



EMPIRICAL REVIEW OF RICE FARMERS' INVESTMENT IN VALUE ADDITION IN KEBBI STATE, NIGERIA

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ABSTRACT

The study reviewed empirical analysis of rice farmers' investment in value addition activities in Kebbi State, Nigeria. An attempt was also made to describe the various rice value addition activities in Nigeria. The empirical reviewed describe the stages in rice value addition activities to include input supply, production, harvesting, processing, parboiling, milling, winnowing, destining, bagging and marketing. Result indicated that only 16.0% of rice farmers in Kebbi State engaged in the first category of value addition activities, that is, parboiling, winnowing and drying only, and only 6.0% of rice farmers involved in the second category of value addition which included parboiling, winnowing, drying and de-stoning. Only 2.0% of rice farmers engaged in the last category of rice value addition which comprises of parboiling, milling, drying, de-stoning and bagging. Several studies reviewed revealed that investments in rice value addition activities in Nigeria are profitable, however, result reviewed showed that majority of rice farmers (76.0%) in Kebbi State were not involved in value addition activities. It was recommended that farmers should be encouraged to take advantage of the benefits in value addition activities to improve their livelihood activities and increase their income which invariably reduced their poverty status.

Keywords: Investment, Livelihood activities, Poverty, Processing, Value addition.

INTRODUCTION

Agricultural economy in Nigeria is still largely characterized by production and direct sale of agricultural outputs in its raw form with very little capacity for transformation of produce from its raw form to other value added products. This is as a result of inadequate capacity of primary producers to add value to their produce due to socio economic, economic, environmental and technological constraints. This has manifested in the form of low production efficiency and limitation in the diversity of goods produced, but a major integral part of the food supply chain is value added, which expands the range, quality and utility of food supply (Bashorun, 2013).

Rice sector being a critical sub-sector of agricultural sector can serves as a means of conserving foreign exchange and improve the nation economy. Rice is a staple food for about 2.6 billion people in the world. It is the leading cereal crop of south and east Asia, which are thickly populated regions of the world and the global output shows that the Asian continent account for about 92%, while American and Caribbean account for 5% and 3% for Africa (Oladimeji and Abdulsalam, 2013). It is also the most important staple food for large part of the world human population. Rice is the most important grain with regard to human nutrition



and calorie intake (Usman, 2011). It provides more than one fifth of the calorie consumed worldwide by human species, though relatively lower in protein compare to other cereals, it contains a better balance of amino acids (Oladimeji and Abdulsalam, 2013).

The term value chain refers both to a set of interdependent economic activities and to a group of vertically linked economic agents, depending on the scope of the study the focus of the analysis can be on the activities or on the agents. A value chain starts with the production of a primary commodity, ends with the consumption of the final product and it includes all the economic activities undertaken between these phases such as: processing, branding and packaging (Bellù, 2013).

The value addition starts from the input supply, and flows through the production, processing and marketing stages. At the production stage, farmers adopt different production systems for various reasons and it is geared towards income maximization (Bellù, 2013). Income maximization entails comparison of costs and returns from different enterprises and stages of the value chain. This serves as a decision guide to rice farmers towards the realization of their production goals, as it is necessary that they know the most reliable type of production system to cultivate on and the extent of value addition to engage in (Dalipagic and Elepu 2014).

The rationale for value addition is predicated on the need to increase rural incomes, employment and investment opportunities. Focusing on value addition by small scale operator is important. This will permit investment on additional processing facilities so that marketable surpluses can be pushed to processors and farmers can reduce post-harvest losses thereby increasing farm income. Value addition can help farmers to claim part of the unexploited profit going unclaimed in the manufacture of food, fibre and industrial or other product from agricultural produce (Kehinde and Aboaba, 2016).

