



## Prospects and Challenges of Sustainable Rice Production in Igbemo Ekiti, Southwest Nigeria

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### Abstract

This is a historical survey research with focus on the sustainability of indigenous rice production in Igbemo Ekiti, Southwest Nigeria. Igbemo Ekiti is predominantly an agrarian community known for the production of large quantity of indigenous rice popularly called Igbemo rice. This local rice was available in most major markets in Nigeria up till the 1980s. However, many farmers previously engaged in the planting of Igbemo rice have abandoned it for other businesses because of the challenges confronting the indigenous rice industry. The lands used for cultivating Igbemo rice have been deployed to the cultivation of other crops. Imported polished rice has since overtaken the place of Igbemo rice in the market. The rice business is indeed on the verge of extinction in the town. Consequently, this paper examines the origin, growth and decline of Igbemo rice Industry. It documents the numerous challenges confronting local rice production in the areas of cultivation, harvesting, processing and marketing of Igbemo rice. The paper concludes that Igbemo rice industry has great potentials for sustenance and expansion if advanced technology is deployed and stakeholders in the industry are given adequate incentives by Government. The method adopted for the study is basically historical, involving the use of both primary and secondary source materials. One hundred and fifty (150) informants were purposively selected and interviewed using unstructured questions. This was complemented by visitation to rice farm sites, rice drying locations, various rice mills and rice marketing centres in Igbemo Ekiti between 2014 and 2017.

**Keywords:** Rice, Igbemo-Ekiti, Nigeria, Ekiti State, Agriculture.

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## INTRODUCTION

Igbemo Ekiti is internationally acclaimed for its indigenous rice industry where rice farming is a primary economic activity, though largely at the subsistence level. As a matter of fact, an estimated 70 percent of the adult population, both male and female, is actively engaged in rice production in Igbemo Ekiti (NISER, 2002: 93). This rising interest in rice cultivation is on account of high demand which is partly the result of increasing population growth, income levels and rapid urbanization. Interestingly, it has been widely reported that rice is perhaps the most common staple food not only in many developing countries, but in the world at large where more than half of the world's population is said to rely on rice as the major daily source of calories and protein (Hauser, 2003, cited in Basorun, 2013: 78; Atungulu and Pan, 2014; Bruntrup, 2006). Unfortunately however, though rice remains an important agricultural product and a major arable crop grown in Ekitiland (Daramola, 2005), especially in Igbemo Ekiti, its supply is still considered insufficient to match its increased demand (Adeola, 2002: 48; Longtau, 2000:47). Given the above scenario, it is essential to examine ways of improving and expanding Igbemo rice industry to commercial level in order to take advantage of the economies of large scale production and meet the ever growing world demand for rice.

## STATEMENT OF THE PROBLEM

The need for a sustainable increase in rice production cannot be over-emphasized (Nguyen and Ferrero, 2006:2). This is because it has been established that demand for rice consumption far outweighs local rice production in Nigeria and the world at large (FAO, 2001; Okpiliya, 2003). Tran (2002) affirms that rice production had been reducing drastically globally since 2002. This challenge has been well pronounced in Nigeria and Ekiti-State over the years. For instance, while average demand for rice in Ekiti State alone between 1996 and 2010 stood at 215 metric tons; average annual rice production in Ekiti State was a paltry 67.23 metric tons (National Bureau of Statistics, 2010). This has inevitably resulted in huge rice importation from foreign countries to supplement rice supply in the country (Fakayode, 2009). This has gulped a huge part of Nigeria's foreign exchange earnings (Osanyinlusi and Adenegan, 2016:49). It has also led to high incidence of smuggling of rice into the country through the country's land borders at Idi-Iroko and Seme.

Incidentally, Ekiti State, with an estimated total area of 4596 km<sup>2</sup> available for agricultural production, is undoubtedly blessed with abundant land for rice production as well as production of other food crops for local consumption and sale within the country. Given this background information, this paper was construed to: identify the economic relevance of rice production to the farmers and government of the state; analyse the methods of local rice cultivation, processing and marketing in Igbemo Ekiti and Ekiti State at large; highlight the reasons for the decline in Igbemo rice industry and; examine the strategies for reviving the industry to take advantage of the economies of large scale production and meet the ever growing world demand for rice.



## GEOGRAPHICAL DESCRIPTION OF THE STUDY AREA

The area of study is Igbemo\_Ekiti, Ekiti State, Southwest Nigeria. It lies within latitudes 7° 4' and 7° 42' North of the equator and Longitudes 5° 23' and 5° 23' East of the Greenwich Meridian (Population Compendium, Ekiti State, 2006). It is an upland zone of about 250 meters above sea level. Politically, the town is situated within Irepodun/Ifelodun Local Government Area (LGA), and Ekiti Central Senatorial District of Ekiti State. Igbemo ranks third (with a population of 23,024) out of the eleven (11) major settlements in the LGA's population of 16,286 (Population Compendium, Ekiti State, 2006). Igbemo Ekiti is part of the Western axis (above 250m) made up of rich alluvial deposits. The plains have rich fertile soils which support intensive farming which is the main stay of inhabitants (Akinwamide, 2015: 16).

