ECONOMIC IMPACT OF OLAM OUT-GROWER PROGRAMME ON RICE FARMING IN KAAMBE DISTRICT OF GUMA LOCAL GOVERNMENT, BENUE STATE, NIGERIA

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Abstract

The research assesses the economic impact of Olam Out-Grower programme on rice farming to help improve rice production in Benue State. A sample size of 184 rice farmers comprising of 116 participating rice farmers of the programme and 68 non-participating rice farmers were randomly selected. Using a 'before' and 'during' project approach the study has determined the change in farm yield and income of rice farmers. The results reveal that there is 30.58% increase in farm yield per hectare and the average income of rice farmers has improved by 60.95% in the area. The research concludes that, Olam Out-Grower programme has impacted positively on the productivity of participating rice farmers, but the farmers do not benefit much from the economic value of their farm output. Therefore, the study recommends that Olam out-grower programme should shift its extensive rice farming approach to intensive rice farming approach in order to improve on value addition of rice farming in the area.

INTRODUCTION

Globally, rice is a very important food crop. It is an ancient crop consumed as healthy and staple food by more than half of the world population. Rice is consumed by over 4.8 billion people in 176 countries and is the most important food crop for over 2.89 billion people in Asia, over 40 million people in Africa and over 150.3 million people in America (Daramola, 2005). Rice production occurs in all agro-ecological zones in Nigeria with the middle belt enjoying a comparative advantage in production over the other parts of the country One of the problems facing rice production in Nigeria is lack of competitiveness resulting from low and uneconomic production, poor access to expensive inputs (especially fertilizers and credit facilities), low capacity to meet quality standards and little or no encouragement for private sector participation. To reverse this trend, the government of Nigeria encouraged farmer friendly policies with the presidential initiative to improve rice production. Taking advantage of this current government policy of high import tariff on milled rice, Olam Nigeria limited, a major rice importer, decided to test a new business approach by investing in local production of high quality rice for Nigeria's domestic market.

In 2005, Olam began processing locally produced rice from a government rice mill located in Makurdi, Benue State. However, the company was faced with the challenge of insufficient supply of high quality rice to meet their 18,000 metric tons capacity per year target. In 2006, the United States (US) government, through United States Agency for international Development (USAID), entered into partnership with Olam. The goal of this partnership was to promote demand driven production by developing a supply chain model that encouraged the use of improved technologies, building farmer's capacity, commercial linkages to credible market outlets and strategic public private partnership (USAID, 2009). The organization's intended development impact includes continued direct benefits to rural populations and a demonstrable impact on sustainability given its ability to enhance the efficiency and transparency of agricultural business logistics and provide knowledge transfer in the primary processing of products.

This set the standards needed to meet the requirement of international buyers, thereby providing best practices for local firms to emulate (Akpodovhan, 2008). Olam's focus on rice was to encourage commercial production of the grain because of its profitability and great potential for rice production in the state. According to Kurawa, (2007), five million tons of rice is consumed annually in the country, out of which 3.5 million are imported, while Nigeria has the potential to produce all the rice it needs and have an exportable surplus.

Olam's investment programme is divided into three components:-
(i) Production through an extension out-grower programme
(ii) Value addition through processing
(iii) Increasing market share in finished product markets through improved product quality and branding.

The main objective of Olam out-grower programme is to address constraint in the production value for market-demand in improved rice varieties. The programme specific targets for farmers and participating processors are to:

i. Strengthen raw material base and ensure sustainability of premium rice supply.
ii. Enhance farmers capacity by improving productivity and production through training
iii. Develop the input market and ensure easy access to agric-inputs such as seeds, fertilizers and credit facilities at a competitive price.
iv. Increase the market share of local rice in Nigeria

The extension out-grower programme is designed to strengthen the capacity of small holder farmers to produce a sustainable supply of high quality rice. This extension programme develops farmers' capacities to economically use appropriate production and post harvest technologies to ensure improved productivity and a sustained volume of high quality rice at economically viable cost. Model farms are used for the multiplication of improved rice varieties and as a platform for farmers training, field days and demonstrations. The factory provides a credible market by paying a premium price for the produce if it meets both quality and quantity requirements. With the programme, it is hoped that rice production in Benue State will experience resurgence.

Despite the fertile lands and millions of rice farmers in this country, Nigeria is the second largest importer of rice in the world and the largest in Africa, importing some three million tons a year to meet the demand from its growing population. Dramatic rises in global rice prices and stiff import taxes have led to significant increases in food costs. Many rice importing nations have also become concerned about their own food security strategies and have reduced import quantities, or banned it completely. This has led to serious food security issues in African nations, for whom rice is a staple food. The primary objective of Nigeria's initiative on rice is to enhance household food security and income, eliminate import and generate exportable surplus. Behind this initiative is the policy that Nigeria has tremendous potentials and resources for sustainable rice production and export.

These available large areas of fadama land resources in the country at large and Benue river flood plains in particular brought about the cultivation of rice in large quantities in the region. With anticipation of increased rice production, an agro-based processing firm in the state (Agro-Millers, Makurdi), was established to process rice produced for consumption in and outside the state. Agro-millers, Makurdi was to ensure demand of un-milled rice in order to encourage rice farmers. But the boom was short lived. After a short time, the firm's demand for un-milled rice declined and farmers were forced to supply their produce to local processing firms in the state. These local firms, producing low quality processed rice were unable to stand competition from imported rice. The problems of local rice production were compounded not only by the poor quality but also by the many varieties of rice produced within the region leading to high cost of processing and poor quality of milled rice.

In order to revamp the firm and rice farming, Olam Nigeria Limited took over the management of the Agro-millers in 2005 in conformity with the Federal Government privatization and commercialization policy. As part of the organization's quest to revive the company's productivity and rice farming in the state, they introduced an extension programme called 'the out-grower programme' which currently involves 50,000 rice farmers. This study intends to find out the ways in which this programme has affected rice production in Kaambe district of Guma local government area, Benue state. Most of the literature investigating the impact of improved agricultural input on farmers and the associated agro-based firms focuses on strategic assessment for agriculture and economic growth in rice producing regions, the dynamics of rural livelihoods, as well as commodity and market trends. Increasingly, globalized markets are critically important for determining investment priorities for rural development.

