Assessment of Rice Farming Challenges during the Pandemic Period in Ikwo, Ebonyi State

Ejike-Alieji, Adaeze U.P

Alex Ekwueme Federal University Ndufu Alike

ABSTRACT

Crop production is a vital element of agriculture in Nigeria. Climate change alters climate variables, but climate variability affects crop yield directly by influencing crop growth and development. Rice production is important in ameliorate the climate by removing methane from the atmosphere. Farmers in Ebonyi are becoming more involved in rice cultivation operations, which help to moderate climate conditions. Data on important climate variable were assed from FMARD, Federal Ministry of Agriculture and Development report 2020 to validate the impact of rainfall onset and cessation on moderation of climate impact.

Keywords: NA

Classification: DDC Code: 635.9 LCC Code: SB404.9

Language: English

London Journals Press

LJP Copyright ID: 573364
Print ISSN: 2515-5784
Online ISSN: 2515-5792

London Journal of Research in Humanities and Social Sciences

Volume 23 | Issue 4 | Compilation 1.0

Assessment of Rice Farming Challenges during the Pandemic Period in Ikwo, Ebonyi State

Ejike-Alieji, Adaeze U.P

ABSTRACT

Crop production is a vital element of agriculture in Nigeria. Climate change alters climate variables, but climate variability affects crop yield directly by influencing crop growth and development. Rice production is important in ameliorate the climate by removing methane from the atmosphere. Farmers in Ebonyi are becoming more involved in rice cultivation operations, which help to moderate climate conditions. Data on important climate variable were assed from FMARD, Federal Ministry of Agriculture and Development report 2020 to validate the impact of rainfall onset and cessation on moderation of climate impact.The resulting impact relating to rainfall such as flood or dry spell in the study area within the period of 2019 and 2020 farming season. This season, coincided with the period of COVID 19 with many constraints both natural, human or pandemic induced on the rice production were assessed with a comprehensive questionnaire. A total of 104 rice producers (28 Processors, 76 farmers) were sampled randomly in 3 communities in Ikwo. Majority of respondents attributed the high cost of rice in 2019/2020 farming period to challenges other than COVID 19 related causes (68 percent). Using appropriate statistical tools, response from the farmers were analyzed while climate data (rainfall) from the FMARD reports was used to compare resulting effect of flood or dry spell (1percent) in 2019 and 2020 respectively.The study were guided with 4 clear objectives as followsi)characteristics of the Ikwo rice farmers.ii)Developing a frame work COVID 19,rainfall related impacts(flood/dry spell) and rice production challenges.iii)finding out the perceived impact of COVID 19 to rice farming in 2019/2020 farming season iv)find out if flood and dry spell recorded are related to onset/cessation of rain in the studied period.

Major problems in the study area were identified as inadequate provision of funds/capital (79 percent), inadequate input provision (67percent)are forces leading to high cost of rice produced within the study period. Finally, corresponding recommendations of best management practices on how to tackle the outlined challenges in situations such as the pandemic alteration period in the future were made. Emphasis on relevance of Ebonyi State, women as the major available labor force in rice farm clearing glaringly noted could be encouraged with adequate funds, imput, extension services and basic climate information especially in situation such as the pandemic era in 2019.Also this study highlighted labour shortage was overcomed due to increasing women participation within the period (79 percent) Ikwo women are crucial to improving agricultural productivity and food security in the state. Therefore, women farmers empowerment in this agricultural community is highly recommended to boost rice output in the community and the State at large.

Author: Adaeze U.P. Department of Geography, Alex Ekwueme Federal University Ndufu- Alike, Ebonyi State, Nigeria.

I. INTRODUCTION

In Nigeria, research and development has focused on women's participation, access to productive resources, and decision-making responsibilities in agriculture and related sectors throughout the last few decades. Many studies argue that the gender gap that impacts agricultural output of many major crops such as rice in many developing countries is due to variations in men and women's duties, priorities, and access to resources and services at the community and household levels. In the case of the rice value chain in Nigeria, there

London Journal of Research in Humanities and Social Sciences

could be a link between economic, and gender factors in agriculture during this Pandemic.

In many aspects, climate change and COVID 19's enlarged obstacles endanger women rice farmers' efforts to produce rice. As a result of global warming.Climate change and COVID 19 extended challenges pose threat to the effort of women rice farmers towards rice production in many ways. Climate change as a global phenomenon is undermining the effort towards achieving the sustainable development goals (SDGs). The intergovernmental panel on climate change (IPCC) described climate change as the change in global climate patterns which can be identified by variability in climate properties over time. (IPCC 2018).

Over the past century, global average surface temperature has increased approximately by 0.60 Cand this has affected both plants and animals differently, this also affect economic growth because agricultural productivity is affected (Akin 2015). This become even more worrisome during the announcement of the first case of COVID-19 announced in Nigeria.

COVID-19 named SARS-COV-2 was first reported by officials in Wuhan City, China in December 2019 (World Health Organization, 2020). Investigation by Chinese authorities identified human case with onset of symptoms in early December 2019 (Wang, 2020). The World Health Organization declared COVID-19 a global pandemic in March, 2020 (World Health Organization 2020).

The first confirmed case in Nigeria was announced on 27th February 2020, when an Italian Citizen in Lagos was tested positive for the Virus (NCDC,2020). This marked the beginning of the difficult engagement among farmers all over the world especially farmers in Ebonyi State.Rice value chain was severely affected within this period.2019/2021(Ibukun and Adebayo, 2021; GAIN, 2020). Climate change, as well as agriculture, food insecurity, and rice production problems were all aggravated by the epidemic.

