

# Effects of Paddy Rice Production on the Welfare of Farmers And The Determinants of the Achievements of Paddy Rice Farmers In Niger Delta Region Of Nigeria

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## Abstract

This study examined the effect of paddy rice production on the welfare of farmers and the determinants of the achievements of paddy rice farmers in Niger Delta Region of Nigeria. Multistage sampling technique was used to select a sample of 300 rice farmers from three states out of the nine states in the region based on their strength in rice production. Data were collected using structured and validated questionnaire. Both primary and secondary sources of data were used in the study. The result highlighted some of the achievements farmers gained in producing rice like; source of regular income, easy feeding and clothing, ability to train children in school, among others which are all instruments of poverty eradication and sustainable rural development. The result also showed that household size, household income per adult equivalent; micro credit and yield have positive relationship with the welfare of farmers meaning that increase in each one of them leads to increase or improvement in the welfare of farmers. It was concluded that paddy rice production has positive effect on the welfare of farmers in the study area. It was recommended that: farmers should be encouraged to form co – operatives amongst themselves also farmers should be taught, encouraged and empowered to source for high yielding seeds for use in their production.

**KEYWORDS:** Welfare, Achievement, Determinants, Regression, Paddy Rice, Niger Delta.

## 1.0 INTRODUCTION

Rice cultivation is the principal activity and source of income for millions of households around the globe. Several countries of Asia and Africa are highly dependent on rice as source of foreign exchange earnings and government revenue also Rice is the second largest produced cereal in the world after wheat. (Kadiri, Fausat. 2014). Rice is a crop that cuts across regional, religious, cultural, national and international boundaries. Rice production is geographically concentrated in Western and Eastern Asia. Asia is the biggest rice producer in the world accounting for 90% of the world's production and consumption of rice. China and India, which account for more than one-third of global population supply over half of the world's rice. Brazil is the most important non-Asian producer, followed by North and Central America, United States of America ranks third in North America continent after Brazil and North and Central America. Nigeria ranks second in Africa after Egypt (Kadiri, Fausat. 2014).

There has been a major decline in world rice production since late 2007 due to many reasons including climatic conditions in many top rice producing countries as well as policy decisions regarding rice export by government of countries with considerable rice production. Despite a low world rice production in 2009, the current global rice stocks are much higher than in 2007. In the last two years, rice stocks have increased by more than 16 million tons from 75 million tons in 2006 to 91.5 million tons in 2009 (Rice Trade, 2011).

According to Shellemiah (2006), Africa spends over two million dollars importing rice from Asia, with an increased consumption rate of almost six per cent, and that rice is no longer a luxury crop since poor people as well as wealthy eat Rice. The estimated annual paddy rice production of Africa is about 24million tones (15.6Mt equivalent of milled rice). Additionally, 10 Mt of milled rice is imported into the continent annually (Manful, 2010).

Rice is an increasingly important crop in Nigeria. It is relatively easy to produce and it is grown for sale and for home consumption. In some areas there is a long tradition of rice growing, but for many, it is considered a luxury food for special occasion only. With the increased availability of rice, it has become part of the everyday diet of many in Nigeria. There are many varieties of rice grown in Nigeria; some of these are traditional varieties while others have been introduced into the country. Rice is grown virtually in all the agro-ecological zones in Nigeria (Akande, 2003). This is because, Nigeria have ideal climatic conditions which is akin to that of South East Asia where the crop is produced for export.

A combination of various factors seems to have triggered the structural increase in rice consumption in Nigeria. Urbanization is the most important cause of the shift in consumer's preference towards rice in Nigeria. Rice is easy to prepare compared to the other traditional cereals, thereby reducing the chore of food preparation and

fitting more easily in the urban lifestyles of rich and poor alike. Similarly, as men work at greater distances from their homes in the urban setting, more meals are consumed from the market where the ease of rice preparation has given it a distinct advantage. Also, as women enter the labor force, the opportunity cost of their time increases and convenient foods such as rice, which can be prepared quickly rise in importance. These trends have meant that, rice is no longer a luxury food but has become a major source of calorie for the urban poor and rich.