Igbemo Ekiti falls within the tropical hinterland (wet) climate as found in the rain forest belt. The temperature ranges between 21c and 30c throughout the year. Annual rainfall supports the growth of food crops like yam, cassava, cocoyam, plantain, maize and rice.

## ORIGIN OF RICE PRODUCTION IN NIGERIA

Ajala and Gana (2015:2), citing Hardcastle (1959), report that "rice production started in Nigeria in 1500 BC with the low-yielding indigenous red grain species *O. glaberrima* Steud and then widely grown in the Niger Delta area. WARDA reported about the high-yielding white grain *O. Sativa* L. introduced in 1890, and by 1960 it accounted for more than 60 per cent of the rice grown in the country. Rice is one of the most important arable crops grown in Igbemo Ekiti and Ekiti State at large. (Adeola, 2002:48). Other major food crops grown in Igbemo Ekiti and Ekiti state at large include: yam, maize, cassava, plantain, groundnut and vegetables, with yam being the dominant food crop followed by cassava, maize and rice.

### Origin of Igbemo Rice Industry

Available information indicates that Igbemo rice industry started in 1945. The man who introduced the cultivation of rice to Igbemo Ekiti was Pa Ariyo, a native of Ayedun Ekiti who settled at Orun quarters in Igbemo Ekiti in the early 1940s (Personal Communication, O. Adamolekun, 29 September 2014). He started to grow rice beginning from 1945, though nobody knows exactly from where he brought the rice because there was no rice in Ayedun Ekiti where the man migrated from (J. Fadipe, Personal Communication, 14 May, 2017). Unfortunately, Pa Ariyo died many years ago without leaving behind any information as regards the place of origin of the rice grains he cultivated. Consequently, the present study is unable to trace the origin of that species of rice beyond 1945 when the rice producing industry started gradually in Igbemo Ekiti.

Meanwhile, Pa Ariyo was reported to be a big time farmer who specialized in cultivating rice and yam. His rice business thrived considerably and this soon attracted other



people into rice farming. The individuals who were labourers under him soon started to grow their own rice that by 1960, it has spread throughout Igbemo Ekiti (J.Akintayo, Personal Communication, 30 September 2014). Around 1950's, the government gave Igbemo Ekiti rice mill and it was managed by Mr. Ademilusi who is a native of Igbemo Ekiti. He was supported by Engineer Omoke who is a native of Ihumudumu in Isan Local Government Area of Edo State (J. Osamiluyi, Personal Communication, 28 September 2014). Since then, a number of Igbemo Ekiti indigenes and immigrant settlers alike have established rice mills in all the quarters of the town.

## ECONOMIC IMPORTANCE OF IGBEMO RICE

Generally speaking, rice is one of the most important staple foods for most Nigerians, Africans and indeed for about 50% of humanity (Daramola, 2005; Reynolds, 2016:1). Uba (2013) adds that an estimated 70% of the Nigerian populace feed essentially on rice, with about 30% of their cereal-based diets also derived from rice (Dimelu, et al. 2014:206). Kassali et al. (2010), cited in Reynolds (2016:1), reported that rice accounts for a substantial portion of dietary energy to the growing population in most African countries as it accounts for 715/cal/caput/day, 27 percent of nutritional protein and 3 percent of nutritional fat. This is further complimented by the report of Bhuiyan, Paul & Jabber (2002), cited in Gbadamosi & Daniel (2014: 89), that "rice provides 75% calories and 55% proteins to the average daily diet of consumers". The nutritional value of rice has been succinctly highlighted by Tran (2002), a FAO expert as noted below:

... rice is the main source of food energy and is an important source of protein providing substantial amounts of the recommended nutrient uptake of zinc and niacin. It is very low in calcium, iron, thiamine and riboflavin and nearly with no beta-carotene. However; there appears to be some genetic variation for iron and zinc content in rice, which may offer an opportunity for improving its nutritional value.

Igbemo rice, like other rice brands, is consumed essentially as a staple food. It is used as a special food often associated with big celebrations and entertainments. It is valuable as a fast food and a time saving food item especially in urban areas, since milled rice requires little heating before it is ready for consumption (E. Ariyo, Personal Communication, 25 September 2014). Igbemo rice has really promoted food security in Ekiti State and Nigeria at large.

Rice has also been a major source of starch for domestic and industrial uses. Ashogbon, and Akintayo (2013:72-74) report that it is usually isolated from rice flour by using the alkaline deproteination method. Briefly, rice grain was first dehulled and ground to powder using a laboratory grinder. The rice flour was thereafter mixed with sodium hydroxide (NaOH). The mixture was stirred on a magnetic stirrer and stored overnight. The supernatant was decanted, and fresh volume of sodium hydroxide was added to the solid phase and stirred for another set of hours at ambient temperature. The procedure was

repeated twice after which the solid phase was washed with NaOH, blended and filtered. Distilled water was added to the filtrate and allowed to stand for 3 h. The supernatant was decanted and distilled water was added again. The starch residue was collected and dried in a vacuum oven (Ashogbon, & Akintayo 2013:72-74.)

