

## Evaluation of Benin- Owena River Basin and Rural Development Authority Irrigation Project in Illushi and Ega-Oria Communities of Edo State, Nigeria.

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**Abstract:** The study assessed the effect of (BORBRDA) irrigation project on rice farmers in Illushin and Ega-Oria, the study described the demographic characteristics of project farmers as well as examined the crop yield; income and the extent of use of BORBRDA recommended irrigation practices. Data for the study were obtained from thirty-five purposively sample projects farmers involved in rice production. Analysis of data indicated that majority (97.4%) of the respondents were between 5 and 8 members in their households. Also, the results indicated that there were difference in income above N10, 000 and crop yield (91,216.1Kg) before and after irrigation practices were adopted by the project farmers. It was suggested that the project farmers should be assisted with land preparation in order to reduce labour requirements on the farm.

**Key words:** irrigation project, income, yield and Nigeria

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### INTRODUCTION

Water is a precious agricultural resource. The importance of water in agricultural production is underscored by the objective of the Nigeria government water resources development policies. The policy objectives stated among others are to:

- i. undertake a comprehensive development of both underground and surface water sources for multi-purpose use;
- ii. undertake schemes for control of erosion or floods and for water shed management including afforestation.
- iii. construct and maintain dam, dykes, polder wells, boreholes, irrigation and drainage systems and other works necessary for food production and human water need;
- iv. provide water for reservoirs and lakes for irrigation purposes to farmers and other groups of people as well as for urban water supply schemes;
- v. control the pollution of waters, lakes, lagoons, and creeks in the country; and
- vi. assist in the development of fisheries and improved irrigation on the rivers, lakes and reservoirs, lagoons and creeks in the country (FMAWRRD, 1990).

In order to fulfill the above objectives, the Federal Government in 1976 set up the River Basin Development Authorities (RBDA) in each of the five agro-ecological zones of the country. The main focus of the RBDA is to develop the Nigeria water resources to facilitate agriculture and rural development and to solve the problem of drought and unemployment. The Benin-Owena River Basin and Rural Development Authority (BORBRDA) is one of the RBDA, set up to implement the agricultural development plan in the South-West agro-ecological zone.

The primary aims of the agricultural development in BORBRDA project area include increasing the income of farmers; increasing the production of basic food crops, increasing the production of fruits and vegetables for sale as well as initiating livestock husbandry as supplementary farm enterprises in the rural areas(NCEA,1999). The means of realizing this aim by BORBRDA are through broadening the range of products on individual farms by crop diversification, increasing crop yields per unit area or by adding new lines of production to the existing ones by increasing the cropping periods per year through irrigation.

This study was taken to evaluate the effect of BORBRDA irrigation on beneficiary farmers' income and crop yields. The specific objectives include:

- i. to describe the demographic characteristics of the project farmers.
- ii. To examine the income and crop yields of the project farmers.
- iii. To examine the extent of use of BORBRDA irrigation practices by the project farmers
- iv. To evaluate the effect of irrigation practices on project farmers income and crop yield.

#### **Hypothesis of the Study:**

There is no significant difference in the project farmers' income and crop yields before and after adopting irrigation practices.

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## **MATERIALS AND METHODS**

The study was conducted in Illushi/Ega-oria rice irrigation project areas of Edo State. Illushi/Ega-Oria are communities located in Esan South Local Government Area. Agriculture is the primary occupation of the people in the two communities and are noted for rice production. Illushi and Ega-oria are among the irrigation project sites of BORBDRA in Edo State due to their peculiar physical features. The communities share boundary with River Niger. Some of the land mass is swampy and some derived Savanna. Illushi and Ega-Oria irrigation project started in 1994 and was designed to pump water directly from river Niger to the fore bay and irrigate about 5000 hectares of land by gravity through canals.

### ***Design and Sampling Procedure:***

For the purpose of this study, all BORBRDA irrigation farmers were randomly selected from the project site. This gave a total of 35 respondents. Data for this study were obtained from both primary and secondary sources. The primary data were obtained by means of interview schedule while the secondary data were obtained from pre-and post projects surveys conducted by BORBRDA.

