

*Full Length Research Paper*

# Assessing the Competitive African Rice Initiative / German International Corporation (CARI/GIZ) Program Intervention on Productivity of Small scale holder Rice Farmers in Miga Local Government Area, Jigawa State, Nigeria

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**ABSTRACT:** This study assessed the Competitive African Rice Initiative / German International Corporation (CARI/GIZ) Program Intervention Support to Small Scale Rice Farmers in Miga Local Government Area of Jigawa State, Nigeria. Respondents were drawn using multistage sampling technique, the first stage, involved a purposive selection of CARI / GIZ project participating communities, at the second stage, eight (8) communities were purposively selected (Mugina, Hantsu, Mudiga, Miga B, Agufa, Damaganawa, Romawa, and 'Yandadi) while at the third stage was the selection of (1) small-scale rice farmers groups participating in CARI / GIZ project from each participating community and at the fourth stage (10) small-scale rice farmers participating in CARI / GIZ project were selected at random as the respondents for this study giving a total of (80) respondents and were served with questionnaires. Data collected were analyzed using frequencies and percentages. The result of the study shows the over dominance of male rice farmers and accounted for (93.75%), age, (37.5%) of them are within the age brackets of 31-40 years, married (56.0%), with household size of 1-10 persons

accounted for (52.5%), education was 100% as the respondents have one form of education or the other, farm size (of less than 1 hectare (37.5%), farming experience 1-15 years (87.5%), average yield before CARI/GIZ intervention was 4.3 tonnes while after intervention 6.2 tonnes. Major constraints were land tenure system (27.5%), high cost of inputs (23.7%), low access to mechanization (22.5%). It was concluded that the CARI/GIZ project has an effect on the participants' livelihood in the study area. Thus, the utilization of technology by farmers will lead to an increase in agricultural productivity in the study area. The following recommendations are proffered, the government should give priority to small-scale rice farmers in the programme of National Agriculture development authority (NALDA) in order to provide more land to farmers, and small landholdings was the major constraints in the study area.

**Keywords:** Competitive, African Rice Initiative / German International Corporation, and Smallholder Rice Farmers

## INTRODUCTION

Nigeria is currently the largest rice producer in West Africa. Due to its large population, the country is also the region's largest consumer of rice in absolute terms. Its estimated annual demand for milled rice is 5.2 million

tonnes, while the average national production is 3.3 million tonnes. The supply and demand gap of 1.9 million tonnes can only be bridged by importing rice. Nigeria's rice processing capacity is 2.8 million tonnes of paddy

(JICA, 2013). In spite of these sizeable food imports, the Food and Agriculture Organization (FAO, 2014) states that in 2012 about 9.4 million Nigerians or about 6 per cent of the population were undernourished and the poverty level in 2010 was estimated at 69 per cent (NBS, 2012). Given this level of poverty, food insecurity and undernourishment in Nigeria, food losses and waste, which occur along the entire food value chain, are unacceptable, considering the low levels of productivity and low use of modern farming practices hinder efforts to achieve progress in this direction. Various efforts by government and non-governmental organizations (NGOs) have been made to raise agricultural productivity by providing farmers with better production technologies. A prominent example has been the Competitive African Rice Initiative / German International Corporation (CARI/GIZ). The Competitive African Rice Initiative seeks to improve the livelihoods of at least 122,000 smallholder farmers in Nigeria, Ghana, Burkina Faso, and Tanzania by facilitating market linkages. In Nigeria CARI/GIZ interventions have so far reached out to male and female small-scale farmers in about six states in Nigeria. These states are Niger, Kogi, Kebbi, Jigawa, Kano and Zamfara.

The goal of the project is to significantly improve the livelihoods of 120,000 rice farmers by increasing the competitiveness of domestic rice supply to meet increasing regional and global demand. This study intends to assess the benefit of the competitive African Rice Initiative/ German international co-operation (CARI/GIZ) Program intervention among smallholder rice farmers in Miga Local Government area of Jigawa State. The competitive African rice initiative (CARI)/German international cooperation (GIZ) is an initiative, which provides its participants with risk management, financing, trading and strategy solutions. CARI/GIZ hopes to achieve two things at once. Fixes the rice value chain so that bank can lend with confidence to the sector and encourage bank to lend to the agricultural value chain by offering them strong incentives and technical assistance. CARI/GIZ technology intervention strategy consists of training extension agents (EAS) who in turn cascade down acquired knowledge to smallholders rice farmers (SHRF). Training consists of at least three different sessions including. (a). Pre-season training sessions before the start of the growing season. (b). Mid-season training about two months after the first, and (c). End of season training at the end of the season for analysis and evaluation of the season and its result, (CARI, 2013).