The Igbemo rice industry has also contributed significantly to rural employment. Majority of the youth and adult population in Igbemo Ekiti are engaged in the industry either as farmers, harvesters, processors, millers, traders or drivers. Most of these people have been making good living through the rice business. It is indeed a major contributor to items of trade and also contributes to the small holders revenues in the study area. Money realized from the sales of rice is used to train their children and to own houses and other basic necessities of life (K. Adeyefa, Personal Communication, 25 August 2014).

Rice grains and its by-products are equally useful in the manufacturing of alcoholic beverages. The low fat content is important when used in brewing beer. It is also used as livestock feed in the form of rice bran and hay. But apart from that, milled rice when ground into powder is used in the preparation of infant weaning foods because of its high digestibility, especially when mixed with milk (F. Taiwo, Personal Communication, 20 August 2014).

## **CULTIVATION, PROCESSING AND MARKETING OF IGBEMO RICE**

The rice production system in Igbemo-Ekiti has three key legs. These are: cultivation and harvesting, processing and marketing.

### **CULTIVATION AND HARVESTING**

#### **Method of Cultivation**

Rice in Igbemo is grown in upland field. Upland rice is grown on free-draining soils where the water level is permanently below the roots of the rice plant. The upland rice environments are defined on the basis of soil, climate, water resources and topography.

Majority of the farmers obtained their farm lands through inheritance as an inherited family possession, some obtained their own farm lands on rent and in most cases paid in kind, in the form of rice harvest which is given to the land owner at the end of the rice cropping season.

The area of land cultivated by the farmers is very important as it determines to a large extent the crop population on the farm and consequently the quantity of harvest. Rice farmers cultivated small plots that were less than or equal to 2 hectares (K. Adeyefa, Personal Communication, 25 August 2014). This implies that the farm units were generally small sized. Rice farming in the study area is therefore on small scale basis.

Land preparation in the form of clearing and burning begins in February/March of every year. Planting is carried out after the first rain, which usually comes during the last week of March or early April. The sowing process involves the use of cutlass and pointed stick to dig the soil for up to 3cm to 4cm deep. Then between 6 and 8 seeds are sown per hole. Holes are dug close to each other and are not more than 6cm apart (K. Adeyefa, Personal Communication, 25 August 2014). Weeding is necessary to ensure that the rice plant is not stifled or deprived of any necessary nutrients during the growing periods. This should be done thrice before harvest, using hoe, cutlass or chemicals. Weeding may be more than three times depending on the type of soil and the amount of rain fall for that particular year. Weeds respond positively to heavy rainfall. This dictates the number of times weeding is carried out.

Application of soil enriching fertilizer is necessary to increase yield per rice plant (K. Adeyefa, Personal Communication, 25 August 2014). Some of the rice farmers apply fertilizers to their rice farms. They apply herbicides to control weeds on their farms; herbicides used by farmers include gramozone, 2-4 D and weed crusher. However, majority of the farmers said that weeds take advantage of fertilizer than rice seed and thus makes weeding more difficult (Felicia Bodunde, Personal Communication, 26 August 2015).

Once the fields have enough water, the rice grows quickly reaching maturity within three months. Rice is ready for harvesting when the grains are hard and are turning yellow/brown (about 30-34 days after flowering). Rice is fully matured for harvesting when 80-85 of the grains have straw colour (Oba Banji, Personal Communication, 27 August 2016).

### **Labour for Rice Production**

Labour supply for rice production in Igbemo Ekiti in the olden days was through polygamy families. This was to enable them to get large families that would work on their farms and also because there were no labourers at that time. Then, a man's greatness was measured by the numbers of wives, children and the size of the farm he has. The larger the family, the easier their labour during the planting and harvesting seasons. They had no stipulated hours of work but worked from dawn till dusk. It was only the weather that affected or changed this pattern.

While the above system still subsists, the most common form of labour today is the indenture system whereby a poor man takes a loan from rich farmers and enter into an agreement to work for him for certain period of time. He could also apprentice his child, young brothers or relatives to serve as domestic servants for his creditor for as long as he owed. The agreement was terminated only when all conditions of lending had been fulfilled. This system enabled the rich to have large plantations which led to abundant production of Igbemo rice.

Hired labour was a later development which is now facing a serious crisis because the youths who constitute this labour group are in schools or at the urban centres looking for

jobs. Agatus and Garas (migrant labourers from the Middle Belt region) who provided effective labour in the 1980s have stopped coming in large numbers. It is, therefore, difficult for farmers to have adequate labour in Igbemo Ekiti nowadays.

