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Yam Farmers' Perceived Effects of COVID-19 Pandemic on Yam Production in Taraba State, Nigeria

*Shuaib, A.U., Ephraim, S.C. and Tsukutoda, I.I

Department of Agricultural Economics and Extension, Federal University Wukari, Taraba State, Nigeria

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***CORRESPONDING AUTHOR:**
abdulrashidusman02@gmail.com

ABSTRACT

The main objective of the study was to determine the effects of COVID-19 pandemic on yam production in Taraba State. A total of 120 respondents were purposively selected from 8 village communities of 4 local government areas of the state. The local government areas were: Wukari, Ibbi, Yorro and Zing. Data were collected on both socio-economic and farm characteristics of the respondents. Other areas include: perceived effect of COVID-19 pandemic on yam production, information needs of the respondents during COVID-19 pandemic, and constraints to adaptation strategies experienced by the respondents during COVID-19 pandemic. Data collected were analyzed using frequency and percentages, mean score, standard deviation and factor analysis. The result of the analysis revealed that the majority (72.5%) of the respondents were males and married (68.3%) and the farmers mean age was 35 years. The mean household size of the respondents was 5 persons. The pandemic had negatively affected yam production in the study area and led to decline in farm income, shortage of input supply, general outbreak of yam beetle disease. Information needs of the respondents includes: access to marketing, access to fertilizer, access to credit. Major constraints encountered by the respondents in adapting to the adverse effect of the pandemic include high cost of labour, communication/ language barrier in getting information about COVID-19 pandemic, and diversion of COVID-19 pandemic palliative meant to cushion the adverse effect of the pandemic. It was recommended that government should strengthen early warning and surveillance systems to detect and monitor emerging infectious diseases.

INTRODUCTION

The COVID-19 pandemic, first reported in Wuhan, China, in December 2019 and declared a global pandemic by the WHO on March 11, 2020, had profound effects worldwide, impacting 210 nations (Noor, Maqbool, Bhatti & Khan 2020). In Nigeria, the activation of the National Coronavirus Emergency Operation Center led to stringent measures (Adepoju, 2020). including lockdowns, which disrupted agricultural activities crucial for the economy, particularly for the 76% of households engaged in farming (Amankwah, Gourlay & Zezza 2021). The pandemic severely affected farmers' socio-economic conditions, especially in rural areas like Taraba State, where

inadequate healthcare facilities hindered effective pandemic response and threatened food security (Audu, 2022).

Yam, a staple crop in Nigeria, represents a significant part of global production, with the country contributing 70-76% of total output, (Obidiegwu, Lyons & Chilaka, 2020). In 2022, the total global production of yam reached 88,257 kilotonnes (kt), marking a 2.11% increase from the previous year and a 39.8% rise over the last decade and Nigeria is the world's leading producer of yam, accounting for approximately 69.3% of global production (Helgi Library, 2024). In 2022, Nigeria's yam output was estimated at 61,171 kt (Helgi Library, 2024). Despite its importance, challenges such as rising costs, low capital, land scarcity and poor infrastructure hindered yam production (Ariyo, Usman, Olorukooba, Olagunju, Oni, Suleiman & Ariyo 2020). The International Institute of Tropical Agriculture warned that yam farmers could lose up to 75% of potential yields due to delays in planting caused by COVID-19 restrictions. While many sought agricultural labour due to limited job opportunities during the lockdown, the overall productivity and income levels of yam farmers were significantly impacted (Ufondu, Maziya-Dixon & Okonkwo 2020).

While some studies have examined the broader impacts of COVID-19 on agriculture and food security, (Siche, 2020; Workie, Mackolil, Nyika & Ramadas 2020; Mardones, Rich, Boden, Moreno-Swit, Caipo, Zimin-Veselkoff, & Baltenweck 2020; Aromalan & Muyanga, 2020; Balana, Oyeyemi, Ogunniyi, Fasoranti, Edeh, Aiki & Andam 2020). There is notable inadequate empirical research specifically addressing its effects on yam production. This gap complicates efforts by government and private sectors to develop effective strategies to support farmers and mitigate the pandemic's adverse effects on this critical agricultural sector.

