



The Impact of Population Dynamics on Agricultural Value Chain in Rivers State, Nigeria

Nathan Udoinyang (PhD in view)¹

¹Department of Economics, Faculty of Social Science, Post Graduate School, Ignatius Ajuru University of Education, Rumuolumeni, Portharcourt, Rivers State, Nigeria.

Abstract

This study was designed to investigate the impact of population dynamics on agricultural value chain in Rivers State, Nigeria. The study aimed at investigating the impact of population dynamics on agricultural value chain in Rivers State. The population of the study consist of the total population of Rivers State. With the aid of Taro Yamane formulae, a sample size of 400 were generated. 400 questionnaires were strategically distributed to two local government area from each of the three (3) senatorial districts that made up Rivers State. The research questions of the study were analyzed using statistical tools of mean deviation in Statistical Package for Social Sciences (SPSS) with a mean criterion of 2.50. The findings review that the impact of population dynamics on agricultural value chain in Rivers State are: decrease in the availability of farmlands, destruction of farmlands, pollutions, illegal food importation in River State etc. The study concluded that agricultural value chain problems is not caused only by population dynamics, but by the absence of effective public policy design to reduce these problems. That as long as policies are in place that control the rate of child birth, human population and their impacts on the products and services people make and use, agricultural sustainability can and will permeate everyday decision-making of residents, indigene, non-indigene and government of Rivers State thereby leading to sustainable and friendly agricultural environment.

Keywords: Population, Population Dynamics and Agricultural Value Chain.

Introduction

For many years past, we have become increasingly aware of population, natural resources, and agricultural problems facing communities, nations and the world at large. During the period, population; natural resources, and agricultural issues have grown in scope and urgency. Many developing countries are using their natural resources at rates faster than the natural rate of replacement to sustain their rapid population growth; to generate foreign exchange; and to produce raw materials for industries. Land, water and forests are among those valuable resources under excessive pressure due to human exploitation. “Millions of poor farmers destroy vast tracts

of forest lands to make room for agricultural activities that will provide sufficient food for their household, community or country” (Pay Drechsel et al. 2001). Agriculture is still the main focus of national development plans of many developing countries, particularly in Nigeria. Land policies and reforms have been widely instituted in several countries in an effort to improve the performance of the agricultural sector. However, it has not always been accompanied with success. In most countries, traditional agricultural practices and low productivity still persist despite major reforms and large monetary investments to transform the sector. “Where agricultural innovations have been introduced, short-term successes have often been followed by long-term problems on natural resources and the environment” (Miay, 1976; Drechsel, Kunze and Vries, 2001). Human population has grown slowly throughout most of our history. Only the past 200years has move rapid global population growth become a reality. In 1963, the U.S. National Academy of Sciences published *The Growth of World Population*, a report that reflected scientific concern about the consequences of global population growth, which was then reaching its peak annual rate of two percent. Paul Ehrlich (1968) published *The Population Bomb*, which focused public attention on the issue of population growth, food production, and the environment.

In 1800, global population had reached about 1billion after many centuries of very slow growth. In a century and a half more, the figure reached 2.5billion. A rapid post world war II acceleration in growth doubled population to 5billion in less than 40years. Extraordinary rapid population growth about 2percent per year took place from 1950-1975. During this extremely “rapid growth, various scholar/authors sounded the alarm regarding the dangers of the exponential growth that a population of 5billion increasing at 2percent per year would reach 20billion in 70years and 40billion in a little over a century.” Many nations especially developing nations like Nigeria with rapid population growth have low standard of living, whereas many developed nations with low rate of population growth have high standard of living. The global problem of food scarcity is exacerbated by the constant increase in population growth, with no complimenting increase in the output of agricultural produce. Over the years it has become a major focus of most governments especially Nigerian to provide enough food for her citizenry which will in-turn curb the series of social discord that could emerge if a hunger-crisis breaks out, and create an enabling atmosphere for strategic economic development by providing the working population with one of the most important physiological needs. The rapid globalization of the Agricultural markets has led to the generation of new production and distribution systems, as well as new consumption patterns. One of the objectives of modern agriculture is to reduce to the barest minimum the problems associated with agricultural loss, wastages and output underutilization by ensuring an efficient optimization of all the linkages between the producer and final consumer through the “Value-Chain” concept. The basic characteristic of a Value Chain is market-focused collaboration; different business enterprises working together to produce and market products and services effectively and efficiently by allowing businesses to respond to the marketplace through linking production, processing and marketing activities to meet market demands. Agric-food Value Chains are designed to increase competitive advantage through collaboration in a venture that links producers, processors, marketers, food service companies, retailers and supporting groups such as shippers, research groups and suppliers. One of the central ideas of the Agricultural Value Chain concept is the differentiation of the total agro system and the