Based on this assertion, investment in value addition by the farmers in Nigeria will not only improve food supplies but also reduce imports and generate more income to the farmers (Obasi and Enyia, 2016). Most often, the deficiency in quantity does not make the local food products compete favorably with the imported ones (West Africa Rice Development Association, [WARDA], 2015). The study of rice farmer's investment in value addition, therefore, is essential because of the concern for both quality and promotion of commercial investment in rice in Nigeria The objective of the study was to describe the various value addition activities employed by the farmer.

Stages in value addition activities are described as follows:

1. Input supply: This stage is concerned with the sourcing of raw materials required for agriculture production, processing, and trade. Inputs may either be procured locally or imported. The final value of an input at its place of use includes all manufacturing costs, transportation costs, customs duty and tax, and unofficial payments incurred up to that point. The efficiency of a country's input supply system therefore has a major bearing on the performance of the entire value chain.
2. Production: The stage is concerned with primary agriculture production and ends with the sale of a raw commodity at the farm gate. These transactions may occur literally at the farm gate or at some other point where the farmer hands over ownership of the product, some



type of primary processing (such as the shelling or bagging of dry grain) may take place at the farm level. The major inputs used in the production of rice in the study area identified as land, water, labour, fertilizer, chemicals and seed.

3. **Harvesting.** The process of collecting the mature rice crop from the field is called harvesting. This can be done manually or mechanically. Depending on variety, rice crop usually matures between 115 and 120 days after establishment (activities include cutting, stacking, and handling, threshing, cleaning and hauling). Good harvesting methods help maximize yield and minimize damage and deterioration. Paddy rice is harvested when the grains have a moisture content of around 25%. In Nigeria where rice is almost entirely the product of smallholder agriculture, harvesting is carried out manually, although there is a growing interest in mechanical harvesting. Harvesting can be carried out by the farmers themselves or by hired labour. Harvesting is followed by threshing, either immediately or within a day or two. Subsequently, paddy needs to be dried to bring down the moisture content to no more than 20% before threshing and milling.

Some of the challenges faced by the farmers are after harvesting, inadequate spacing for drying the paddy to the moisture content suitable for storage. Fred *et al.* (2012) reported in his study that rice farmers have drains that are supposed to take the waste waters away from the fields. Virtually these drains are non-functional that is most of them are choked and this poses a lot of problems for the farmers. Some of these problems include flooding of the fields when they are to be drained, also farmer who have flooded fields have to pay extra for harvesting, some of the flooding continues even when the fields are not being cultivated and this makes it difficult for the owners of those lands to crop during the cropping season.

4. **Processing:** The processing stage involves the transformation of agriculture raw materials into local and internationally traded goods. Raw commodities, of course, are also traded and this stage may not apply to every crop. Rice processing comprises of two stages parboiling and milling. These are two independent activities that are rarely consolidated into one. The parboiling appears to be mostly on consignment while the milling is mostly on contract. The main value adding activities include; harvesting, storage and paddy aggregation at traders' level, parboiling, milling, winnowing destining and bagging (Cadoni & Angelucci, 2013; and Hussaini *et al.*, 2019).
5. **Parboiling:** Parboiling is a process of soaking, briefly heating, and drying paddy before it is milled. The process swells the grains, loosens the hulls, and toughens the grain. All this allows for a substantial increase in milling recovery from about 67% to 75% helps to promote food security and minimize imports. Also, during this process some of the nutrients in the bran will leach into the endosperm providing for a somewhat more nutritious final product. This is enough to refer to parboiled rice as enriched rice.
6. **Milling:** The second process is milling to remove the hull and bran that produces the final polished rice consumer product. This is typically done in the same community as the parboiling, and may be mostly on contract instead of consignment or purchase basis. It may also include a cleaning or de-stoning process to remove any remaining stones. If done, de-



stoning will be just prior to milling and perhaps in a continuous flow with the mill. It should be noted that any mechanical de-stoning at this point will result in loss of some good grain. Thus even if there is only two or three percent stones and mud clods, the de-stoning process will result in up to 10% loss in paddy. This again has to be factored into what the farmers can receive for their paddy.