METHODOLOGY

The study was conducted in Taraba State, Nigeria. The state is one of the states in north east geopolitical zone. The state lies between latitude $6^{0}30^{11}$ and $9^{0}36^{11}$ north of the equator and longitudes $9^{0}10^{11}$, $11^{0}50^{11}$ East of Greenwich Meridian (Abdulhamid, Yahaya, Yahaya, & Cletus 2020). The state has a land area of 54,473km^{2} and a population of 3,331,885 people (National Bureau of Statistics, 2020). The State predominantly features guinea savanna as its main vegetation cover and the topography is essentially marked with mountainous lands intersected by large river valleys (Hassan, Jonatthan & Idris 2022). Yam cultivation in the state is labor-intensive and mostly a continuation of traditional techniques involving crude instruments that have been passed down through successive generations (Yusuf, Yusuf, Yusuf, Philip, Abba, 2020).

Sampling Procedure

The population of the study comprised yam farmers in Taraba State. Sampling procedure was used to select the sample size. In the first stage, two senatorial zones (Northern and Southern senatorial zones) were purposively selected for the study because of their proven strength and popularity in yam production. In the second stage, two high yam producing local government areas were purposively selected from each of the senatorial zones giving a total of four local governments (Wukari Ibbi, Yorro and Zing). In the third stage, two dominant yam farming town communities were purposively selected in each of the selected local governments giving rise to 8 town communities (Monkin, Yakoko, Pantisawa, Mumuye, Tsukundi, Rimi Uku, Puje and Sarkin Kudu). In the fourth stage, one village community was purposively selected from each of the selected town communities making a total of 8 village communities (Bibong, Della, Nyajja, Dilla, Avyi, Bye-Pyi, Gindin Waya and Masu).

In the final stage, 120 respondents were interviewed from the selected village communities, for this study; however, 120 questionnaires were administered. This was done by selecting every yam

farmer randomly not minding their status in the community. The process was repeated until the required sample size was obtained.

The sample size was determined by using the formula given by Taro Yamane (1967):

$$n = \frac{N}{1+N(e)^2}$$

Where;
n = sample size;
N = population of the study;
E = error of margin taking at 5% level
Therefore, a total of 120 yam farmers were selected proportionally for the study. (Table1).

$$n = \frac{251}{1+251(0.5)^2}$$

$$n = \frac{251}{1+251(0.0025)}$$

$$n = \frac{251}{1+0.6275}$$

$$n = \frac{251}{1.6275}$$

$$n = 120.43$$

Data for this study were collected from the respondents using structured interview schedule which were divided into 4 sections based on the objectives. Section one covered socio-economic characteristics of the respondents, section two dealt with perceived effects of COVID-19 pandemic on yam production, section three highlighted yam farmers' information needs during COVID-19 pandemic and section four identified constraints to adaptation strategies of farmers during COVID-19 pandemic.

The study used descriptive statistics such as frequency, percentages, mean score and standard deviation. Also, likert-type scale was used measure respondents' opinions and perceptions on the effects of COVID-19 pandemic whereas factor analysis is used in grouping related variables and their underlying relationships.

RESULTS AND DISCUSSIONS

Socio-economic Characteristics of Farmers

Table 1 indicates that 72.5% of the respondents were males. Gender gap is probably because of number of issues such as cultural norms, resource availability, societal expectations regarding women's roles and the demanding nature of yam production. A study conducted by Obidiegwu and Akpabio (2017), found that yam production is frequently perceived in Nigeria as a male-dominated venture that prioritizes male achievement and social prestige.

Table 1 shows that the majority (68.3%) of the respondents were married, 29.2%, 1.7% and 0.8% were single, divorced/separated and widowed respectively. The implication is that married couples are likely to adapt to adverse effect of COVID-19 pandemic than their unmarried counterparts since they have access to labour. Ufondu et al., (2021), reported that yam farmers had wives who helped them with farm labour during the pandemic.

