Impact of Agricultural Transformation Agenda (ATA) Program in Advancing the Socio-Economic Statutes of Smallholder Rice Farmers in Adani-Omor Zone, Southeast, Nigeria

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Abstract

The study investigated the impact of ATA program policies on the socio-economic statutes of rice farmers in Adani-Omor rice production zone. It identified the socio-economic characteristics of the rice farmers and constraints to farming. It also assessed the extent to which the program policies have enhanced the productivity and wellbeing of the farmers. Adani-Omor is one of the four (4) staple crop processing zones (SCPZs) selected for the ATASP Phase 1. It was purposively selected because of the predominance of rice farming in the area and rice is one of the target crops under the ATA program. Data for the study were collected through a questionnaire administered to a sample of 160 rice farmers comprising 80 participant and 80 non-participant farmers. The data analyses reveals that ATA program made a positive impact on the incomes of the farmers since there was a significant difference in their incomes before and after the program. Also, the program exerted a positive significant impact on their access to credit and agro inputs. The result also shows a significant difference in the access to irrigation facilities, credit and fertilizer between participants and non-participants. The major constraints to the full implementation of the program objectives in the area included postharvest losses and poor processing facilities. This study concludes that ATA significantly reduced the cost of farm operation, increased the yield and income of participant farmers. It subsequently recommends the expansion of ATA to cover all categories of rice farmers in the study area. More so, low-cost and improved technologies for storage, processing, transportation and marketing should be introduced to minimize loss of revenue. Policy interventions that contribute to better access to inputs and farmer-specific efficiency factors should be sustained.

Keywords: Agricultural Transformation Agenda (ATA), Smallholder farmers, Rice Economy, Adani-Omor

1.   Introduction

The inability of rice production in Nigeria to meet domestic demand has raised a number of questions in policy circle. The level of rice imports in Nigeria with such abundant agro-ecological and other natural resources suitable for its production is worrisome, especially as rice is gaining such importance in the average Nigerian diet (WARDA, 2007). Nigeria consumes nearly 6 million tons of rice annually and more than half of it is imported parboiled rice (FAOSTAT, 2013). However, apart from increase in population led demand, rice has become a staple in most household due to rapid urbanization and associated changes in family occupational structure and convenience in its preparation (Goni and Amaza, 2006). Nigeria's per-capita rice consumption level has grown significantly at 7.3% per annum, rising from 15.4kg in the 1980s to 22kg in the 1990s and 25.4kg in 2012 (FMARD,2013). Hence, rice is an economically important food security crop in Nigeria.

The Federal Ministry of Agriculture (2012) estimated that the annual supply of food crops (including rice) would have to increase at an average annual rate of 5.9% to meet food demand, and reduce food importation significantly. Studies have shown that aggregate rice production in Nigeria has been growing at about 2.5% per annum in recent years (Goni et al., 2007). But the annual rate of population growth has been high (about 3%) (CBN, 2010). The reality is that Nigeria has not been able to attain self-sufficiency in rice production despite increasing hectares put into production annually (CBN, 2012). Nigeria's rice import bill estimated at $695 million annually has been a source of concern because of the nation's immense unutilized capacity to grow enough rice and feed the whole of West Africa. Presently, Nigeria produces about 3.4 million tonnes of rice, and depends on imports to meet the annual national demand (World Bank, 2010).

Nigeria is endowed with favorable ecologies for rice cultivation. The country has immense potentials for growing the crop since virtually all the rice growing ecologies (the upland irrigated, inland valley swamp, deep water floating and tidal mangrove swamp) abound in Nigeria (Abdullahi, 2012). Rain fed lowland rice is the most predominant rice production system, accounting for nearly 50 per cent of the total rice-growing area in Nigeria; 30 per cent of production is rain fed upland rice, while just 16 per cent is high yielding irrigated systems and the remaining 4 percent is for other production systems (Cadoni, 2013; Fashola, 2007). The major strengths of the Nigerian economy are its rich agricultural and human resource base and its huge market. Its major weakness is its difficulty in mobilizing these resources in a strategic way to diversify the economic base and reduce dependence on oil and imports. Consequently, the economy remains vulnerable to externalities such as

changing world prices for crude oil and rising prices of food imports.