### ***Measurement of Variables:***

The dependent variables of this study were income and crop yields. Income and crop yield were measured by asking respondents to indicate their annual income from rice farm while crop yield was measured in kilogrammes of rice per hectare of rice farm, through memory recalled and validated by BORBRDA facilitators record the independent variable includes irrigation practices introduced to project farmers by BORBRDA. Other independent variables measured were demographic characteristics such as age, household size, and educational level and farm size. Age was measured in years; household size was measured as the number of people who eat from the same cooking pot; educational level was measured as the number of years of formal schooling and farm size was measured in hectares of farmland cultivated. Acceptance of irrigation practices was measured by asking respondents to indicate their use of irrigation water, fertilizer and land preparation provided by BORBRDA. Percentage and t-test were used in analyzing data collected. To determine the effect of irrigation practices on income and crop yield t-test was employed.

## **RESULTS AND DISCUSSION**

### ***Socio-economic Characteristics of Respondents:***

Results in Table 1 show that the mean age of the respondents is 44.1 years with more than half (57.1%) of them between 30 and 45 years. About 17% of the respondents are both below 30 years and 60 and above 60 years of age. This results indicates that majority of the respondents are still active, agile and physically disposed to pursue economic activities since a total of 74.3% of them are between 30 and 50 years of age. Most (71.4%) of the respondents had no formal education while only 28.6% of them had any form of formal education. Van den Ban and Hawkins (1996) said that education enhances individual's ability to make accurate agricultural decisions and to innovate. With majority of the respondents lacking formal education, their ability to understand and implement BORDRDA irrigation project recommendations is highly limited. Majority (62.9%) of the respondents have between 5-8 members in their household, some (22.9%) have 1-4 members while only few (14.2%) of them have above 8 members in their household. Most farmers rely on members household for labour. Results also show that most (82.9%) operate less than 1<sup>1</sup>/<sub>2</sub> hectares of farmland. This means they were to large extent small-scale farmers, before their selection as project farmers.

### ***Extent of Adoption of BORBRDA Irrigation Practices:***

Data in Table 2 show the extent of adoption of irrigation practices by BORBRDA project farmers. Majority (57.1%) of them use irrigation water while some of them in addition to using of irrigation water adopted associated recommendations such as fertilizers application (34.3%) and land preparation (8.6%). This results reveals that more than half of the respondents use only irrigation water and less than half (42.9%) adopted total recommendations of the BORBRDA. Yield performance of those adopting complete package will obviously be better than those adopting incomplete package.

### ***Effect of Irrigation Practices on Project Farmers Income and Crop Yield:***

Table 3 shows respondents farm income from rice production before and after involvement in the BORDRDA irrigation project. Before irrigation practices were adopted by respondents, most (82.9) of them earned less than N5,000 whereas, after irrigation some (N37.2%) of them earned above N25,000 indicating income difference of above N20,000. The highest income earner before irrigation earned between N11,000 and N15,000 and after irrigation it was above N25,000, representing an increase of N10,000 and above. Reason for

the difference in income was sought by investigating yield performance of respondents before and after irrigation. Results are as indicated in Tables 4 and 5.

**Table 1:** Socio-economic characteristics of Respondents (N = 35).

Variables	Frequency	Percentage
Age in years		
Below 30	2	5.7
30-35	6	17.1
36-40	8	22.9
41-45	6	17.1
46-50	5	14.3
51-55	4	11.4
56-60	3	8.6
Above 60	1	2.9
X=44.1		
Educational status:		
No Formal Education	25	71.4
Had Formal Education	10	28.6
Household size:		
1 – 4	8	22.9
5 – 8	22	62.9
Above 8	5	14.2
Farm Size:		
<1½	29	82.9
1½ - 2½	4	11.4
2½ - 3½	2	5.7