As a result, rice (Oryza spp.), the world's second-most-consumed cereal (after wheat), influences the lives of millions of people worldwide Akande T. (2020). Rice provides around 80% of the calories required by more than half of the world's population (FAO, 2020). In Nigeria, it has become a staple cuisine, with every household, both rich and poor, consuming it(Esiobu NS, Onubuogu GC (2020).The increase in demand could be due to increased population and income levels, as well as the convenience with which it can be prepared and stored Esiobu NS, Onubuogu GC (2020).

II. PROBLEM STATEMENT

The International Monetary Fund [IMF] forecasted in April 2020 that the global economy would drop drastically by 3% and that the economy of Sub-Saharan Africa would contract by 1.60 percent in 2020, indicating that the pandemic phase will have disastrous repercussions on the global economy (IMF, 2020; CDC and Prevention, 2020). In a worst-case scenario, the Economic Commission for Africa (ECA) predicts that economic activity in Africa as a whole will decrease by 2.60 percent, negatively impacting major economic sectors such as agriculture (ECA 2020). As a result of the foregoing, men and women's roles, priorities, and access to resources and services differed even more as the rice farming suffer. This paper thus enumerates the barriers that strained the rice value chain and aims at evaluating the barriers and challenges that distorted the rice farming in the state within the study period.

Aim : To find out the major barriers that strained the rice value chain more importantly the farming aspect. It therefore assesed the barriers and challenges that distorted the rice farming in the state within the study period.

Objectives: The study were guided with 4 clear objectives as follows.

- Characteristics of the Ikwo rice farmers.
- Find out the perceived impact of COVID 19 to rice farming in 2019/2020 farming season
- find out relationship with flood and dry spell recorded with onset/cessation of rain in the studied period.

- Major problems in the study area were identified.

III. METHODOLOGY

Study Area and sampling techniques: Ikwo is choosen as the study area because rice is their major agricultural produce in Ebonyi state as a whole. Therefore the entire Ikwo rice producing community was studied. Two community was picked at random. A total of 76 farmers were studied. The list of the sample frame was obtained from the local community head. The study targeted the rice farming season of 2019 and 2020.

Data collection and Analysis: The questionnaire was used to generate the primary data used for this study while secondary data on rainfall onset, sensation, dry spell and flood impact was obtained from FMARD, Federal Ministry of Agriculture and Development report 2020. The socio-economic characteristics of farmer, major challenges facing rice farmers within the farming period 2019/2020 including the effect of COVID 19 the impact were captured in different sections of the questionnaire used for this study. Data analysis was done using Descriptive statistics such as percentages, mean and flow chart.

IV. BARRIERS TO RICE PRODUCTION IN THE PANDEMIC PERIOD

During the pandemic, many climate and environmental restrictions influence rice-producing areas in the south east. Climate change and COVID 19 lockdown measures are the most significant during the study period. Rice has surpassed wheat as Nigeria's most important staple food and cereal crop. (NCRI, 2004; Akpokodje et al., 2001). With a yearly consumption growth rate of 4.4 percent (IFDC, 2008), it is the fastest increasing commodity in Nigeria's food basket (Akande, 2003). Nigeria is the top rice grower in the West African sub-region (Oyinbo et al., 2013).

Nigeria consumes about 5.4 million metric tons of rice per year. Local output, on the other hand, is only 2.3 million metric tons per year.Increasing rice production could therefore, contribute to domestic food security and foreign exchange earnings for the nation. Rice marketing entails all the activities involved in moving rice from the point of production to where it is needed by the final consumer (Bassey et al., 2013), in the desired form and at the appropriate time. Rao et al. (2012) stated that agricultural marketing plays an important role in stimulating production and consumption and in accelerating economic development. According to Onu and Okunmadewa (2001), market performance includes the relative efficiency of production (that is, price relative to the average cost of production).

Global food prices continued rising for the second consecutive month in July 2019 led by vegetable oils and dairy products. However, cost of rice in Ebonyi state is extremely high owing to persistent External Environmental factors resulting from the pandemic control measure(lockdown)and factors relating directly and indirectly to Climate change consequences, increase in demand for rice as palliative or inflation as well as the effect of the distorted rice value chain within the initial stage of the Pandemic starting in 2019 made an unprecedented price and demand shift in many parts of Ebonyi State. As a result of the above, bushel off rice that was #4000 before the covid-19, N11,500, N12,500 and at present is a bushel is sold as much as 18,000 naira in Ebonyi state markets, the city is already affected by hunger, thus many of the inhabitants are poor without formal education. Some Food Commodity Prices are increasing mainly because of local logistical problems and up till now the price of rice and other commodity persists in different localities even at this post pandemic period.

V. RICE FARMING CHALLENGES RELATED TO CLIMATE EVENTS

Climate change is one of the most serious threats to Nigeria agricultural sector and food security, because of its sensitivity and vulnerability to high ambient temperature and rainfall fluctuations. For instance, higher temperature lowers the yields of the desirable crops, while encouraging weeds and pest proliferation and changes in

precipitation patterns increase the likelihood of short-run crop failure and long-run production declines. It thus the variability creates a huge challenge for food production (Claire, 2009). Climate change drive extreme weather events such as floods and the increased risks of drought, crop yields losses and are affecting all economic sectors to some degrees but the agricultural sector is the most vulnerable as agricultural production remains very dependent on climate resources (Ajokporise, 2011;Ayandele et al, 2010).

In Ebonyi state, the low output of rice farmers in 2019 and 2020 may be attributed to high incidence of pests, increasing incidence of weeds and diseases resulting from extreme events of the climate in the form of droughts, flooding and its consequences and labour shortage resulting from the lockdown measures. In Ebonyi State, Nigeria, there is increase in rice production but the current level of production still does not meet the estimated national requirement of 5 million metric tons of rice due to the incidence of climate change and increase in population and the effect of of the 2019 Pandemic lockdown measures. These put pressure on the rice value chain within the Country. (Onyenweaku et al, 2000;Oselebe, 2019).