specialization of each element so as to optimize the entire system. The rate of population dynamics will determine the level of agricultural value chain and problems a community, region and nation will experience. As the population of Rivers State continue to increase and becomes more affluent, there is increased pressure on agricultural value chains to deliver sustainable food production, distribution, and consumption that simultaneously foster human wellbeing. As a result, there is renewed interest from policymakers, development institutions, civil society organizations, and private businesses in examining the role of food and agricultural markets in promoting sustainable growth that benefits people and the planet (FAO, 2017a; OECD–FAO, 2018). Agricultural value chains are undergoing profound transformations and are facing multiple environmental and social challenges. The impact of population dynamics, especially the absolute increase in human numbers each year due to natural increase and/or mobility, has had a crucial effect in the state of natural resources. As population continues to expand in number, it exerts increased pressure on the proper functioning of the ecosystem and natural resource stocks. The growing population of Rivers State poses challenges to politics, agriculture, sustainable development, environment, food security and migration not just to Rivers State but Nigeria as a whole. In the present day, research in Nigeria have confirmed the persistent growth of population size which have bring about decrease in the rate of food production, congestion, unemployment resulting to social disorder. The population of Rivers State was 3,187,864 in 1991 and has increased to 5,198,716 NPC census 2006, which is projected at 3.5% growth rate by annum by NBS. The focus now in Rivers State is how to increase agricultural productivity and value chain with minimal attention given to resource/environmental sustainability in order to cater for the timing population in the state which in return affect the agricultural value chain system and has become a problem in the state. Therefore, the research problem is what are the impact of population dynamics on agricultural value chain in Rivers State? Base on this background that the researcher intends to carry out this study in other to provide solutions this problem that has been identified.

Conceptual Clarifications

Population Dynamics

Anyanwu et al (1987) put forward that “Population in Economics refers to the number of people (human population) living in any defined area such as Lagos, Abuja, Aba, Port Harcourt, Uyo. Population is the total number of people living in a particular geographical area over a given period of time. Population dynamics refers to how the number of individuals in a population changes over time. It can also be seen as the way in which the size and age structure of populations change over time and the characterization of that change in mathematical terms. Population dynamics is the changes in the size, structure, and distribution of the global population.

Components of Population Dynamics

The main components of population dynamics are births, deaths, and migration. Birth Rate (B): This is the rate at which new babies are born in a country. High birth rate increases the population size, if it is low the population size will decrease. Death Rate (D): this is the rate at

which death occurs in a country. High death rate will decrease a country population, while low death rate will increase the population size. The difference between births rate and deaths rate represents natural growth rate.

Johnson U.A (2003) “defined migration as the movement of people into and out of a country over a period of time.” He also stated that migration is sub-divided into two which are as follows: Immigration (I): this is a process whereby people can move into a country from other countries. Increase in immigration increases the population size of a country. Emigration (E): this is a process whereby people go out of a country to settle in other countries either permanently or on a temporary basis.

Agricultural Value Chain

The concept agricultural value chain concept has been used since the beginning of the millennium, primarily by those working in agricultural development in developing countries. Although there is no universally accepted definition of the term, it normally refers to the whole range of goods and services necessary for an agricultural product to move from the farm to the final customer or consumer. Published definitions include the World Bank’s the term ‘value chain’ describes the full range of value adding activities required to bring a product or service through the different phases of production, including procurement of raw materials and other inputs, actors connected along a chain producing, transforming and bringing goods and services to end-consumers through a sequenced set of activities.

Evan Tarver (2020) define value chain as the process in which business receive raw materials, add value to them through production, manufacturing, and other processes to create a finished product, and then sell the finished product to consumers.

