



A SURVEY ON IMPACT OF IRRIGATION FARMING ON RURAL DEVELOPMENT IN MAKARFI LOCAL GOVERNMENT AREA, KADUNA STATE

ABSTRACT

This study surveyed the impact of irrigation farming on rural development in Makarfi Local Government Area, Kaduna State. Three (3) research objectives and questions guided the study. Descriptive survey method was employed and the population of the study was all the inhabitants of Makarfi Local Government Area, Kaduna state totalling one hundred and

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Introduction

Tackling rural poverty, unemployment and food insecurity are matter of concern to development specialist and is debated amongst governments, donor community and development agencies (Rodríguez-Pose & Hardy, 2015). In this regard, there is a pressing and urgent need to find ways to reduce the gap between the wealthy and poor to ensure sustainable rural development in Makarfi Local Government Area, Kaduna state and Nigeria as a whole (Sudhir & Yassir in Dube, 2015). To that effect, rural irrigation schemes have been put forward by the government, NGOs and development partners as one of the veritable tools that can foster rural development.

Theoretical postulations and country experiences in developing regions underscore the crucial role of agricultural growth for poverty reduction (Eboh, Oduh & Ujah, 2012).

While growth is essential for poverty reduction, it should be noted that it does not always lead to rapid poverty reduction and two scenarios can



forty six thousand two hundred and fifty nine (146,259), while sample of four hundred (400) respondents comprising irrigation farmers, perishable good traders, students and civil servants selected through proportionate sampling technique. The instrument titled “ Survey on Impact of Irrigation Farming on Rural Development (SIMIFRAD)” questionnaire was used for data collection, which contained four (3) sections in relation to the study variables based on 4-point Likert scale. Cronbach alpha was used for the analysis of reliability and reliability coefficient of .91 (Section A); .82 (Section B); .89 (Section C) were obtained respectively. Mean and standard deviation were used to present the descriptive data and a mean of 2.5 and above was analyzed as agreed, while below 2.5 as disagreed. The study revealed that, irrigation farming contributes to employment opportunity and income generation by cutting down the rate of rural-urban migration, increasing per capita aggregate production, providing youths with income that they invest in businesses, increasing the demand for farm labour and use of hired labour, increasing farmers’ income regularly and agricultural productivity. irrigation farming contributes to poverty alleviation through reducing indebtedness among the people, helped families to enrol their children in both public/private schools, helped families to build their own houses, provided member with money to buy their children and wives good clothes and basic necessities, helped many youths to further their education in the home, increased families income for providing nutritious food in their homes, provided youths with income that enabled them to marry and take proper care of their families. Finally, it was found that, irrigation farming contributes to food security by increasing the availability of food items, reduced malnutrition among children, providing flexibility in decision-making with regards to food storage, improved the regular household supply of food items, enabled in-flow of people from different communities to buy food stuffs/ items as well as provide families with enough food commodities throughout the year in Makarfi Local Government Area, Kaduna state. Base on the findings, it was recommended that, Government, Commercial Banks and Development Partners should provide farmers with soft-loans in order to boost irrigation farming; Government at the Local Level should provide enough storage facilities for irrigation farmers, this will go a long way in achieving sustainable food security in Makarfi Local Government Area.

Keywords: Irrigation Farming, Poverty Alleviation, Employment Opportunity, Food Security and Rural Development



serve to illustrate this (Nwafor, Ehor, Chukwu & Amuka, 2011). In one scenario, a country grows at 5% p.a. and reduces the poverty rate by 50% after 5 years. In another scenario, the same country can grow at the same 5% per annum and reduce poverty by 10% in 5 years. The growth in the first scenario is normally said to be more pro-poor because it is more able to reduce poverty. This difference in the poverty outcomes of growth results from the sources of growth in the different scenarios.