Rice farming is highly dependent on environmental factors which are the most important among several factors that influence agricultural production (Onyegbula, 2017). According to Edeh et al. (2011), rice production depends on optimum combination of factors of production in order to achieve remarkable yield. These factors are not limited to the familiar production inputs but include the various environmental factors provided by nature. Rainfall characteristics (intensity and duration), relative humidity and temperature constitute these weather-related and environmental factors that affect rice production and yield.

The production of rice which is one of the world's most important crop in terms of food security. It therefore help in addressing poverty. Rice as an important staple food is adversely affected by climate variability and change since temperatures in rice-growing areas, increase with continued change in climate (Gumm, 2010).

Therefore, there is evidence to suggest that climate change has potential devastating consequences on humanity (Intergovernmental Panel on Climate Change (IPCC) 2014). Evidence from literature and past studies have revealed that the recent global warming has influenced agricultural productivity leading to declining important food production such as rice (Kurukulasuriya & Mendelsohn, 2006; IISD, 2007; Lobell et al., 2008). Climate change has already affected crop yields in many countries such as in the study area. (IPCC, 2007; Deressa et al).Global food prices continued rising for the second consecutive month in July 2019.

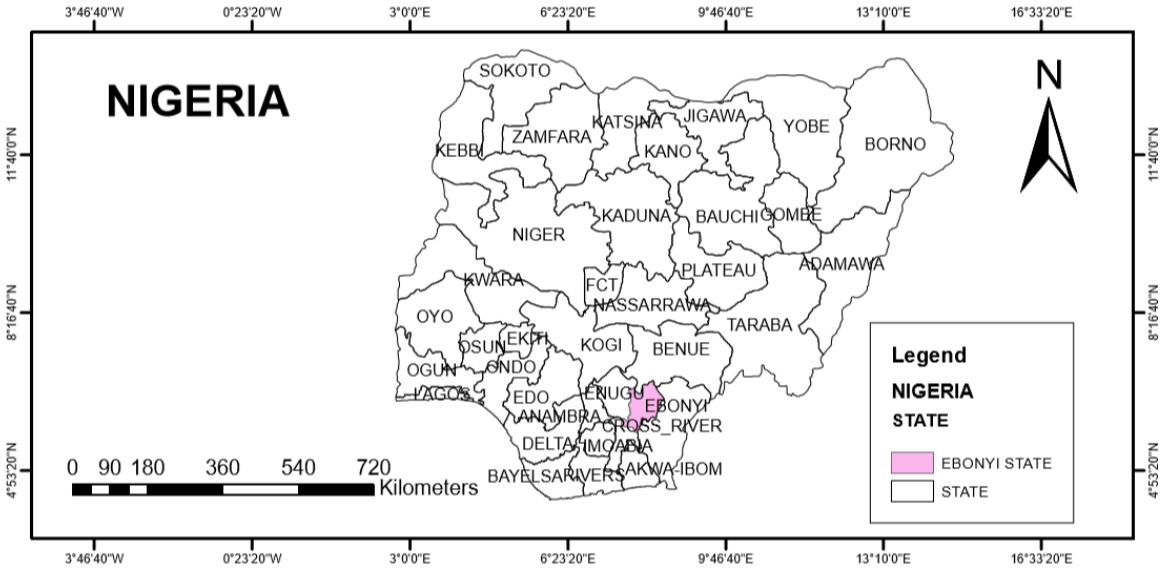

Fig. 1: Location of Ebonyi State, Nigeria

However, cost of rice in Ebonyi state is extremely high owing to persistent External Environmental factors resulting from the pandemic control measure(lockdown)and factors relating directly and directly to Climate change consequences, increase in demand for rice as palliative and the effect of the distorted rice value chain within the initial stage of the Pandemic starting in 2019 made an unprecedented price and demand shift in many parts of Ebonyi State. As a result of the above, bushel off rice that was #4000 before the covid-19, but is now ₦17,500, ₦18,500 respectively in markets, the city is already affected by hunger. This price fluctuations have Some unimaginable impact on the farmers take home income at the end of each farming season as shown in fig.2 above.

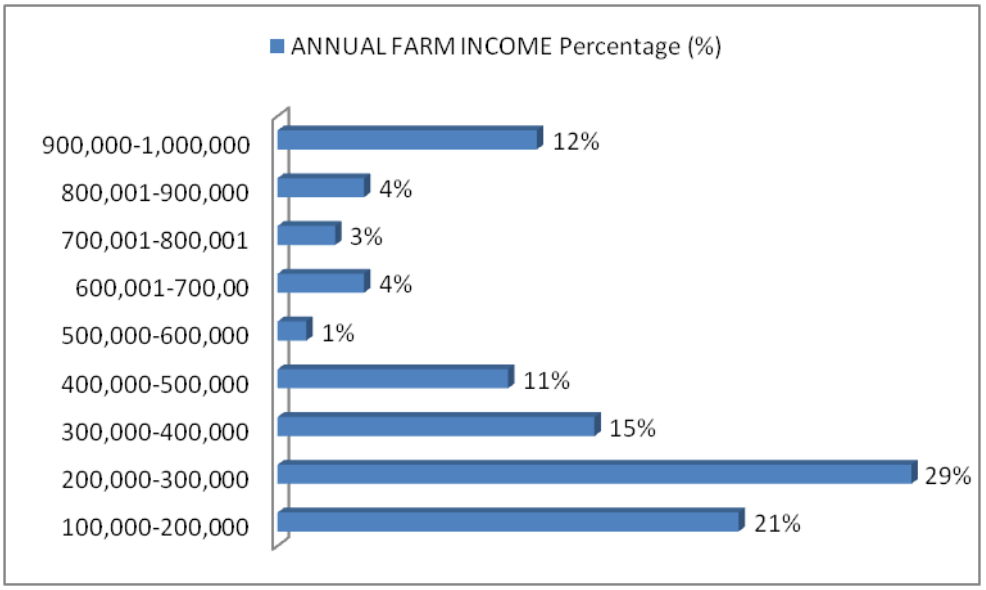

Fig. 2: Annual farm income range for Ikwo farmers over the increasing rice cost 2019/2020