According to Onyishi, et al.,(2010), the main production ecologies of rice are rain-fed lowland, rain-fed upland, irrigated lowland, deep water floating, and mangrove swamp. They noted that, land area for rice production under rain-fed upland is 25%, rain-fed lowland 50%, irrigated lowland 16%, deep water and mangrove 9%, and their share of production is 17%, 35%, 27%, and 3% for rain-fed upland, rain-fed lowland, irrigated lowland, and deep water mangrove respectively. The deep water mangrove is not fully developed in Nigeria because; there is lack of appropriate technology (Singh et al., 1997).

In recent time, Nigerians have increased their level of foreign rice consumption irrespective of their relative prices simply because they are polished, stone free and easy to cook. Yet nutritionally, the local varieties produced in Nigeria are far better than those imported. Rice production is very essential in Nigeria as a whole and in Niger Delta in particular because, it guarantees food production; creates employment opportunities; reduce poverty; and create capacity building at both individual and institutional levels. All these are needed for Sustainable Rural Development of a region.

Sustainable development aims at accelerating economic development in order to conserve and enhance the stock of environmental, human and physical capital without making future generations worse off. When applied to agriculture, sustainability suggests that food production at present leaves enough nutrients in the soil that would produce food for the future generations. It also suggests that food and fibre, as well as animal products, will be produced, in adequate quantities and quality to meet, on regular and continuous bases, growing demands for agricultural products. Sustainable agriculture is that agriculture that would enable us to meet the above goals. Put succinctly, it will bring about, increase in agricultural production at both aggregate and per capita level increase in foreign exchange earnings through export promotion and import substitution, provision of gainful employment opportunities, self-sufficiency in food production, generate savings (capital) for investment in other sectors, and preserve and conserve the natural resource base, to enhance its productivity (Imodu, 1999).

The definition of rural development varies from one point of view to the other. Rural development may be centered on income criterion in which the concept is made to address the problem of rural poverty. Or it may be a sociological concept in which the rural poor represent a reservoir of untapped target group that should be given the opportunity to enjoy the benefits of development through improved education, health and nutrition. Rural development is the improvement in the living standard of the rural dwellers by engaging them in productive activities such as the establishment of rural industries that will increase their income. It is seen by these scholars as a means of raising the sustainable living of the rural poor by giving them the opportunity to develop their full potentials. Rural development can be distinguished from agricultural development which it entails and transcends. In essence Rural Development may imply a broad based re-organization and mobilization of rural masses in order to enhance their capacity to cope effectively with the daily task of their lives and with changes consequent upon this. It recognizes that improved food supplies and nutrition, together with basic services, such as health and education, not only directly improve the physical well-being and quality of life of the rural poor, but can also indirectly enhance their productivity and their ability to contribute to the national economy.

For the purpose of this study, the definition of rural development according to Moseley, (2003) was adopted and it stated that, Rural Development generally refers to the process of improving the quality of life and economic well-being of people living in relatively isolated and sparsely populated areas.

Niger Delta presents excellent agronomic environment for rice production and to stimulate this, various government interventions have been made, unfortunately, rice production remains at the low ebb why? If Niger Delta potential capability is properly harnessed, it will open up the latent man power in the region and provide a reputable means to forestall restiveness which is on the high side in the region. Moreover, there is currently a dearth of research work on rice production in the Niger delta as a strategy for sustainable rural development especially now that the nation is working towards our National food security.

### **Objectives of the study.**

The broad objective of this study was to determine the effect of paddy rice production on the welfare of rice farmers in the Niger delta region of Nigeria.

The specific objectives of the study include to:

- i assess the socio-economic characteristics of rice farmers in the region;
- ii determine the effects of paddy rice production on the welfare of farmers in the region;

iii formulate paddy rice production and rural development nexus

### **Hypothesis of the study.**

The following hypothesis was tested:

Rice production positively and significantly affect welfare of farmers in the study area.