Government interventions in agriculture are usually in the form of agricultural policies. According to Idachaba (2006), attempts towards explaining the widening gap between the high promises of agricultural research findings and the disappointing reality on farmers' fields has led to a consensus on policy being the principal constraint facing agriculture in Nigeria. Nigerian policy in relation to the rice sector appears to be motivated by a whole range of factors and circumstances including (i) the desire to curtail unfair competition from imported rice, (ii) the quest for self-sufficiency and national food security, (iii) the challenge of reducing poverty and raising farmers' incomes, (iv) the need to generate increased employment by encouraging school leavers to go into rice production, (v) the desire to reverse the heavy outflows of foreign exchange for rice imports, and (vi) the desire to raise the nutritional level of the average Nigerian by making domestic rice available at affordable prices (Abubakar, 2013; Ezedinma, 2005). These objectives are unassailable, it therefore aims to discourage imports and take advantage of the comparative advantage and potentials existing in many production regions and natural habitats such as the fadamas, flood plains and swamp areas in Nigeria.

Problem Statement

Despite the vast potentials for rice production in Nigeria, majority of the rice farmers are smallholders with an average farm size of less than 2 ha, applying a low-input strategy to agriculture, with minimum input requirements and low output. Their production resources are grossly inadequate to support rice production on commercial basis. The vast majorities of these farmers have limited access to modern inputs and other productive resources, unable to apply optimally farm inputs as recommended by research institutes and are unlikely to have access to pesticides, fertilizers, hybrid seeds and irrigation at affordable prices without some form of public sector intervention. Rural financial services are still scarce and the rural finance policies implemented by Nigeria some decades ago have not yielded the desired impacts on the wellbeing and productivity of smallholder farmers. These factors coupled with the use of low external inputs have been responsible for the low rice productivity in Nigeria.

The ATASP Phase 1 was initiated in 2012 and implemented by the Federal Government of Nigeria under the ministry of agriculture and rural development (FMARD), to assist farmers to access farm inputs at affordable prices and to develop agricultural value chains for rice and some selected crops. The general focus of ATA policies were geared towards agribusiness promotion, increased private sector investment in agriculture, reduction of post-harvest losses, value addition to agricultural produce, development of rural infrastructure and enhancement of farmer's access to financial services and markets. Its specific objective is to increase on a sustainable basis, the income of smallholder farmers, small/medium scale processors and rural entrepreneurs that are engaged in the production, processing, storage and marketing of 5 key crops namely; rice, cassava, sorghum, cocoa and cotton. The goal of the rice transformation agenda is to achieve self sufficiency in rice production and complete substitution of imported rice by 2015.

ATASP was implemented in four staple crop processing zones (SCPZs) namely; Adani-Omor, Bida-Badeggi, Kano-Jigawa and Kebbi-Sokoto. Also a total of 21 LGAs in 7 States were included in the program. One main thrust of ATA is to rehabilitate all irrigation projects in the zones to extend the farming season and achieve all year round farming. Hence, it will contribute to poverty reduction and food security because an improvement in the productivity of the smallholder farmers will translate to improved food security. This increase in farmers' income is by providing direct subsidy through discounted seeds, fertilizers, agro-chemicals and farm machinery equipment hire. These will be supplied to accredited farmers by government certified agro-dealers.

The projected far reaching end of ATA in the study area needs an understanding of its policy awareness, constraints to utilization and impact on the farmers' welfare. It's against this backdrop that this study was broadly designed to examine the impact of ATA on the socio-economic status of rice farmers in Adani-Omor zone, to assess the extent to which participation in the program has enhanced their level of production efficiency and also identify the problems associated with the program in the study area. More so, since self-sufficiency and import substitution in the rice sector are current priorities of the Nigerian government, it is very important to investigate the causes of such disincentives at farmers' level.

