor (WMS=1.75), Lack of resistant rice varieties (WMS=1.63), Pest and diseases (WMS=1.32). The result implies that lack of skill and inaccessibility of land constituted the greatest constraint to the rice production among the respondents.

5.2 Conclusion

The students concludes that respondents were still agile and productive, the rice production among the respondents is highly profitable and lack of skills, inaccessibility to land and lack of credit facilities constituted the major constraints to rice production

5.3 Recommendations

1. Government should train farmers on necessary skills needed for profitable rice production in the study area

2. Government should also provide credit facilities to rice farmers for them to acquire inputs in order to cultivate more hectares of land

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