This study intends to determine the socio-economic characteristics of rice farmers and also to measure the effect of rice production on the welfare of the farmers. This will enable us to determine whether the crop is contributing positively to the live of the farmers, this will help in improving the lives of the citizenry in the area and hence a sustainable rural development. The Niger Delta of Nigeria is the 3<sup>rd</sup> largest wetland in the world. The delta is a vast flood plain built up by the accumulation of sedimentary deposits washed down the Niger and Benue rivers. It is composed of four ecological zones: coastal barrier islands, mangroves, fresh-water swamp forests and lowland rainforests. The region consists of nine (9) states of the Federal Republic of Nigeria which are Abia, Akwa-Ibom, Bayelsa, Cross River, Delta, Edo, Imo, Ondo and Rivers States, and occupies an area of over 74000sq.Km with a population of over 35 million people (Niger Delta Development Commission, 2010). Niger Delta Region of Nigeria, like all Delta Regions all over the world, is very fertile and suitable for rice cultivation. According to National Bureau of Statistics (2007), in considering only the Niger Delta States, Ondo state came 1<sup>st</sup> in Areas Planted to Rice by States, followed by Abia state, Edo and Delta States came 3<sup>rd</sup> and 4<sup>th</sup> respectively, Cross River State came 5<sup>th</sup>, Imo State came 6<sup>th</sup>, while Akwa-Ibom, Rivers and Bayelsa States came 7<sup>th</sup>, 8<sup>th</sup> and 9<sup>th</sup> respectively.

## **2.0 MATERIALS AND METHODS**

The study was carried out in the Niger Delta Region of Nigeria. This Region is a densely populated region sometimes called the Oil Rivers because it was once a major producer of palm oil. The Niger Delta, as defined by the Nigerian Government, covers over 70,000km<sup>2</sup> and makes up 7.5% of Nigeria's land mass (Wikipedia, 2010). Historically and cartographically, it consists of present day Akwa-Ibom, Abia, Bayelsa, Cross-River, Delta, Edo, Imo Ondo and Rivers states. The South-South Niger Delta includes Akwa-Ibom, Bayelsa, Cross River, Delta, Edo and Rivers States; South-East includes Imo and Abia states while Ondo state constitutes the South West Niger Delta State.

A representative sample was selected for the study using a multistage sampling technique. Three states, Abia, Ondo and Imo States were purposively selected because of their relative strength t in rice production. Two Local Government Areas from each of the state, Abia (Arochukwu and Bende LGAs), Imo (Okigwe and Ihitte-Uboma LGAs), Ondo (Akoko North and Odigbo LGAs) were purposively selected based on their rice production intensity making a total of six Local Government Areas (LGAs). In each LGA selected, a list of rice producing communities was compiled through the assistance of ADP staff. From this list, five communities were selected randomly giving a total of thirty communities. In each of the selected communities ten rice farming households were randomly selected giving a total of fifty (50) farmers per LGA and hence a total of three hundred rice farmers. This technique gave every rice farmer in each community an equal opportunity of being part of the study

Data for this study were collected from both primary and secondary sources. Primary sources include information that was obtained from oral interview, observations and interview schedule. Two sets of interview schedule were used: the village level and farmer's household level. Structured interview schedule was utilized in gathering primary data.

Secondary source of data include information from journals, text books, internet search, websites, published and unpublished materials relevant to the study.