### **Harvesting**

The harvesting season begins in July. This involves the employment of contract-harvesters who are in most cases young adults and secondary school graduates who are normally engaged on ad-hoc basis for the purpose of harvesting. One unique element of the contract of engagement is that payment may be made either in cash or rice or both, depending on the final agreement reached by the farmers with the harvesters. Meanwhile, it is essential to stress that the harvesting task is not left solely in the hands of the contract-harvesters. Rather, the farmers, together with their wife or wives and children, are also deeply involved in the harvesting process. This was done not only to speed up the process of harvesting but largely to prevent or minimize incidences of rice theft and waste. Transportation of paddy from the farm is largely performed by humans.

### **Storage**

Rice paddy intended for storage is properly dried and stored in sack. Rice producers in Igbemo store rice for various purposes. The most important reasons for storage is to keep seed for the subsequent season and storage for consumption. The duration of storage varies and depends on the storage purpose: Rice storage for seed lasts for seven (7) months; rice storage for sales lasts for five (5) months. The means of storage is in bags, irrespective of storage purpose. Storage is done in the home.

The purpose for storing seed and consumption are: off season sales can fetch subsequently higher prices, stored rice can serve as a potential reserve of cash whereby rice is sold when needs arise. But some producers sell their rice soon after harvest time so as to liquidate debt and replenish cash reserves.

### **Rice Processing in Igbemo Ekiti**

Rice is processed in the study area by parboiling, drying and milling. The processing stage starts with drying. Unlike in advanced countries where dryers are used to hasten the drying process, the various methods used for drying paddy in Igbemo-Ekiti include field, sun, and in-store drying. This not only elongates the time involved in the process but also leads to the problem of improper rice drying which has been causing rice kernels to fissure leading in turn to loss of rice quality. This indeed conforms to the submission of Atungulu and Pan (2014:17) that “fissured rice will drastically reduce the yield of whole-grain rice kernels and may cause mold growth and quality loss during storage”.

The drying process is followed by the milling stage. Milling brings rice to a suitable state for human consumption. It involves the removal of husk and bran layers, resulting in the production of white rice. Typically, milling is achievable using different methods such as one-step milling process, a two-step process, and the multistage process. The latter process is typically used in large commercial mills where rice is handled through different operations and machines as paddy gets transformed to white rice.

Milling is an exclusive duty of the male, while more females engage in parboiling and drying; a joint activity that takes place in the residential quarters of the processors. Parboiling is the precooking of rice prior to milling (Bosede, Agboola, Personal Communication, 22 August 2017). In the town, the par boilers use one -to- three days soaking, after which the rice is steamed for about 20 to 25 minutes at a temperature range of 80 – 100oC. Rice drying on concrete platforms, road sides, and nylons for two to three days follows, to prevent the growth of fungi and bacteria and facilitate easy milling. There are at least 15-20 functional rice mills in Igbemo Ekiti (Personal observation). There are usually small rice mills in cubicles which exist within every 100 meter radius in the residential areas, and are operational on single proprietorship.

Most often, the processing activities are managed by family members who run the business within private compounds. In this situation, workers are recruited exclusive by any selection criteria; and for those hired, the upgrading of skills is done mostly through on- the-job training. A high failure rate, especially in the areas of hygiene, processing techniques and accounting processes have been observed in their operations. This is as a result of lack of basic training in processing by majority. In general, most of the processors are illiterates. The processors frequently apply local knowledge and experience, since they lack vital technical skills needed in processing and packaging of the rice products (Oba Banji, Personal Communication, 20 September 2017).

Two major sources of obtaining paddy by the processors are: First, through personal harvest of the processors who are partly rice farmers. Second, are the rice farmers in the town. Processing generally terminates as soon as harvests are over. The activities of the processors as not being regular, most small rice mills in the area operate at about one ton per hour due to lack of availability of sufficient paddy for processing (Olu Kayode, Personal Communication, 20 September 2014).

The processors that are millers operate mechanized milling units of the old technology which limit their operational expenses and productivity. The parboilers and dryers operate manually. The processors engage the services of 2-3 labourers. Generally, the processors hardly place the labourers on monthly wages on account of the inconsistent supply of paddy. They are often hired when there is high pressure of processing work especially during the harvesting period on varying charges based on age and skills acquired (Personal Communication, Moshood Balogun, 21 September 2017).

Most of the processing activities are of small scale, typically without complex processing techniques. Hence, the processor is contented without financial assistance, training and advice on product development and professional service that covers a wide range of processing phases. The very few that get assistance are the millers who secure loans from private agencies or mortgagees with whom they have close relationships. Lack of fund to facilitate work efficiently is, therefore, a major barrier. Complicating the problem is the inability of the low income processor to meet the requirements of high collateral and other legal prerequisites of lending institutions. Labour procurement is not a serious predicament because the present processing techniques do not encourage any special skill. In the rural environment, however, unskilled and cheap labours are available for the prevailing manual operations.