Table 1: Socio-economic characteristics of the farmers

Socio-economic characteristics	Frequency	Percentage	mean
Sex			
Male	87	72.5	
Female	33	27.5	
Marital Status			
Single	35	29.2	
Married	82	68.3	
Divorced	2	1.7	
Widowed	1	0.8	
Age(years)			
20 – 29	26	22.0	
30 – 39	58	49.2	
40 – 49	26	22.0	34.9
50 – 59	2	1.7	
60 and above	6	5.1	
Level of Education			
No formal education	23	19.2	
Primary School attempted	1	0.8	
Primary school completed	18	15.0	
Secondary School attempted	5	4.2	
Secondary school completed	32	26.7	
Tertiary	41	34.2	
Household Size			
1 – 5	36	30.0	
6 – 11	78	65.0	
12 and above	6	5.0	5
Membership of organization			
Member	100	83.3	
Not member	20	16.7	
Years of experience in farming			
1-10	27	22.5	
11-20	53	44.2	18.36
21-30	35	29.2	
31 and above	5	4.1	
Years of experience in yam farming			
1-10			
	32	26.7	
11 – 20	53	44.2	17.65
21 – 30	29	24.1	
31 and above	6	5.0	
Farm size allocated to yam production			
1 – 5	108	91.5	
6 – 9	9	7.6	2.75
10 and above	1	0.8	
Annual Income from yam farming			
100 – 100,000	5	4.0	
100,001 – 300,000	34	28.6	
300,001 – 500,000	40	33.6	603291.67
500,001 – 900,000	26	21.8	
900,001 – 1,500,000	8	7.0	
1,500,001 – and above	6	5.0	

Source: Field survey, 2023

Table 1 reveals that 49.2% of the respondents were between the ages of 30 and 39 years, 22% were between the ages of 20 and 29 and 40 and 49 years respectively, 5.1% were between the ages of 60

– 69 years while the remaining 1.7% of the respondents were between the ages 50 and 59 years. The mean age of the respondents was 34.9 years. This revealed that the majority of the respondents were youth, at peak of their productive age and likely to be actively involved in yam production. Younger farmers are better equipped to adopt modern farming techniques and mitigate the impact of COVID-19 more quickly than their older counterparts. (Esiobu, 2020).

Respondents perceived effects of COVID-19 pandemic on yam production.

Table 2 shows the respondents perceived effects of COVID-19 pandemic on yam production. The result shows that respondents had high perception in the following areas: decline in yam income ($\bar{x}$=3.82), decrease in yam produce ($\bar{x}$=3.82), shortage of input supply ($\bar{x}$=3.79), shortage of farm labour ($\bar{x}$=3.78), increase in cost of production of yam ($\bar{x}$=3.73), poor marketing of yam produce ($\bar{x}$=3.66), disruption of agricultural activities ($\bar{x}$=3.64). These factors were largely contributed by the fragility of rural agricultural systems and the particular difficulties presented by the pandemic in the study area. The findings match those observed in earlier studies. Obayelu, Obayelu, Bolarinwa, and Oyeyinka (2021), found that travel and movement restrictions during the pandemic affected the demand for agricultural products. Ilesanmi, Ilesanmi and Afolabi (2021), found that the lockdown measures and restrictions of movement during the pandemic contributed to a shortage of labour for agricultural production in Nigeria.

However, farmers priotise utilization of family labour ($\bar{x}$=3.09) and explore marketing channel to sell yam produce ($\bar{x}$=2.88). It is observed that in the study area, there is a strong sense of community and reliance on extended family networks. As such, families turn to their close relatives for support and assistance, including sharing labour in farms to cope with the challenges posed by the pandemic. Also, yam farmers admit to selling their products in yam markets while adhering to COVID-19 protocols. When government announced lockdown, yam markets were allowed to open once in a week between the hours of 8:00 AM to 4:00 PM. This put farmers on pressure to make panic sales usually at lower prices. On off-market days, yam farmers resort to using their mobile phone to call yam marketers to sell to their produce at their homes at relatively low price. Marsden, Zander and Lassa (2023), found that smallholder farmers adapted to the pandemic by accessing family labour and sought short marketing channels and diversified distribution channels by removing middlemen.

