Survey of Irrigation Farming and Its Profitability Among Women Farmers in Wurno Irrigation Scheme

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Abstract

The role of women in agricultural production in most developing countries cannot be overemphasized accounting for about 32% of GDP, producing most of the food that is consumed locally for instance, vegetable, fruits and cereal crops which are produced through irrigation and rain fed agriculture. This study aimed at examining the level of profit obtain by the women participating in wurno irrigation scheme. Interview was conducted using open ended questionnaire with 95 selected respondents using Key informant interview as back up in strengthens the findings. Statistical tables and descriptive analysis were employed in analyzing the retrieved information. Findings shows that major crops mainly cultivated by women in the scheme are Rice 53%, Pepper and tomatoes 16% respectively. 73% of the participants invested between # 300 – 400 thousand annually. 59% of the women irrigation farmers in the scheme strongly believe in earning profit in the scheme farming activities, while 15.6 % rejected the believe. The challenges identified by women include lack of modern irrigation facilities and their applications, poor access to loan, political and cultural marginalization. The work recommended that women should be thought on how to ensure water storage through rain water harvesting, provision of modern credit facilities, bank loans, and avoidance of third party in all their activities.

Keywords: Irrigation Farming, Profitability, Women Farmers, Lugu Dam.

Introduction

Women play a crucial role in agricultural production in most developing countries of the world accounting for about 32% of Gross Domestic Product (GDP) and also produce over 70% of the food grown worldwide (FAO, 2010). They are active in both cash and subsistence agricultural sectors producing crops like millet, rice, maize, cotton and vegetables which have enhanced food security all over the world. Women's knowledge and labour play a key role in sustaining the many diverse, local food systems and production that still exist today throughout the world, particularly in developing countries (LEISA, 2009). In Nigeria, women make up to 60 – 80 percent of agricultural labour force, depending on the region and produce two – third of the food crops through irrigated agriculture especially in the northern part of the country (Yahaya, 2002). Irrigated agriculture is aimed at growing crops during dry season, lengthening growing season, insurance against climatic variability and drought, attaining higher yields and meeting market demands at all seasons (DPI, 2010). Irrigation farming provides a better means of providing profit for both men and women farmers as a result of high prices crops command during dry seasons (Fakoya et'al, 2007).

Nigeria has a great potential for the production of high–value vegetables and cereals during the dry season. This is because the country is endowed with underground water reserves, which necessitated the need to utilize this potential resource and ensure continuous cultivation to generate dry season farm income. For this reason, government initiated the First National Fadama Development Project in the early 1990s. The project was to develop small–scale; simple low–cost, farming techniques to be financed by the World Bank. According to Adesoji, Farinde et'al (2011), the First Fadama Development Project (Fadama I) which was implemented between 1993 and 1999 was executed in seven core states: Bauchi, Gombe, Jigawa, Kano, Kebbi, Sokoto and Zamfara.

Women play a very significant role in agricultural production in Nigeria. They are however accorded little attention. Inadequate information on the lives of women participation in agriculture has helped to under-estimate their importance in the economy and hence led to their neglect in policy issues. They participate in many aspects of rural life in paid employment, trade and marketing, as well as in many unpaid activities, such as tending of crops and animals, collecting water and wood for fuel, and caring for family members (Akpan, (2015).

Profitability of irrigation farming has to do with how much gain is derived from irrigation farming after the sales of the farm product. An economic analysis of dry season irrigated farming in Asa River, Kwara State, Nigeria. The profitability was measured as both the gross and net margins. Both total cost and gross margin showed that dry season irrigated farming was less costly and more profitable compared to rain fed farming (Ayinde, et'al, (2011). The major resource used in production is land, labour capital and management. The benefit associated with agricultural productive relies heavily on cost incurred for those that are related

with the quality of resource put into the production process. FAO (2010b) defined cost as the value of inputs used in production while return refers to the gains from production.

This study therefore employed the probe analysis to examine the types of crops mainly grown by women, describe the profit generated in order to measure it as one of the motivated factors of participation in irrigation farming along Wurno irrigation scheme.

Material and methods

The Wurno Irrigation scheme (WIS) lies between Latitudes13.19703N and 13.285N, Longitude 5.36533E and 5.42416E; about 25Km north east of Sokoto, The State Capital. The irrigation project covers 1,200 hectares and was initiated by erstwhile Regional Government of Northern Nigeria. Hence, the first rehabilitation was in 1963 to 1964 by Dalbato and Bugialo Consulting Engineers under the authority of the then Northern Regional Government. Presently, it covered an area of 1200 hectares (figure 1).Wurno Irrigation Project which is constructed along the Rima River, 50 km away from Goronyo Dam. The scheme is surrounded by villages such as Wurno, Lugu, Tutudawa, Kwargaba, Gidan Modi, Gidan-Kamba and Gidan-Bango.