Using Nigeria as an example, a 5% growth coming primarily from the oil sector would have much lesser impact on the poverty level compared to the same 5% which comes primarily from the agriculture sector. This is because the agricultural sector is a major employer of a larger proportion of Nigerian population (USAID, 2009; Dim & Ezenekwe, 2013; Tersoo, 2013; Oyakhilomen & Zibah, 2014). Hence, when growth comes from sectors that most poor people work in (the agriculture sector in Nigeria's case), poverty is reduced faster.

The rates of poverty reduction have historically been very closely related to agricultural performance – particularly to the rate of growth of irrigation farming. In simple terms, this indicates that as a country increases her agricultural productivity, the greater her chance of achieving significant reduction in poverty. Despite decades of investment in new agricultural technology, irrigation farming and rural development, hunger and poverty continue to plague large areas in Nigeria (World Bank, 2004; Anowor, Ukwani, & Ezekwem, 2013). This has led to high rate of unemployment among youths in Makarfi Local Government Area.

Thus, employment opportunities can generate through irrigation farming for both agriculture and non-agriculture sectors. With irrigation farming, helps to improve the living standards of farmers, increase their income and as such, change their consumption pattern in favour of more nutritious, rich and superior food, get money for education and health care services of their children among others. On the other hand, it also generates non-farm employment opportunities for milling factories, food processing companies and agro-based activities, to mention just a few (Llanto, 2012). With irrigation farming problem of food insecurity can be solved.



It has been observed that in the rural areas, the people adopt several strategies such as borrowing food or money to buy food/purchasing food on credit, eating foods that are less preferred or less expensive, rationing money to household, limiting portions at meal time, and skipping meals among others. This is directly linked to their purchasing power which also is linked to the quantity, quality and the time farmers bring farm produce to the market. Irrigation farming is one sure way of producing crops at a time when the crops are not usually grown to take advantage of higher crop prices thereby gaining a higher profit margin. Apart from improving the purchasing power and standard of living of farmers, off-season farming enhanced by irrigation will contribute to the food security situation and rural development in Makarfi Local Government Area (Anyanwu, Anyadike, Nwoke, & Chukwuma, 2010). At the juncture, it is important to look at the concept of irrigation farming and rural development.

Nwa in Anyanwu, Anyadike, Nwoke and Chukwuma (2010) defined irrigation farming as the application of water to supplement soil moisture in order to make up water requirements for crops. The practice is justified in three cases: when settled agriculture is restricted by inadequate rain (as in arid areas) or inadequate land to meet food needs of growing population (as in densely populated parts of the country); when there are wide variations in rainfall from year to year and during the year, with respect to the amount, incidence, temporal and spatial distribution (a common experience throughout the country); and when irrigation is likely to make significant contribution to national food security and poverty alleviation. Thus, irrigation farming can be summarized to mean any process, other than by natural precipitation, which supplies water to crops or any other cultivated plants.

On the other hand, rural development should be viewed as a process raising the capacity of the rural people to control their environment. Environment does not mean only agriculture or economic development, it includes all aspects of rural life social, economic, culture and political. Rural development as a process should continuously raise the capacity of the rural people to influence their total environment, enabling them to become initiators and controllers of change in their environment rather than merely the passive objects of eternal manipulation and



control (Ajaero & Onokala, 2013; Nugroho, Pramukanto, Negara, Purnomowati & Wulandari, 2016). Rural development must result in a wider distribution of benefits accruing from technical development and the participation of weaker sections of the rural population in the process of development.

Rural development encompasses: Improvement in levels of living, including employment, education, health, nutrition, housing and a variety of social services; Decreasing inequality in the distribution of rural income and in rural-economic urban balances in income and economic opportunities; and The capacity of the rural sector to sustain and acceleration in the pace of these improvements (Nugroho, et.al., 2016). Rural development is process of improving the economic and social life of the people residing in the local areas.