Table 1

BARRIERS AFFECTING THE RICE VALUE CHAIN			
Response	**Assigned values**	**Frequecy (F)**	**Percentage(%)**
death/emotional instability	1	6	8%
drought/flood	2	1	1%
labour shortage	3	11	14%
None	4	45	59%
yield	5	13	17%
Total	**5**	**76**	**100%**

Source: Author "s analysis

VI. RICE FARMING BARRIERS AS A RESULTING FROM COVID 19 CHALLENGES

The agricultural sector was not immune to the problem. According to the African Development Bank (AfDB), the continent's economy will decrease by as much as 3.40 percent throughout the research period (AfDB, 2020).

The COVID-19 pandemic outbreak in Nigeria was marked by severe precipitated rice crises, interrupting the rice value chain system and posing a significant threat to the rice and food value chains.Agriculture sector was not left out in this dilemma. The African Development Bank predicted that the economic contraction for the whole continent will be as much as 3.40 percent within the period under study(AfDB, 2020)

London Journal of Research in Humanities and Social Sciences

Rice was primarily used as a palliative during the epidemic, resulting in a scarcity of rice seedlings for rice growers. The food industry is one of the areas that was exempted from the lockdown since it is considered critical. During the lockdown, many households, especially rice farmers, experienced varied degrees of hunger and food instability.

The restriction on farmland mobility contributed to labor shortages in the rice industry, and the lockdown was announced just before the planting season began. This resulted in a labor scarcity, which resulted in production losses and a rice farm and market deficit.

Rice [Oryzaspp] is the world's second most widely consumed cereal crop, with millions of homes worldwide (Akande,2020). Rice is used by about 80% of the world's population.Rice was primarily used as a palliative during the epidemic, resulting in a scarcity of rice seedlings for rice growers. The food industry is one of the areas that was exempted from the lockdown since it is considered critical. During the lockdown, many households, especially rice farmers, experienced varied degrees of hunger and food instability.

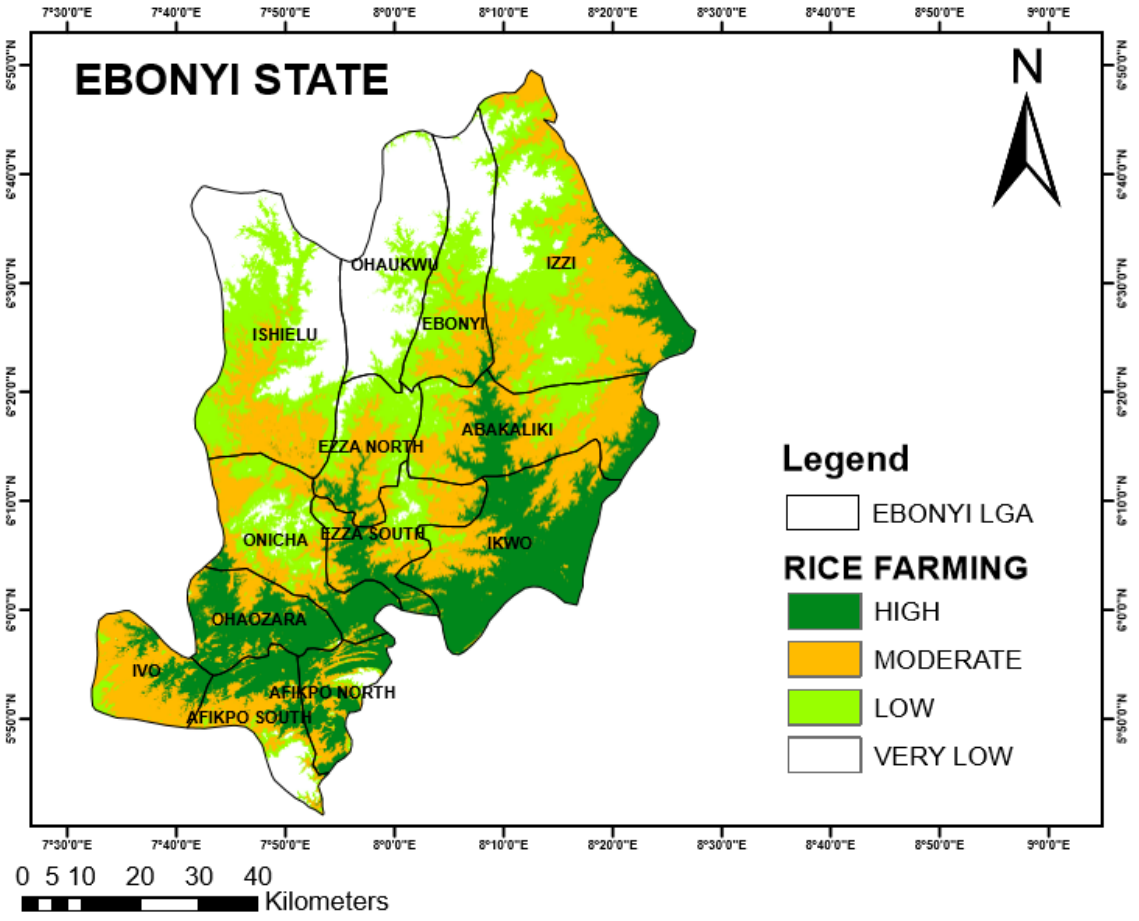

Fig. 3: Rice farming in Ebonyi state

Crop production is predominately rice-based, also faced with increasing vulnerability as well.The increasing variability, intensity and erratic nature of rainfall, rising incidence of flood and soil erosion may be responsible for serious decline in production and in the high cost of rice over these years in the south east.