## MARKETING

It is apt to stress that the role of rice marketers as a key support of food supply in Igbemo-Ekiti and environs cannot be over-emphasised. Major key players involved in local rice marketing in Igbemo-Ekiti include the farmers, traders (both retail and wholesale traders, mostly women) and the transporters, who are predominantly men.

Local rice marketing in the study area occurs in four stages. The first stage is harvesting, the second stage is movement from the farm to processing centre. Stage three consists of moving the milled rice from processing areas to urban consumption centre, while the last stage encompasses wholesaling and retailing in the urban centre. At the commencement of the harvesting season in July, the rice marketers visit Igbemo to enter into series of contract-harvest arrangements with the farmers. In the deal, some assist the farmers to harvest and subsequently purchase their rice, while others, who had earlier supplied chemicals or capital to the rice farmers, demand payment with rice. There is, therefore, a partial involvement of the marketers in the first two production stages. Stages three and four activities take place in the market places (Personal Communication Yemi Oladapo, 25 September 2014).

Rice is moved from Igbemo to both rural and urban areas, but more to urban market where there are more people with corresponding increase in demand. Rice producers sell their paddy to traders and millers. Rice traders normally come from outside village. The place of transaction for rice sales varies. Most sales takes place within the village, at the main market or at the local market, at the farm and at the mill. The rice is mostly consumed at the mill. Most of the rice marketers are females who specialize in trading. Majority prefer to locate in the neighborhood markets within hometown usually, rice marketers in the region assemble the product in reasonable quantities for the next market after a market operation. As some locate in shops, others sell at home, while a few hawk the rice” (Personal Communication, Florence Akindele, 26 September 2015). The people of Igbemo involvement in rice distribution, however, are to earn a living, and improve family obligations. A sizeable majority of the marketers operate within the region; sell within the state and take their goods to other states.



People from across the nooks and crannies of Ekiti state, indigenes and non-indigenes alike converge on Igbemo to buy rice all year round (Johnson Oluwole, Personal Communication, 26 August 2014). The rice traders buy in different measures and weights. The big metal basin (20 – 22Kg) used by the wholesaler usually called “garawa” and the small-rubber basin (1.2 Kg) otherwise called “congo” costs N12, 000 and N500 respectively as at July, 2017 (Personal Observation). However, the price of rice in any given time of the year is greatly dependent on the yearly harvest. Generally, the “congo” which is used by the retailers is the common unit of measurement in Ekiti state.

In conclusion, the marketing structure of the rice has been predominantly local as the traffic of traders towards Igbemo is programmed in line with the market days in the town where the processors habitually work. Quite often, the practice leads to artificial scarcity of rice.

### **REASONS FOR THE DECLINE OF IGBEMO RICE INDUSTRY**

Research has revealed a number of reasons for the decline of Igbemo rice industry. Some of these are highlighted below.

The poor quality of locally produced rice is perhaps one of the most important reasons for the decline of consumer patronage of Igbemo rice. It is widely agreed that Igbemo indigenous rice is of poor quality when compared to imported rice. It is not processed under hygienic conditions. During the sun drying stage standing, dryers usually tread barefooted on the drying rice. This makes it easy for animals and birds to contaminate rice paddy. One can imagine the possibility of producing clean and de-stoned rice under this condition. Apart from being full of debris, the presence of small stones is also its major deficiency. These stones expose the local rice consumers to nutritional and health hazards including damages to their teeth and high incidence of exposure to appendicitis and other infections, including the dreaded Ebola virus. This largely explains why most consumers prefer the imported polished rice from other countries such as Thailand, Bangkok, and China to the indigenous rice (Idris, et.al. 2013; Ajala and Gana, 2015:3-4).

The use of relatively primitive tools for farm operation is another major hindrance to rice production, like other agricultural practices in Nigeria in general and in Igbemo Ekiti in particular. The tools and equipments used on the farms depict the level of modernization of the equipment. Most of the rice farm operators employed conventional farm inputs like hoes, cutlasses and baskets for their farm operations. The rice farmers indeed suffer a dearth of modern farming implements. The non-ownership of durable assets especially tractors, sprayers and harvesters is definitely a stumbling block to large scale commercial rice farming in Igbemo Ekiti.

Igbemo rice production is also adversely affected by low adoption and low usage rates of agricultural technologies such as inorganic fertilizers and improved seeds, high yielding varieties like hybrid rice and improved crop management techniques. This is largely a result of the low literacy level of rice farmers in the area. It is very instructive to note that education facilitates farmer's understanding and use of improved crop production practices. This reinforces the strong correlation between literacy level and diffusion of information and application of scientific and technological discoveries. In this wise, the low level of education of farmers in the study area creates a difficult problem for the spread of agricultural innovations and modern farming methods, leading to poor farm management practices and poor yield. The situation is worsened by the preponderance of an ageing farming population in the area. Over 80% of the rice farmers in Igbemo Ekiti are between the ages of 60 and 80 years who lacked the needed strength, vigour and agility for effective farm management. The majority of the youthful population has drifted to urban centres in search of greener pastures. As a result of this rural-urban migration of youths, labour for rice production became expensive. Since rice farming is not mechanized in Igbemo Ekiti, low rice production has been a recurrent decimal in the history of Igbemo rice industry. This is in line with the findings of Dimelu, et al. (2014:207) that the dearth of critical human resources capacity to drive the farm system has been largely responsible for low rice production in Nigeria.

