AN ASSESSMENT ON THE ROLES OF IRRIGATION FARMING TOWARDS NATIONAL DEVELOPMENT.

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Abstract

Irrigation farming has increased in Nigeria in the recent times. The possible reason for this is the increased awareness from the Fadama project jointly funded by World Bank, Federal Government and State Governments. This work was carried out to assess the income generating potential of irrigation farming which may reduce poverty and hunger and directly achieve an important aspect of the Natinal Development. The study which was conducted between October 2005 and April 2006 covered towns and villages within the South Western region of Nigeria using data collected from a sample of four hundred and fifty Fadama (irrigation) farmers. Structured questionnaires were administered to irrigation farmers in selected towns of two randomly selected Local Governments of two selected states (Oyo and Ogun States). The result of the study showed that irrigation farming is a profitable venture. Farmers realized an average net income (profit) of N109, 750 from irrigation farming for the period. Furthermore, irrigation farming was found to be capable of alleviating poverty among farming households because they were able to live above US $1/day/person which is the threshold for poverty level. Hence irrigation farming can be used to achieve the MDG of reducing poverty and hunger. The Ordinary Least Square (OLS) regression showed that farm size, years of irrigation experience, seed, labour and fertilizer were found to have significant effects on profit realized from irrigation farming. Major crops grown are vegetables (such as Okra,

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Introduction

In the year 2000, member states of the United Nations came together to create a more prosperous world. In order to achieve this, the joint declaration set out eight ways: the National Development. One of the eight ways is Irrigation farming for the "Eradication of extreme hunger and poverty". The problem of hunger and of course malnutrition cannot be addressed without paying proper attention to agriculture. In the developing countries, most farmers practice rain-fed agriculture which results in low productivity, low income, perpetual poverty and malnutrition. To improve agricultural productivity in these countries, irrigation farming along with the use of improved seeds, fertilizers and other relevant inputs become the best alternative option. This will help in reducing hunger and malnutrition because there are direct relationships between agricultural productivity, hunger, malnutrition and poverty (Strauss 2008). It is a known fact that increased agricultural productivity enables farmers to produce more food, which translates into better diets and under good market conditions offers a the farmers opportunity to earn more income. Despite its plentiful resources and oil wealth, poverty is widespread in Nigeria. The situation has worsened since the late 1990s, to the extent that the country is now considered one of the 20 poorest countries in the world. Over 70% of the population is classified as poor, with 35% living in absolute poverty. Poverty is especially severe in rural areas, where social services and infrastructure are limited or non-existent. The great majorities of those who live in rural areas are poor and depend on the agriculture for food and income. About 90% of the country's food is produced by small-scale farmers cultivating tiny plots of land who depend on rainfall rather than irrigation systems (Annon, 2008).

One of the goals of irrigation farming is the provision of right amount of water at the right time for plant growth and development. Consequently, it ensures sustainable agriculture with its economic benefits. Globally, massive investments have been made in the development of irrigation scheme. In Nigeria, according to NINCID (2009), recent survey suggests that 39% of the land mass is potentially suitable for agriculture and out of this between 4.0 and 4.5 million ha (approximately 4.5 to 5.0%of the land) are judged suitable for irrigated agriculture but only 1.1 million ha can be supported fully by the water avai-lable, the remaining 3.4 million ha being Fadama. The benefit of irrigation (which is the artificial supply of water for agricultural crop growth) in Nigeria is not limited to food supply alone but it also serves as a source of income and employment during the slack period of rain-fed Agriculture.

There are two distinct seasons in Nigeria. These are the rainy (April to October) and the dry (November to March) season. Farmers are usually less busy on the farm during the dry season; therefore, irrigation farming serves as an alternative employment and additional source of income during the period. Irrigation farming practice has increased tremendously because of increasing demand for vegetable and other food items during off farming season. Fadama is a Hausa (a major ethnic group found in the northern part of Nigeria) word meaning fertile alluvial plain soil located near rivers but the word is ordinarily used to represent dry season irrigation farming in Nigeria. Blench and Ingawa (2004) defined Fadama as flood plains and lowly areas underlined by shallow aquifers and found along Nigeria's river systems. 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 in underground water reserves. Given the need to utilize this potential resource and ensure continuous cultivation to generate the dry season farm income, government initiated the first National Fadama development Project in the early 1990. The project was to develop small-scale, simple, low-cost, farmer managed irrigation scheme under the World Bank financing. According to Adesoji et al. (2006), 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. Following the widespread adoption of the Fadama technology, farmers realized income increases of up to 65% for vegetables, 334% for wheat and 497% for rice. Impressed by the achievement of Fadama I, government approached the African Development Fund (ADF) and the World Bank for financial support towards the second Fadama Development Project (Fadama II). The ADF approved a credit facility of UA 22 million (US $ 30.8 million) in December 2003 and the Fadama II commenced in June 2004. The project duration is six year. The Fadama II objective is to sustainably increase the incomes of Fadama users-those who depend directly or indirectly on Fadama resources (farmers, pastoralists, fishers, hunters, gatherers, and service providers) through empowering communities to take charge of their own development agenda.