The restriction on farmland mobility contributed to labor shortages in the rice industry, and the lockdown was announced just before the planting season began. This resulted in a labor scarcity, which resulted in production losses and a rice farm and market deficit are represented in a logical frame below(fig 4)

Rice [Oryzaspp] is the world's second most widely consumed cereal crop, with millions of homes worldwide (Akande,2020). Rice is used by about 80% of the world's pop.

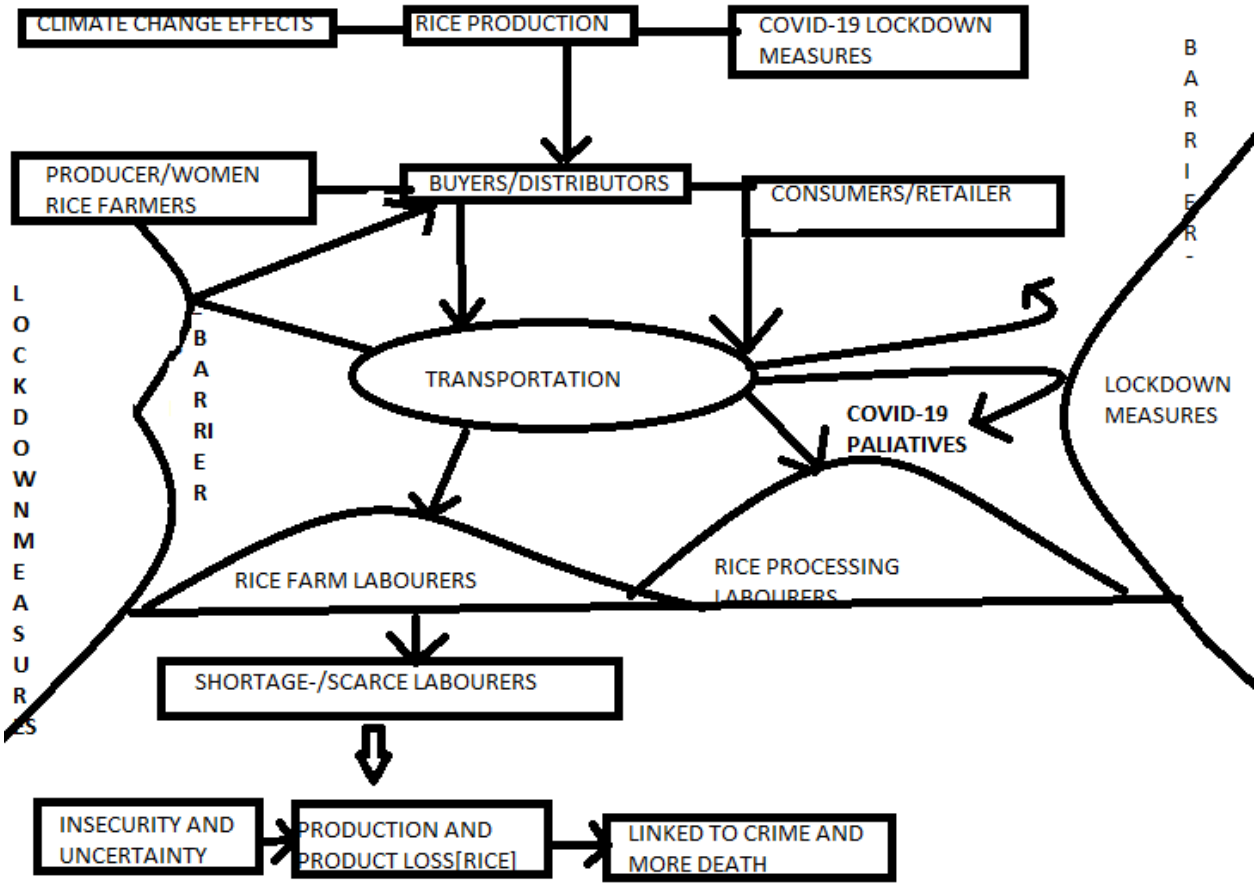

Fig. 4: Rice Value Chain And Barrier 2019/2020

Table 2: Challenges of rice farming in 2019/2020 farming season

BARRIERS AFFECTING THE RICE VALUE CHAIN		
Responses	**Frequecy (F)**	**Percentage(%)**
No	27	36%
Yes	49	64%
Total	76	100%

Figure 1: Barriers Related to Covid Versus Others(Not Related to Covid Pandemic Outcome)

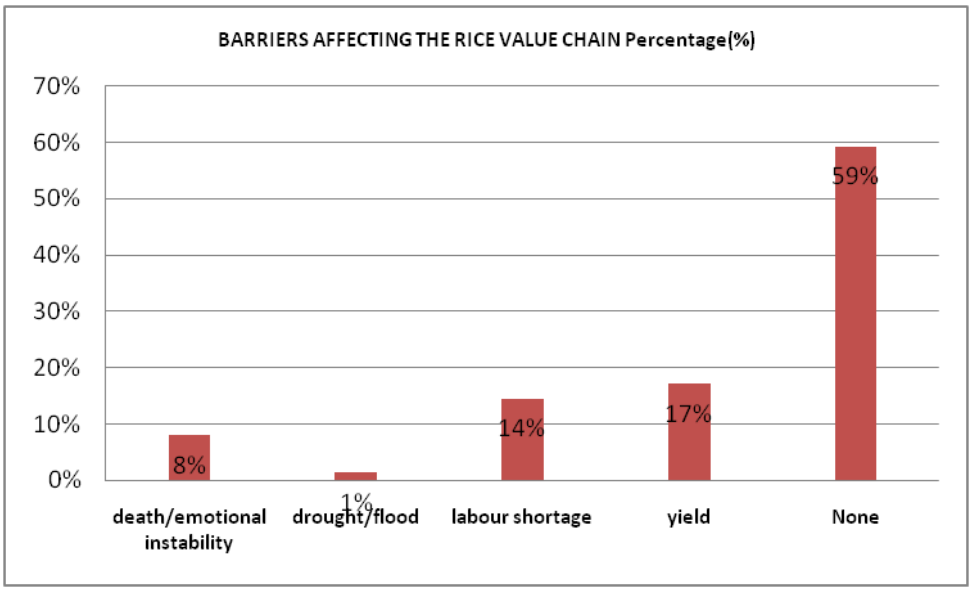

Fig 5: Source: Author's Analysis(2019/2020 Rice farming season)