## METHODOLOGY

### Study area

Miga Local government is one of the twenty-seven local Government areas that constitute Jigawa state. Miga Local Government area is located at a longitude 20°, 25°N

and latitude 8°, 25°E of Jigawa state. It borders Jahun local government by south and west, Kafinhausu local government by the east and Auyo local government by the North. It experiences two different climate conditions (wet and dry season). The wet season usually begins from the month of May and stops around the month of November, while the dry season usually begins in the month of December and runs through the month of February, but due to the advancement of Sahel savannah, the climatic variation of the year is usually unpredictable. The temperature is 27°C with the rainfall 600mm annually. Their major occupation is farming, pastoral and crop farming. About 90% of the people are small scale farmers and local entrepreneurs. The main languages are Hausa-Fulani dominant and their religion is Islam. Miga Local Government has a very fertile land (sandy, loamy, sandy loam, clay and clay loam soils) which is suitable for both plants and animal productions. Some of the crops cultivated include cowpea, watermelon, millet, groundnut, wheat, maize, rice and other associated food and cash crops. The local government covers a land area of 1,170 square kilometres and 80% is arable, 10% grazing area.

### Sampling techniques and sample size

Multistage stage sampling technique was used to select the respondents. The first stage involved purposive selection of CARI / GIZ project participating communities. At the second stage, eight (8) communities were purposively selected (Mugina, Hantsu, Mudiga, Miga B, Agufa, Damaganawa, Romawa, and 'Yandadi). The third stage was the selection of (1) small-scale rice farmers groups participating in CARI / GIZ project from the each participating community. And at the fourth stage (10) small-scale rice farmers participating in CARI/ GIZ project were selected at random as the respondents for this study (Table 1). Therefore, 80 smallholder rice farmers were served with the questionnaire for this project work. Data was collected from both the primary and secondary sources. Data from the primary source were collected by the use of a well-structured questionnaire administered to the respondents. Secondary source of data collection were from textbooks, journals, Jigawa Agricultural and Rural Development Authority (JARDA) Annual Reports. Data was analysed using simple descriptive statistics to achieve all the objectives.

## RESULTS AND DISCUSSIONS

### Socio-economic characteristics of respondents

Respondent's generally differs in socio-economic characteristics. These characteristics influence the ability of respondents to participate in the Rice production under

**Table 1:** Sampling frame and sampling size.

Farmers group	Num. of registered farmers	Sample Size
Mudiga Rice Farmers Ass.	30	10
Miga B rice farmers association	30	10
Hantsu Rice Farmers Ass.	30	10
Mugina Rice Farmers Ass.	30	10
Agufa Rice Farmers Ass.	30	10
Damaganawa Rice Farmers Ass.	30	10
Romawa Multipurpose Coop.	30	10
Yandadi Rice Farmers Ass.	30	10
Total	240	80

Source: Field survey, 2018

**Table 2:** Age distribution of respondents.

Age (years)	Frequency	Percentage
≤ 20	3	3.07
21-30	22	27.05
31-40	30	37.05
41-50	10	12.05
51-60	11	13.07
≥ 60	4	5.00
Total	80	100

Source: Field survey, 2018

**Table 3:** Sex distribution of respondents.

Gender	Frequency	Percentage
Male	75	93.75
Female	5	6.25
Total	80	100

Source: Field survey, 2018

the CARI/GIZ project. Such differences in socio-economic characteristics of respondents also provide the context within which the participation can be understood. The socio-economic characteristics of respondents considered for this study were the age, gender, marital status, level of education, household size, farm size and annual farm income.

### Age of the respondents

Age of the respondents is one of the most important socio economic characteristic in understanding their views about a particular problem. Therefore, age indicates level of maturity of an individual as such, becomes important for examining respondents. The results in (Table 2) revealed that 37.05% of the respondents fell within the age bracket of between 31 to 40 years; also 27.05% of the respondents were within the age bracket of 21 to 30 years, while 13.07% of the respondents were within the age bracket of 51 to 60. These values are a representation of large number of able-bodied farmers within their youthful and productive state of life. This can influence the farmer's decision to utilize new innovations. Bamire and Manyong, (2003) in

their study reported that age of an individual affects his mental attitude to new ideas.

### Gender of the respondents

Gender is another important factor to participation in any development programme in any given social situation, which variably affect social or economic phenomenon. The result in (Table 3) reveals that majority (93.75%) of the respondents were males while 6.25% of them were females. The most probable reason for such overwhelming majority of the respondents are male farmers is that, male farmers constitute the household heads and they respond on behalf of the households except in a situation where the household head is female (Idrisa *et al.*, 2007).