The project has three components capacity building and advisory services, community infrastructure development and project coordination and management. The main features include, empowering the farmers, supporting the provision of market infrastructure, improving the conflict resolution mechanism, supporting rural and non-farm enterprises, focusing on the contribution of women and supporting increased food production and efficient management of

Fadama resources (FDP, 2005) the implementation is to be carried out through the bottom- top approach-individual farmer are coordinated by the community level project implementation committee, who are themselves coordinated by the local government level project implementation committee. The local government level project implementation committee is coordinated by the state level project implementation committee, while the state committee is coordinated by the federal level project implementation committee. The takeoff of the Fadama II represents one of the ambitious step by the government to achieve the goals of reducing hunger in the country, however, achieving the stated objectives will not only require good execution and management but also the avoidance of factors that caused the failure of similar projects in the past (Babatunde et al., 2008). Fadama III Project also to be sponsored by the World Bank is about to commence. Eradication of extreme poverty and hunger is a prime goal of the millennium development goals of the world summit of the United Nations. Therefore, there is an urgent need to assess the impact of irrigation farming in relation to the National Development for eradication of hunger and poverty from Nigeria perspective. Such study would provide baseline information for governments, development agencies and potential farmers who are interested in irrigation farming. Specifically, the objectives of the study were to describe the socioeconomic characteristics of irrigation farmers; to identify problems militating against irrigation farming in the study area; to determine profitability of irrigation farming and to determine factors affecting profit and hence estimate a profit function.

Methodology

The study area

The study area is Nouth-Eest Nigeria which comprises of six states Bauch, Gombe, Yobe, Adamawa, and Borno states. The area is located in low rain foul zone of the country with the major part of it having derived savanna vegetation. The major occupations of the inhabitant of these areas are farming trading, craftsmanship and civil service with about 60% of the population engaged in farming. Major rivers capable of supplying irrigation water to the farmers is the Benue river along with its smaller tributaries. This was the reason for the establishment of Lake-Chad river Basin Development Authority alongside other River basin Development Authorities in the country in 1970 by the Federal Government. The main function of the River Basin Development Authorities is to develop infrastructures in areas close to the big rivers and

encourage agriculture through irrigation. The study area has a wide distribution of rivers, streams and lowlands that are often explored by local farmers especially for dry season farming. Farmers usually plant Rice, Onion Tomato, Okro, and Pepper through irrigation in the areas during dry season. Only few farmers plant maize sparsely on irrigated farms. Several agro-allied industries are also located in this area.

Sampling and Data Collection

Data used for this study were collected from a farm survey of four hundred and fifty (450) farmers selected from a list of farmers practicing irrigation farming in the study area. The farmers were selected through a multi-stage sampling procedure as used by Rahji and Rahji, (2008). The first stage was the random selection of two states (Bauchi and Yobe) from the list of the four states in the region. The second stage involved the purposive selection of two Local Governments noted for irrigation farming from each of the two selected states. Respondents were then randomly selected from the lists of farmers involved in irrigation farming in the areas. A total of two hundred and twenty-five (225) respondents were sampled in each of the two states. This amounted to a total of four hundred and fifty (450) irrigation farmers. Data were collected with the aid of structured questionnaire designed to elicit information on socioeconomic characteristics viz age, family size, education and years of farming experience; irrigation variables viz access to water, ownership of pumping machine and frequency of irrigation; economic viability of irrigation activities viz fixed costs such as rental value of land, depreciation to implements like cutlasses, hoes, pumping machines, and baskets; variable costs (such as cost of seed, fertilizer and labour), interests and revenues from irrigation farming. Income as used in the analysis and the discussion sections of this paper are net income from the sales of farm produce harvested from irrigated farms which is obtained by subtracting total cost from total revenue. The questionnaires were subjected to test pretest method of validation, (Reynolds and Diamantopoulos, 2009). This was used to adjust the content of the questionnaire.