2. Objectives of the Study

The broad objective of the study is to examine the impact of ATA in advancing the productivity, income and attitudinal changes among smallholder rice farmers in Adani-Omor SCPZ

Specifically, the study is designed to;

  i. Examine the socio-economic characteristics of the participant farmers (PFs) and Non-Participant farmers (NPFs) in the study area.
  ii. Determine the impact of ATA program policies on productivity of the rice farmers
  iii. Determine the impact of ATA program on farmers socio-economic statutes and annual income

iv.   Ascertain the extent to which ATA program assisted farmers to access farm inputs

v.   Identify the major challenges faced by the rice farmers in the study area

Hypothesis

Ho_1: There is no significant difference in the total land and farm inputs used between participant farmers and non-participant farmers in the ATA program.

Ho_2: ATA program has no significant impact on socio-economic statutes of the smallholder rice farmers in the study area.

3.   Methodology

This study was carried out in Adani-Omor rice production zone, Southeast Nigeria. Specifically, Adani-Omor were chosen for this study because they are one of the four staple crop processing zones selected for ATASP Phase 1 program. More so, they account for over 70 percent of the rice produced in the region. There is a lower Anambra Irrigation project (LAIP) in Omor, Ayamelum LGA of Anambra State. Also, Adani in Uzo-Uwani LGA of Enugu State has the Adarice irrigation project.

The target population for this study was both participant and non-participant farmers from the two selected communities. The list of registered rice farmers was obtained from Rice Farmers Association of Nigeria (RIFAN), offices of the two states. From the list obtained, registered number of rice farmers was 487. For each of the two communities, eighty (80) rice farmers were randomly selected comprising forty (40) ATA participants and forty (40) non-participants. Therefore, a total of one hundred and sixty (160) farmers formed the sample size. Data were collected through the administration of structured questionnaires and oral interviews for more clarification of issues. Socio-economic characteristics of the rice farmers were sought under different periods namely; before the introduction of ATA support program Phase 1 and after the introduction of the ATA program. This was for easy comparison of the two periods for the purpose of determining the impact of the program on rice production and socio-economic welfare of the farmers. Objective three was analyzed by using percentages while chi-square (x^2) and t-test statistics were used to analyze objective two. Data were generated from the measured socio-economic variables of the farmers. Data measured with ordinal scales were subjected to t-test ($p<0.05$), while those that were measured with nominal scale were subjected to chi-square ($p\leq0.05$). Objective five was analysed using factor analysis with varimax rotation. Here, factors loading of 0.04 and above were adopted in naming and interpretation of the factors and constraint variables.

4.0 Results and Discussions

4.1 Socio-Economic Characteristics of Rice Farmers

Table 1: Distribution of Respondents on Socio-Economic Characteristics

Options	Frequency	Percentage
Gender	**(n=160)**	**(%)**
Male	152	95.0
Female	8	5.0
Age (years)		
21-34	21	13.3
35-44	43	26.6
45-54	68	42.5
More than 54	28	17.5
Educational Qualification		
No formal education	101	63.3
Primary education	28	17.5
Secondary education	17	10.8
Post- secondary education	13	8.3
Household size		
1-4	25	15.8
5-9	36	22.5
10-14	17	10.8
More than 14	33	20.9
Farm size (hectares)		
Less than 1	84	52.8
1-2	71	44.4
More than 2	9	5.8
Farming experience (years)		
1-9	117	73.3
10-19	9	5.8

More than 19	33	20.8
Method of land acquisition		
Family land	53	33.3
Rented land	15	9.2
Commercial land	92	57.5
Sources of farm labor		
Family labor	115	71.7
Hired labor	8	5.0
Commercial labor	20	12.5
Family and hired labor	17	10.8
Production constraints		
Damage by pest and flood	64	40.0
Inadequate funds	33	20.8
Labor shortage	13	8.3
Other problems	49	30.9