### 3.0 RESULTS AND DISCUSSION

#### 3.1 Socio – economic characteristics of the respondents

**Table 1 presents the socio-economic characteristics of the respondents**

Socio-economic characteristics of respondents	Percentage (%)	Mean
<b>Age:</b>		
25 – 35	10.33%	49years
36 – 45	27.67%	
46 – 55	35.00%	
56 – 65	17.33%	
66 – 75	9.69%	
<b>Marital Status:</b>		
Single	9.33%	
Married	70.00%	
Divorced	10.00%	
Separated	1.00%	
Widowed	9.67%	
<b>Gender:</b>		
Male	64.33%	
Female	33.67%	
<b>Participation:</b>		
Part time farming	61.00%	
Full time farming	39.00%	
Educational attainment		6- 10 years
Years of experience in rice farming		17 years
Farm size		2.32 (ha)
Farmers household size		6

Source: Field Survey Data, 2012.

Table 1 presents the mean of the socio economic characteristics of rice farmers in the study area. The table showed that most of the respondents fell within the age group 36 – 55years which was about 62.66% of the total sample, with a mean of 49years. This implied that rice farming is being practised by middle age farmers. This finding is consistent with the findings of Ibitoye et. al., (2012), who found that the mean age of rice farmers in their study area, was 45years. This showed that rice farmers belong to the middle age classes, who are physically fit to withstand the stress and risks involved in rice production, and are more mentally alert to embrace new techniques of rice production. Also, rice production in the study area was dominated by male farmers who comprised of 64.33% of sampled farmers. This is in contrast with Ibitoye, et al., (2012) who found out that there were more female rice farmers than males in their study area. The result also showed that 69% of rice farmers were part time farmers and 70.00% were married, this implied that rice farmers were people with high responsibility who needed income from other sources to meet up with their financial obligations. The table also showed that rice farming has been a long time practice amongst the farmers in the study area which on the average was 17 years. The level of education attained was (6 – 10 years) on the average and the experience attained over the years will assist the farmers to be able to adopt new technologies. Lastly, the result showed that farmers in the study area were small – scale farmers (2.32 hectare) and this small farm size make mechanization difficult thereby limiting output of rice to subsistence level leaving little for commercial. Also, Ibitoye et. al., (2012) confirmed that (53.00%) of rice farmers in Ibaji cultivated between 1-3 hectares.

#### 3.2 Welfare of famers.

##### 3.2.1 Achievement of rice farmers in the study area

Table 2 presents the achievements of rice farmers in the study area

**Table 2 Distribution of achievements of rice farmers in the study area.**

Achievements	Frequency *	Percentage (%)
Source of regular income	300	100.00
Easy feeding and clothing	286	95.33
Ability to train children in school	300	100.00
Provision of accommodation	188	62.67
Building more houses	169	56.33
Marrying more wives	46	15.33
Ability to sustain the family	300	100.00
Buy more household properties.	204	68.00
Provision of social amenities In the rural areas	290	96.67

\*Multiple Responses were recorded

**Source:** Field Survey Data, (2012).

The result of table 2 showed that One hundred per cent (100%) of the rice farmers' claimed to have source of regular income, ability to train children in school and ability to sustain family, followed closely by provision of social amenities in rural areas (96.67%), easy feeding and clothing (95.33%). These are followed by buying more of household properties (68.00%), provision of better accommodation (62.67%), building more houses (56.33%) and marrying more wives (15.33%) respectively. All these achievements were signs of enhanced welfare as a result of producing rice for the rice farmers. All these were made possible as a result of regular income from rice production. These continuous achievements of the farmers over time will ultimately lead to sustainable rural development in the study area.

### 3.2.2 Factors affecting the Achievements of respondents

Table 3 presents the factors affecting the welfare of respondents in the study area.