7. **Winnowing:** Winnowing is an agricultural method developed by ancient cultures for separating grain from chaff. Its simplest form, it involves throwing the mixture into the air so that the wind blows away the lighter chaff, while the heavier grains fall back down for recovery. It can also be used to remove pests from stored grain. Winnowing usually follows milling in rice preparation and often done in open spaces such as in paddy fields, the winnowing process takes advantages of natural winds. This process is often used by farmers harvesting rice to separate filled grains from empty ones or unwanted matter such as weeds, straw, sand, and dust particles, to obtain a more pristine harvest.
8. **De-stoning:** *Paddy de-stoning* is a primary process in rice production and a processing technique for removing stones and broken grains from a batch of milled rice. De-stoning activities was carried for the purpose of increasing the quality capacity and efficiency. It is a post-harvesting process for value addition of rice activities.
9. **Bagging:** Rice storage facilities take many forms depending on the quantity of grain to be stored, the purpose of storage Bagging is made either from jute or woven plastic. Depending on the size of storage, these bags are normally formed into a stack and it can be done in various sizes 25kg 50kg and 100kg for the consumer to meets its in required and affordable forms.
10. **Marketing:** Rice marketing is the performance of all business activities in the flow of paddy and milled rice, from the point of initial rice production until they are in the hands of the ultimate consumers at the right time, in the right place and as convenient as possible, at a profit margin so as to keep the farmer in his farming operation (Ihene, 1996). Marketing of local rice are divided into four stages with a change of product ownership occurring between each pair of stages. The first stage is production through harvesting. Stage two include movement from the farms to processing centres while stage three consist of moving the milled rice from processing areas to urban consumption centres. The fourth stage encompasses whole sailing and retailing in the urban centers. Marketing make rice available to both rural and urban dwellers through marketing channel, transportation is also important in marketing of rice, without transportation rice cannot be evenly distributed throughout the nation.

Past studies on investment in rice value addition activities like Ewuzie *et al.* (2020) found out in his study comparative analysis of profitability of actors in rice value chain in Nigeria that the net returns, benefit-cost ratio and return on investment for value chain actors demonstrate that investment along the rice value chain are viable and profitable. This was supported by Ugwuonah (2017) that observed rice production along value chain are lucrative in production-related, processing-related as well as marketing-related investment opportunities in the rice value chain. Furthermore, the study reported significant differences in value added,



net return, benefit-cost ratio as well as return on investment among the rice farmers, rice processors and rice traders are consistent with the findings of previous scholars in the literature (Achike and Anaku, 2010; and Ben-Chendo *et al.*, 2017) although the values of these key profitability indicators have improved substantially in some states. Their findings also show viable investment opportunities as well as areas of possible interactions by private and public agencies for improved profitability and wealth creation.

Hussaini *et al.* (2019) presented the determinants and profitability of rice farmers investment in value addition activities in Kebbi State and found that the net return of farmers in stage one value addition (parboiling, winnowing and drying) indicate the average rate of returns on investment was ₦1.25 indicating that for every ₦1 invested in value addition in the study area, a profit of ₦1 and 25 kobo was made. Thus, it could be concluded that the value added to rice in the study area was though on a small scale, and economically viable. However, the farmer's investment in stage two (parboiling, winnowing, drying and de-stoning) of value addition reveals that the average rate of return on investment (return per naira invested) was ₦1.33 indicating that for every ₦1 invested in the study area; a profit of ₦1 and 33 kobo was made. Thus, it could be concluded that value addition in the study area is profitable indicating that for every ₦1 invested in the study area; and for the category three of value addition (parboiling, winnowing, drying, de-stoning and bagging) activities a profit of ₦1 and 35 kobo was made. Thus, it could be concluded that value addition in the study area is profitable. And there will be increase in income, if the quality of rice can be increased by the farmers engaging in winnowing more to get good clean quality. This was in line with Ugwu *et al.* (2014) also confirmed that rice processing is worthwhile investment at both processing and marketing level as evident in the net processing and also Ibitoye *et al.* (2014) revealed that the net return from rice processing in the Bassa LGA was ₦1.61.