Source: Field survey 2014

Table 1 shows the socio-economic profiles of the respondents. The responses on the age of the respondents show that majority of the respondents are still in the productive stage of their lifecycle. From the table, 13.3% of the respondents are within the ages of 21-34 years, 26.6% are within 35-44 years, 42.5% are between 45-54 years while only 17.5% are more than 54 years. On educational qualification of the respondents, the result on the table shows that 63.3% have no formal education, 17.5% have primary education and 10.8% have secondary education while only 8.3% have post secondary education. The table also shows that 15.8% of the respondents have family sizes of 1–4; 22.5% (5-9); 10.8% (10–14) while 20.9% have above 14. The average family size however is 9. More so, majority of the respondents 73.3% have been into farming not more than 9 years. The table also displayed the farm size in hectares of the respondents, 52.8% of them have less than 1 hectare, while only 5.8% have more than 2 hectares. The major constraints to production are pest infestation and periodic floods having 40%. The respondents also specified other problems to include, frequent conflicts among farmers and pastoralists and difficulty in accessing farm roads in transportation of farm produce.

4.2 Impact of ATA program on productivity of farmers
Table 2: Summary of t-test analysis comparing the hectares of land under rice farming among PF and NPF

	Participant Farmers (PFs)			**Participant and Non-participant Farmers**		
Hectarage(ha)	(x)Before	(x) After	t-cal $P<0.05$	PFs (x) After	NPFs (x) After	t-cal $(p<0.05)$
Total hectarage of Rice Farm Land	1.84 (0.33)	2.08 (1.33)	1.17	2.08 (1.33)	1.50 (1.33)	2.76
Hactarage of total rice farm under study	0.65 (0.42)	0.87 (0.47)	-2.26	0.87 (0.47)	0.64 (0.39)	2.88
Rice	0.06 (0.1)	0.07 (0.11)	0.28	0.06 (0.11)	0.05 (0.10)	0.42

Source: Field Survey 2014

(df = 158, t-table value = 1.98, Significance= $p<0.05$) Data in parenthesis indicate standard deviation.

From the statistics in table 2, the total hectares owned before the introduction of ATA program was 1.84 ha and 2.08ha after the introduction. Therefore, there was no significant difference (t=1.17, $p < 0.05$) between the total hectares of rice farm owned by the participant farmers before and after the introduction of ATA program. However, there was a significant difference (t=2.26, $p < 0.05$) between the total hectares of rice farm land grown and harvested before and after the introduction with values x=0.65 and x=0.87 respectively. This implies that as a result of the positive and direct influence of the ATA program on the participant farmers, they increased the hectares of rice grown. Table 2 also indicates that there was a significant difference (t=2.76, $p < 0.05$) between the total hectares of rice farm land owned by the PFs (x=2.08 ha) and the NPFs (x=1.50 ha). More so, the table shows a significant difference (t=2.88, $p < 0.05$) between the total hectares of land grown by PFs (x=0.87 ha) and the NPFs (x=0.6 ha). This was as a result of the direct impact of the program on their productivity. Therefore, it can be deduced that the ATA program impacted positively on the productivity of the rice farmers. We therefore accept the Ho_1.

4.3 Impact of ATA program on the Socio-economic statutes of the farmer

Table 3: Chi-square Analysis of the Impact of ATA program on the Socio-Economic statutes of the rice farmers.

Socio-economic variables	PFs			PFs and NPFs		
	Before (n-80)	After (n-80)	X^2value (p0<.05)	PFs After (n=80)	NPFs After (n=80)	X^2= value (P0<.05)
Estimated Annual Income from Rice Production (N)						
1,000 – 10,000	20	5		15	6	
11,000 – 20,000	29	12		12	27	
21,000 – 30,000	9	6	42.56	6	10	15.92
31,000 – 40,000	5	5		5	5	
41,000 – 50,000	2	22		22	20	
51,000 – 60,000	15	30		30	12	
Sources of irrigation water Stream	44	39		39	64	
Wash bore/ tubewell Pond	3	27	38.69	27	6	
Open well	5	5		9	5	38.2
Sources of Agrochemicals ADP	5	8		8	5	
Market/dealer	39	62		62	47	
Do not apply agro-Chemicals	31	5		5	23	
ownership of Irrigation Infrastructure						
Water pump	5	36		36	5	
washbore/tubewell	5	21	108.18	21	5	118.194
Sprayers	18	18		18	7	
Do not have any of the above	52	5		18	7	
Attitude toward crop Production						
Very positive	5	34		34	10	
Positive	61	36	52.45	36	60	18.25
Negative	9	5		5	5	
Very negative	5	5		5	5	