The Structural Adjustment Programme (SAP) of the 1980s and its attendant trade liberalisation policy, that opened the borders of Nigeria to indiscriminate importation of rice from numerous countries, also impeded the growth of Igbemo indigenous rice industry. Except for the period 1984-1985 when General Mohammadu Buhari's led federal military government closed Nigeria's land, air and sea borders, rice importation stifled local rice production drastically. The country is yet to recover from this slump. This is largely because during the hey days of imported rice, a majority of Nigerians became glued to imported polished rice. Consumption of local rice has since reduced drastically. This in turn affected local rice production as most of the farmers and labourers abandoned rice cultivation.

Lack of access to training on pest management is another challenge bedeviling Igbemo rice industry. A major traditional problem in rice farming is the incessant menace of pests (e.g. birds) and rodents (e.g. rats, grass cutters etc.). This is indeed an age-long problem which rice farmers may continue to grapple with for long in all rural communities. These pests and rodents have established themselves as sworn enemies of rice farming in Igbemo Ekiti. Since rice farms are in open fields, which incidentally is their own natural habitat, it may require an advanced technology to effectively manage the negative impacts of these rodents and pests. As it were presently, rice farmers in Igbemo Ekiti lack access to training on modern pest management techniques and have thus employed traditional methods of management to curb their negative effect. Young boys and girls are hired on daily basis to join farmers in chasing away birds from rice farms between 6.00am and 6.00pm on daily basis, especially during critical periods of rice production. This process is not only tedious and costly, but is also grossly ineffective. Low rice yield and waste have been their impact in the study area.

Igbemo rice production is also suffering from inadequate funding or poor agricultural credit system. Almost all the Igbemo rice farmers are poor and could not afford the purchase of modern farm implements needed for expansion. This largely explains the preponderance of small rice farm holders in the area (Daramola, 2005). Unfortunately, governments at all tiers have not been responsive to the financial plight of rice farmers. Some of the government credit system intervention programmes have not been properly coordinated and are equally afflicted by corruption. The effect is that meager funds provided by government for agricultural ventures have always ended up in the purses of some corrupt civil servants and non-farmers. This is deterring large scale commercial rice farming in the study area.

Another problem of rice farming in Igbemo Ekiti is poor transportation facilities. Roads linking the rural settlement with their farm-stead on one hand and the markets on the other hand are either non-existent or in extremely poor state. Added to this is that good vehicles are scared from plying the farm routes. The farms are thus abandoned for dilapidated and off-road vehicles. This is affecting movement of farmers and their farm produce to the farms and market outlets. This has gone a long way to dissuade large production among rice farmers for fear that their produce may suffer rot at the end of the day due to dearth of effective means of transportation.

The precarious situation of rice farming which is seasonal in Igbemo Ekiti has been worsened further by competition from crops like cassava, maize, yam, cocoa, kolanut farming which yields higher financial returns for farmers. Due to the fact that rice milling was seasonal as a result of the seasonal nature of paddy rice production and supply, a majority of rice farmers in Igbemo Ekiti compelled to engage in other occupations besides rice farming, processing and marketing. This lack of specialization has robbed rice production the needed concentration and expertise for improvement and expansion of production capacities.

Other problems of rice production identified in the literature Dimelu, et al. (2014:207) are: single cropping season, changes in government policies in the area of concession and tariff, poor market infrastructure, drought and extreme rainfall due largely to climate change. (Gbadamosi & Daniel, 2014:89; Dimelu, et al., 2014:207).

## **STRATEGIES FOR SUSTAINABLE RICE PRODUCTION IN IGBEMO EKITI**

Having highlighted the various challenges confronting Igbemo rice, it is essential to examine the ways out of these predicaments.

First on the list is the provision of new methods and equipments for rice processing: Modern rice processing techniques and equipments should be introduced to enhance improved rice processing in Nigeria. Paddy separator and de-stoner machines should be

procured for rice farmers. This is highly imperative given the general observation that a major deficiency of indigenous rice in Nigeria is the presence of stone in the rice grains.