In Ikwo, Ebonyi state rice production is affected with 1 percent flood /drought impact relating to climate event and harzard while Ikwo is not alone as these are among the obvious climate change hazards ravaging communities across Southeast Nigeria as seen table 2and represented with fig 5 above. The other challenges faced by farmers within this period includes yield at 17percent with a less labour shortage impact of 14 percent. Relatively farmers accounted for the the death/ loss of loved ones to have affected them more than the climate related impacts at 8 percent.

VII. RESULTS AND DISCUSSION

Characteristics of farmers as shown below includes active participation of all age ranges and more importantly the women folk as much as 79 percent agree to effective women participation in rice farming especially in farm clearing and harvesting.The major active rice farmers are within the age range 41-50 and 51-60 usally this concides with farmers with the high farming experience over a decade.

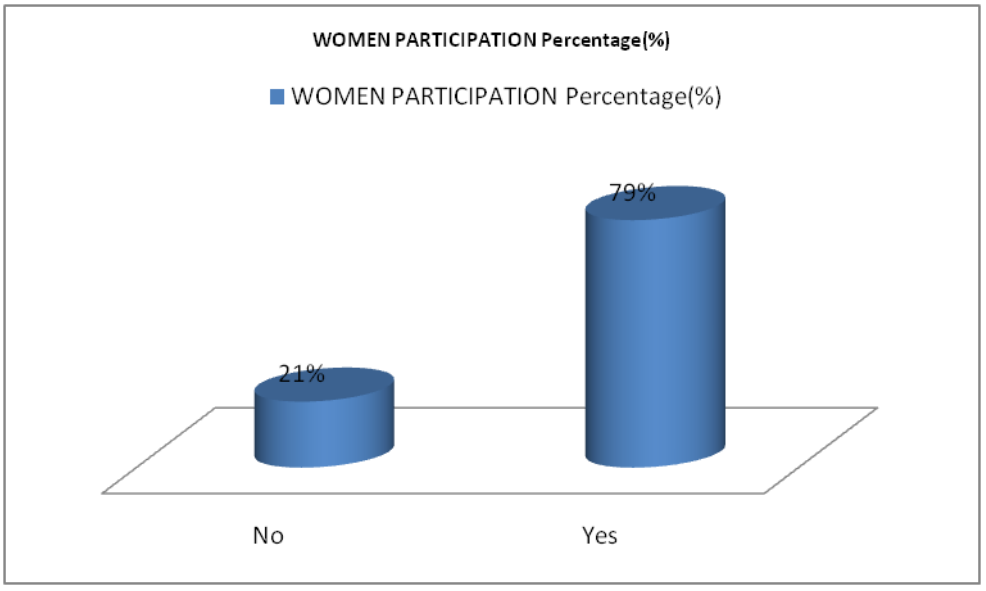

Fig. 6: Perceived women participation by the rice farmers

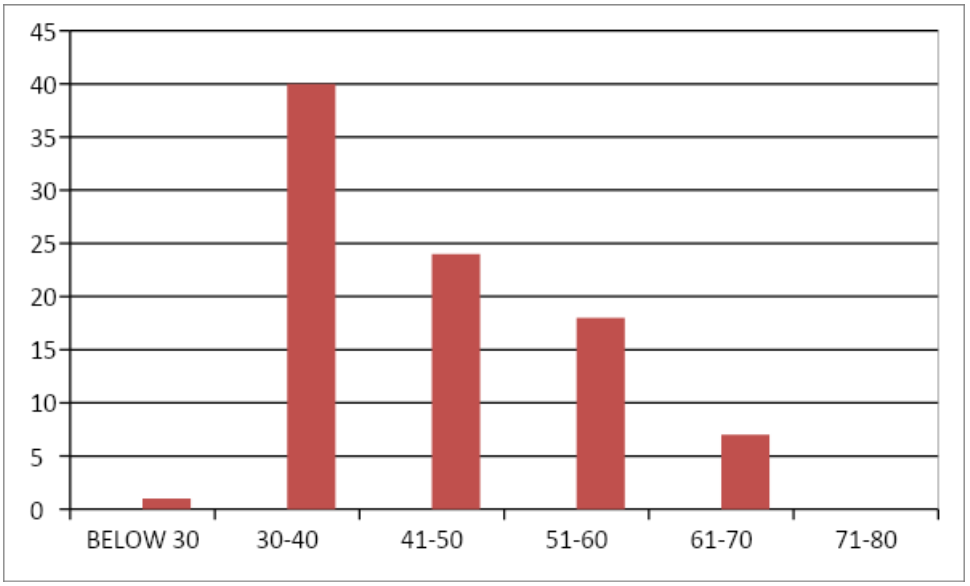

Fig. 1: Age of Rice Farmers in Major Rice Producing Community In Ebonyi State(Ikwo)

Character and age of rice farmers and the major challenges encountered within the period under study are grouped into 2(minor and major impacts) in other to elicit the important information. The minor impacts includes flood/dry spell or drought 1percent,emotional instability 8 percent, challenges relating to yield and income at 17 percent and finally labor shortage at 14percent.Most of the farmers recounted nothing about this impact(69)and therefore are categorized as none. Farmers are of the opinion that the impact is indeed minor that is the reason for most farmers not categorizing it any of the above discoursed as an eminent treat or hazard, hence their grouping as minor barriers to rice farming in 2019/2020 farming period.