Empirical studies revealed that, irrigation farming/ Fadama farming contributes to poverty alleviation, employment and food security. For instance, Adeoye, Yusuf, Balogun and Carim-Sanni (2011) study revealed that, more than half of the villages in the Fadama II local government areas have more infrastructures than non-Fadama II villages. This implies that the Fadama/ irrigation farming programme had contributed significantly to the development of infrastructural facilities. Thus, irrigation farming contributed to increase in the income of farmers as a result of modern farm implements provided by the programme, which have helped in large-scale and all-season farming, thereby increasing agricultural production and infrastructural development in the rural areas. Also, Burton et al (2005) study found that, irrigation development has contributed immensely to improved food security. The proportion of global food supplies due to improved irrigation is significant

Thirtle et al (2001); Hussain and Hanjra (2004); Fan (2005); You et al (2010) studies found relationship between irrigation farming, poverty alleviation and employment opportunities. Thus, their studies revealed that, irrigation benefits the poor though higher production, higher yield, lower risk of crop failure, and higher and year round farm. Irrigation enables smallholders to adopt more diversified cropping patterns, and to switch from low-value subsistence production to high-value market-oriented production. And also increases production which makes food available and affordable.



However, Kudi, Usman, Akpoko and Banta (2008); Okpara in Anowor, Ukweni and Ezekwem (2013) studies found that there was little improvement in their income of the people as a result of irrigation farming. The implication is that better income gives better purchasing power and hence the improvement of living standards. Though, this cannot be generalized to the current study area. It is against this backdrop, that the researcher conducted a survey on impact of irrigation farming on rural development in Makarfi Local Government Area, Kaduna State.

Statement of the Problem

Agriculture (non-irrigation and irrigation system) generates employment for over 70 percent of the total labour force, accounts for about 60 percent of the non-oil exports and, perhaps most important, provides over 80 percent of the food needs and as well contributes to poverty reduction in the country (Adegboye, 2004; Onwuemenyi, 2008; Central Bank of Nigeria [CBN], 2008). Despite these indicators, irrigation farming in Makarfi Local Government Area in recent times remains inadequate and indeed far less than its potentials. Food demand exceeds the supply thus leading to large importations of food, which further erodes the economies foreign exchange. Poverty is more pronounced in the rural areas and unemployment is on the increase with little or no available studies to explain these emerging trends. This gap in studies is what motivated the researcher to conduct a survey on impact of irrigation farming on rural development in Makarfi Local Government Area, Kaduna State. Thus the research questions were:

- i. In what ways do irrigation farming contributes to employment opportunity and income generation in the study area?
- ii. What is the contribution of irrigation farming to poor alleviation in the study area?
- iii. In what ways do irrigation farming contributes to food security in the study area?

Objectives of the study

This study was meant to achieve the following specific objectives:



- i. To find out whether irrigation farming contribute to employment opportunity and income generation in the study area.
- ii. To examine the contribution of irrigation farming to poor alleviation in the study area.
- iii. To find out the contribution of irrigation farming to food security in the study area.

Materials and Methods

This study employed descriptive survey method. The population of the study was all the inhabitants of Makarfi Local Government Area, Kaduna state totalling one hundred and forty six thousand two hundred and fifty nine (146,259) (National Population Commission, 2006), while sample of four hundred (400) respondents comprising irrigation farmers, perishable good traders, students and civil servants was selected through proportionate sampling technique. The instrument titled “Survey on Impact of Irrigation Farming on Rural Development (SIMIFRAD)” questionnaire was used for data collection. The instrument which contained four (3) sections in relation to the study variables was developed based on 4-point Likert scale. The instrument was validated by senior lecturers in Department of History, Faculty of Art and Islamic Studies, Bayero University, Kano. In order to establish the reliability of the instruments, 23 copies of the questionnaire was administered to master’s students in Development Studies at Bayero University, Kano who were not part of the main study, while Cronbach alpha was used for the analysis and reliability coefficient of .91 (Section A); .82 (Section B); .89 (Section C) were obtained respectively. Mean and standard deviation were used to present the descriptive data and a mean of 2.5 and above was analyzed as agreed, while below 2.5 as disagreed.

