



## Assessing the economic impact of COVID-19 pandemic on rice production in Kebbi State, Nigeria

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### Abstract

The study assesses the economic impact of Covid-19 on rice production in Kebbi State, Nigeria. Multi-stage sampling technique was used to select the rice farmers used for the study. Stage one involving purposive selection of (5) Local Government Areas that are predominant in rice production in the State. Stage two involving random selection of 50 farmers from the list of registered rice farmers in each of the selected Local Government Areas given a total of 250 rice farmers used for the study. Data collected were analyzed using descriptive statistics involving frequency, percentage and mean scores. Results of the study revealed that the most of the rice farmers (94%) were aware of the Covid-19 pandemic and their common source of information were radio (100%) and friends and relatives (89%). Similarly, the results showed that the amount of farm inputs utilized by the rice farmers have reduced during and after the pandemic. For instance, quality of seed utilized before the disease outbreak was 80kg/ha which declined to 45kg/ha during the pandemic and made a small recovery to 65kg/ha after the pandemic. The level of fertilizer used dropped from 250kg/ha before the pandemic to 150kg/ha during the pandemic but recovered to 250kg/ha after the pandemic. Annual yield also declines from 4000kg/ha before the disease to 2000kg/ha during the pandemic. Off-farm income was also affected by Covid-19. For instance, money realized from trading reduced to half (₦223,843/annum) compared to what is as obtained before the pandemic (₦410,567/annual). However, income realized from civil service was not affected much. Some of the coping strategies adopted to survive were reliance on savings and sale of assets. The study, therefore, recommended channels of farm inputs, processing and marketing be adequately established and protected to ensure that they are not affected by imposition of regulations to address emergencies such as Covid-19. The State Government needs to provide more assistance to rice farmers in the State to enable them fully recover from the adverse effect of Covid-19 which still persist.

**Keywords:** COVI-19, rice production, Impact, Kebbi State

### 1. Introduction

Rice (*Oryza sativa* L.) is the main food crop of an estimated 40% of the world's population [1, 2]. The World's more than three billion people depend on rice as their staple food and the demand for rice is more rapid in Nigeria compared to other West African countries [3]. This rapid increase in rice demand is largely due to rapid population growth, increased urbanization and people's preference for rice as a convenience food [3]. Annually, about 5 million metric tons of rice is consumed in Nigeria and over 80% is imported costing the country a humongous amount of money [4].

As a result of the COVID-19 pandemic, however, majority of the local rice farmers are hindered from accessing markets to sell their products or buy essential farm inputs or struggle due to higher food prices and limited purchasing power. Among the local farmers, those that work as part-time labourers are hard hit by job and income losses in harvesting and processing. The

supply and demand chains of rice are, therefore, distorted and farm families become the hardest-hit [5].

With the declaration of COVID-19 as a global emergency by World Health Organization (WHO) on March 2020, its impacts on the entire world population and the economy were reported [6]. In this regard, a report by [7] has indicated that the crisis caused by the coronavirus pandemic is plunging the world economy to depths unknown since the Second World War, adding to the woes of an economy that was already struggling to recover from the pre- 2008 crisis. A scenario simulation report by [8] revealed that the global growth could fall by half for the year 2020 due to the direct effects of COVID-19 and the global economy may enter recession at least in the first half of the year 2020 when direct and indirect effects of COVID-19 are added together. OECD [9] predicated a sharp decline in the economic growth of world major economies as; China from 5.7% to 4.9%, Europe 0.8% instead of 1.1%, the rest of the

world 2.4% instead 2.9%, with world GDP falling by 0.412 from the first quarter of 2020.

[5] opined that the impacts of COVID-19 on agriculture will affect all elements of the food system, from primary supply, to processing, to trade as well as national and international logistics systems, to intermediate and final demand. It will also affect factor markets, namely labour and capital, and intermediate inputs of production. [10] observed that 'border closures, quarantines, market supply chain and trade disruptions due to COVID-19 pandemic are restricting people's access to sufficient/diverse and nutritious sources of food, especially in countries hit hard by the virus or already affected by high levels of food insecurity'. In addition, local farmers are hindered from accessing markets to sell their products or buy essential inputs, or struggle due to higher food prices and limited purchasing power.

As more than 80 percent of rural population rely on subsistence farming in West Africa, market closure, restriction on internal and cross borders movement limit markets access leading to significant harvests loss. Consequently, smallholder farmers' incomes are shrinking and purchasing power decreasing [11]. As the COVID year (2020) year planting period started in May/June, the Covid-19 epidemic was forcing governments to cut agricultural expenses and to prioritize health-related expenditures. As a result, millions of farmers did not receive subsidies for the 2020 agricultural season. If the above-mentioned restrictions continued, farmers did have access to market to buy good quality seeds, fertilizers and other farm inputs (source).