Source: Field Survey 2014.
Significant (p≤0.05)

Annual Income: From the results in table 3, there was a significant difference (x^2 = 42.556, p < 0.05; DF=5) between the estimated project farmer's annual income from rice production before and after their participation in the ATA program. Also a similar difference (x^2=15.92, p < 0.05; DF=5) existed in the estimated annual income from the total rice production between the participant farmers and non-participant farmers as a result of the program. The implication of these findings is that the program made an appreciable impact on the annual income of the participant farmers. Hence, we reject the Ho_2.

Sources of irrigation water: Table 3 shows that there was a significant difference (x^2= 38.69, p < 0.05; DF=3) between the sources of irrigation water to the participant farmers (PF) before and after their involvement in the ATA program. A similar significant difference (x^2=38.20, p < 0.05; DF= 3) existed in the sources of irrigation water between the participant farmers (PFs) and the non-participant farmers (NPFs) as a result of the presence of the program. These findings imply that before the introduction of the program, the PFs were probably using available streams and lakes as their only source of irrigation water especially in the dry season. However, with the introduction of ATA input resources, they could now make use of wash bore and tube wells. This observed changes in the PFs source of irrigation water is an indication of the positive impact of the ATA program on their socio-economic statutes.

Sources of Agro chemicals (fertilizers, herbicides and insecticides): Results in table 3 indicated that there was a significant difference (x^2=48.59, p < 0.05; DF=3) between the sources of agrochemicals to the PFs before and after their participation in the program. Also there is a significant difference (x^2=36.78, p < 0.05; DF=3) in the sources of agrochemicals between the PFs and NPFs. These observed significant differences

confirm the benefits of the program to the farmers' wellbeing.

Ownership of input resources: Table 3 also revealed a significant difference (x^2 =108.19, p < 0.05; DF=3) between ownership of input resources by the PFs before and after their involvement in the project. Also in the ownership of program resources between the PFs and NPFs, there was a significant difference (x^2 = 118.19, p < 0.05; DF=3). This implies that many of the PFs acquired input resources like water pumps and adopted the innovations as a result of their involvement in the program. The NPFs on the other hand had no direct access to these resources because of their non-involvement.

Attitude to rice farming: Table 3 also indicated a significant difference (x^2 = 52.45, p < 0.05; DF = 3) in the farmers attitude to rice farming before and after their involvement in the program. Also there was a significant difference (x^2 = 18.23, p < 0.05; DF = 3) in the attitude to rice farming between the PFs and NPFs. It is evident that involving in the program created positive attitudes towards rice farming among the farmers. Hence, the project has succeeded in increasing the attitude of the farmers to rice farming.

4.4 Major Challenges faced by the Participant Farmers

Table 4: Varimax Rotated Constraints faced by the Participant farmers in Rice farming

Constraint Variables to project farm	Factor 1 Post harvest Problem	Factor 2 Logistic Problem	Factor 3 Poor Farming Incentives
Lack of operational fund	0.58	0.11	0.14
Difficult In marketing	0.54	0.02	0.36
Pests and diseases infestation	0.47	0.36	0.05
Poor fertility level of the soil	0.45	0.24	0.33
Low productivity	0.19	0.66	0.08
High cost of farm inputs	0.13	0.63	0.04
Difficult in getting water	0.17	0.58	0.16
Lack of improved seed for planting	0.21	0.57	0.05
Lack of sufficient land	0.18	0.44	0.19
Poor storage facility	0.07	0.40	0.15
Poor extension services	0.08	0.25	0.07
Lack of credit facility	0.03	0.13	0.72
Poor rural access roads	0.03	0.22	0.64
High cost of labour	0.19	0.09	0.57
No access to mechanization	0.43	0.21	0.51
Lack of training on new techniques	0.09	0.03	0.51
Poor processing facilities	0.75	0.29	0.18
Low prices of produce	0.72	0.39	0.23