Uke *et al.* (2018) also revealed that the average total revenue from paddy sale per ha is ₦300,000 while the total revenue from milled form was ₦525,000. The findings imply that rice farmers realized more income from selling their produce in milled form than in paddy form. Omoare and Oyediran (2017)) revealed in assessment of factors affecting rice (*oryza spp.*) value chain in Ogun and Niger State showed that value addition at production state was ₦350/kg in Ogun State and ₦280/kg in Niger State. At the processing stage the value added was estimated to ₦500/kg in Ogun State and 400/kg in Niger State. Value added at marketing stage was put at ₦750/kg in Ogun State and ₦550/kg in Niger State. It implies that the value addition increases from production to marketing stage across the sample states but Ogun State recorded higher increment throughout the rice value chain.

Also, these results showed that marketing stage has the highest margin which is an indication of increased earnings from value addition at marketing stage compared to least earning at production. This is a pointer to the reason why rural rice farmers that sell their rice at farm gate earn less hence, remains poor. Value addition to rice is very important at this point to help the rural poor farmers out of poverty (Omoare and Oyediran, 2017).

Farmers made the most value additions although their socio-economic conditions have not improved (Aree and Yaovarate, 2001; Achike and Anaku, 2010; and Ben-Chendo *et al.*,



2017). However, the present findings do not mean that there is no equity in the rice value chain contrary to the findings of the previous findings. The differences in net return (income) of the actors are explained by their scale of operations as some farmers are small scale farmers with a mean farm size of one hectare.

According to Chidiebere-Mark (2017) in analysis of value chain in rice production systems in Ebonyi State, reported in his findings that gross margin accruing to the rice processor or trader for a metric ton of basic milled rice is ₦55,800; and that if the processor goes further to add value to the rice by processing to quality rice, he incurs a cost of ₦2,600. This comprises costs of further processing activities like de-stoning and bagging. A metric ton of quality rice is sold at the price of ₦160, 000 per bag. The processor makes an additional gross margin of ₦9,400 per metric ton. The total gross margin accruing to that of quality rice is hence ₦65,200. This shows that though a higher amount is spent to further add value to get quality rice, the gross margin is higher than for basic milled rice.

The percentage gross margin contribution to trade of basic milled rice and quality rice is 34.875% and 5.875%, respectively. Par-boilers and millers receive a marginal profit of 6.875% of the total worth. The small margins are a disincentive to the investment in rice processing by small miller. However, horizontal integration can increase the market share of these categories of value chain actors. The total percentage margin to producing one metric ton of further processed rice from paddy is 40.75%. This implies that investment in rice value chain and production of quality rice is profitable.

Amolegbe *et al.* (2016) reveals in his study that the breakdown of market margin of the major processors, i.e., the par-boilers and millers. The parboiling and milling operations were identified as the most important processing operation along the value chain; hence the market margin was computed for each of these operations. In all, ₦424,838 was the average revenue generated from processing operation, while a cost of ₦256,612 was incurred, thereby giving an average processing market margin of ₦168 225. However, majority of the millers do not trade produce (i.e., purchase paddy and sell rice) but only process paddy on a fee basis for others (producers, traders or consumers). The processors (mainly the par-boilers and millers) were identified as the most important actors in the value chain. This is because the processors incurred the highest amount of cost, i.e., ₦256,612 and earned the highest amount of revenue, i.e., ₦424,838 giving the second largest market margin of ₦268,225, along the rice value chain. Therefore, promoting improvements in processing equipment and quality control will be essential to increasing the product quality and price at the consumer level (Micro, Small and Medium Enterprise [MSME], 2009).