Results and Discussions

The variables investigated in the study were irrigation farming, poverty alleviation, employment opportunity and food security in relation to rural development. These variables are assessed independently with specific research questions and objectives as follows:



Research Question One: In what ways does irrigation farming contributes to employment opportunity and Income Generation in the study area? Data collected from item 1 – 10 were used to answer the research question. The summary of the analysis is presented in table 1.

Table 1: Mean responses scores on Contributions of Irrigation Farming to Employment Opportunity and Income Generation

| S/N | Items Statement | Male | | Female | | | |
|-----|---|------|-----|-----------|------|-----|-----------|
| | | Mean | S.D | Decision | Mean | S.D | Decision |
| | Irrigation farming: | | | | | | |
| 1. | reduces the rural-urban migration. | 2.95 | .65 | Agreed | 2.92 | .68 | Agreed |
| 2 | increases per capita aggregate production. | 3.00 | .54 | Agreed | 2.99 | .58 | Agreed |
| 3 | provides youths with income that they invest in businesses. | 3.10 | .61 | Agreed | 3.05 | .47 | Agreed |
| 4 | contributes to poverty. | 2.21 | .77 | Disagreed | 2.18 | .88 | Disagreed |
| 5 | increases demand for farm labour and use of hired labour. | 2.56 | .67 | Agreed | 2.58 | .65 | Agreed |
| 6 | decreases incomes of farmers | 2.14 | .88 | Disagreed | 2.20 | .86 | Disagreed |
| 7 | leads to underutilization of arable lands. | 2.20 | .70 | Disagreed | 2.35 | .87 | Disagreed |
| 8 | increases agricultural productivity. | 2.90 | .51 | Agreed | 2.68 | .55 | Agreed |
| 9 | reduces in income inequality among families. | 3.16 | .52 | Agreed | 3.10 | .56 | Agreed |
| 10 | improves regular cash incomes of families. | 2.98 | .56 | Agreed | 3.01 | .66 | Agreed |



Cumulative Mean 2.72

2.71

n=372

Table 1 presented the responses of participants in the study on contributions of irrigation farming to employment opportunity and income generation in the study area. The result revealed that the respondents agreed with item 1, 2, 3, 5, 8, 9 and 10, while disagreed with item 4, 6 and 7. In other words, the respondents averred that irrigation farming contributes to employment opportunity and income generation by cutting down the rate of rural-urban migration, increasing per capita aggregate production, providing youths with income that they invest in businesses, increasing the demand for farm labour and use of hired labour, increasing farmers' income regularly and agricultural productivity. The cumulative mean of items in table I is 2.72 for male and 2.71 for female respondents which is greater than 2.5. Also, the standard deviations of all the items are between .47 and .87 which is less than 1.00, which is lower value. This showed that, the respondents agreed with most of the items in Table

1. **Research Question Two:** What is the contribution of irrigation farming to poor alleviation in the study area? Data collected from item 11 – 20 were used to answer the research question. The summary of the analysis is presented in

Table 2.

Table 2: Mean Response scores on contributions of Irrigation Farming to Poor Alleviation

| Item Statement | | Male | | | Female | | |
|----------------|---|------|-----|-----------|--------|-----|-----------|
| | | Mean | S.D | Decision | Mean | S.D | Decision |
| S/N | Irrigation farming: | | | | | | |
| 1 | reduces indebtedness among people. | 3.21 | .56 | Agreed | 3.11 | .67 | Agreed |
| 12 | increases access to credit through promotion of micro credit schemes. | 2.28 | .90 | Disagreed | 2.22 | .78 | Disagreed |