Nesbitt (2003) observed that, planning and prioritizing rice research requires a deeper understanding of the people's access to use of natural resources and other forms of capital such as physical, financial and social capital, their interactions with government agencies, None Governmental Organizations (NGOs), and other institutions that influence their livelihood strategies. It is critically important to understand the changes in farmers' practices that are currently taking place and drivers of such changes, including farmers' knowledge concerning their technological choice and how the components of livelihood systems and rice technologies interact. Such an understanding provides the scientific basis for improved farm input design, targets and delivery (Odusina, 2008).

The development of the rice economy heavily depends upon the speed with which agricultural extension services are achieved. The rate of rice agricultural business growth in any country depends on the speed with which the current subsistence oriented production system is transformed into a market orientated production system through extension service (Shabu, 2011). Among the many institutional support services that need to catalyse and support the transformation process, the agricultural extension service plays a critical role. Since it contributes to the development of farmer's skill and knowledge to adopt new and improved technologies (improved seed varieties, farm implements, chemicals and practices), the approaches and processes with which the skill development and access to information are realized in the area (Gebremedhin, Hoekstra, and Tegegne, 2006).

Extension service means different things to different people. Traditionally, extension got its name from the process of "extending" agricultural knowledge. The agricultural knowledge was assumed to stem from the results of agricultural research and the clients were the farmers. Many people and organizations still see agricultural extension in this role namely the system of Transfer of Technology. In this approach, the extension process takes place in a one way direction (Terblanche, 1990 and Beynon, 1996). According to Moris (1997), extension service refers to the mechanism for information and technology delivery to farmers. This conceptualization of the extension service has been the basis for the transfer of technology extension model. A more comprehensive definition of extension service is given by the World Bank (2000) as a 'process that helps farmers become aware of improved farm inputs and adopt them in order to improve their efficiency, income and welfare'. A broader definition of extension service to include facilitation of linkages of farmers with other institutional support services such as input supply, credit and agricultural produce marketing is taken. Hence in this paper, extension service is defined as a service of information, knowledge and skill development to enhance adoption of improved agricultural inputs and facilitation of linkages with other institutional support services (input supply, output marketing and credit facilities).

Extension services in Nigeria in the period leading to independence and following was focussed on improving crops grown primarily for export such as soy beans, beniseed and ground nuts. Some efforts were made to deal with problems associated with the growth of staple crops like yams. During the military era and until recently the focus was on increasing production and productivity in view of achieving food security (Daramola, 2005). However, it had become apparent that extension service without integrating farmers into the process cannot effectively realize sustained growth in rice production. Perhaps as a result, the government policy on rice production has recently started to emphasize the transformation of subsistence rice production into market oriented production as a basis for long-term development of the agricultural sector. Such policy emphasis on market orientation has led to the recent establishment of Olam Out-grower extension service by Olam Agro-millers Nigeria Limited. Within this programme, specific emphasis is given to the role of co-operatives for the supply of credit and input/output marketing services.

The extension service has made proper linkages with the co-operatives. According to Erenstein and Lancon (2003), the role of extension is more critical for commercial oriented farmers than for subsistence farmers. When farmers produce primarily for the market (both domestic and export markets), quality and standard of the produce becomes much more important than during subsistence production. Since competitiveness depends partly on quality of produce. That is, in the long-run, Benue rice will be able to compete effectively with any rice in the world. Also, changing market conditions and consumer preferences require rapid adjustments in production technologies, and timely and effective transmission of market information. Post harvest handling and technologies play critical role in market oriented production. Meeting quality of produce depends heavily on the use of the right technologies and methods of production. Important in this respect is also the role extension services have to play in linking the different public and private stakeholders involved in input–output marketing and credit supply.

Agricultural extension approaches and methods have been changing in a number of developing countries in recent years to reflect a new development paradigm that emphasizes sustainability, institutional change, and a participatory learning process leading to local capacity building and empowerment process (Cho and Boland, 2000). Extension service has diverse definitions but can be summarized as a field where agricultural professionals play a role in identifying, adapting and sharing technology that is appropriate to the needs of individual farmers within diverse agro-ecological and socioeconomic contexts (USAID, 2008). It is assumed that farmers were not as knowledgeable as educated agricultural extension agents about necessary changes for improving their farming practices. Programmes were established based on the recommended technology packages without farmers input. In 2005, new hybrids and genotypes were introduced across agro-ecological and socio-economic conditions in an attempt to remove farm-level constraints and increase production through widespread adoption of the packages developed by Olam Out-grower agents. The environmental and socio-economic repercussions of this target brought the need for increased farmer input to the forefront of development and extension discussions.

Several agricultural extension systems have been tried in the country in order to overcome the shortcomings militating against rice production. Benue State Agricultural and Rural Development Authority (BNARDA, 1994) and Madukwe (1995) classified them into conventional extension systems and nongovernmental extension systems. The conventional extension systems included the Ministry of Agriculture Extension System, the University Extension System, the Agricultural Development Project Extension System, and Specialized Extension System. The nongovernmental extension systems encompassed extension systems practiced by religious organizations, oil companies and private commercial companies.

The most revolutionized extension system was the Agricultural Development Projects (ADPs) extension system, otherwise known as Training and Visit Extension system. It made an appreciable impact on agricultural and rural development before the withdrawal of the World Bank loan (Madukwe, 1995). Many extension agents no longer visit the contact farmers and other rural farm families. Ovwigho and Ifie, (2004) stated that the extension agents were biased in favour of richer farmers. He also noted that the Training and Visiting system assumed that a functioning research apparatus was already in place and this was not the case. Ovwigho, (2009) noted that the conventional extension system practiced in Nigeria cannot thrive well in a democratic system of government practiced in the country and called for private extension outfits to solve crisis in the rice production. Also, he explained that the University Extension System in Nigeria was used to promote the National Accelerated Food Production Programme. The system involved implementing agricultural extension programmes in farming communities around university locations. The system suffered a lot of set-backs which included inadequately trained extension personnel, complicated extension packages, lack of co-ordination and insufficient funds.