**Table 3 Multiple Regression Analysis of the factors affecting the Achievements of Respondents in the study area.**

Variables	Linear Form	Double Log Form	Semi Log Form	Exponential Form
Constant	123475.95 (3.79)**	10.74 (12.18) **	12.42 (87.57) **	-486033.95 (- 1.39)
Age (X <sub>1</sub> )	-768.81 (-1.46)	- 0.23 (-1.77)**	0.02 (- 1.07)	111151.14 (-2.17)
Sex (X <sub>2</sub> )	1816.45 (0.18)	0.01 (0.10)	- 0.09 (-2.14)	44977.86 (1.55)
H/h size (X <sub>3</sub> )	5160.31 (3.45)**	0.11 (2.39)	0.02 (2.40)	37164.11 (1.97)
Educ.status (X <sub>4</sub> )	-451.97 (-0.14)	0.33 (0.61)	-0.06 (-3.83)	37087.38 (1.75) **
Farm exp. (X <sub>5</sub> )	-408.97 (-0.76)	-0.00 (-0.09)	-0.01 (-2.71)	30248.40 (1.66)
Farm size (X <sub>6</sub> )	0 -6535.23 (-1.08)	0.26 (2.26)	0.04 (1.32)	58978.17 (1.27)
H.I / A.E (X <sub>7</sub> )	298.36 (6.98)**	0.40 (4.05) **	0.01 (4.79) **	19417.00 (0.49)
Yield (X <sub>8</sub> )	24.65 (23.21)**	0.01 (0.15)	4.99 x 10 <sup>-5</sup> (10.81) **	99027.07 (2.80) **
M. Credit (X <sub>9</sub> )	-25623.81 (-2.58)	-0.03 (-0.38)	-0.16 (-3.62)	25383.72 (0.93)
R <sup>2</sup>	0.872	0.686	0.710	0.562
S.E.E	79378.54	0.361	0.345	1.43x10 <sup>5</sup>
f- value	217.15**	56.68**	78.34**	33.21**

**Source:** Field Survey Data, (2012).

Figures in parenthesis are t values,

\* means significant at 1%, \*\* means significant at 5%:

In this study, it was hypothesized that the achievements of paddy rice farmers is dependent on the following: age ( $X_1$ ), sex ( $X_2$ ), household size ( $X_3$ ), educational status ( $X_4$ ), farming experience ( $X_5$ ), Farm size ( $X_6$ ), household income per adult equivalent ( $X_7$ ), Yield ( $X_8$ ), and micro credit ( $X_9$ ). A multiple regression model was used to analyse the effect of these variables on the welfare of respondents. Four functional forms were tried and the one with the best fit was chosen as the lead equation for further analysis of the explanation of the behaviour of these variables.

The linear form of the functions has the highest values of f-statistics (217.15) and coefficient of multiple determinations ( $R^2$ ) (0.872) which means that 87.2% of the explained variable (expenditure) is being explained by the explanatory variables ( $X_1$ - $X_9$ ). The linear form had four ( $X_3$ ,  $X_7$ ,  $X_8$  and  $X_9$ ) of its nine explanatory variables significant at both one per cent (1%) and five per cent (5%) levels of significance.

In view of these, the lead and chosen form is the linear functional form, and the equation is expressed thus:

$$Y_E = 123475.95 - 768.81X_1 + 1816.45X_2 + 5160.31X_3 - 451.97X_4 - 408.97X_5 - 6535.23X_6 \\
 (3.79) \quad (-1.46) \quad (0.18) \quad (3.45) ** \quad (-0.14) \quad (-0.76) \quad (-1.08) \\
 + 298.36X_7 + 24.65X_8 - 25623X_9 \\
 (6.98)** \quad (-23.21) ** \quad (-2.58) **$$

From the lead equation, sex ( $X_2$ ), household size ( $X_3$ ), household income per adult equivalent ( $X_7$ ) and yield ( $X_8$ ) have positive relationship with the dependant variable ( $Y_E$ ) meaning that increase in each one of them independently while other were constant increases the welfare of the respondents. The result also showed that, household size, household income per adult equivalent, yield and micro-credit were all significant at both five (5%) and one per cent (1%) levels of significance, this shows how important these variables are to the welfare of rice farmers.