### Marital status of the respondents

Marriage is one of the most important social institutions more especially in the rural settlements were Agriculture was their primary occupation. This variable tells whether

**Table 4:** Marital status of the respondents.

Marital status	Frequency	Percentage
Single	20	25.00
Married	45	56.00
Widowed	8	10.00
Divorced	7	8.07
Total	80	100

Source: Field survey, 2018

**Table 5:** Household size distribution of respondents.

House hold size	Frequency	Percentage
≤ 5	15	18.07
6-10	33	41.02
11-15	15	18.07
16-20	8	10.00
≥ 20	9	11.02
Total	80	100

Source: Field survey, 2018

**Table 6:** Level of education of the respondents.

Educational attainment	Frequency	Percentage
No education	15	18.7
Primary education	35	43.7
Secondary education	20	25.0
Tertiary education	6	7.5
Adult education	4	5.0
Total	80	100

Source: Field survey, 2018

the respondents under study were married or not, divorced or widowed. The results in (Table 4) reveal that majority (56.00%) of the respondents were married, single 25.00%, widowed 10.00% while 8.07% were divorced. The results coincide with the findings of Idrisa *et al.* (2007) who reported that married people constitute the highest percentage. On the other hand married people have more responsibilities and hence they take whatever they do with high levels of seriousness. In that case, they will be willing to participate in any programme that will provide them with improved technologies to enhance the welfare of their families. This is more especially in the study area where culture restricts interaction between males and females. Women attend functions, including extension training only with the consent of their husbands.

### Household size of the respondents

This variable was measured by adding the number of wives, children, relatives and dependants that are living with the respondents. Family size is an important variable that can assist in determining the respondent capacity to improve or increase his productivity. Results from the

study (Table 5) shows that 41.02% of the respondents had between six to eight members per family, 18.07% of them had between less than five and nine to eleven members per family respectively, 10.00% of the respondents have sixteen to twenty members per family while 11.02% has more than twenty. Family labour is an important component of labour for small scale farmers. This is mainly because the subsistence farm household is resource poor and may have to depend on family labour for Agricultural activities which in most instances is labour intensive (Idrisa, 2009). Also Kodjo *et al.* (2020) in their study reported that tilapia farmers who have no other source of income were, on average, more likely able to hire external labor force promptly.

### Level of education of the respondents

Education is one of the important characteristics that might affect the attitude and ease of understanding societal phenomenon. Results in (Table 6) showed that majority (43.07%) of the respondents had attained primary level of education and secondary education level accounted for 25.00%; about 7.05% had attained tertiary level of education, and 5.00% Adult education while 18.

**Table 7:** Distribution of respondent's according to farm size.

Farm size (Hectares)	Frequency	Percentage
<1	30	37.05
1 – 5	15	18.07
6 – 10	10	12.05
11-15	10	12.05
16-20	8	10.00
>20	7	8.07
Total	80	100

Source: Field survey, 2018

**Table 8:** Distribution of respondent's according to farming experience.

Farming exp. (Years)	Frequency	Percentage
≤5	20	25.00
6-10	30	37.05
11-15	20	25.00
≥ 16	10	12.05
Total	80	100

Source: Field survey, 2018

07% of them had no formal education at all. Education influences farmer's decision to participate in a project or not. Educated people are expected to perform certain jobs and functions with higher efficiency and are more likely to participate and try new technologies in shorter period than uneducated people (Agbamu, 2006).

### Farm size of the respondents

This refers to the total area of farmland (in hectares) used for maize production by the respondents. It was assumed that the larger the farm size the farmer has, the better in utilizing technological packages. The results in (Table 7) shows that (37.05%) of the respondents had less than 1 hectare while 12.05% of the respondents had between 1 to 5 hectares and 11-15 hectares of land respectively, 10.00% had 16 to 20 hectares of land, 8.07% had more than twenty hectares of farm land. It can be seen that a vast majority of the respondents had less than 5 hectares of land. This is typical of farming in third world countries which is characterized by small farmland holding (World Bank, 2008). Farmers operating on small farmland holdings may view new technologies as risky.

### Farming experience of the respondents

Farming experience of rice farmers is a function of their capacity in sustaining and maintaining the farming practices they may have acquired over years. This variable was measured by periods of years spent as full time farmers. As reflected in (Table 8), that respondent has less than 5 years of farming experience were 25.00%, those that fell within 6-10 years were 37.05%,

those within the category of 11-15 years accounted for 25.00% and (12.05%) of the respondents had more than 16 years of farming experience. This implies that it is possible for the rice farmers participating in the CARI/GIZ project to continue with the technologies provided to them.

### CARI/GIZ Rice production technologies practiced by the respondents

The result in (Table 9) reveals that majority of the farmers (16.02%) transplanting young seedlings of 2-3weeks and use of improve seed (10.9%), safety use of agrochemicals ((9.1%) line transplanting (12.8%), use of chemical fertilizer, while (14.6%), group sales of paddy rice (15.7%), group purchase of inputs (20.1%).