In a recent interview, the Director General of the Rice Research Institute, Badegi Abdulahi in 2008, noted that programmes which served as links between research institutes and farmers were no longer in existence. He suggested an improved extension service such as private participation as the only way to overcome the lingering problems in rice production of the country. Besides the general government extension programmes in Nigeria, there also exist some private extension programmes for the advancement of agriculture. The foremost participants in private extension services are United African Company, John Holt, Nigerian Tobacco Company, and Diocesan Agricultural Development Programme of the Catholic Diocese of Ijebu-Ode, among several others who became involved in agricultural production, processing, and marketing (Adedoyin, 1995). Recently, Green River Project of the Agip Oil Company, Ciba Geigy, Agro-Chemical extension outfit, and Olam Nigeria Limited (formerly Agro Millers) at Makurdi, Benue State, Nigeria has been found to inject positive changes into the life of the communities where these private companies located their extension programmes (Akele and Chukwu, 2004; Isife and Madukwe, 2005).

A common extension method employed by these private organizations include farmers' participation in programmes planning and implementation, input service delivery (seed, herbicides, and fertilizers), and marketing incentives to enhance technology adoption. However, farmers are not directly charged fees for extension services received. The mode of operation is devoid of complex bureaucratic procedure. This structure allows flexibility and prompt response to the needs of the farmers (USAID, 2009). Private Extension Services must be slowly and carefully adopted in Benue State for effective rice production. This is in line with the experience of Ogun State Agricultural Development Programme and Catholic experience of Ogun State Diocesan Agricultural Development Project, Ijebu-Ode to operate a private extension outfit for certain categories of farmers (large and medium scale) (Cho and Boland, 2000).

Such partnership involves mixed funding shared between public and private stakeholders. Although, in several developing countries, public-private extension service collaboration has been established (Saliu and Age, 2006 and Terblanch, 2008). However, this partnership will be at the detriment of poor small scale farmers in the area of technology transfer. Notwithstanding, private extension has proven to be more effective than the public extension service. This implies that Olam intervention programme an extension outfit can revive rice production as the programme usually involves farmers in all its extension service delivery processes. Agricultural extension plays a crucial role in the field of development because most developing countries have rural based economies whose sustainability and productivity are directly linked to natural resources and their management. The traditional roles of transferring and disseminating agricultural technologies are proving insufficient in today's global context. Particularly in the last ten years, both development and extension programmes have been subject to scrutiny and questioning both within and outside the field, because there has been a significant change in approach to agricultural extension services from public to private and farmers' participation (BNARDA, 1994 and Zinnah, 2000).

The participation of farmers in the extension process began as a result of privatization and commercialization of Agro-based and Agro-Allied industries in the country. With the new approach which is more of agricultural commodity approach, Farming System Research and Extension contributed to widespread understanding that farming systems are complex, farm-level constraints do limit adoption and the role of the farmers in any crop production to any region (Alabi, and Mafimisebi, 2004). A participatory learning process needs to be incorporated where farmers and other development beneficiaries have real decision-making power and are part of the problem analysis and solution generation (Gebremedhin, and Tegegne, 2006). Involving farmers themselves in the process of research and development in such a way that their participation is highly interactive and empowering implies changes in values, attitudes, and behaviour in order to ensure that significant learning takes place among all actors: researchers, extension agents, and farmers (Gebremedhin, and Tegegne, 2006).

In the 1990s, development programmes worldwide have recognized that local participation in extension programme is the key to a sustainable rice farming, long-term adoption of new technologies and approaches. Interactive participation is the approach that facilitates this kind of learning environment (Gebremedhin, and Tegegne, 2006). The sustainability question is greatly affected by extension programmes of both private and public organisations because environmental issues emerge directly from the human use of natural resources. A necessary condition for sustainable resource use is that large number of farming households must be motivated and willing to coordinate resource management. Facilitating group analysis and collective management requires new extension skills and tools. An approach that incorporates sustainability as a central principle therefore requires new ways of motivating collective action and learning, in addition to the skills and tools for working with individuals. According to USAID (2008), "rice farmers in Benue State are making money and feeding the nation through the impact of an extension service", but it is not clear whether the private approach adopted by the firm is farmers participatory which seems to be the most effective approach of Agricultural Extension Services for any crop production.

Eighty-five percent of Sub-Saharan Africa's poor live in the rural areas and depend largely on agriculture for their livelihoods (World Bank, 2000). Perhaps, the most valid generalization about the poor is that, they are disproportionately located in the rural areas, and they are primarily engaged in agriculture and associated activities. They are more likely to be women and children than adult males, and that they are often concentrated among minority ethnic groups and indigenous peoples (Todaro & Smith, 2003, World Bank, 2007, and Peoples Daily, 2009). Rural poverty reduction means sustained improvement in the well-being of rural people through sustained improvement in the agricultural sector. According to Mwabu and Thorbecke (2001), since three out of four poor people in developing countries (883 million people) live in rural areas in 2002, most depend on agriculture for their livelihood, directly or indirectly. A more dynamic and inclusive agriculture can dramatically reduce rural poverty. The increasing importance of rice as a staple food world over has made rice production the most viable agricultural business. This means that, an improved rice production can reduce poverty more than any crop production in rural areas. Nigeria has implemented several public sector extension delivery systems through the Training and Visit system and lately through the Unified Agriculture Extension System of the World Bank supported multi states Agricultural Development Programme (ADP). Agricultural inputs, especially seeds and fertilizer, have long been controlled by the government for political rather than economic reasons, squeezing out the private sector (BNARDA, 1994 and Erenstein, Lançon, Akande, Titilola, Akpokodje and Ogundele, 2003).