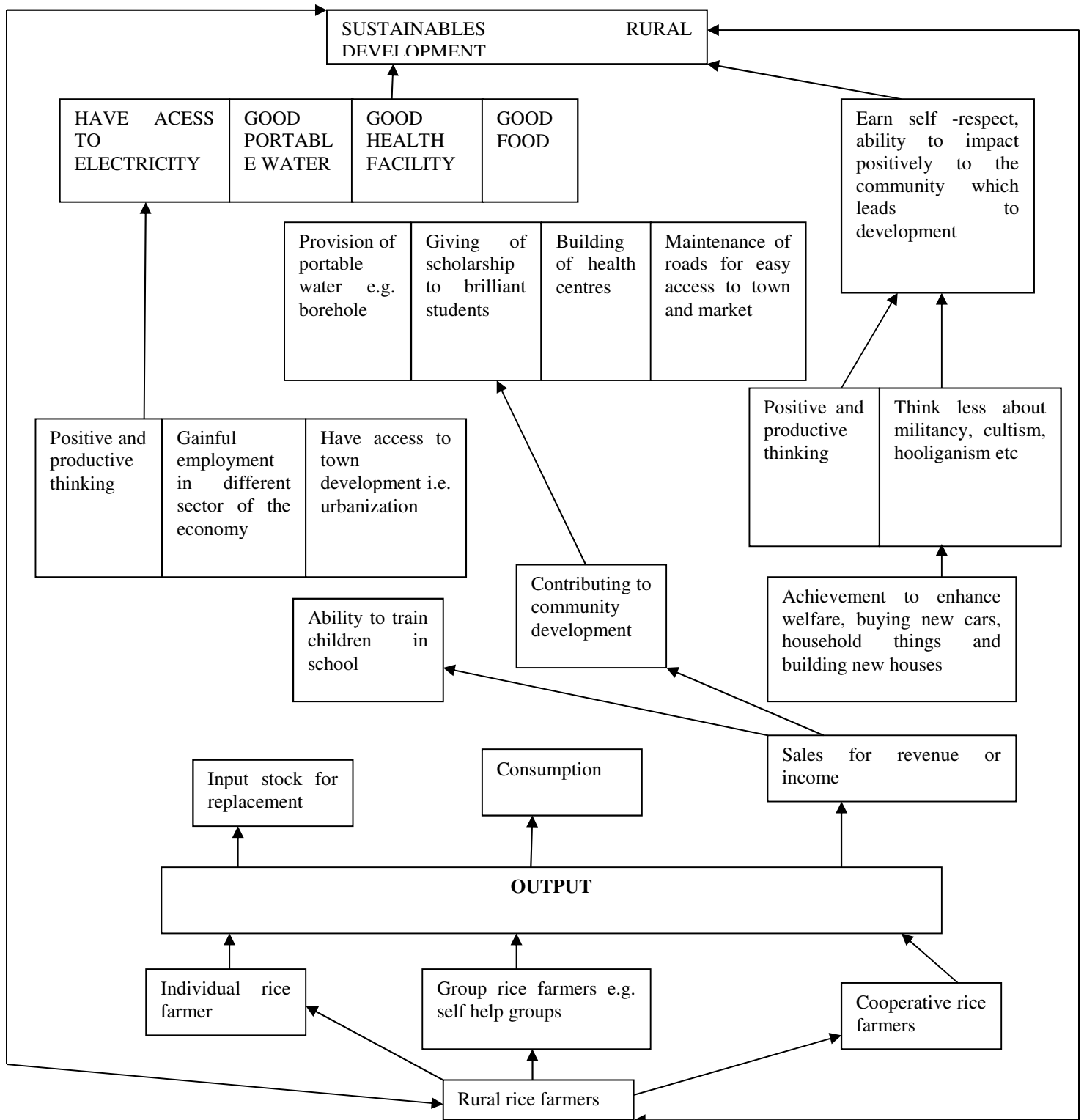
The coefficient of house hold size was significant at both 5% and 1% and positively related to welfare of farmers showing that household size of respondent is an important factor influencing the welfare of farmers in the study area. The more household size, the higher the number of family available as family labour, this leads to increase in output of the farmers and ultimately the income of the farmers increased which was spent on enhancing the welfare of respondents.