Nwaobiala and Adesope (2015) also analysed the economics of smallholder rice production systems in Nigeria. The study compared the net profit between upland and swamp rice farmers and assessed the protection and comparative advantage in rice processing in Nigeria. It determined the contributors to value-addition in the processing of paddy rice into basic milled rice and value-added rice and asserted that the margin derivable from the processing of paddy rice into basic milled rice per ton was lower compared to further processing of basic milled rice into value added rice per ton.



Furthermore, United States agency for international development (USAID, 2009) carried a study on Nigeria's rice value chain. The study aimed to examine the role of rice in Nigeria's food security and to present a practical vision for the development of the domestic rice value chain. The study found that under the right circumstances rice can be competitively produced by small holders of about 5 hectares. Furthermore the study recommended that an increase in the number of industrial mills and development of the supply of high quality rice will have a positive spin-off effect on the market and operational efficiency in the rice supply channels and also recommended that Nigeria should develop a commercially-driven production, milling, processing and marketing capacity that can deliver at least one million extra metric ton (MT) of rice that is cost and quality competitive.

Adeyeye (2012) asserts that investments in increasing the quality of locally produced rice and the need for value re-orientation will encourage increased consumption of local rice. This is because processing is more efficient with milling, sorting, polishing, grading and bagging all carried out within one unit. This corroborates with the work of Samson (2018) who confirms that imported rice cleanliness is the major factor for its patronage in Nigeria at the expense of Nigerian market. The coefficient of swell indicating that imported rice has more swelling capacity than Nigerian rice, this is in consonance with Bamidele *et al.* (2010) who noted that household prefer imported rice to Nigerian rice because of higher quality and grade. Samson (2018) also asserted that Preference of either Nigerian or imported rice was influenced by several factors such as high cost, cleanliness, taste, texture, flavour, swelling capacity, and affordability. Campaigns aim at creating awareness on the negative effect of importing large tons of rice on the development of the nation's rice market should be encouraged. Nigerian rice producer should improve the quality of the rice for it to have competitive advantage over imported rice.

Chidiebere-Mark (2017) found out from his findings analysis of value chain in rice production systems in Ebonyi State Highlighting the actors contribution of processing basic milled rice to quality rice as shown in Figure 1. It showed the percentage value added of each activity at the processing stage. The percentage cost of adding value from paddy to basic milled rice is 7.625% and it covered activities like paddy transportation, parboiling and drying as well as milling. Percentage contribution of further processing to quality rice was estimated at the margin of basic milled rice of 34.875% is higher than that of quality rice of 5.875%. This may be a disincentive for processors to go into further processing. However, an extra margin raises the income of the processor as well as adds value to the rice to satisfy the demand and quality concern of the urban consumer.