The category B barriers includes inadequate access to credit facilities ,no/inadequate to extension contacts and information and inadequate(high cost) provision of input such as fertilizer,improved seedlings, herbicide, pesticides and even farming implements and machines.

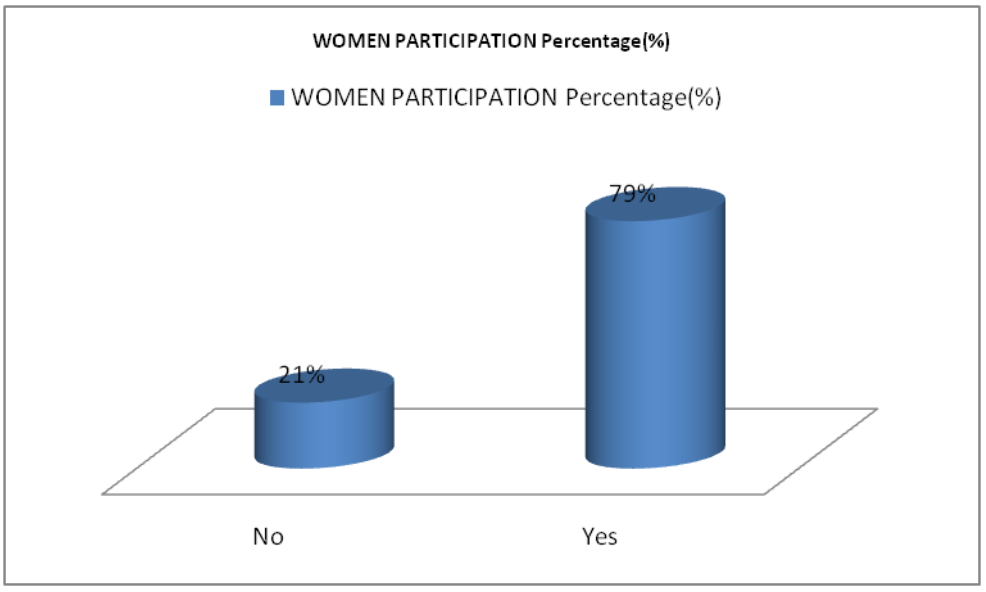

Fig. 4: Access to credit

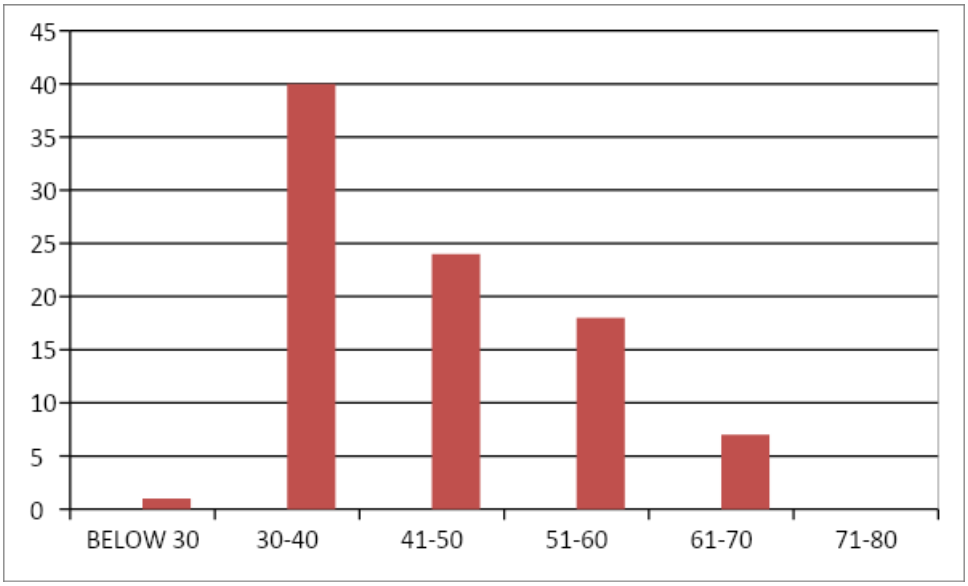

Figure 3: Extention contact presence according to the farmers

VIII. CONCLUSION

This paper sustained a discussion on the argument that since the beginning of the COVID 19 Pandemic in Nigeria under a changing climate in Ebonyi State. The lockdown measure led to increased demand for rice in the State and its neighbors. Rice was a major "palliative" product for use for the government, non-governmental organizations and the populace. This increasing stress on rice value chain, labor scarcity and mobility also led to increased burden on rice farmers in the Ebonyi State. This study pointed out the rice production systems barriers and the need for improved farming practices in place to increase yield, particularly now with the increasing count on barriers affecting rice value chain. The barrier of Pandemic and Climate related events are double threat for farmers. As a matter of urgency, farmers must respond to this new threat (COVID-19) by choosing measures that improve yield by minimizing all that constitutes a barrier to their yield and farming process. Also take measures that will ensure consistency in market supply and distribution across the distribution chain. Therefore, the challenges affecting rice production should be top priority. Farmers should respond to this new threat of COVID -19 by choosing methods that can improve rice yield without necessarily increasing labor intensity.