| | | | | | | | |
|----|--|------|-----|-----------|------|-----|-----------|
| 13 | helps families to enrol their children in both public / private schools | 3.20 | .56 | Agreed | 3.12 | .58 | Agreed |
| 14 | helps families to build their own houses. | 3.30 | .62 | Agreed | 3.26 | .66 | Agreed |
| 15 | provides member with money to buy their children and wives good clothes and basic necessities in the home. | 3.33 | .58 | Agreed | 3.29 | .61 | Agreed |
| 16 | helps many youths to further their education. | 3.23 | .57 | Agreed | 3.20 | .68 | Agreed |
| 17 | increases families income for providing nutritious food in their homes. | 3.16 | .80 | Agreed | 3.18 | .67 | Agreed |
| 18 | reduces resources for accessing modern health care services. | 2.01 | .88 | Disagreed | 2.10 | .80 | Disagreed |
| 19 | provides youths with income that enable them to marry and take proper care of their families. | 3.26 | .58 | Agreed | 3.22 | .56 | Agreed |
| 20 | did not help in reducing idleness among youths and adults, | 2.28 | .76 | Disagreed | 2.30 | .83 | Disagreed |



| | | |
|-----------------|------|------|
| Cumulative Mean | 2.93 | 2.90 |
|-----------------|------|------|

n=372

Table 2 presented the responses of the participants on contributions of irrigation farming to poor alleviation in Makarfi Local Government Area. The respondents agreed with item 11, 13, 14, 15, 16, 17 and 19, while disagreed with item 12, 18 and 20. Put simple, the respondents agreed that, irrigation farming helped to reduce indebtedness among the people, helped families to enrol their children in both public/private schools, helped families to build their own houses, provided member with money to buy their children and wives good clothes and basic necessities, helped many youths to further their education in the home, increased families income for providing nutritious food in their homes, provided youths with income that enabled them to marry and take proper care of their families. The cumulative mean of items in table 2 is 2.93 for male and 2.90 for female respondents which is greater than 2.5. Also, the standard deviation values were less than 1.00, which is lower value. This showed that, the respondents had similar view on items in table 2.

Research Question Three: In what ways do irrigation farming contributes to food security in the study area? Data collected from item 21 – 30 were used to answer the research question. The summary of the analysis is presented in table 3.

Table 3: Mean Responses Scores on contributions of irrigation farming to food security.

| S/N | Items | Male | | | Female | | |
|-----|---|------|-----|----------|--------|-----|----------|
| | | Mean | S.D | Decision | Mean | S.D | Decision |
| 21 | increases the availability of food items. | 3.27 | .56 | Agreed | 3.12 | .61 | Agreed |
| 22 | reduces malnutrition among children. | 3.20 | .67 | Agreed | 3.33 | .65 | Agreed |



| | | | | | | | |
|----|---|------|-----|-----------|------|-----|-----------|
| 23 | decreases the choices of food items/stuffs for families. | 2.05 | .88 | Disagreed | 2.15 | .82 | Disagreed |
| 24 | provides flexibility in decision-making with regards to food storage. | 3.09 | .56 | Agreed | 3.21 | .58 | Agreed |
| 25 | improves the regular household supply of food items. | 3.28 | .22 | Agreed | 3.24 | .56 | Agreed |
| 26 | increases scarcity in essential food items such as vegetable, tomatoes, pepper, cabbage, and cucumber among others. | 2.25 | .88 | Disagreed | 2.30 | .86 | Disagreed |
| 27 | enables in-flow of people from different communities to buy food stuffs/ items. | 3.38 | .31 | Agreed | 3.60 | .26 | Agreed |
| 28 | provides families with enough food commodities throughout the year. | 2.86 | .67 | Agreed | 2.81 | .66 | Agreed |
| 29 | makes hunger to become an issue. | 2.26 | .78 | Disagreed | 2.34 | .65 | Disagreed |
| 30 | makes food items more | 2.16 | .86 | Disagreed | 2.26 | .73 | Disagreed |



| | | |
|------------------------|------|------|
| costly and scarce. | | |
| Cumulative Mean | 2.78 | 2.84 |