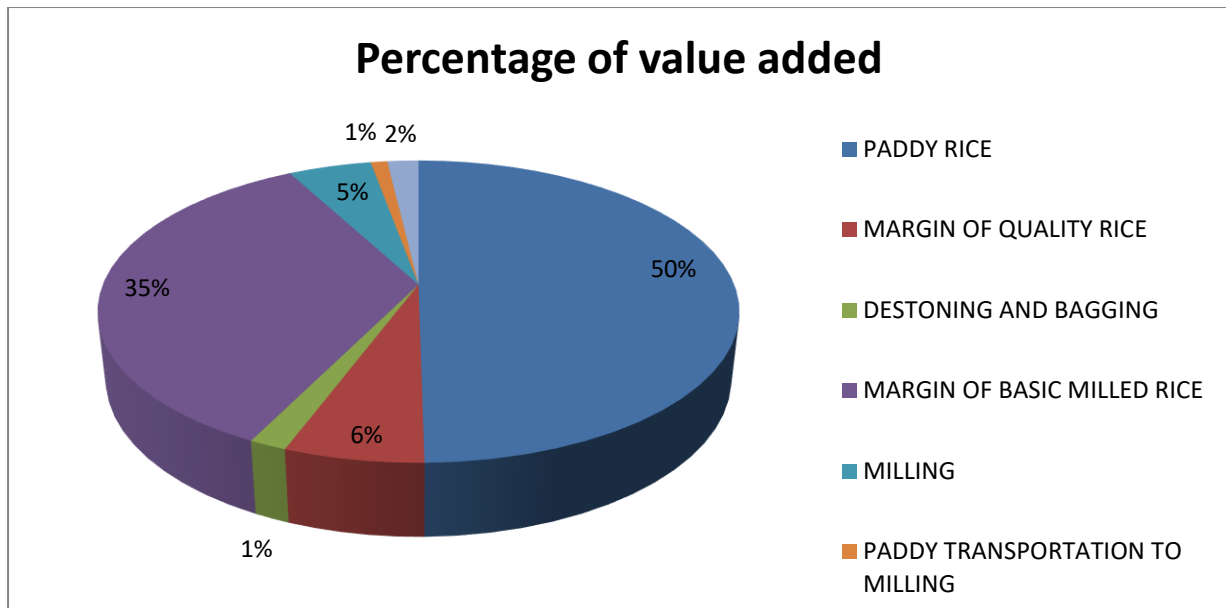


Figure1: *Contribution of processing basic milled rice to quality*

Value Addition Activities Employed by Rice Farmer in Kebbi State, Nigeria

The result in Figure 2 depicts the distribution of rice actors based on value addition activities employed. The results revealed that majority (76%) of the farmers are not involved in value addition activities. This implies that majority of the famers sell their rice n paddy form after harvests. So many reasons can be adduce as a result that some farmers lack of awareness of value addition advantage, fear of risk of price fluctuation, inadequate knowledge of technologies of value addition and probably inadequate capital to go into value addition among many others. In addition, plausible reasons why farmers did not engage in value addition was hoarding of the paddy rice against the season when there is shortage in market so they can sell at high price (Okorje, 2003 cited in Ben-Chendo *et al.*, 2017).

Rice is mainly marketed in paddy and milled forms but most rice producers sell a greater portion of their rice in paddy than in processed form. However, 24% of rice farmers engage in one form of value addition. The result further revealed that about 16% of the respondent goes into value addition of parboiling the paddy rice, milling and manual winnowing of the rice while 6% of the respondents were involved into parboiling, milling and no winnowing after the milling. This can be attributed to the fear that the rice will reduce in quantity which will lead to low income for them after winnowing. Finally, about 2% of the respondents undergo the whole process of value addition by parboiling, milling, winnowing and bagging. This respondent normally take their produce to central market which enable get high income because of the demand for clean rice in the area and in turn give them high income.