REFERENCES

1. Africa Development Bank (AFDB) (2020)."Africa economic outlook 2020 amid COVID-19 Supplement.
2. Akande T (2020). An Overview of the Nigerian Rice Economy; Agriculture and Rural Development Department the Nigerian Institute of Social and Economic Research (NISER).
3. Akande, T. (2003). An Overview of Nigerian Rice Economy. Retrieved from.
4. Akin bode S.O (2015).Access to credit implication for sustainable Rice production in Nigeria.J. sustain Dev. Africa 15(1).
5. Akpokodje, G., Lancon, F. and Erenstein, O. (2001). Nigeria's Rice Economy: State of the Amare, M., Abay, K.A., Tiberti, L. and Chamberlin, J. (2021). COVID-19 and food security: Panel data evidence from Nigeria. Food Policy 101 (2021) 102099 https://doi.org/10.1016/j.foodpol.2021.102099.
6. Art. Paper presented at the Nigerian Institute for Social and economic Research. Available from:https://unep.ch/etb/etp/events/Agriculture/nigeria.pdf.
7. IPPC (2018) Climate change: impact, adaptation and vulnerability.part A. Global and sector aspect. Contribution of working Group11 to the fifth assessment Report of the intergovernmental panel on climate change, field, C.B and Barros (Cambridge,UK and

New York: Cambridge University press 2018).
8. Ebonyi state Handbook on the Indonesian Agriculture Support Programme (IASP) for Nigeria.
9. Economy Stakeholders Workshop, Ibadan, 8-9 November 2001. :Pp 26.
10. Ejike-Alieji, A.U.P and Ekpoh, J.I(2021) Climate Variability and rice yeild:Climatology approach to food security.Book chapter in Hand book of Climate change Management. Meteo Springer/Nature. https://meteor.springer.com.
11. Ejike-Alieji, A.U.P. and Ekpoh, I.J. (2020) Rice yield management for improved food security in a climate variability scenario of Ayamelum in Anambra State. Nigerian Journal of Geography and the Environment; 4(2): 164-175.
12. Esiobu, N.S and Onubuogu, G.C (2014). Trend perception and adaptation Option of arable crops farmers to climate change in Imo state Nigeria: a multinomial logit approach. World science journal 2014. 5(9):12-24.
13. Esiobu, N.S. And Onubuogu,G.C (2020). Sustainability and determinate of farmers mitigation strategies to Green House Gases (Ghgs) Emission in Rice Agric- food system in Nigeria. IntechOpen:Doi:https://dx doi.org/10:5772/IntechOpen 93188. Vol.9(6):pp:01-16.
14. FAO (2019) Food and Agricultural Organisation (FAO). The State of Food and Agriculture; 2010–2019. Rome; 2020. p. 202.
15. GAIN (2020) Impact of COVID-19 on Food Systems in Nigeria.Situation Report - Edition 1. November 2020.
16. H.L.Miller Cambridge and New York. Cambridge University Press http://www.unep/etu/etp/events/agriculture/nigeria.pdf.
17. Ibukun, C.O. and Adebayo, A.A. (2021). Household food security and COVID-19 pandemic in Nigeria. *AfricanDevelopment Review*,33:S75–S87.
18. Oselebe, H.O. (20 I 9), Knowledge and Technology Transfer for Agricultural Revolution in.
19. Oyinbo, O., Omolehin, R.A. and Abdulsalam, Z. (2013). Household Consumption Preference for Imported and Domestic Rice in Kaduna State, Nigeria: Implication for Rice Quality Improvement. Production Agriculture and Technology Journal, 9(1): 29-37.pp. 1-16.
20. Patricia Caffrey, Timothy Finan, SylwiaTrzaska, David Miller, Rita Laker-Ojok and Samuel Huston (2020)Sustainability and Determinate of Farmers' Mitigation Strategies to Greenhouse Gases (GHGs) Emission in Rice Agric-Food System in Nigeria.Rijeka, Croatia: IntechOpen; 2020.
21. IPCC forth assessment report edited by S. Solomon, Z.Chen, K.B.Avery, and United States Agency for International Development (USAID).(2013). *Uganda Climate Change Vulnerability Assessment Report*.
22. Wang H, Wang Z.B, Dong Y. Chang R, " COVID-19 page" Nigeria Centre for Disease Control.https:// COVID-19 NCDC.gov.ng / Retrieved 24 July,2020 WARDA. 55pp.
23. WHO(2020) "WHO Director Generals Opening remarks at the Media briefing on COVID-19 Africa- protecting lives and economies.
24. World Health Organization (WHO,2020). Infection, prevention and control during health care when COVID-19 is suspected. https://www who.int/publications- details/infection-prevention and control during health care- when novels- Coronavirus - infection- is- suspected.20200125.
25. Amare, M., Abay, K.A., Tiberti, L. and Chamberlin, J. (2021). COVID-19 and food security: Panel data evidence from Nigeria. Food Policy 101 (2021) 102099 https://doi.org/10.1016/j.foodpol.2021.102099.
26. United States Agency for International Development (USAID). 2013). *Uganda Climate Change Vulnerability Assessment Report*. Prepared by Patricia Caffrey, Timothy Finan, SylwiaTrzaska, David Miller, Rita Laker-Ojok and Samuel Huston.
27. Climate change: impact, adaptation and vulnerability.part A. Global and sector aspect. Contribution of working Group11 to the fifth assessment Report of the intergovernmental

panel on climate change, field, C.B and Barros (Cambridge,UK and New York: Cambridge University press 2018).
28. Akin bode S.O (2015).Access to credit implication for sustainable Rice production in Nigeria.J. sustain Dev. Africa 15(1).
29. World Health Organization (WHO,2020). Infection, prevention and control during health care when COVID-19 is suspected. https://www who.int/publications- details/ infection-prevention and control during health care- when novels- Coronavirus-infection- is- suspected.20200125.
30. Wang H, Wang Z.B, Dong Y. Chang R," COVID-19 page" Nigeria Centre for Disease Control. https:// COVID-19 NCDC.gov.ng / Retrieved 24 July,2020
31. World Health Organization (WHO, 2020) "WHO Director Generals Opening remarks at the Media briefing on COVID-19 Africa-protecting lives and economies.
32. Africa Development Bank (AFDB) (2020)." Africa economic outlook 2020 amid COVID-19 Supplement.