The current agricultural extension system carried out through the State Agricultural Development Projects has manpower availability, but lacks the resources and motivation to implement a result oriented extension system. Following Ogundele, Oladale, and Babatunde, (2008) it is uncertain if Nigeria can maintain its traditional agricultural research and extension system (including public extension programmes). The emerging reforms and changes in knowledge structure of agriculture explicitly indicate that the traditional agricultural extension system alone cannot sufficiently address the challenges of the new trends. It is uncertain, if Nigeria can maintain its public extension programmes in the long run on a sustainable basis (Odoemena, Ihedioha, Ibana and Okoli, 2008 and Saliu and Age, 2009).

With this uncertainty, it became necessary for the extension delivery services be anchored on the private sector. Poised to reverse this trend, the government of Nigeria developed in line with the observations, a state withdrawal from extension services through privatization and commercialization of agro-based and agro-allied facilities. Through this process, Olam Nigeria Limited took over an agro based processing firm in Benue state and at the same time established an extension programme called 'Out grower Programme'. Over the past decade, agricultural extension service delivery in Benue State has undergone many changes, all intended to improved service delivery to smallholder and resource constrained farmers. Several extension service programmes have come and gone due to the fact that no considerable improvements in agricultural productivity were realized (Saliu, Obinne and Audu, 2009). Private extension system intervention has been at the centre of debate triggered by inefficient public agricultural extension service delivery. The debate is anchored on the premise that private sector is more efficient in a sustainable extension service delivery.

Much study on the impact of private extension service delivery has been carried out in other parts of the country like Diocesan Agricultural Development Programme of the Catholic Diocese of Ijebu-Ode and several others. None have been carried out in the state to show how efficient the private extension service delivery can sustainably impact the fortunes of farmers in the area. Since no one has evaluated the impact of private sector extension services to help improve agriculture in the area, the work set out to do it.

MATERIALS AND METHODS

The study assessed the impact of Olam Out-Grower programme on rice farming in Benue state. The time frame of the study covered the period of 2004 and 2009. The year 2004 was chosen as the starting point because it marks the period before the inception of Olam Out- grower programme in 2005.

Assessing the impact of Olam Out-Grower intervention on rice farming in Benue State required information on before (i.e before 2005) and after 2005 on the following issues of rice production in the state. For the after/during effects, the current situation was used. That is, change in yield of rice farmers, change in the economic status of rice farmers in the study area as a result of Olam Out-Grower programme intervention. Admittedly this "glosses over" changes that might have occurred in the intervening years, but it is believed that the current is an accumulation of the years since the intervention and therefore a good indicator of the impact of the Out-Grower programme. Data was collected from 116 participating rice farmers and their rice farms, and 68 non-participating rice farmers of the programme and their rice farms. Data obtain from the field observation and questionnaire survey included: size of rice farms, rice yield, income, and cost of farm inputs such as fertilizer, pesticide/herbicide, seeds, labour and capital. Also economic benefits derived by farmers.

The researcher analyzed the data collected using the following techniques; percentage change to ascertain the change in farm size, rice yield and income from 2004 to 2009. Graphs were used to show the difference in farm size, rice yield and income of participating and non-participating rice farmers of the various communities and also the economic status of rice farmers.

Study Area

Kaambe district is located between latitudes $7^{0}38^{1}$N and $7^{0}52^{1}$N and longitude $8^{0}50^{1}$E and $9^{0}05^{1}$N. The area shares boundary with Saghev ward to the east, on the north by Uvir ward, on the west by Abinsi ward all of Guma local government area of Benue State, and in the south by Tarka local government area of Benue state. The location of the area in Guma local government area is shown on figure 1.1

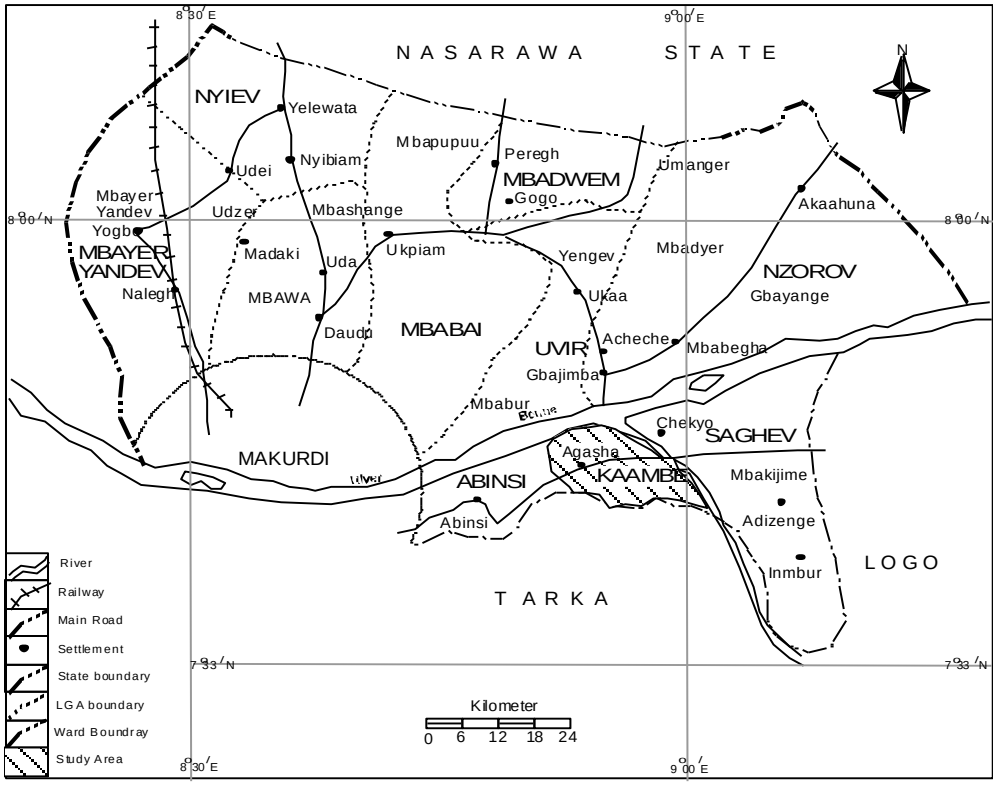

Fig. 1.1: Map of Guma Local Government Area Showing Kaambe District.

