

# Irrigation Technology Adoption in Kwara State

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## ABSTRACT

*This study analyzed the irrigation technology adoption in in Kwara State, Nigeria. A multistage sampling procedure was employed for the selection of respondents for the study. The first stage involved the purposive sampling of Oke-Oyi and Songa irrigation scheme. The second stage involved random sampling of villages and communities where farmers that were involved in the irrigation scheme are located. The third stage involved the random and representative selection of irrigation farmers (treatment) and non-irrigation farmers (control). Farm-level and household-level primary data were obtained with the use of well-structured questionnaire and interview schedule from 348 respondents, from villages and communities covering a total of five (5) Local Government Areas. Data were subjected to descriptive statistics and two sampled t-test. About fifty six percent adopted the selected irrigation technology, while 44.25% did not adopt it. The adopter were more educated than the non-adopters, and they also have bigger farm sizes of okra, pepper, maize and sorghum. It was concluded that, education was vital to the adoption of irrigation technology. Adopters of*

*irrigation technology had high propensity to acquire large farm size.*

## Keywords-

*Irrigation; adoption status and two sampled t-test.*

## 1. INTRODUCTION

Irrigation technology has the ability to regulate water supply to crops especially at times when the crops need water most and provides drainage facilities for the disposal of excess water, which is impossible with rain-fed agriculture (Simeon, 2010). Irrigation increases agricultural production by providing all year round farming opportunities through the artificial supply of water to crops. Thereby reducing poverty and unemployment by offering employment especially to rural households, ensuring food security and by stabilizing (or lowering) food prices both in the rural and urban markets (Lipton *et al.*, 2003).

Agricultural production in sub-Saharan Africa is adversely affected by erratic rainfall events within and between years. This has led to poor yields, low productivity, food insecurity and poverty within the farming population, thus emphasizing

the need for irrigation in the region (Adeoti, Barry, Namara, Kamara and Titiati, 2007). Moreover, Nigeria is endowed with 74 million hectares of arable land and additional 2.5million hectares of irrigable land, yet the country has not been able to take comparative advantage of the climatic condition, the large expanse of land and ever increasing teaming population to make her sufficient in food production, despite the fact that variety of crops thrive well with maximum yield in different ecozones of the country (Toriola, 2009). In short, the nation has one of the best agro-ecology to grow variety of crops. The low utilization of the immense natural and available irrigation resources in Nigeria may be due to the poor awareness of current irrigation and farming technologies among farmers.

The objectives of this are to;

- compute irrigation technology adoption status of the households in the study area,
- Compare the differences between some selected characteristics of adopters and non-adopters of irrigation technology in the study area

Hypothesis of the study:

- $H_0$ : There is no significant difference between the selected characteristics of adopters and non-adopters of

irrigation technology in the study area

## 2. METHODOLOGY

The study was conducted in Kwara State, Nigeria. Specifically, the study covered Oke-Oyi and Songa scheme of the Lower Niger River Basin Development Authority. Kwara State consists of sixteen (16) Local Government Areas. The State is located in the middle belt (North Central) of the country within latitude  $7^{\circ}45'N$  and  $9^{\circ}30'N$  and longitude  $2^{\circ}30'E$ - $6^{\circ}25'E$ . The State is bounded in the north by Niger State, in the South by Osun and Ondo States, in the East by Kogi State and in the West by Oyo State. Kwara State shares an international boundary with the Republic of Benin (Taiwo, 2005). The population of the state is put at 2,371,089 which is made up of 1,220,581 males and 1,150,508 females. It covers an estimated land area of  $32,500km^2$  out of which 75.3% is cultivable and found suitable for almost all forms of food crops (Federal Office of Statistics, 1996; Saraki, 2008). The State has two main climatic seasons, the dry and wet season. Annual rainfall ranges between 1000 to 1500mm while the average temperature lies between  $30^{\circ}C$  and  $35^{\circ}C$  (KWADP, 1996). The State is divided into four zones by the Kwara State Agricultural Development Project (KWADP) in consonance with ecological characteristics, cultural practices and project's administrative convenience. These are: Baruteen and Kaima Local Government Areas (Zone A);

Edu and Pategi Local Government Areas(B); Asa, Ilorin East, Ilorin South, Ilorin West and Moro Local Government Areas (Zone C); and Ekiti, Ifelodun, Irepodun, Offa, Oyun, Isin and Oke-Ero Local Government Areas (Zone D).

Population of the study was made up of all farmers in the rural areas of Lower Niger River Basin Development Authority in Kwara State, Nigeria. A multistage sampling procedure was employed for the selection of respondents for the study. The first stage involved the purposive sampling of Oke-Oyi and Songa irrigation scheme. The second stage involved random sampling of villages and communities where farmers that were involved in the irrigation scheme are located. The third stage involved the random and representative selection of irrigation farmers (treatment) and non-irrigation farmers (control). Farm-level and household-level primary data were obtained with the use of well-structured questionnaire and interview schedule from 348 respondents, from villages and communities covering a total of five (5) Local Government Areas.