A structured interview using an open-ended questionnaire was carried out with 95 systematically selected respondents. Interview schedule was used to elicit information from the respondents with the use of Focus Group Discussion (FGD). The data generated from the interview were processed using SPSS and Excel Software, to generate primary descriptive statistics (frequencies, tables and charts). On the other hand, the information gathered from the Key Informant (KII) was presented using descriptive statistics in analyzing the data from the study.

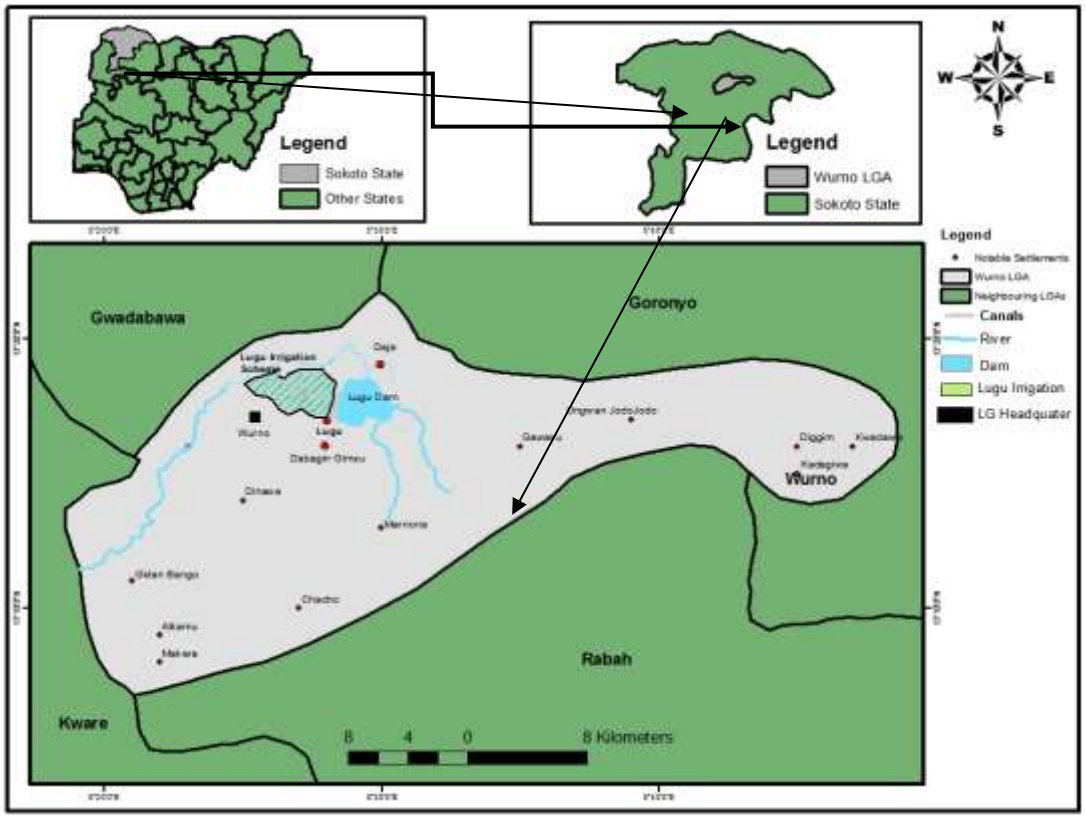

Figure 1. Wurno Irrigation Scheme
Source: OSGOF GIS, UDUS. 2025

Result and discussion

Table 1: Socio-Demographic Characteristics of the Respondents

Variable	Frequency	Percent
(a) Age of Respondent		
Between 21years and 30years	4	4.2
Between 31years and 40years	63	65.6
Between 41years and 50years	29	30.2
Total	**96**	**100.0**
(b) Marital Status of Respondent		
Married	32	33.3
Divorced	23	24.0
Separated/Widower	41	42.7
Total	**96**	**100.0**

(c) Educational Level Attained by the Respondent

Non-formal education	21	21.9
Primary education	18	18.8
Secondary education	8	8.3
Quranic education	49	50.0
Total	**96**	**100.0**
(d) Farming Experience of Respondent		
Less than 10 Years	1	1.0
11-20 years	2	2.1
21 years to 30 Years	51	53.1
31 years to 40 years	42	43.8
Total	**96**	**100.0**
(e) Number of Farm Workers employed by Respondent		
1-2 workers	41	42.7
3-4 workers	55	57.3
Total	**96**	**100.0**

Source: Field Work, 2024

Types of Crops cultivate in the Wurno Irrigation Scheme

The result in Table 2. showed that women participating in the irrigation farming cultivate pepper, vegetable and tomato, onion and garlic, rice, sweet potato, wheat, beans and sugarcane with rice been the majorly cultivated crop (53.1%) This indicate that many of the women irrigation farmers grow rice. This might not be unconnected with the fact that majority of the people in Sokoto State considered rice as their major staple food. This finding is in line with the result from the Key Informant Interview granted to one of key informant which went thus:

> "The major crop we grow is rice because rice is our major food. We eat rice through different processes. We cook it and eat with stew, we use it produce *Masa* (rice cake), "*Danbu*", Tuwon Shinkafa (rice meal) etc. we also get money from the excess production."