Source: Ministry of Lands and Survey, Makurdi.

Agriculture forms the backbone of Kaambe ward economy, engaging more than 70% of the working population in the area. Though the agricultural system was largely subsistent and depended highly on hand tillage with few people practicing mechanize farming. With Olam intervention, mechanization has gradually crept in. The use of farm inputs such as improved seeds, fertilizers, insecticides and herbicides is on the increase through the activities of Olam out grower programme intervention.

RESULTS AND DISCUSSION

Characteristics of Rice Farmers in the Area

Age Distribution of Rice Farmers

Age determines to some extent how productive an individual is in carrying out agricultural activities. It plays an important role most especially in the traditional system of agriculture practiced in the third world countries.

Table 4.1: Age of respondent

S/No	Age	Respondent	Percentage (%)
1	15-29	09	10.23
2	30-44	42	36.96
3	45-59	28	31.81
4	60-74	06	6.82
5	75-89	03	3.41
	Total	**88**	**100.00**

Source: Author's Fieldwork, 2010

Table 4.1 shows that, 68.77% of the respondent were within the age category of 30 to 59 years, thus they are said to be in the productive age to be able to cope with the rigours of rice production.

The mean age of respondent is 43.82 years which indicates that they were still very active. The active age of rice farmers participating in the Olam out-grower programme implies that, their farm labour is productive and as such made the intervention timely.

Period of Rice Cultivation among Respondents

Rice a major commodity is an increasing important crop in the state and the country at large. Cultivation of this crop decades ago attracted few farmers. Today, it has become a major food and cash crop due to the decline in maize production world over.

Table 4.2: Period of rice farming of participating farmers

S/no	Years	Respondent	Percentage (%)
1	Below 5	10	11.11
2	6-10	21	23.33
3	11-20	39	43.33
4	21-30	13	14.44
5	31-40	04	4.44
6	41 and above	03	3.33
	Total	**90**	**100.00**

Source: Researcher's Fieldwork, 2010

Table 4.2 shows that majority of the rice farmers in the study area have stayed in the business of rice cultivation for between 11 to 20 years represented by 43.33% of the respondent. The mean period of rice cultivation of respondent was 15.69 years which indicates that rice cultivation in the study area is a recent phenomenon. However, with the programme intervention farmers are ready to adopt new rice farming practices in order to better their experience in rice farming.

Period of Rice Cultivation with Olam Extension Out-Grower Programme

Since the inception of Olam Out grower programme in 2005, the number of rice farmers participating in the programme has been on increase. Although, the programme recorded the greatest number of rice farmers in 2007 (Table 4.3).

Table 4.3: Period of rice cultivation of rice farmers with Olam out-grower programme

S/no.	Year	Respondent	Percentage (%)
1	2005	08	9.88
2	2006	16	14.82
3	2007	34	41.98
4	2008	13	16.05
5	2009	09	11.11
6	2010	01	1.23
	Total	**81**	**100.00**

Source: Researcher's Fieldwork, 2010

Table 4.3 revealed that, the number of respondent that joined the programme in 2007 was 34 representing 41.82% of the respondent. Initially, farmers were sceptical, a few number joined in 2005 represented by 9.88% of respondents, while 14.82% of the respondents joined in 2006. Subsequently, the rate at which farmers joined the programme declined. That is, 16% of the respondent joined in 2008, 11.11% joined in 2009 while 1.23 % joined in 2010. This is because of Olam withdrawal in some aspect of the programme in 2010 such as the area of loan facilities and provision of farm inputs that are loan bound.

Areas of Olam Out-Grower Programme Intervention

In the organization quest to improve supply of high quality rice to the company, they embarked on measures to strengthen farmers' capacity through improved productivity and production through training, profitability of rice cultivation through improved production techniques and adoption of scientific agronomic practices to facilitate farmers' access to credit facilities.

They also strengthened crop inputs and equipment use in rice cultivation and to support farmer groups through mobilisation and collective training. These areas of interest of Olam Out grower impacted the entire process of rice cultivation in the area.

Table 4.4: Areas of Olam out-grower intervention

S/no.	Olam's efforts to improve the quantity and quality of rice	Respondent	Percentage (%)
1	Training	18	16.82
2	Introduced improved variety	27	25.23
3	Provide farm inputs such as pesticide/herbicide, fertilizer, etc	34	31.78
4	Provide loan	19	17.76
5	Encourage farmers to store their rice.	09	8.41
	Total	**107**	**100.00**

Source: Researcher's Fieldwork, 2010

Table 4.4 revealed that, the major area of intervention is provision of farm input to assist rice farmers in their rice production. Majority (31%) of the respondent said their farm inputs were provided by Olam out grower programme. In addition, 25.25% of the respondents affirmed that Olam project provides them with improved varieties of rice which changed their fortune entirely through increased yield and income. While, 17.76% of the respondents said the programme provides them with loan, 16.82% said the programme trained them on how to effectively handle their rice farm, and 8.41% of the respondent said the programme encouraged them to store their rice in order to increase its value.

Sources of Rice Market

Marketing of rice produce is one of the most essential factor influencing farmer's participation in rice production. Available efficient markets with premium prices encourage farmers to increase their production. The adoption of improved varieties provided by Olam out grower has made farmers to produce quality paddy. With the improved quality rice, market value of rice has increased drastically and as such attracted Olam market agents. These agents purchase quality rice to feed the Agro-millers processing industry located in the state capital.

Table 4.5: Sources of rice market

S/no	**Market Source**	**Respondent**	**Percentage (%)**
1	Local Consumers	16	20.78
2	Olam Agents	53	68.83
3	Export Market Agents	05	6.49
4	Intermediaries	03	3.90
	Total	**77**	**100.00**

Source: Researcher's Fieldwork, 2010

Table 4.5 above shows that, 68.83% of the respondents supply their rice produce to Olam Agro millers processing company through Olam Agents. This implies that, the processing firm was paying a premium price as stated in the objectives of Olam out grower programme. Also, 20% of the respondent sold their rice produce to local consumers which reflect the amount of rice consumed in the area. While, 6.49% of the respondent sold their rice produce to export agents, and the remaining 3.90% sold theirs to intermediaries such as retailers and wholesalers.

