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PRODUCTION OF RICE (*Oryza sativa* (L.)) IN NORTHERN PARTS OF NIGERIA AND ITS CONSTRAINTS; AN OVER VIEW

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Abstract: **Rice as one the major stable food in Nigeria can help boost the economy of Nigeria. Rice production has not meet the consumption demand of the rapidly growing population. Hence, this review intends to examined the various constraints encountered by rice farmer's in Northern parts of Nigeria. Currently, Nigeria is not self-sufficient in rice production, but it has the capacity to produce the quantity it needs and even more for export. International organizations and Non-Governmental organizations have contributed immensely in rice production in collaboration with Agricultural Development Programmes in Nigeria which lead to increase in rice production but the increase is not enough for self-sufficient in Nigeria. Nigeria have 5 major rice ecologies: upland, lowland, hydromorphic, deep inland water and mangrove swamps. If these ecologies are utilized optimally, rice importation into the country will automatically stop. If farmers in Nigeria will use rice variety with yield that have the capacity to withstand some environmental stress factors, Nigeria will be self-sufficient.**

Keywords: **Rice production, environmental stress, varieties and constraints.**

1. INTRODUCTION

Rice is the most economically important food crop in many developing countries and has also become a major crop in many developed countries where its consumption has increased considerably (Ajala and Gana, 2015). It is the stable food crop for over half the world 's population and the most important among all the cereal crops (Dogara and Jumare, 2014). Rice is one of the major cereals widely grown for food in Nigeria as it is grown in paddies or on upland fields, depending on the requirements of the particular variety (The Punch, 2016). As at December 20916, the Punch newspaper reported Nigeria as the second highest importer of rice in the world. High rate of rice importation in Nigeria has forced government to take several steps to redress the trend, including placing a total ban on the importation of rice as well as the recent government initiative on rice that is geared towards increasing domestic production. All these happen in the face of abundant potentials the country has in rice production and its capabilities to be self-sufficient in rice production (Akinbile *et al*., 2018). Nigeria has huge human resources, favourable climate and potential to undergo a steady transformation in terms of techniques and marketing of rice (Otung, 2017)

There has been a steady increase in rice production and consumption in Nigeria. With the expansion of the cultivated land area of rice production and consumption in Nigeria, this production increase has not been enough to meet consumption demand of the ever increasing population in Nigeria (Imolehin and Wada, 2000). Akinbile *et al*., (2006) stated that farmers need to be assisted to have current knowledge of improved sources of information and have access to all inputs needed for effective production. Otherwise, rice farmers will suffer low and decreasing yields owing to increasing production costs and lack of required inputs. Nigeria has the potential to be self-sufficient in rice production, for both food and if possible

industrial raw material needs and for export. However, a number of constraints have been identified as limiting to rice production efforts by Nigerian farmers. Such constraints occur in production, processing, storage and marketing (Akinbile *et al*., 2018). Rice cannot be consumed in the form in which it is harvested except it passes in the rice production chain. The constraints facing farmers in the rice production chain are peculiar to each stage of production. These constraints reduce rice output and when the output is also not well processed, the economic value of the products becomes reduced. The constraints also frustrate efforts to make the local variety qualitative and more attractive to Nigerians (Akinbile *et al*., 2018). Hence, this study was carried out to examine the constraints associated with rice production in Northern parts of Nigeria.

DROUGHT

Drought is a major constraint to rice production in Northern Nigeria because rice requires a lot of water for optimum growth and yield. Rice requires about 1200 mm to 1600 mm of rainfall evenly distributed throughout its growing period (Kamai *et al*., 2020). Rice is most susceptible to drought stress at both the vegetative and reproductive stages. A dramatic reduction in grain yield occurs when drought stress coincides with irreversible reproductive process (Pantuwan *et al*., 2002). The severity of drought is higher in uplands than in the lowland (Kamai *et al*., 2020). Matanmi *et al*., (2011) reported that about 40 % of the respondents claimed that fluctuation in climate was a constraint to their rice production. Decreased rainfall coupled with intermittent drought is a common feature in the tropical and sub-tropical savannas (Mohammed *et al*., 2015). It has been estimated that 25 % of the fields used for upland crop production are prone to yield reduction as a consequences of drought (Jeong *et al*., 2010). Drought tolerant varieties developed through plant breeding are more accessible to farmers than costly agronomic practices or irrigation enhancements that might require large investment by farmers (Zheng *et al*., 2010). Rice varieties recommended for northern Nigeria, therefore, fall within early and medium maturity classes that have the tolerance to and or the capacity to avoid drought (Kamai *et al*., 2020).

SOIL FERTILITY

Soil fertility in Northern Nigeria has progressively declined due to increased pressure on land resources arising from rapid population expansion, which is forcing farmers to adopt continuous cropping coupled with the use of an inadequate amount of fertilizer or other soil amendments (Kamai *et al*., 2020). Fertilizer availability has been a pressing issue for a long time, most especially in Nigeria where the price keeps on skyrocketing despite government intervention (Mohammed *et al*., 2019). Akinbile *et al*., (2018) reported that high cost of inputs (96.0 %) and lack of availability of fertilizer (76.0 %)were considered as severe production constraints militating against rice enterprise.

Several studies have shown that the soils in Northern Nigeria are deficient in nutrients, being far below critical levels for the production of most crops, including rice (Kamai *et al*., 2020). Farmers are mindful of the significance of fertilizers that is both organic and inorganic in farming activity (Ezui *et al*., 201).

LAND AVAILABILITY AND PREPARATION.

Land is very important factor in rice production despite the fact that rice can be cultivated in shallow water. It has a significant role to play in increasing the quantity of rice production as well as sustaining it (Ezra and Yahaya, 2012).