The respondents had minor perception on the following effects during COVID-19 pandemic: increase area under yam production ($\bar{x}$= 2.00), selling yam produce at high profit margin ($\bar{x}$= 1.91), improvement in health and livelihood of yam farmers ($\bar{x}$= 1.78), COVID-19 Palliatives address some of the challenges facing yam production ($\bar{x}$=1.50), yam farmers embrace insurance policy ($\bar{x}$= 1.47), yam farmers prevented yam waste ($\bar{x}$= 1.42) and government intervened in yam production ($\bar{x}$= 1.38). These perceived effects underscore the complexity of the situation in the study area and the need for a comprehensive and targeted approach to addressing the specific needs of yam farmers. For example, the respondents stated that the government's COVID-19 palliatives were not effective and were primarily aimed at addressing the immediate and pressing needs of the population during the pandemic (food assistance and healthcare resources). Similarly, according to most respondents, government did not intervene in yam production during COVID-19 pandemic despite the significance of yam production in the study area; government did not prioritize the sector despite being severely impacted by the pandemic. A study conducted by Amare, Abay, Tiberti and Chamberlin (2020), revealed that some farmers in Nigeria lost their income due to the pandemic and farmers did not gain profit during the year 2020 planting season.

Table 2: Perceived effects of COVID-19 pandemic on yam production

Effects	Mean	Std. Deviation
Decline in farm income	3.82*	0.47
Decrease in yam produce	3.82*	1.97
Shortage of input supply	3.79*	0.48
Shortage of farm labour	3.78*	0.52
increase in cost of production of yam	3.73*	0.53
poor marketing of yam produce	3.66*	0.67
Disruption of agricultural extension activities	3.64*	0.61
Increase in poverty	3.60*	0.76
Yam waste	3.58*	0.78
Reduced demand for yam	3.50*	0.87
Reduction in area under yam production	3.37*	1.08
Farmers priotise utilisation of family labour	3.09*	1.08
Farmers explore marketing channels to sell their produce	2.88*	1.10
Outbreak of yam beetle disease	2.81*	0.81
Death of farmer	2.45	1.17
Farmers increase area under yam cultivation	2.00	1.18
Selling yam produce at high profit margin	1.91	1.11
Improvement in health and livelihood of yam farmers	1.78	1.01
COVID-19 government palliatives addressed some of the challenges facing yam production	1.50	0.73
Yam farmers embrace insurance policy	1.47	0.70
Prevention of yam waste	1.42	0.64
Government intervened in yam production	1.38	0.54

Source: Field survey 2023, Cut-off point 2.5

Information needs of respondents on COVID-19 pandemic

Entries in Table 3 depicts that farmers have various information needs during COVID-19 pandemic. Thus, access to marketing information and access to fertilizer ($\bar{x}$= 2.81), alternative supply of input ($\bar{x}$= 2.79) and access to farm credits ($\bar{x}$=2.73) were some of the information the respondents needed during COVID-19 pandemic. Others include: access to extension contact ($\bar{x}$=2.62), information on COVID-19 spread in Nigeria ($\bar{x}$=2.27), access to improved seed ($\bar{x}$=2.26), information on COVID-19 prevention ($\bar{x}$=2.24), information on government policies on COVID-19 ($\bar{x}$=2.17) and information on symptoms of COVID-19 ($\bar{x}$=2.09). Yam value chain related information needs such as access to fertilizer, alternative supply of inputs, access to market and access to improved seed depicts the importance of reliable and accessible agricultural inputs during the pandemic. Meeting these needs is crucial for maintaining agricultural productivity and ensuring food security. The information needs related to COVID-19 prevention, spread, symptoms and government policies highlight the desire for accurate, up-to-date information on the pandemic.

The finding is in congruent with the work put forth by Otache (2020), that during COVID-19 pandemic farmers found it difficult to obtain fertilizer. Also, Efe (2020), study on COVID-19 information seeking strategies of rural dwellers of Delta North, Nigeria, revealed that majority of respondents needed information on COVID-19 prevention.