Impact of Olam Out-Grower Programme on the Output of Rice Farmers

Using the before and during project approach to determine the change in yield of rice farmers as a result of Olam intervention revealed that, the project has impacted positively on the yield of rice farmers in the area. Thus, the activities of the programme have resulted to increase in yield of rice farmers and also increase in yield per unit area.

Table 4.8: Change in rice yield (kg) of participating farmers after programme intervention

S/N	Community	Average Yield (kg) 2004	Average Yield (kg) 2009
1	Agasha	3443	7936
2	Tyulen	2570	6640
3	Gberkyon	3240	7170
4	Mbagbaav	1980	4810
	Average	**2808**	**6639**

Source: Researcher's Field Survey, 2010

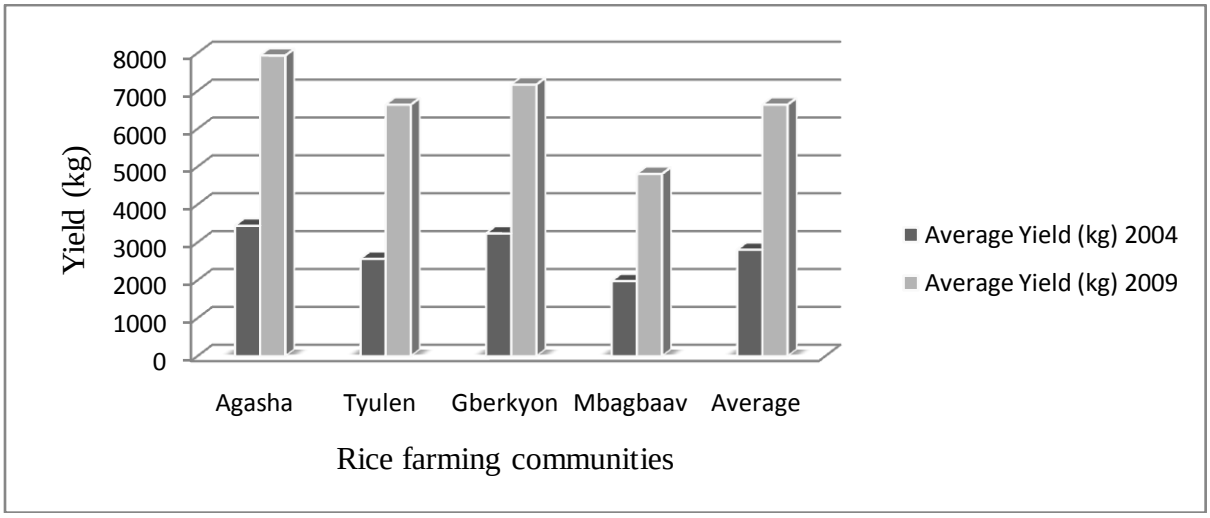

Fig. 4.3: Change in yield (bags/100kg) of after programme intervention.

Table 4.8 above shows that average yield for Agasha community in 2004 was 3443kg and 7936kg in 2009. Similarly, Tyulan community average yield is 2570kg in 2004 and 6640kg in 2009. Also, Gberkyon community with 3240kg in 2004 and 7170kg in 2009 while, Mbagbaav with 1980kg and 4810kg in 2004 and 2009 respectively (Figure 4.3).

Table 4.9: Change in yield per hectare of participating rice farmers of the programme

S/N	Community	Mean yield/ha kg/ha (2004)	Mean yield/ha kg/ha (2009)	% change
1	Agasha	883	1082	22.54
2	Tyulen	942	1216	29.09
3	Gberkyon	693	927	33.77
4	Mbagbaav	599.6	821	36.93
	Average	**779**	**1012**	**30.58**

Source: Field Survey, 2010

Rice yield per hectare of farmers in the various communities is 883 kg/ha in 2004 and 1082 kg/ha for Agasha with percentage change of 22.54%. Tyulen with 942 kg/ha in 2004 and 1216 kg/ha in 2009 represented by a percentage change of 29.09%. Gberkyon, 693kg/ha in 2004 and 927kg/ha in 2009 represented by a percentage change of 33.77%. While, Mbagbaav with 599.6 kg/ha in 2004 and 821kg/ha in 2009 showing a percentage change of 36.93% (Table 4.9). Despite the fact that Gberkyon and Mbagbaav communities have bigger farm sizes, rice yield per hectare in the areas is very low compared to Agasha and Tyulen communities which have smaller farm sizes. This is because, Agasha and Tyulen communities have better production infrastructure such as market and access roads. This implies that for the programme to thrive well in these areas, facilities must be put in place to support farmers in the study area. Looking at the mean percentage change for rice farm size (82.26%) and rice yield per hectare (30.58%), it means that, the out-grower extension service laid more emphasis on expansion of farm size as against increase in output per unit land.

That is, the approach is more of extensive rice production than intensive method of rice production. They were more interested in production than productivity. This is because of the large areas of fadama land in the study area.