The data were mainly primary. The tools and procedure that were employed elucidated the objectives of the study and it includes the following.

Descriptive statistics were employed. They are the mean, percentages and frequency distribution. These were used as tools to describe the irrigation technology adoption status of the

individual farmers that were selected for the survey.

Two sampled t-test was used to test significant differences between socio economic characteristics of adopters and non-adopters of the selected irrigation technologies of the Lower Niger River Basin Development Authority.

$$T = \frac{\bar{X}_i - \bar{X}_j}{\sqrt{\frac{S_i^2}{n_i} + \frac{S_j^2}{n_j}}}$$

(1)

$\bar{X}_i$  = Mean variable for socio economic characteristics of non-adopters irrigation technology

$\bar{X}_j$  = Mean variable for socio economic characteristics of adopters of irrigation technology

$S_i^2$  = Sample variance for socio economic characteristics of non -adopters irrigation technology

$S_j^2$  = Sample variance for socio economic characteristics of adopters of irrigation technology

$n_i$  = Number of non-adopters of irrigation technology

$n_j$  = Number of adopters of irrigation technology

### 3. DISCUSSION

Table 1 shows that, about 56% of the respondents adopted the selected irrigation technology of the Lower Niger River Basin

Development Authority, while 44.25% did not adopt it.

**Table 2: Irrigation technology adoption status**

Adoption status	Frequency	Percentage
Adopters	154	44.25
Non Adopters	194	55.75

Source: Field survey, 2013.

In Table 2 were shown the results of the analysis of the difference between some selected characteristics of adopters and non-adopters of the irrigation technology. The means of pepper farm size, ease of land acquisition and awareness on irrigation were all significantly different at 1% level. Their means are higher for adopter than for non adopters. The means of years of schooling, okra farm size, maize farm size, sorghum farm size and adoption of irrigation were also higher for adopter than for

non adopters, but they were not significantly different. The higher value of means for adopter indicated that adopter had larger farm size for pepper, okra, maize and sorghum. Adopters had better ease of land acquisition and awareness on irrigation than non adopters. Similarly, adopters were more educated than non adopters.

The means of dependency ratio was higher for non-adopters than for adopters and is significantly different at 5% level. The means of household size, number of extension visits and access to credit were also higher for non adopter than for adopters, but were not significantly different. The higher value of means for non-adopters indicate that, non-adopters had larger number of dependant to cater for, household size, number of extension visit and access to credit facilities.

**Table 2: Analysis of difference between some selected characteristics of adopters and non adopters**

Characteristics	Adopters	Non-adopters	Difference	T-test
Years of schooling	6.17	5.52	- 0.65	- 1.134
Dependency ratio	1.38	1.66	1.54	2.316**
Household size	7.07	7.63	0.56	1.347
Okra farm size	0.99	0.80	-0.18	-2.227
Pepper farm size	0.84	0.49	0.65	-5.703***
Maize farm size	1. 39	1.38	1.39	-0.021
Sorghum farm size	0.69	0.65	-0.05	-0.727
Ease of land acquisition	0.89	1.63	0.74	11.161***
Number of extension visit	0.02	0.84	0.82	10.235***
Awareness on irrigation	1	0.52	- 0.04	- 11.752***
Access to credit	0.99	1	0.01	1.123

\*\*\* 1% level of significance, \*\* 5% level of significance, \* 10% level of significance

Source: Field survey, 2013.

The hypothesis in this study was stated in the null form. The hypothesis stated that, there is no significant difference between the

selected characteristics of adopters and non-adopters of irrigation technology in the study area. Table 2 stated the significant levels of these

explanatory variables. Pepper farm size, ease of land acquisition and awareness on irrigation were all significantly different at 1% level. Moreover, dependency ratio was significantly different at 5% level. Therefore the hypothesis that, there is no significant difference between the selected characteristics of adopters and non-adopters of irrigation technology in the study area was rejected.

#### 4. CONCLUSIONS AND RECOMMENDATIONS

Education was vital to the adoption of irrigation technology. Government should therefore, adequately increase annual budgetary allocations to educational sector in order to make basic education (i.e primary up to junior secondary school) compulsory, and education at all levels should be made free. Family planning should also be encouraged in order to reduce large family size which could have negative effect on farmers productivity resulting from the competition between household up-keep and farming input expenditures. Adopters of irrigation technology had high propensity to acquire large farm size. Therefore, the ministry of agriculture and non-governmental organizations (NGO's) should overhaul the agriculture extension sub unit by employing qualified, adequate numbers and diligently supervised extension workers: so as to enhance awareness and adoption of irrigation technology.

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