### Average yield in tonnes per hectare before and after CARI/GIZ project

This aspect looked at the average yield per hectare of the CARI/GIZ project participants before and after the project. Results of the yield obtained in (Table 10) shows a significant yield increase from 3-4 tonnes per hectare to 5-6 tonnes per hectare. This result corroborates with Garba, (2017) that reported increase of sesame yield influence farmers to adopt improved production technologies in Jigawa state.

### Effects of CARI/GIZ technology practice on their livelihood

Result in (Table 11), depicts that the CARI/GIZ project has significantly affected their livelihood.

**Table 9:** CARI/GIZ rice production technologies practiced by the farmers.

Technologies	Percentage*
Transplanting young seedlings of 2-3weeks	16.5
Use of improve seed	10.9
Safety use of agrochemicals	9.1
Line transplanting	12.8
Use of chemical fertilizer	14.6
Group sales of paddy rice	15.7
Group purchase of inputs	20.1

Source: Field survey, 2018; \*Multiple responses

**Table 10:** Average yield in tonnes per hectare before and after CARI/GIZ project.

Average yield/community	Before	After
Mugina	4.3tonnes	6.2tonnes
Hantsu	4.0tonnes	6.4tonnes
Mudiga	4.5tonnes	6.5tonnes
Miga B	3.9tonnes	5.7tonnes
Agufa	4.2tonnes	5.9tonnes
Damaganawa	3.7tonnes	5.8tonnes
Yan dadi	4.7tonnes	6.0tonnes
Romawa	3.6	5.5
	tonnes	tonnes

Source: Field survey, 2018

**Table 11:** Effects of CARI/GIZ technology practice on their livelihood.

Technology practice	Frequency*	Percentage
Increased income	32	8.9
Increased food availability	91	25.5
Development of new technology	31	8.7
Provide employment	27	7.5
Assistance from government	68	19.1
Access to market information	34	9.5
Access to production inputs	44	12.3

Source: Field survey, 2018; \*Multiple responses

**Table 12:** Constraints experienced by the respondents.

ICTs	Frequency	percentage	Rank
Low level of education	10	12.5	5 <sup>th</sup>
Lack of access to credit	11	13.7	4 <sup>th</sup>
Land tenure system	22	27.5	1 <sup>st</sup>
Low access to mechanization	18	22.5	3 <sup>rd</sup>
High cost of inputs	19	23.7	2 <sup>nd</sup>
Total	80	100	

Source: Field survey, 2018

The results showed increased income (8.9%), increased food availability (25.5%), development of new technology (8.7%) provide employment (7.5%), assistance from government (19.1%), access to market information (9.5%) access to production inputs (12.3%). This implies that any meaningful agriculture development should always target smallholder farmers with production packages that will consider their socioeconomic characteristics which its effects can be easily realized.

Utilization of innovation refers to the decision to apply an innovation and to continue to use it (Rogers, 2003).

#### **Constraint to small-scale rice farmers CARI/GIZ project participants**

Table 12 shows the ranking of respondent according to constraints experienced in the CARI/GIZ project. The most serious constraint was land tenure system, 1<sup>st</sup> (27.5%), high cost of inputs 2<sup>nd</sup> (23.7%), low access to mechanization 3<sup>rd</sup> (22.3%), lack of access to credit 4<sup>th</sup>

(13.7%) and low level of education 5<sup>th</sup> (12.5%). The implications of these results are that if farmers are aware of their constraints, they can easily devise a means of Ali et al. 331

overcoming it.

## Conclusion and Recommendations

From the findings of the research work, it was concluded that the CARI/GIZ project has effect on the participants livelihood (increase income, increase food, provide employment etc) in the study area. Thus, utilization of technology by farmers will lead to increase in agricultural productivity in the study area. Based on the findings of this study, it is pertinent to make some recommendations. The recommendation made will assist the farmers towards improvement in their skills and knowledge for the development of Agriculture. The following recommendations are proffered:

1. Government should revisit the programme of National Agriculture development authority (NALDA) in order to provide more land to farmers to address the issue of land tenure system in the study area.
  2. Government should provide credits facilities to the real practicing rural farmers and not pseudo farmers whose interest is not in Agricultural production.
  3. Farmers should be encouraged to organize themselves into cooperative societies and social groups.
  4. Farmers should be given more easy access to credits.
- In light of this, there is need to link farmers to sources of credits given its importance in the utilization of improved agricultural technology. Credit is very important in encouraging farmers to utilize improved technology. Farmers can be linked to credit through establishing financial institutions such as the micro finance banks in the rural areas.

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