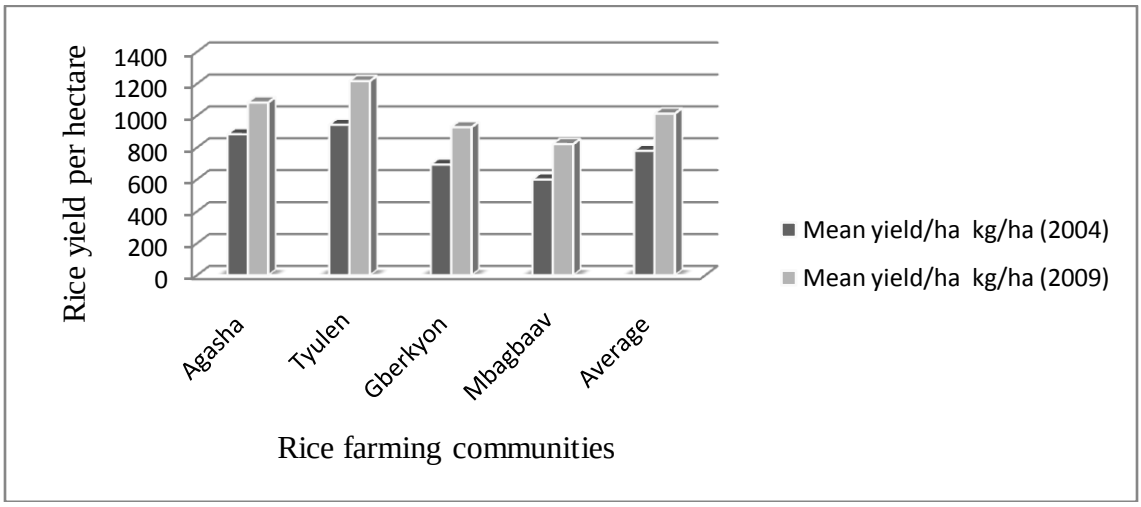

Fig. 4.4: Change in Rice Yield per Hectare (kg/ha)

Comparison of yield per hectare between participating rice farmer's of the programme and non-participating.

A comparison of rice yield per hectare between participating and non-participating rice farmers of the programme shows that, output per hectare of participating rice farmers was higher compared to non-participating rice farmers of the programme. Mean output of 1012 kg/ha for participating rice farmers of the programme while, mean output per hectare of non-participating rice farmers of the programme was 713 kg/ha in the study area.

Table 4.10: Comparison of output/ha between participating and non-participating (2009)

S/N	Community	Output/ha of non-participating rice farmers (kg/ha)	Output/ha of participating rice farmers (kg/ha)
1	Agasha	686	1082
2	Tyulen	786	1216
3	Gberkyon	612	927
4	Mbagbaav	767	821
	Average	**713**	**1012**

Source: Researcher's Field Survey, 2010

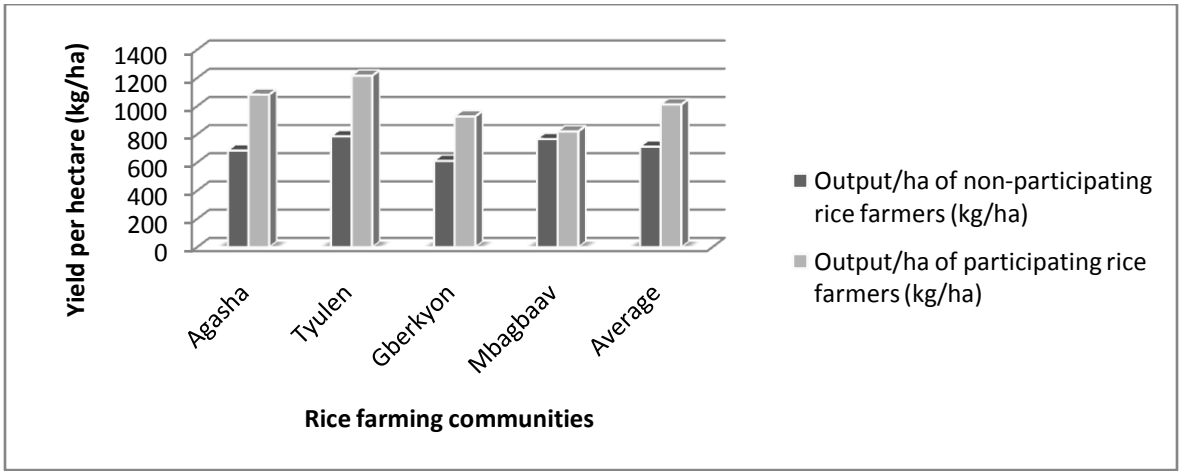

Fig. 4.5: A comparison of rice Yield between Participating and Non-participating Rice Farmers of the Programme

From the graph above, mean output for participating and non-participating rice farmers of the programme in Agasha community is 1082 kg/ha and 686 kg/ha respectively. Tyulen had 1216 kg/ha and 786 kg/ha, Gberkyon, 927 kg/ha and 612 kg/ha and Mbaghaav with 821 kg/ha for participating rice farmers and 767 kg/ha for non-participating rice farmers. This implies that, the intervention of the extension programme has affected not just yield but also yield per unit area.

Impact of Olam Out-grower Programme on income of rice farmers

The field survey revealed that, income of rice farmers has steadily improved during the period of Olam Out grower programme intervention. Current changes revealed by the study showed that gross income of rice farmers has increase as a result of Olam Out grower programme intervention.

Table 5.1: Income of participating rice farmers of the programme

s/n	Community	Mean income (₦) 2004	Mean income (₦) 2009	Mean income/ha (₦) 2004	Mean income/ha (₦) 2009	% change
1	Agasha	247,636	662,727	60,292	80,516	**33.54**
2	Tyulen	94,500	526,500	38,050	75,358	**98.05**
3	Gberkyon	192,600	514,325	41,190	65,407	**58.79**
4	Mbagbaav	132,250	355,525	37,884	58,113.	**53.40**
	Average	**166,746**	**514,769**	**44,354**	**69,848.5**	**60.945**

Source: Author's Field Survey, 2010

Table 5.1 above shows that Tyulen community has the highest gross income increase from ₦38,050/ha in 2004 to ₦75,358/ha in 2009 with a percentage change of 98.05%. Followed by Gberkyon community with gross income increase from ₦41,114/ha in 2004 to ₦65,407/ha in 2009 represented by a percentage increase of 58.79%. Similarly, Mbagbaav community has a gross income increase from ₦37,884/ha in 2004 to ₦58,113.08/ha in 2009 with a percentage change of 53.40%. Agasha showed the least gross income increase from ₦60,292/ha in 2004 to ₦80,516/ha in 2009 representing 33.54% increase (Figure 5.1).