Sources: field survey 2014

Table 4 shows the varimax rotated constraints faced by the PFs. Based on the clustering of item loadings, Factor 1 was named 'Post-harvest problems'; Factor 2 was named 'Logistic problems', while Factor 3 was named 'Poor Farming Incentives'. These three (3) factors represent the major constraints being faced by the PFs. Specific issues with the high loadings under the Post-harvest problems included; processing difficulties (0.75), low prices of produce (0.72), lack of operating capital (0.58), marketing difficulties (0.54), pest and disease infestation (0.47) and poor soil fertility (0.45). There is limited linkage between the smallholder farmers and the agricultural processing and product transformation industries.

Items with high loadings under logistic problems included; low productivity (0.66), high cost of farm input (0.63), difficulty in getting water for irrigation (0.58), lack of improved seeds and seedlings (0.57), inadequate land (0.44) and poor storage facilities (0.40). In order to ensure sustainable high agricultural productivity and enhance efforts to increase the income and wellbeing of the farmers, logistic supports such as adequate provision of planting materials, farm inputs, cost effective irrigation schemes and increased access to farm land should be guaranteed. According to Akinbola (2002), any strategy developed for achieving sustainable crop production by smallholder farmers, must tackle the problems posed by poor access to land, inadequate input supply, poor production and marketing infrastructure and poor access to credit.

Item which loaded very high under poor farming incentives included; lack of training on new farming techniques (0.51), poor access to credit facilities (0.72), lack of access road (0.64), high cost of labour (0.57). This implies that the farmers were faced with the problem of poor farming training, access to credit and input resources. This could lead to poor participation and low productivity in rice farming. It is only when a rice farmer is well equipped, trained and provided with some form of incentives, that he can participate actively in ATA program and adopt innovations towards increased productivity.

5. Conclusion

ATA is a commendable intervention program for improved rice productivity, enhanced income for farmers and food security in the study area. The program initiative led to operation of larger farm sizes, higher yield and increased income for the participant rice farmers. This was mainly as a result of its appreciable impacts on participant farmers' access to farm inputs at comparatively lower prices, access to farm credit, irrigation and mechanization. It can be inferred that despite government policy challenges and the constraints experienced by the rice farmers, ATA program still hold a comparative advantage for increased productivity in rice and increased income among its participants. Postharvest losses, logistics and poor capital incentives posed some problems in the study area which affected the full actualization of the rice farming potentials. However, if ATA implementation is improved consistently and sustainably, the ultimate goal of increased productivity and reduction in imports can be achieved.

Recommendations

i.   Government should conscientiously provide adequate sensitization through the mass media on the huge benefits embedded in the Agricultural Transformation Agenda program, like accessibility to farm inputs and minimum price guarantee for rice farmers.

ii. Government should increase the monitoring, coordination and implementation of the ATA programme, ensuring the removal of bureaucratic procedures that may restrict its beneficiaries from enjoying the positive impacts of ATA policies sustainably.

iii. Low-cost and effective technologies for processing and milling of rice should be developed and given to the farmers to enable them increase the quality of local rice.

iv. Transportation and marketing arrangements should be enhanced to ensure easy movement of rice from the farm to the consumers. Marketing might involve the government buying the excesses of the rice from the farmers to minimize their losses. This will ensure that farmers realize maximum benefit from their production activities.

v.   Farmers should be motivated and encouraged to participate actively in the already formed Rice Farmers Association (RIFAN) at different levels to enable the strengthening of group action. This will guarantee ease in acquiring inputs, accessing credit, training in the usage and maintenance of irrigation facilities and other incentives.

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