This is also in agreement with the study by Musa, et'al (2013) that investigated the economic analysis of crop production under Jibya irrigation project of Kastina State and found that irrigation farmers in the area cultivate crops such as wheat, cowpea, groundnut, onion, maize and tomato. Similarly, this finding is tandem with the finding of the study of Adelodun et'al (2018) and Effiong et'al (2015) which evaluated the irrigation practice in Nigeria and revealed that irrigation farmers grow crops such as rice, maize, tomato, pepper, onion, sugarcane and wheat.

Table 2: Crops Cultivated by women irrigation farmers in Wurno Irrigation Scheme

Crop	Frequency	Percentage (%)
Pepper and Tomato	16	16.7
Rice	51	53.1
Sweet Potato	5	5.2
Wheat	3	3.1
Onion and Garlic	9	9.4
Vegetation Leaves	5	5.2
Beans	4	4.1
Sugarcane	3	3.1
Total	96	100

Source: Fieldwork, 2024

Profitable of Irrigation Farming to the Women

Table 3. shows the profitability of irrigation farming to women participating in it. The table shows that 72.9% of the respondent invested between ₦50, 000 and ₦100, 000, the table further shows that 68.8% of the women produced less than 20 bags of their farm produce while 31.3% produced between 21 and 30 bags of rice. It could be inferred from the table that 59.4% of the women claimed they got more than the money they invested in irrigation farming after the sales of their farm produce. The remaining, 21.9% of them said they made less than what they invested. It reveals that they have acquired properties such as house, farmland, car and made some investments. This shows that 84.4% of the women irrigation farmers agreed and confirmed that irrigation farming is profitable while the only few (15.6%) said it is that irrigation farming is not profitable.

Table 3: Information on the Profitability of Irrigation Farming

Variable	Frequency	Percent
(i) Amount invested in the irrigation Farming		
₦101,00-₦200-000	4	4.2
₦301,000-₦400,00	70	72.9
above ₦400,000	22	22.9
Total	96	100.0
(ii) Number of bags produced at the end of the harvesting period		
Less than 20	66	68.8
21-30	30	31.3
Total	96	100.0

(iii) Amount realized after sales of the farm produce		
Less than my investment	21	21.9
The same as what I invested	18	18.8
Above what I invested	57	59.4
Total	96	100.0
(iv) Properties acquired with money from the irrigation		
Build house	40	41.7
Farmland	20	20.8
Buy a car	17	17.7
Other investment	19	19.8
Total	96	100.0
(v) Is irrigation profitable		
Yes	81	84.4
No	15	15.6
Total	96	100.0

Source: Author Fieldwork, 2024

This is in consonance with the result presented on the factors motivating women into irrigation farming where in 66.8% strongly agreed that profitability was the factor that attracted them into the activity. This result agrees with the finding of Tashikalma *et al*, (2014), who conducted a comparative profitability analysis of selected rain-fed and irrigation food crops in Adamawa State, Nigeria. The study revealed that the average gross marginal income realized per hectare of rice, maize and tomato for irrigation farming is more than that of the rain-fed farming for the same crops and on the same hectare of land. The study of Tashikalma *et al*, (2014) might be true because under irrigation farming, farmers have the opportunity to farm throughout the year and that might be a greater advantage over the rain-fed agriculture if other factors remain constant. The studies conducted by Ammani (2015); Baba (2010); Rao *et al* (2016) had proved that irrigation farming is profitable and lucrative if properly handled. Many of the farmers indicated that they made profit from the irrigation farming because they made use of family labour as revealed during the Focused Group Discussion where the respondents stressed that to them, irrigation farming is more profitable if the cost of production is not much. They added that the reason is that, with irrigation, they can plant crops at least three times a year unlike in the rain-fed farming.