Apart from that, government should prioritise investment in rural development to support agricultural production and provide impulses for private initiatives. Government should focus on rural development, especially in the area of road construction. In this wise, Government should make community roads accessible from the farms to the town, to enable farmers to transport their goods without much stress. This is expected to assist the farmers and boost local rice production. It will also go a long way in creating jobs for myriad of youths roaming about the streets and thus propel the nation's economic growth and enhance food security in Nigeria (Basorun, 2013: 78). To further enhance patronage of the rice marketers beyond Ekiti State at a price that will maximize profit, improvement of access road to Igbemo by the State government should be accorded priority (Basorun & Fasakin, 2013:151). Government should take serious steps to link the sub-regions to Igbemo Ekiti with asphalted lanes to maximize access to the town. This will surely improve free flow of traffic which in turn will generate more trips and income for the marketers. This is to make local rice increasingly available for consumption at affordable prices. Post-harvest losses, of course, will greatly diminish as an efficient transportation system enhances domestic rice marketing (Basorun & Fasakin, 2013:151). This should be complemented through improvement in other infrastructural facilities of the areas where farms and factories are located to make life meaningful and attractive to rice farmers.

Curbing rice importation into the country is another key factor for sustaining Igbemo rice production. Government should curb the importation of rice into the country. Restriction of rice importation has the propensity of motivating rice farmers in Nigeria to take up the challenge of meeting the domestic demand for the commodity. Ajala and Gana (2015:2). However, this must be done with tact and caution. A similar view was earlier expressed by Dare Adekolu, as reported by (Oyakhilome, 2016). According to him, before placing any ban on rice importation, Government should provide necessary support for the local rice industry. This will help sustain the courage of the current actors in the industry and further encourage new entrants. This will also help reduce the cost of production and make high quality rice available in large quantities and at affordable prices. By doing this, local production will be able to meet the national demand for rice and possible left-over for export to boost foreign exchange earnings.

There is also the need for effective management of climatic vagaries. Making reference to various research results, Olanrewaju et al. (2017: 95) affirm that "climate variability is a threat to food security" in Nigeria, being in the tropical region. He stated further that occurrence of abnormal weather episodes results in crop yield reduction across Nigeria. This therefore underscores the necessity of managing the challenge of climatic vagaries effectively, if the goal of attaining self-sufficiency in rice production will be successful. The example of Mali where rice farmers have employed the strategies of pump-

based small-scale plots and dam-based irrigation, to boost rice production, becomes relevant here.

Allocation of larger expanse of land for rice cultivation is equally essential for promoting Igbemo rice industry. More land has to be devoted to rice cultivation to increase production. This may be done through different methods such as: establishment of farm settlements and rice colonies in conducive areas through acquisition of fallow, rich farmlands presently unoccupied across the state.

Formation of cooperative societies by rice farmers should also be given serious consideration. According to the International Cooperative Alliance (ICA), (2010), (cited in Ibitoye, 2013 and as quoted by Dimelu, et al., 2014:206), a cooperative society is “an autonomous association of persons unified voluntarily to meet their common economic, social and cultural needs through a jointly-owned and democratically controlled enterprise”. Lasserre (1979:155), cited in Aremu (1990:xiii) described the cooperative society as “the most favoured climate for individual development, the pleasantest in which to live, and the most conducive to technical and economic efficiency”. By forming cooperative societies, rice farmers will be able to pool their capital, labour, goodwill and other resources together in order to achieve economies of large scale production. They will also enable members to negotiate favourable trade agreements with other parties for improved pricing ( Afolami, et al., 2012).

Provision of opportunity for training and retraining for rice farmers on modern methods of pest management is equally essential. It should be reiterated that the invasion of wild birds and pests that usually destroy rice farms when the crops are mature for harvesting has been a recurrent challenge in rice farming. Traditionally, Igbemo rice farmers have engaged people to disperse birds on rice farms on daily basis for about a month when they can no longer feed on the rice stalks. As a way out of this predicament, government and other relevant agencies should help farmers to procure sprayers for them to kill pests destroying their crops and to train them on how to operate the sprayers. This will go a long way to reduce the stress of local rice farmers and improve their crop yields. This will equally help farmers grow sufficient quantity of rice for a growing population through access to innovative technologies. To achieve this goal, extension workers should be employed and empowered to visit farmers regularly to educate them on new research findings that could promote best practices in rice production. Similarly, frequent training and retraining programmes should also be organised and encouraged for producers, producer and traders in the industry.

Furthermore, rice farming should be mechanized. It is an incontrovertible fact that food security can no longer be achieved in this era of bloated human population by an agricultural system that depends significantly on manual methods of production. Without mincing words, rice farming without mechanization is tedious and not so profitable. But with mechanization, farming would become more attractive to youths as opposed to the growing

trend of 'okada' business in the town and country at large. To this end, Government should urgently come to the aid of rice farmers by procuring large numbers of modern farm implements like tractors, harvesters, dryers and de-stoners among others, to aid improved and increased rice production. Some of the expected effects of mechanized rice farming as identified by Tran (2002) include: higher labour productivity, reduction of post-harvest losses, increased crop yield, income generation, increased added value of rice output and high propensity for import substitution.