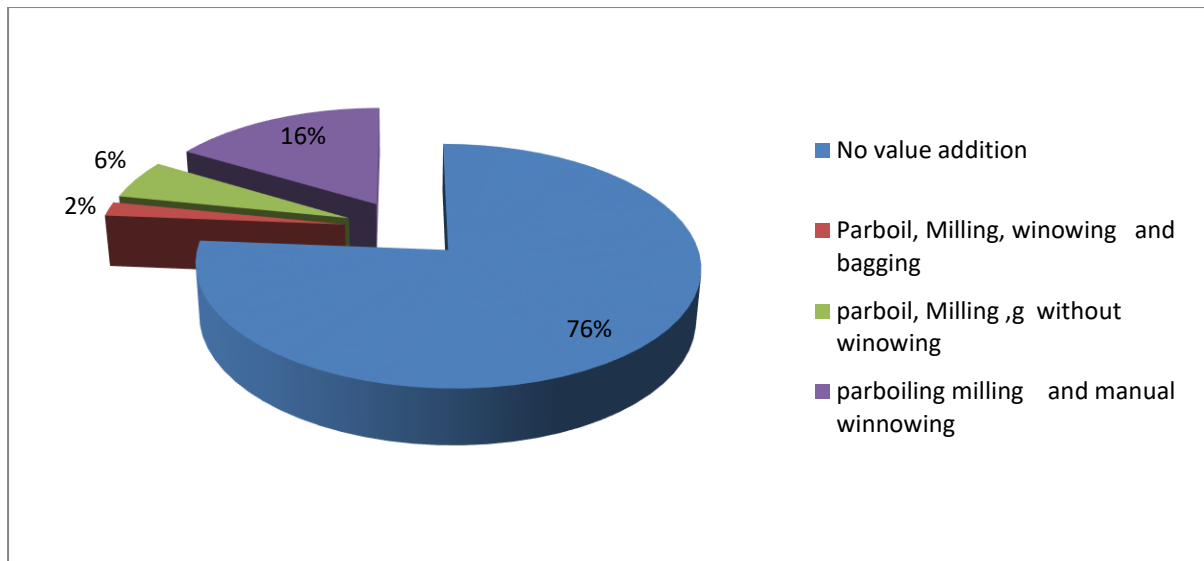


Figure 2: Contribution of value addition activities employed by farmers in Kebbi State

CONCLUSION AND RECOMMENDATIONS

Having, reviewed a numbers of literatures on analysis of investment in value addition activities of rice, it was concluded that the more the farmers invest in one or more activities, the more income generation. However, as the actors goes along the value chain, the more income generated at every nodes of the chain. It was recommended from the review that farmers should not stop in first stage of value addition activities to improve their livelihood activities and generate more income. It is also suggested that rice farmers should form a formidable cooperative societies in collaborations with extension agent both private and government to enable the farmers get more information on the benefits of rice value chain investment.

REFERENCES

- Achike, A. I. and Anaku, T. A. K. (2010). Economic analysis of the marketing margin of rice farmers in Ebonyi State. *Journal of Tropical Agriculture, Food, Environment and Extension*, 1(1): 47-55.
- Adeyeye, V. A. (2012). *Strategies for enhancing consumption of locally produced rice in Nigeria*. Nigerian Institute of Social and Economic Research (NISER), Ibadan, Nigeria.
- Amolegbe, K. B. and Adewumi, M. O. (2016). *Value Chain Analysis of the Rice Industry in Nasarawa State, Nigeria* *Gashua Journal of Irrigation and Desertification Studies*, 1(2): 1-20.
- Aree, W. and Yaovarate, C. (2011). *Agribusiness management towards strengthening agricultural development and trade III: Agribusiness Research on Marketing and Trade: Rice Marketing System in Thailand*. Thailand, the Ministry of Agriculture and Cooperatives.