On the contrary, respondents had low information needs on orthodox or herbal treatment to combat COVID-19 ($\bar{x}$=1.97) and information on suitable diet to boost immune system against COVID-19 pandemic ($\bar{x}$=1.93). Mistrust and skepticism may be the reason why the respondents disagree over the importance of information on herbal treatment and suitable diet. It is likely that they might not believe the information given about suitable diets or they could be dubious about the efficacy of conventional or herbal remedies. The finding of Dhok Butola, Anjankar, Shinde, Kute, and Jha (2020), stated that keeping the immune system healthy during the pandemic such as eating immune-boosting foods, getting enough sleep and engaging in physical activity will help in COVID-19 prevention. However, Gorvett (2020), found that there is also a scientific consensus that the concept of boosting the immune system is a myth and that there is no scientific evidence to support the idea that suitable diets or wellness habits can help prevent COVID-19 infection.

Table 3: Information needs of yam farmers during COVID-19 pandemic

Information needs	Mean	Std. Deviation
Access to marketing information	2.81*	0.46
Access to fertilizer	2.81*	0.44
Alternative supply of inputs	2.79*	0.50
Access to farm credits	2.73*	0.62
Access to extension contact	2.62*	0.61
Information on Covid-19 spread in Nigeria	2.27*	0.79
Access to improved seeds	2.26*	0.91
Information on Covid-19 prevention	2.24*	0.79
Information on government policies on COVID-19	2.17*	0.81
Information on symptoms on COVID-19	2.09*	0.81
Information on orthodox or herbal treatment for COVID-19	1.97	0.79
Information on suitable diet to boost immune system	1.93	0.79

Source: Field survey, 2023. Cut-off point 2.0

Respondents' constraints to adaptation strategies to the effect of COVID-19 pandemic

Table 4 shows the result of rotated matrix indicating the extracted factors of the response of yam farmers. The result shows that 4 major factors were extracted. Factor 1 (Lockdown related constraints), 2 (Information related constraints), 3 (Palliative related constraints) and 4 (Corruption related constraints).

The loading variables grouped under factor 1(Lockdown related constraints) are: high cost of labour (0.830), scarcity of hired labour (0.821) and difficulty in acquiring farm input (0.629). These constraints were largely aggravated as a result of the COVID-19 pandemic lockdown. Respondents asserted that high cost of labour is among the constraints they encountered in adapting to the adverse effect of COVID-19 Pandemic. This is not unrelated to the possibility that seasonal migrant labourers were unable to travel to farms due to lockdown and health concerns. Consequently, this worsened the potential labour shortage, making it more costly to attract and retain the available workforce. Scarcity of hired labour is also experienced by the respondents. This implies that many prospective farm workers may be worried about their chances of contracting COVID-19 disease. Additionally, potential laborers' mobility might have been restricted by government-imposed lockdowns and movement restrictions. Obayelu et al. (2021), stated due to Nigeria's crude farming

practice which was further worsened by COVID-19 pandemic, there was a scarcity of hired labour required for the production process during the 2020 farming season.

Also, respondents affirmed that they experienced difficulty in acquiring farm inputs. This is probably due to the possibility of a rise in demand for inputs as farmers across the nation dealt with similar issues. Prices might have increased as a result of the increased demand and concerns about future shortages, making it more challenging for farmers to afford. According to most respondents some suppliers have taken advantage of the situation by hoarding inputs and inflating prices due to perceived scarcity, making it even more difficult for them to access affordable inputs.

The loading variables under factor 2 (information related constraints) are: communication/ language barrier in getting information about COVID-19 pandemic (0.811); insufficient power supply to watch television and have access to reliable news on COVID-19 pandemic (0.872); information on COVID-19 is technical/ cumbersome to understand (0.942); government policies on COVID-19 are not well publicized (0.972). Respondents asserted that information on COVID-19 is technical/cumbersome to understand. This is related to the reality that resources and technology, including the internet, are frequently few in rural areas. Farmers could thus find it difficult to get current information regarding COVID-19 and its effects. Furthermore, agricultural pursuits take up farmers' daily schedules and require their time and attention. When people are concerned with providing for their basic necessities, they might not have the time or resources to devote much attention to learning the technical parts of health crises. Balogun (2020), found that low literacy levels in rural areas make it difficult for farmers to understand complex information related to COVID-19 and government policies. Also, among the constraints, respondents asserted that government policies on COVID-19 are not well publicized. This implies that in some cases, government initiatives may be delayed due to bureaucratic process. The policies may have lost some of their urgency or relevance by the time they are prepared for public. Even if policies are well-developed, the government might not have a strong communication plan in place to make sure that the information reaches every part of the public. Efe (2020), found that government policies on COVID-19 were not adequately publicized, which have affected farmers' awareness and understanding of the policies.