Source: Field survey, 2012

**Table 2:** Adoption of irrigation practices by respondents.

Irrigation	Respondents	Percentage
Irrigation Water	20	57.1
Fertilizer	12	34.3
Land Preparation	3	8.6
Total	35	100

Source: Field survey data, 2012

**Table 3:** Income Distribution of Respondents.

Income	Before Irrigation		After Irrigation	
	Frequency	%	Frequency	%
< than N5,000	29	82.9	2	5.7
5,000-10,000	4	11.4	7	20.0
11,000-15,000	2	5.7	6	17.1
16,000-20,000	-	-	3	8.6
21,000-25,000	-	-	4	11.4
> 25,000	-	-	13	37.2
Total	35	100	35	100

Source: Field survey, 2012.

The modal yield per hectare before and after irrigation was between 1,000 and 2,000 kg/ha representing 60% and 42.9% respectively. The highest yield per hectare before irrigation was between 2,000 and 3,000kg/ha while the highest yield after irrigation was 5,000kg/ha and 6,000kg/ha as represented by 8.6% and 11.4% of the respondents respectively. The difference in yield performance could be attributed to irrigation practices adopted by respondents as shown by results of t-test analysis in Table 5

**Table 4:** Yield per hectare of Respondents .

Yield (kg/ha)	Before Irrigation		After Irrigation	
	Frequency	%	Frequency	%
400-900	11	34.1	2	5.7
1,000-2000	21	60.0	15	42.9
2,000-3,000	3	8.6	9	25.7
3,000-4,000	-	-	2	5.7
4,000-5,000	-	-	3	8.6
5,000-6000	-	-	4	11.4
Total	35	100	35	100

Source: Field survey, 2012

**Table 5:** Difference in Yield before and after irrigation.

Irrigation Status	Mean	Mean Difference	t	Probability Level
Before Irrigation	1439.3	1,216.1	5.05	0.000
After Irrigation	2,655.4			

Source: Computed from Field survey, 2012

The mean rice yield before irrigation was 1,439.3kg while the mean yield after irrigation was 2,655.4kg. The mean difference of 1,216.1kg was significant at 1% probability level. The computed t-value is 5.05. The result shows that rice yield after irrigation is significantly higher than the yield obtained before irrigation.

**Conclusion and Implications:**

The study results indicate that majority of the respondents are still active, agile and physically disposed to pursue economic activities as a total of 74.3% of them were between 30 and 50 years of age. Most of (71.4%) of them had no formal education thereby limiting their ability to understand and implement BORBRDA irrigation project recommendations. BORBRDA farmers are small-scale farmers cultivating less than 1½ hectares of land with household size of between 5 and 8 members. The study also reveals that more than half of the respondents use only irrigation water and more than half of them adopted total BORBRDA recommendations. The highest income earned by respondents before irrigation was between N11,000 and N15,000 and after irrigation respondents income rose to above N25,000. The highest yield per hectare before irrigation was between 2,000 and 3,000kg/ha. The mean yield difference of 1,216.1kg was significant at 1% implying that the difference in yield performance is attributed to irrigation practices adopted by the respondents.

The study reveal that more than half of the respondents use only irrigation water and less than half of them adopted total recommendations of BORBRDA. The highest income earned before irrigation was between N11,000 and N15,000 and after irrigation it was above N25,000. The mean yield difference of 1,216.1kg found in the study was significant at 1% level indicating that the irrigation practices induce higher yield performance of respondents.

**Recommendations:**

Based on the findings and conclusions reached in the study the following recommendations are made:

1. BORBRDA in selecting its beneficiary farmers attention should be focused on the active and agile as well as enlightened farmers for enhanced project performance.
2. In order to actualize BORBRDA project goals of increasing yield and income of beneficiary farmers, it should undertake land preparation and allocate a minimum of 5 hectares each to beneficiaries and a minimum of two hectares to any other interested farmer. This not only raises the farming scale of farmers generally but also reduces labour requirement on the farm.
3. For general improvement in farming, non-project farmers should be encouraged to participate in the project activities through such programmes as agricultural shows and exhibitions.

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