- Bamidele, F. S., Abayomi, O. O. and Esther, O. A. (2010). Economic analysis of rice consumption pattern in Nigeria. *Journal of Agricultural Science and Technology*, **12**(1):1-11.
- Basorun, J. O. (2013). Expository analysis of rice processing activities in Igbemo rural Nigeria. *Journal of Social Issues and Humanities*, **3**(2): 78-84.
- Bellù, L. G. (2013). *Value Chain Analysis for Policy Making Methodological Guidelines and country cases for a Quantitative Approach*. FAO Publication. 178Pp.
- Ben-Chendo, G. N. N., Lawal, N. and Osuji, M. N. (2017). Cost and return of paddy rice production in Kaduna State. *European Journal of Agriculture and Forestry Research*, **5**(3): 41-48.
- Cadoni, P. and Angelucci, F. (2013). *Analysis of incentives and disincentives for rice in Nigeria*. Technical notes series, MAFAP, FAO, Rome.
- Chidiebere-Mark, N. M. (2017). *Analysis of value chain in rice production system in Ebonyi State, Nigeria*. A PhD thesis submitted to Department of Agricultural Economics, Federal University of Technology, Owerri. 204Pp.
- Dalipagic, I. and Elepu, G. (2014). *Agricultural value chain analysis in northern Uganda: maize, rice, groundnuts, sunflower and sesame*. Action against Hunger | ACF-International, 74Pp.
- Ewuzie, C. O., Ifediora, C. U. and Anetoh J. C. (2020) Profitability of actors in rice value chain in Nigeria: A Comparative Analysis. *International Journal of Innovative Research and Advanced Studies (IJIRAS)*, **7**(7): 59-66.
- Fred, N., Enoch Kwame, T. and Philip, K. N. (2012)"Resource Use Efficiency in Rice Production: the Case of Kpong Irrigation Project in the Dangme West District of Ghana *International Journal of Agriculture and Forestry*, **2**(1): 35-40.
- Hussaini, A. S., Oladimeji, Y. U., Sanni, S. A. and Abdulrahman, S. (2019). Determinant and profitability of rice farmers investment in value addition activities in Kebbi State Nigeria. *International Journal of Social and Economic Research*, **3**(2): 101-109.
- Ibitoye, S. J., Idoko, D. and Shaibu, U. M. (2014). Economic assessment of rice processing in Bassa Local Government Area of Kogi State, Nigeria. *Asian Journal of Basic and Applied Sciences*, **1**(2): 8-17.
- Ihene, D. A. (1996). *The marketing of staple food crop in Enugu State, Nigeria; A case study of rice, maize and beans*. MSc thesis, University of Nigeria, Nsukka.
- Kehinde, A. L. and Aboaba, K. O. (2016). *Analysis of value addition in the processing of cassava tubers to "garri" among cottage level processors in south-western Nigeria*. 5th International Conference of the African Association of Agricultural Economist. Pp.1-14.
- Micro, Small and Medium Enterprise [MSME] (2009). *Annual report*. 72pp.
- Nwaobiala, C. U. and Adesope, O. M. (2015). Economic analysis of small holder rice production systems in Ebonyi State, South East, Nigeria. *Russian Journal of Agricultural and Socio-Economic Sciences*, **11**(23): 3-10.



- Obasi, P. C. and Enyia, C. O. (2016). Analysis of value addition and livelihood diversification among fadama users in Imo State, Nigeria. *Federal University Technology Owerri Journal*, 2(2): 236 – 251.
- Oladimeji, Y. U. and Abdulsalam, Z. (2013). Analysis of technical efficiency and its determinants among small scale rice farmers in Patigi LGA of Kwara State, Nigeria. *IOSR Journal of Agriculture and Veterinary Science*, 3(3): 34-39.
- Omoare, A. O. and Oyediran, W. O. (2017). Assessment of factors affecting rice value chain in Ogun and Niger State, Nigeria. *Global Journal of Agricultural Research*, 5(4): 43-59.
- Samson, E. O. (2018). Preference for imported and Nigeria rice among rural households in Imo State Nigeria. *Journal of Agricultural Extension*, 22(3): 53-63.
- Ugwu, J. N., Mgbakor, M. N. & Chitor, C. C. (2014). Assessment of value addition in rice and processing in Adani Uzouwani Local Government Area of Enugu State, Nigeria. *International Journal of Agriculture Science and Veterinary Medicine*, 2(4): 53-68.
- Ugwuonah, G. E. (2017). *Market-led approach to agricultural value chain development: issues in investment and wealth creation*. University of Nigeria, Inaugural Lecture, Nsukka, University of Nigeria Press Ltd.
- Uke, P. C., Ochiaka, D. C. and Mgbakor, M. N. (2018). Value Addition Assessment of Rice Production in Anambra East Agricultural Zone of Anambra State. *Asian Research Journal of Agriculture*, 9(3): 1-5.
- United State Agency International Development [USAID] (2009). *Global Food Security Response; West Africa Rice Value Chain Analysis*. Micro-Report No. 161.
- Usman, A. (2011). *Analysis of technical efficiency and its determinants among small-scale rice farmers in Niger State*. Unpublished M.Sc. Dissertation. Department of Agricultural Economics and Rural Sociology, Ahmadu Bello University, Zaria, Nigeria.
- WARDA (2015). Essence of WARDA, the reason why Nigerians are hooked to rice women's involvement in the agro-processing enterprise of the national special programme for food security in Imo State, Nigeria. *Report and Opinion*, 2(7): 69-73.