While it is very common to carryout survey to assess the number of people affected and those that lost their lives due to a pandemic, few study have so far been done to assess the real effects of any of the pandemics such as COVID-19 on rice production in Kebbi state. Similarly, the recent corona virus pandemic is believed to have distorted the entire economic sectors in Nigeria and agriculture is one of such sectors which happens to be the life wire of the people in the State by occupying a center stage of their economic activities. All reported cases on the number of people affected and number of deaths from COVID-19 available so far are based on surveillance data and extrapolations based on projections. Although this information is valuable, absence of parametric information leaves major constraints to understanding the real effects of the pandemic, particularly as it affects rice production in Kebbi State. This shall disallow any meaningful agriculture-specific interventions to be accomplished. This study is therefore, aimed to assess the impact of covid-19 on rice production in Kebbi State.

## 2. Materials and methods

### 2.1 The Study Area

The study was conducted in Kebbi State. The State is located in north-western Nigeria within latitudes 10<sup>0</sup> - 14<sup>0</sup>N and longitudes 3<sup>0</sup>-7<sup>0</sup>E [12]. It covers an area of 36,129 sq km and situated in the Sahel savannah vegetation zone. It is bounded by Niger and Benin Republics to the west and by the Nigerian States of Sokoto and Zamfara in the north east and Niger State to the south [12]. It has a total landmass of about 36,229 km<sup>2</sup> representing 3.92% of the land area of the country. It has a projected human population of 4,304,520 [13]. Kebbi State consists of 21 local government areas and is populated by diverse ethnic groups, prominent among which are Hausa, Fulani, Zabarmawa, Kambari, Dukkawa and Lelna (Dakarkari). The State located in sudano-sahelian vegetation has two distinct climatic seasons; lengthy dry season characterized by high temperatures between 38°C to 42, and a short-wet season lasting about four months [14]

### 2.2 Sampling Technique

The study population comprised of rice farmers in kebbi state. Rice farming households that are engaged in any rice activity that adds value to the crop (such as Production, processing and marketing) during the pandemic constituted the sampling frame for the study. Step one involved purposive selection of 5 LGAs where rice is predominantly cultivated. Step two shall involve collection of lists of rice farmers in each Local followed by identification of those that are engaged in any rice activity that adds value to the crop (such as Production, processing and marketing) during the pandemic. Step three involved random selection of 50 rice farmers (from among those identified in step two) from each Local Government Area already selected. At the end, 250 rice farmers constituted the sample for the study.

Two sets of data were obtained for the study using questionnaire. The first set covered information prior to COVID-19 pandemic and the second set covered information during the pandemic. Focus Group Discussion was organized with the respondents to compliment information obtained through questionnaire.

### 2.3 Data Analysis

Data collected were analyzed using descriptive statistics involving frequency, percentage and mean scores

## 3. Results and Discussion

### 3.1 sources of information and Precautionary measures against the disease

Table 3.1 shows results on the proportion of respondents that are aware of the Covid-19, source of information and some of the precautionary measures adopted during the pandemic. It is revealing from the table that majority of the rice farmers are aware of the

pandemic, and that, most of them have information about the disease through radio (100%) and friends and relative (89%). This indicates that information dissemination through radio and friends and relatives have played significant roles in creating awareness about Covid-19 among rice farmers in Kebbi State. The two sources could therefore be used in disseminating vital information to the rice farmers in the state. The result was in agreement with [11] who reported that about 65% of the rice farmers in Niger State were aware of the pandemic.

Results in Table 3.1 revealed further that hand-washing (100%) and use of face mask (92.4%) are the two major precautionary measures used by the rice farmers as preventive measures against contacting the disease. The result is in line with [12] who observed that hand-washing and use of face masks were the common precautionary measures during the pandemic. Other measures such as personal distancing (19.3%) and self-isolation (23.4%) are not as important as the previously mentioned hand washing and use of face masks.

**Table 3.1:** COVID 19 sources of information and Precautionary measures against the disease

Covid-19 information	Freq	%
Availability of COVID-19 Information		
Yes	235	94.0
No	15	6.0
*Information sources:		
Radio	182	100.0
Bulk Message	24	13.2
Ext. agents	16	8.8
Television	19	10.4
Friends and relatives	162	89.0
	(403)	221.4*
*Precautionary measures		
Hand washing	145	100.0
Face marks	134	92.4
Personal distances	28	19.3

**Table 3.1: Cont.**

Self-isolation	34	23.4
Others	45	31.0
No measures	46	31.7
	(432)	297.9*

\*= Percentage added to above 100 because of multiple

### 3.2 Farm inputs utilization and yield obtained before, during and after the pandemic

Table 3.2 shows information on average levels of farm inputs utilized and yield obtained by rice farmers just before (2018), during (2019-2020) and just after (2021-2022), the Covid-19 pandemic. Results on the levels of farming utilized showed the same trend; that is, there are sharp drops in the quantity of all the farm inputs utilized during Covid-19 compared to the amount utilized just before the pandemic.