The loading constraints under factors 3 (Palliative related constraints) are: Diversion of COVID-19 pandemic palliative meant to cushion the adverse effect of the pandemic (0.847) and inadequate Information about pandemic palliative (0.824). Diversion of the pandemic palliative suggests that if the intended beneficiaries—yam farmers are denied the assistance designed to mitigate the negative consequences of the pandemic, it may be more difficult for them to recover financially from the pandemic's effects. Eranga (2020), revealed that to mitigate the impact of the lockdown, Farmers were among the targeted groups that the Nigerian Federal Government particularly targeted with relief measures. Nevertheless, farmers had expressed dissatisfaction with the way government assistance packages were distributed, reflecting the public's overall discontent. Similarly, lack of adequate information about pandemic palliatives alludes that respondents might not have been aware of some of the measures provided by the government due to poor communication channels, resulting in a lack of knowledge among farmers about the support opportunities.

The loading variable under factor 4 (Corruption related constraints) are: Insincerity among farmers in giving accurate information to government officials (0.764), harassment/payment of bribes/seizure of farm produce by security personnel (0.739) and poor access to farm credit (0.550). Respondents stated there is insincerity among them in giving accurate information to government officials. This is closely related to past and systemic problems that have jeopardized trust between rural communities and the government. Respondents were concerned about whether the

aid would actually benefit them or government officials will use their information to benefit themselves. Respondents also experienced harassment, payment of bribes and seizure of farm produce by security personnel. Pre-existing problems like corruption and abuse of power were heightened in the study area during the pandemic. According to most respondents, Security personnel tasked with enforcing pandemic-related regulations have taken advantage of the situation to seize farm produce and demand bribes for their release. A study conducted by Aborisade (2021), on instances of excessive use of force and misconduct by the Nigerian Police while enforcing COVID-19 measures, found that in enforcing the COVID-19 protocols, police officers have been reported to engage in collection of bribes at check points, extortion, sexual harassment and assault.

Table 4: Constraints to adaptation strategies during COVID-19 pandemic

Constraints	Lockdown related constraints	Information related constraints	Palliative related constraints	Corruption related constraints
Diversion of Covid-19 pandemic palliative meant to cushion the adverse effect of the pandemic on farmers	0.13	0.09	0.85	0.06
Inadequate Information about pandemic palliative	0.23	0.03	0.82	0.09
Insincerity among farmers in given accurate information to government officials	0.15	-0.07	-0.04	0.76
Harassment/payment of bribes/seizure of farm produce by security personnel	-0.17	0.27	0.21	0.74
Difficulty in acquiring farm inputs	0.63	0.08	0.29	0.24
Poor access to farm credit	0.12	-0.07	0.04	0.55
High cost of labour	0.83	-0.05	-0.09	0.18
Scarcity of hired labour	0.82	0.01	0.24	-0.04
Communication/ language barrier in getting information about covid-19 pandemic	0.27	0.81	-0.11	0.03
Insufficient power supply to watch television and have access to reliable news on covid-19 pandemic	-0.03	0.87	0.02	0.01
Information on Covid-19 are technical/ cumbersome to understand	0.01	0.94	0.22	0.00
Government policies on covid-19 are not well publicized	0.02	0.90	0.21	-0.02

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 5 iterations.
Source: Field survey, 2023

CONCLUSION AND RECOMMENDATIONS

It is found that COVID-19 pandemic had adverse effects on yam production in the study area. These includes decline in farm income, shortage of farm labour, outbreak of yam beetle disease. Some of the constraints faced by yam farmers were: lack of information on marketing channel, scarcity of hired labour, corruption among government officials. It is recommended that government should help strengthen early warning and surveillance systems to detect and monitor emerging infectious diseases and authorities should also explore the use of digital solutions and innovations for the distribution of supports to farmers. This can include the use of biometric systems, mobile

applications and electronic vouchers to reduce human intervention, minimize opportunities for corruption and ensure efficient and accountable distribution.

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