Adoption of NERICA rice for upland areas in West Africa is another way of promoting Igbemo rice production. NERICA or new rice for Africa refers to new rice varieties developed in 2000 by WARDA for publication in upland area in West Africa (WARDA 2000, cited in Nguyen and Ferrero, 2006:6). This was done to tackle the problem of low yield of traditional upland rice in the sub-region. Some of the specific advantages of NERICA rice as identified by Nguyen and Ferrero (2006:6) are: shorter growth durations and sustainability of soil fertility for longer period of cultivation. If rice farmers in Igbemo-Ekiti can embrace this new breed rice variety, their rice crop will be able to "escape the adverse effect of drought stresses on yield" and "facilitate the practice of diversified rice-based cropping systems" (Nguyen and Ferrero, 2006:6).

Provision of adequate and accessible funding for local rice farming initiatives by Governments at all levels should also be given adequate consideration. It is heart-warming to note that the Federal Government of Nigeria (FGN) took a bold step in this direction in 2015. The arrangement was that the FGN, through the Central Bank of Nigeria (CBN), agreed to guarantee a N1.8 billion loan from commercial banks for farmers under the Federal Government Rice Support Programme (FGRSP). The programme had since taken off. However, not all states of the federation had benefitted from it. For instance, while Kebbi and Kano states were said to have been lucky to access the fund; Dare Adekolu, Chairman, Ekiti State Association of Rice Processors, Millers and Traders complained that Ekiti rice farmers have not benefitted from the fund. In an interview with Frank Oyakhilome of the National Daily Newspaper on 7 April, 2016, Adekolu alleged that:

Here in Ekiti State we only hear of this on the pages of newspaper and at the same time it may interest you to know that most of these policies of funding, how laudable they might be, always come with very hard- to- meet criteria. So only the rich could access them. They don't get to the common masses that have vision for the industry. Our rice brand-Igbemo Rice despite its prominence in the southwest has not benefitted. Even in November last year we wrote a letter to the Office of the Permanent Secretary, Federal Ministry of Agriculture, Abuja and a follow-up with the Ekiti State office of that ministry has yielded no result. In 2014 Processors, farmers, traders of rice in Ekiti State came under Ekiti State Association of Rice Processors, Millers & Traders for a common front yet all entreaties for support from government have not been responded to (Oyakhilome, 2016).

It is suggested that this trend must end. The centrality of fund availability for growth and expansion in the rice industry is not negotiable. The processors need adequate fund for

up-to-date equipments and as working capital; the farmers need money for high yield quality seeds as well as for pre-harvesting and post harvesting. For these reasons, the state government should also initiate a rice-fund support programme to alleviate the suffering of farmers and thus aid increased rice production in Ekiti state. Micro- finance Trade Unions (MTUs) under the control of the State Ministry of Commerce is advocated. Through these authorized associations and micro-credit unions, the marketers can access loans from micro-finance banks and other credit facilities available in the state.

It is also essential to reduce the price of Igbemo rice, enhance its packaging and branding and polish it to promote its neatness and make it free from stones, husks, grits and weevil. This will make it attractive to consumers, both locally and internationally. This is expected to lead to improved sales of Igbemo rice and raise the profit margin of rice farmers. This is further expected to lead to improved standard of living among rice farmers and motivate more people, especially youths, to embrace rice farming.

## CONCLUSION

This paper has examined the prospects and challenges of Igbemo rice industry. It was observed that Igbemo Ekiti grows typically upland rice as a result of the availability of a superb natural setting of a rain fed upland environment. It submitted that Igbemo Ekiti has a vast expanse of arable rich land and an abundant skilled and unskilled manpower that could support the expansion and sustainability of the local rice industry in the town. It was further learnt that though, most Nigerians prefer local rice varieties to imported rice because of the taste and aroma, the challenge of unhygienic processing has hindered the local rice from competing favourably with imported rice. Given the favourable agro-ecological base of Igbemo Ekiti, she undoubtedly has the capacity for the expansion of rice production. But alas, average rice yield in the country is still low. This is not healthy for the population of Nigeria which is fast growing. Nigeria and Igbemo Ekiti in particular may continue to face acute shortage of rice and high rate of poverty unless concerted efforts are made towards appropriate risk reducing methods in rice production. This becomes highly germane because rice is one of the major staples; whose production if encouraged, can provide the population with the nationally required food security minimum of 2400 calories per person per day (FAO, 2000).

In order to stimulate sustainable production and marketing of Igbemo rice, Government should provide the requisite political will to facilitate enabling infrastructural, technological and financial environments for indigenous rice farmers and entrepreneurs. This is expected to contribute substantially to food security, poverty alleviation, employment generation and generation of reasonable income for the various stakeholders in the rice industry both in Ekiti State and Nigeria at large. It is also envisaged that further investments in the Igbemo rice industry will reduce drastically the billions of dollars spent by the Nigerian government on rice importation and soon put the country on the map of the league of top rice-producing countries in the world like China, India, Indonesia, Bangladesh, Vietnam, Thailand, Philippines, Myanmar, Brazil, and Japan.



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