Also, the coefficients of the household income per adult equivalent, yield and micro-credit were statistically significantly at 5% and 1% and were all positively related to welfare of respondents. Meaning that increase in the yield of rice, and micro-credit would ultimately lead to increase in income. Increase in income of farmers would also lead to improvement in the standard of living of the farmers and hence sustainable rural development.

### 3.2.3 Hypothesis of the study

This hypothesis stated that, "Rice production positively and significantly affect the welfare of farmers in the study area" Since there were significant variables at both 1% and 5% levels of significance from the adopted functional form (Linear Form), the null hypothesis is hereby rejected while the alternative hypothesis is hereby accepted since socio-economic characteristics of (paddy) rice farmers significantly affect their welfare in the study area.

### 3.3 Sustainable Rural Development and Paddy Rice Production Nexus



**Fig 1 Sustainable Rural Development and Rice Production Nexus**

Fig 1 explained that, at the grass root level, rice farmers in the study area living in the rural areas when put together were divided into three main groups, first, the individual rice farmers (IRF) second, the group rice farmers (GRF) i.e. the self-help groups and third, the corporative rice farmers.(CRF). When these three groups were employed in the agricultural sector mainly rice production as the case may be, they produced rice depending on the available resources. This output could be used in three ways, which were input stock for replanting of rice, rice for consumption in their various homes, this will serve

as an achievement of food security which is one of the goals of sustainable rural development and lastly rice for sale in the market which will serve as means of earning income. Good income is synonymous to good livelihood which the farmers achieved by being able to train their children in school, ability to contribute to community development and lastly achievement of an enhanced welfare i.e. buying more of cars, household equipment, building new houses. These three mentioned would have different impacts on the farmers.

It was assumed that, the trained children would have positive and productive approach of thinking, gained employment in different sector of the economy or agriculture on a large scale and have access to urbanization. This aspect of development is known as human element of development. Also, the enhanced welfare of the farmers themselves might lead to positive and productive thinking and also make the farmers desist from engaging in militancy, hooliganism, cultism etc., this is also known as the human element of development.

The social element of development emanated from the contribution of the farmers towards community development whereby they are able to provide portable water to the community e.g. borehole, they would be buoyant enough to give out scholarships to brilliant students, and they would be able to build health centres in their community for the health care of people in the area.

On the other hand as well, the farmer's educated children who were already gainfully employed would have access to goods roads, electricity, portable water and good health facilities in the city. On a broader scale, both the farmers and the educated children would earn self-respect and they would want to impact back to the community, which ultimately leads to development. The sequence of development on the long run leads to a Sustainable Rural Development. Fig 1 showed the Sustainable Rural Development and Rice Production.

#### 4.0 Conclusion and Recommendations

This study had evaluated the effect of paddy rice production and the determinants of the achievements of farmer in the Niger Delta region of Nigeria. Rice is of great importance in the socio-economic life of rural farmers and in the national march towards stopping hunger, mal- nutrition and poverty. From the findings of the study, rice farmers were found to be planting for both subsistence and commercial despite the fact that some of them were literates and had enough experience in rice farming. The study also highlighted some of the achievements farmers gained in producing rice like; source of regular income, easy feeding and clothing, ability to train children in school, ability to sustain family, buying more of household properties among others which are all instruments of poverty eradication and sustainable rural development. The result also showed that household size, household income per adult equivalent; micro credit and yield have positive relationship with the welfare of farmers meaning that increase in each one of them leads to increase or improvement in the welfare of farmers. The following recommendations were made to improve local rice production. Farmers should be encouraged to form co – operatives amongst themselves so that it would be easy for them to have access to larger land and funds in form of credit facility so as to assist each other in expansion of their production. Farmers should be taught, encouraged and empowered to source for high yielding seeds for use in their production. Farmer to farmer within and outside the village may be a better source of dissemination of the high yielding varieties in the communities. This will make the seeds easily accessible and affordable to farmers in the communities.

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