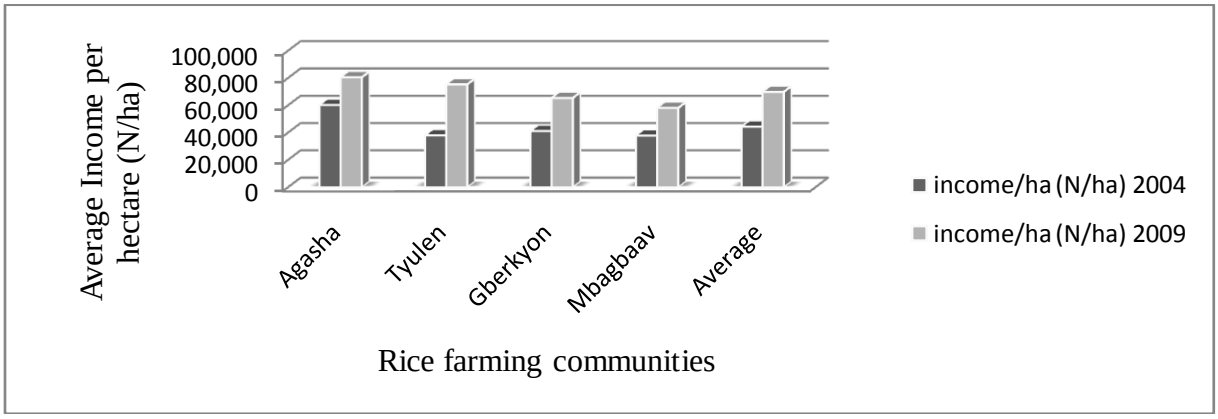

Fig. 5.1: Change in income per hectare

Although, the question of attributing income increase to Olam Out grower programme also arises. A comparison of differences of mean gross income of participating and non-participating rice farmers of the programme was ₦69,845.5/ha for participating rice farmers of the programme, while non-participating rice farmers of the programme was ₦51,755/ha. A difference of ₦18.093/ha which implies that, the difference is as a result of Olam out grower extension programme intervention.

Table 5.2: A Comparison between income per hectare of participating rice farmers of the Olam out grower programme and non-participating

S/N	Community	Non-participating Rice Farmers (₦/ha)	Participating Rice Farmers (₦/ha)
1	Agasha	58,717	80,576
2	Tyulen	51,148	75,358
3	Gberkyon	46,157	65,407
4	Mbagbaav	51,000	58,113.8
	Average	**51,755**	**69,848**

Source: Author's Field Survey, 2010

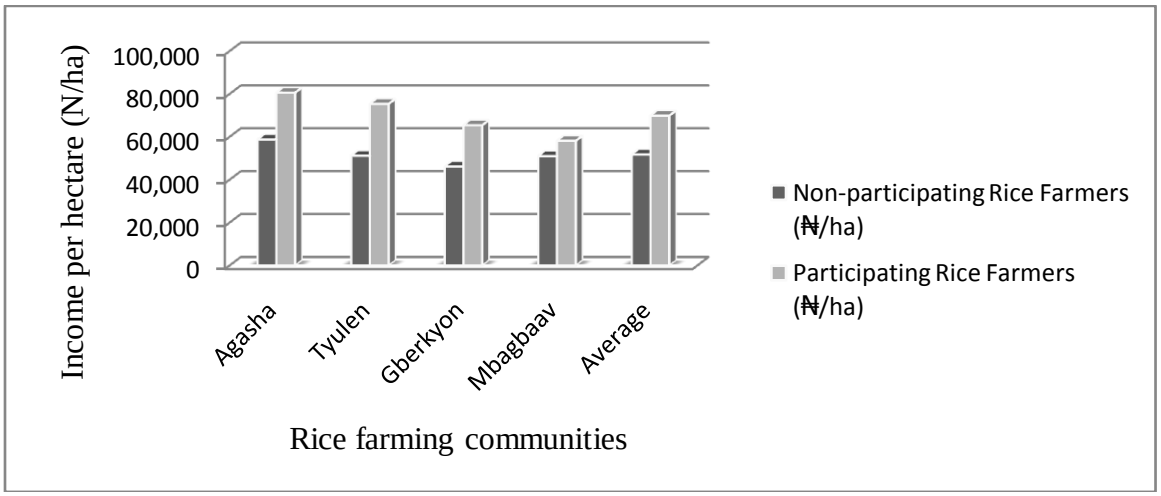

Fig. 5.2: Income of participating and non-participating rice farmers of the programme

Figure 5.2 shows that, Agasha community has mean gross income of ₦80,576/ha for participating rice farmers of the programme and ₦58,717/ha for non-participating rice farmers of the programme, with a difference of ₦21,859/ha. Similarly, Tyulen community has a mean gross income of ₦75,358/ha for participating rice farmers and ₦51,148/ha for non-participating rice farmers, a difference of ₦24,210/ha. Gberkyon community has a mean gross income of ₦65,407/ha for participating rice farmers and ₦46,157/ha for non-participating rice farmers of the programme, a difference of ₦19,250/ha. While, Mbagbaav community has ₦58,114/ha for participating rice farmers and ₦51,000/ha for non-participating rice farmers of the programme, a difference of ₦7,114/ha which shows that, rice farmers participating in the programme were earning a gross income that was higher than those not participating. These implies that, rice farmers participating in the Olam Out grower extension programme were earning on average, a gross income of ₦18,093/ha higher than gross income of rice farmers not participating in the programme. That is to say, the activities of the programme have impacted on the income of rice farmers and therefore improved their economic status

CONCLUSION

In conclusion, the Olam out grower programme has progressive impact which needs to be consolidated in the subsequent years ahead. The programme has impacted positively on the following areas of rice farming process: there was increased farm size in the area, increased yield per hectare, increased income and improved economic status of rice farmers. That is, the programme has impacted positively on the productivity of rice farmers, but the farmers do not benefit much from the economic value of their farm output. With the programme's intervention, rice production in the area has experience resurgence.

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