This is also in agreement with the statement made by Baba *et al* (2010) who stress that using the family labour will reduce the cost of production thereby improving the profit compared to those who hire labour. This finding is in line with the study of Effiong *et al* (2015) which found that women farmers in Bende Local Government Area of Abia State made profit in rice

production. It was stated that each farmers made profit of ₦ 30, 508.03 which indicate that rice production was profitable. This finding is in agreement with the finding of Muntaka (2012) that examined the level of participation of women in Womwn-Irrigation Agricultural Development Progamme (WIA) in Kaduna State and revealed a significant difference between the output and income of WIA and non WIA participants. WIA participants declared a higher income than non WIA participants (₦ 134, 389.04 as against ₦ 26, 636.32)

The result in Table 2. reveals that 95.8% of the respondents' said men gain more profit compared to women in the Wurno Irrigation Scheme. The table further shows the reasons why men gain more profit compared to the women. These include size of farmland (97.9%), size of family labour used (94.8) and farming experience (87.5%). It means men acquire and cultivate more farmland and have the opportunity of using more family labour compared to their women counterpart. As such, they are able to produce more bags of rice thereby making more profit than the women. Likewise, men have more farming experience than the women because men are the pioneer irrigation farmers before women started joining the scheme.

This is in line with the finding of the Key Informant Interview who said:

> *"The men make more profit in the irrigation farming than we do because men have larger farmland and they have the opportunity of using much family labour compared to us. Family labour enables them to save more production cost. Profit is determined by removing the cost of production from the total money realized after the sales of farm produce. If the money gained from sales of farm produce is more than the money spent in the course of farming then there is a profit. On the contrary, if the cost of running the farm is higher than the money realized after the sales of farm produce then it is a loss. Most of the land we occupied are very cheap and along the areas liable to flooding. Another important reason why they gain more profit than us is because they are stronger and more energetic than us. They can handle every farm operation which we women cannot perform very well and they have more farming experience than we do."*

This is in line with finding of Mishra, et'al (2017) who investigated gender differentials in farming efficiency and profits: The case of rice production in the Philippines and found that female-headed farm households, despite having limited access to land, have higher values of rice production than their male counterparts. However, due to higher fixed, seed, and labour input cost, they consequently earned lower profit. This is in agreement with the finding of the study of Bryan et'al (2019) which stated that women face challenges and unequal opportunities in accessing and benefiting from irrigation technologies. They further stated that unless constraints to women's ability to technologies are addressed, women's empowerment is not a guaranteed outcome of irrigation.

Summary of findings

The finding revealed that rice constitutes the major crop cultivated by majority of women irrigation farmers in the Wurno Irrigation Scheme compared to other crops cultivated which constitute 53% of the respondent followed by pepper and tomato production which constitute 16%. These types of foods products are easily demand on the daily basis in the study area. Secondly, 59% among the respondent strongly believe in earning profit after the sales of their farm produce which are above of their spendings. According to this group of people irrigation farming along Lugu Dam is profitable. Another group of the farmers that constitute 15.6% argue that irrigation farming is not profitable. The interview revealed that this group of people invested low amount of money and their farms are located in the areas are liable to flooding with cheap rate of purchase/hiring. Thirdly, from the interview women attested that men make more profit than women in irrigation scheme do to amount of money they spent, provision of security in the night, application of modern methods of farming, seeds and farming tools which require a lot of money. Women do hire farms from the third party which may increase extra charges for their farming activities.

Conclusion

Majority of the women were found to be generating profit from the sales of their farm produce. The study concludes that majority of the women are married and divorcee who inherited the farms or hired it from the third party. with no possession of water pumps, personal land and credit facilities to undertake irrigated agriculture perfectly as men do. They depend on family labour for most of their activities in irrigation with no access to modern facilities like overhead and sprinkler irrigation system. Rice, pepper and tomato are mainly cultivated by the women in this scheme. Provision of Insecurity is affecting the profit outcome of the women as the culture of their society is not allowing them to watch their farms in the night. All the women faced problems such as lack of modern irrigation facilities and their applications, poor access to loan and modern facilities, political and cultural marginalization and non- recognition of their union.

Despite these attractions that the WIS has had on women who have engaged in the scheme, they are still faced with a number of challenges. These include the non-recognition of their union, inadequate land, high cost of farm input, poor market price, and limited access to technical know-how, good quality seeds and incessant flooding at the beginning of the rainy season.

Recommendations

From the forgoing findings the work recommended that, simple modern irrigation facilities such as water pumps, sprinklers and rain boots should be made available to women irrigators, removing the political bottleneck during distribution of irrigation facilities by using on-the-

field distribution method becomes crucial as non-farmers are always the main beneficiaries of pumping machines, seeds and fertilizer. Women irrigators should be taught on how to ensure water storage through rain-water harvesting method and technology, this can be achieved by using extension agents and researchers, provision of credit facilities to women irrigators through agricultural banks and cooperative societies becomes imperative so as to increase productivity and help women have a stable livelihood that will boost their welfare and standard of living. Security concern should be put in place for the profit gain of the women farmers. Third party purchase of land and hiring should be control by the authority concern.

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