n=372

Table 3 presented the responses of participants on contributions of irrigation farming to food security in Makarfi. The respondents agreed with item 21, 22, 24, 25, 27 and 28, while disagreed with item 23, 26, 29 and 30. This implies that, the irrigation farming contributes to food security by increasing the availability of food items, reduced malnutrition among children, providing flexibility in decision-making with regards to food storage, improved the regular household supply of food items, enabled in-flow of people from different communities to buy food stuffs/items as well as provide families with enough food commodities throughout the year. The cumulative mean of items in table 3 is 2.78 for male and 2.84 for female respondents which is greater than 2.5. Also, the standard deviation values of all the items were less than 1.00, which is lower value. This showed that, the respondents agreed with most of the items in Table 3.

Discussions

The study averred that irrigation farming in Makarfi Local Government Area contributes to employment opportunity and income generation by cutting down the rate of rural-urban migration, increasing per capita aggregate production, providing youths with income that they invest in businesses, increasing the demand for farm labour and use of hired labour, increasing farmers' income regularly and agricultural productivity. This agreed with the findings of Adeoye, Yusuf, Balogun and Carim-Sanni (2011) which revealed that, more than half of the villages in the Fadama II local government areas have more infrastructures than non-Fadama II villages. This implies that the Fadama/ irrigation farming programme had contributed significantly to the development of infrastructural facilities. Thus, irrigation farming contributed to increase in the income of farmers as a result of modern farm implements provided by the programme, which have helped in large-scale and all-season farming, thereby increasing agricultural production and infrastructural development in the rural areas. Similarly, Kaswamila (2004), found that irrigation farming develop entrepreneurial skills among young and adult persons in the society. This helps them to budget for their income activities, manage their own affairs and can borrow and repay debt.



The study also indicated that, irrigation farming contributes to poverty alleviation through reducing indebtedness among the people, helped families to enrol their children in both public/private schools, helped families to build their own houses, provided member with money to buy their children and wives good clothes and basic necessities, helped many youths to further their education in the home, increased families income for providing nutritious food in their homes, provided youths with income that enabled them to marry and take proper care of their families. This agreed with the studies of Thirtle et al (2001); Hussain and Hanjra (2004); Fan (2005); You et al (2010) which found relationship between irrigation farming, poverty alleviation and employment opportunities. Thus, their studies revealed that, irrigation benefits the poor though higher production, higher yield, lower risk of crop failure, and higher and year round farm. Irrigation enables smallholders to adopt more diversified cropping patterns, and to switch from low-value subsistence production to high-value market-oriented production. And also increases production which makes food available and affordable. Finally, the study found that, irrigation farming contributes to food security by increasing the availability of food items, reduced malnutrition among children, providing flexibility in decision-making with regards to food storage, improved the regular household supply of food items, enabled in-flow of people from different communities to buy food stuffs/ items as well as provide families with enough food commodities throughout the year. This finding correlates analysis of Burton et al. (2005) that, irrigation development has contributed immensely to improved food security. The proportion of global food supplies due to improved irrigation is significant.

Conclusion and Recommendations

It can be deduced from the study that, irrigation farming contributes to employment opportunity, poverty alleviation and food security through increase in income and effective utilization of arable land for farming activities. However, the farmers do not have access to micro credit schemes. Thus, this had led to shortage of funds and inadequate storage facilities for most irrigation farmers in the study area. Based on these findings, the researcher recommended that:

- i. Government, Commercial Banks and Development Partners should provide farmers with soft-loans in order to boost irrigation farming in Makarfi Local Government Area.
- ii. Government at the Local Level should provide enough storage facilities for irrigation farmers, this will go a long way in



achieving sustainable food security in Makarfi Local Government Area.

- iii. Local Government and Community Based Associations should construct more deep wells and small dams so as to establish more irrigation schemes. This will go a long way in providing a lasting solution to rural poverty, employment and food insecurity. This will help reduce the dependence syndrome that is not sustainable.

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