Similarly, the levels of farm inputs utilized after the pandemic, (2021 and 2022) was greater that the levels utilized during the disease period (2019 and 2020). The outcome of the results may not be surprising because before the Covid-19, farm inputs were easily procured at relatively lower prices compared to during the Covid-19 period when it was very difficult for farmers to procure farm inputs due to markets shutdown and high transportation costs. The same reasons can be advanced on why more farm inputs are used after the pandemic. This finding agrees with [15] who observed that famers little or no access to farm inputs during the lockdown.

Furthermore, yield obtained just before Covid-19 (4000kg/ha) and after Covid19 (3500kg/ha in 2021 and 3000kg/ha in 2022) were higher than that obtained during the pandemic (2500kg/ha in 2019 and 200kg/ha in 2020). This means that there are significant reductions in farm inputs utilized and yield obtained during Covid-19 as compared to the qualities of farm inputs utilized just before and after the pandemic.

**Table 3.2:** Average levels Level of farm inputs utilization and yield obtained before, during and after the pandemic

Farm input	2018 Mean SD		2019 Mean SD		2020 Mean SD		2021 Mean SD		2022 Mean SD	
Seeds (kg/ha)	80	46.33	50	32.44	45	11.98	65	23.46	65	25.09
Fertilizer (kg/ha)	250	231.2	150	98.65	150	76.52	200	111.0	250	90.31
Herbicides (kg/ha)	8	5.09	5	2.23	4	3.01	6	3.99	7	5.21
Labour (manday/ha)	102	47.06	60	42.43	50	12.39	70	55.04	75	43.62
Yield (kg/ha)	4000	2003	2500	1324	2000	1233	3500	2334	3000	212.4

### 3.3 Off-farm income obtained before, during and after the pandemic

Table 3 shows results on off-farm income obtained by rice farmers in Kebbi State. it is revealing from the results that trading is the most important off-farm source of income of the rice farmers, although the average

amount obtained during the pandemic (₦223,843 in 2019 and ₦245,894 in 2020) and after the pandemic (₦243,443 and ₦256,228) are both halves, the amount obtained just before the pandemic. This shows that Covid-19 has brought about reduction in income realized from trading activities engaged by during off-

rice production activities by the farmers. Results of off-farm income obtained from part-time labour shows that average annual income obtained during Covid-19 reduced compared to what the farmers used to obtain before the disease. However, farmers are able to recover after the Covid-19 (₦73,786 in 2021 and ₦123,622 in 2022). However, the amount of income obtained from fishing during Covid-19 was higher than what they

obtain before the pandemic and after the pandemic. This may be because their fishing sites may be located within their immediate rural communities where enforcement of movement restriction may be less, thereby enabling the farmers to concentrate more on fishing for off-farm income generation. On the contrary, there is no much difference in the amount of income generated before, during and just after the pandemic.

**Table 3.3:** Average Off-farm income obtained before, during and after the pandemic

Source	2018	2019	2020	2021	2022
Trading	410,567	223,843	245,894	243,443	256,228
Part-time labourer	109,421	64,664	60,002	73,786	123,622
Fishing	78,600	123,097	146,454	98,880	106,673
Civil servant	276,000	269,345	287,098	274,556	275,099

**3.4 Coping Strategies Against Covid-19**

During the Covid-19 pandemic, different coping strategies have been adopted and such strategies were examined and the result presented in Table 3.4. The table shows that most of the rice farmers sale their assets (54%) and/or rely on savings to survive during the period of the scourge.

**Table 3.4:** Coping strategies by the rice farmers against COVID-19

Type of Coping strategies	Freq	%
Sale of Assets	135	54
Reliance on savings	146	58.4
Reduce consumption	79	31.6
Support from friends and relatives	46	18.4
Support from Government	21	8.4
E-business	12	4.8
Others (specify)	43	17.2
<b>Total</b>	<b>482</b>	<b>192.8*</b>

\*= Percentage added to above 100 because of multiple response

**4. Conclusion**

Base on the results of the study it can be conducted that Covid-19 has adversely affected the on farm and off-farm activities of rice. Farmers in Kebbi State. It has brought about sharp drop in the amount of rice farm inputs utilized and yield realized by the rice farmers in Kebbi State. Some of the coping strategies adopted to survive during the pandemic were realized on savings and sell of assists.

**5. Recommendations**

On the basis of the results outcome, therefore, it is recommended that:

- i. There is the need for the state Government to design an early warning system against future occurrence of an emergency like Covid-19 enable rice farms prepared adequately on how to tackle the situation.

- ii. Used of mobile phone short message services (sms) in an affective mobile phone tool that can be used to provide early warning information to millions of rural famers.
- iii. In order to ensure that rice production is not disrupted in the event of emergencies, farm inputs channels, processing and marketing should be maintained and protected to ensure that they are not affected by imposed regulations to address such emergency.
- iv. There is the need to improve digital enabled services to rice farmers in Kebbi State by providing infrastructure that will ease the agricultural information transfer.
- v. Kebbi State Government needs to provide assistance to the rice farmers in the State to enable them recover from the Covid-19 losses which adverse effects still persist.

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