In Northern Nigeria, rice can be grown in two main areas: i. lowland areas- These are lowlands on the edges of flooded fadamas and irrigation scheme where water is availability for 4.5 to 5 months. In some areas, water may be availability for more than 5 months. Ii. Upland Areas-These are areas with good soil and rainfall of over 700 mm (Kamai *et al*., 2020).

Proper land preparation is necessary for rice production to minimize competition with weeds. Harrowing provide sufficient tilth for rice growth. Ridging is not necessary and is often a waste of space (Kamai *el a*l., 2020). In 2010, out of about 25 million hectares of land cultivated to various food crops, only about 6.37 % was to rice giving an average national yield of 1.47 tons per hectare (Ezra and Yahaya, 2012). A significant increase of area used for the cultivation of rice was recorded between 2010 and 2017 from about 2.4 million hectares to 3.2 million hectares respectively (Erhie *et al*., 2018)

PESTS AND DISEASES

One of the major reasons for the low yields of rice in Nigeria is attack by insect pests. The rice plant is an ideal host for a large number of insect pests, root-feeders, stem borers, leaf feeders and grain feeders. However, pests, pests especially birds, African rice gall midge and striga attack, are major constraints to rice production in northern Nigeria (Kamai *et al*., 2020). Most of the local varieties of rice are vulnerable to pests and diseases. The common diseases associated with rice include: blast, rice yellow mottle virus (RYMV) and brown spot while common rice pests include Diopsis species, African rice gall midge, short horned grasshopper, birds, rice rats and grain sucking insect pests (Sie *et al*., 2008).

Using disease resistant varieties and good cultural practices often limit infection to most of the diseases. Cultural practices such as early sowing, narrow spacing of plants, using scare crow and maintaining weed free field can minimize pest damage (Sie *et al*., 2008)

FARM MECHANIZATION

Farm mechanization is a process of introduction and development of mechanized support of all kinds at various levels of agricultural production in order to reduce manual labour (Lamidi and Akande, 2013). The constraints faced by large scale farmers in Nigeria to mechanization include the following: inability of entrepreneurs to set up manufacturing and repair services, credit facilities and accessibility, inadequate complementary inputs due to high cost, lack of improved infrastructures, poor implementation of policies and in adequate legal capacity to protect the right of owners of machinery (IFPRI, 2010)

The policy objectives of the Federal Government should gear towards addressing this issues. Matanmi *et al*., (2011) reported that 59.1 % of the respondents claimed that lack of processing machines was some very severe constraints to rice production in their study area while Akinbile *et al*., (2018) reported that farmers in Ogun State about 68.0% found machine use to be easy for most of the rice farmers in the study area. Notwithstanding, 22.0 % of the rice farmers indicated restriction to machine (Akinbile *et al*., 2018)

WEEDS

Weeds are capable of reducing yield as a result of the competition they provide to rice plants. For a weed to accumulate 1 kg of dry matter, it means it has reduced 1 kg of potential grain to be produced. The yield loss caused by weeds mostly occur within 20-50 days after establishment of the crop, which is why early weeding is necessary. It is also important to weed immediately after initiation of panicle to prevent shedding caused by weeds (IRRI, 2015).

It is important to identify correctly the weed in order to use the right herbicide base on the label recommendation. Herbicides are more effective when they are applied to small weeds. Nonetheless, pre-emergence herbicides can be applied before weeds are established and post-emergence herbicides after the weeds are established, but care must be taken to avoid crop damage. It is necessary to wear protective clothing before spraying herbicides (IRRI, 2015). Akinbile *et al*., (2018) reported that all the respondents in the study area indicated that access to fertilizer and herbicides is being restricted and serve as a major constraint to rice production.

FUTURE PROSPECTS IN RICE PRODUCTION

a. **Job opportunities**- Agriculture is an important sector that provides jobs to many individuals in Nigeria. About 70 % of Nigerians get their sources of livelihood, either as local farmers, traders, labourers, manufacturers of fertilizer, farm tools and machines etc. (FAO, 1999, Odoemenem and Inakwu, 2011)

b. **Economic stability**- The prediction for the demands of rice remains very strong. By 2035 an additional 116 million tons of rice will be required to feed the growing population. Rice is the most rapidly growing source of food, about 30 million tons more rice will be needed in Africa by 2035, which represents an increase of 130 % in rice consumption from 2010. Nigeria alone will require one third of this extra rice (Bamidele *et al*., 2010)

Nigeria has witness an increase in rice production in recent years (9.3 % per annum) mainly due to increase in rice area (7.9 % per annum) and small amount of yield increase (1.4 % per annum). Nonetheless, the increase in rice production in Nigeria is not sufficient enough to match our increase in consumption (Akpokodje and Erenstein, 2001, Bamidele *et al*., 2010)

c. **Food security**- Food security is basically defined as the access to food at all time for healthy life (Ojo and Adebayo, 2012). A country can only be food secured when more than half of its population have access to food in the required quantity (Idachaba, 2004). The food is expected to meet an acceptable level of nutritional standards in terms of the calorie, minerals required by the body, and people have to possess the means to acquire it in a consistent manner (Ojo and Adebayo, 2012)

2. CONCLUSION

Nigeria has the capacity to be self-reliant and even become a global rice exporter, if the right policies are implemented judiciously. International and local organisations with the aid of Agricultural Development Programme (ADP) are doing fantastic job in enlightening farmers about the cultural methods required to successfully produce high rice grain yield. Improved rice varieties such as Farro 44, NERICA 2 AND 2, GAWAL R1 etc. have shown promising results in some studies carried out. If these varieties are adopted with better management practice the production of rice will surely increase in this country.

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