Results and Discussions

Socio-Economic Characteristics of Respondents

Majority of the respondents (75.8%) were males while the rest (24.2%) were females. This is consistent with Adeoti (2006) who reported that more men were found in farming than women. It however conflicts with Salisu (2001) who reported that irrigation was a male affair only in Northern Nigeria. The disparity may be due to differences in the cultures of the study areas, (that is Fulani and Hausa cultures). In the Fulani and Hausa culture which dominates the North-Easte Nigeria (the area for this study), women are allowed to do tedious jobs like farming while in the Hausa culture which dominates the northern part of the country, (where Salisu 2001 study was conducted) women are not allowed to do such jobs. Eighty-five percent (85%) of the respondents were married and 5% were singles while 7 and 2% were widower and divorces respectively,. Household size of most respondents ranged from those that have 5 members (57.6%) to 8 members (10.4%) with a mean household size of six (6). It is expected that members of the household will serve as a source of cheap labour on the farm. The range of household size is lower when compared with what is obtainable in the Northern part of the country (Salisu, 2001). This may be due to certain socio-cultural factors outside the scope of this study. Furthermore, descriptive statistics showed that majority of the respondents (54%) had primary education (Figure 1). 8.9% of the respondents had tertiary education while 2.9% of the respondents were educated through Mass Literacy Program (Adult Education). It is thus obvious that the educational standard of the respondents were generally low but not as low as other regions in Nigeria especially south eastern Nigeria and the northern part, (Akinsanmi and Doppler, 2005). This relatively higher educational status may encourage acceptance of innovation which may raise farm productivity and income. The average farm size cultivated by the farmers was 0.45 ha. The sizes of irrigation farms owned by the respondents are small when compared with what is obtainable in the northern part of the country, (Salisu, 2001). This may be due to the fact that irrigation farming has existed for ages in the northern zone when compared with the North -Earn zone of Nigeria. Moreover, irrigation land clearing is easier in the northern part of the country (which is mostly vegetated with different species of grasses which can easily be burnt to effect land clearing) while it is more tedious to clear in the south due to tick vegetation and marshy terrain. Factors militating against irrigation farming as reported by the farmers were lack of enough capital in form of soft loans (85%), lack of access to fertilizer as at when due (65%),

unavailability of seeds (37%) and in adequate extension services (9%). It should be noted that some farmers reported more than one problem.

Profitability of Irrigation Farming

Farmers realized an average net income (profit) of N360,000 (about US $300) from irrigation farming. It should be noted however that Fadama (irrigation farming) is not done throughout the years and farmers reported an average period of three months for which they are engaged in irrigation farming. If this net income is divided by ninety days (three months), it means an average farmer realizes N4000 per day from irrigation farming. However, it should be noted that an average farmer has the responsibility of catering for the household and it should be recalled that the average household size was six people per household. In the light of the above, the average net income per person per day from irrigation farming (that is N 4000) (about US $3.6) per day,. This is quite above US $1 per day suggested by the United Nations as the poverty. It has been recommended that for an individual to live above poverty level, he/she must be able to spend at least $1 /day. To this end, irrigation farming can actually take people above the poverty line and possibly live more comfortable lives which are one of the National Development. Furthermore, the rate of Return on Investment (RRI) was found to be 2.00 which imply that for every one naira invested in the irrigation farming business a net profit of two naira accrues to the farmer. This rate of return can be considered to be very high and lucrative compared to many other businesses available around. This also confirms that Fadama farming is a potential vehicle capable of taking people away from poverty to prosperity. Major crops planted are Rice, Tomato okro, Pepper and Maize is sparsely planted.

Factors Affecting Income

Based on the criteria for selecting the lead equation (the best fit) viz: the sign of the coefficients viz-a-viz the a priori expectation; the t-value of each coefficient; the R2 value of the functional forms estimated and the F-value, the Double logarithm functional form was selected. The Multiple Regression Analysis (MRA) revealed that all the variables except Irrigation farming experience (X2), have the expected signs in line with the a priori expectations. Furthermore, the MRA showed that farm size (X1) is significant at _0.01 and it has a positive sign. This implies that the larger the farm sizes the more the income. Years of irrigation experience (X2) is

significant at _0.05 but has a negative sign in contrast to our expectation which implies that experienced farmers are realizing lower income. This may be due to conservative attitude to innovations which may be investigated in some other researches. Seed (X3) is significant at _0.1 with a positive sign in line with expectation meaning that the more the amount the farmer spend Dauda et al. 449

Conclusion and Recommendation

Irrigation farming is a profitable and sustainable venture for the farmers during the off peak period. Farmers make an average net profit of N360, 000 (US $300) for the period. This translates to about US $15.2 per day per farmer for the period (assuming irrigation farming have a cycle of two months) and US $3.6 per person per day (given that the average size of each farming household is six). This is above UN recommendation of US $1.00 per day per person. Therefore, it could be established that irrigation farming can serve as an instrument for alleviating poverty among farmers which is a major item among the national development. It is noteworthy that this amount is not entirely spent on consumption by the farming household and excess can be re-invested in irrigation farming, invested in other ventures or saved for future consumption. In conclusion, it is recommended that policy actions can focus on factors which significantly affect income. Also, irrigation and other agricultural development intervention programs such as the Fadama Project (of the Federal Government and the World Bank) should concentrate on the development of storage facilities and provision of enough soft loans to farmers which were identified as major problems militating against irrigation farming. For instance, farmers are always compelled to sell their produce immediately after harvesting even when the prevailing prices are not favorable to them. Such produce can be stored in raw or semi-processed forms which may command higher prices in latter dates. These can only be achieved if there are good policies backed with adequate extension services that can train farmers on the use of new technology such as irrigation scheduling and pumping machine operating techniques and soon.

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