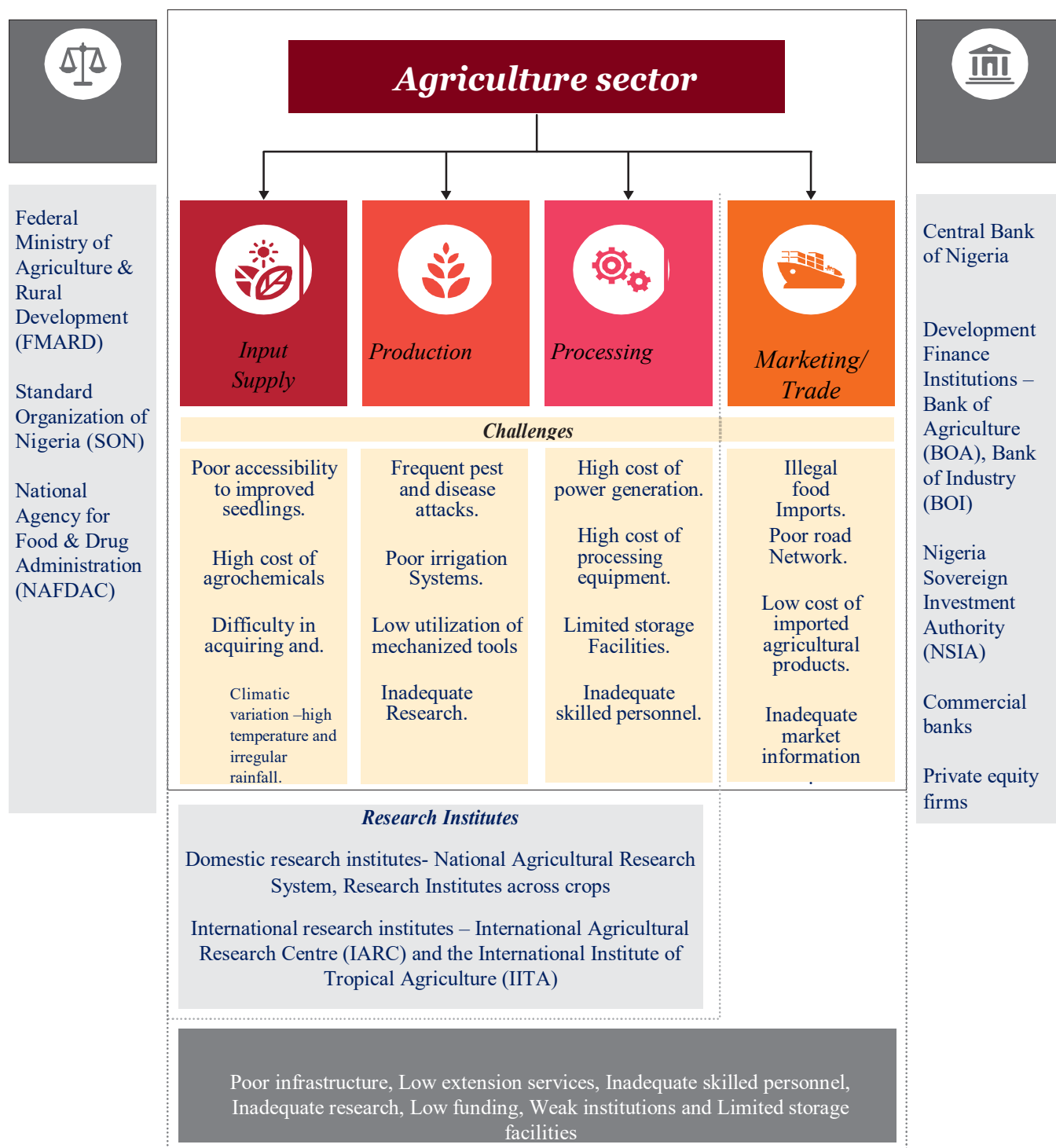
Food and Agriculture Organization (FAO) of the UN, (2005) “A ‘value chain’ in agriculture identifies the set of actors and activities that bring a basic agricultural product from production in the field to final consumption, where at each stage value is added to the product.”

Population dynamics and agricultural value chain

An increasing global population and changing diets are increasing the demand for food. Production is struggling to keep up as crop yields level off in many parts of the world, ocean health declines, and natural resources such as soils, water, and biodiversity are stretched dangerously thin. A 2020 report found that nearly 690 million people or 8.9 percent of the global population are hungry, up by nearly 60 million in five years. The food security challenge will only become more difficult, as the world will need to produce about 70 percent more food by 2050 to feed an estimated 9 billion people. The challenge is escalated by agriculture’s extreme expose to climate change. Climate change’s negative impacts are already being felt, in the form of increasing temperatures, weather variability, shifting agro ecosystem boundaries, invasive crops and pests, and more frequent extreme weather events. On farms, climate change is reducing crop yields, the nutritional quality of major cereals, and lowering livestock productivity. Food production, storage, processing, distribution, retail and consumption are all exposed to wide-ranging forms of environmental change, including slow-moving changes in average conditions

(for example, climate, nutrient and water cycling), smaller-magnitude variations around those means and larger, anomalous disruptions. Increase in population can be propagated or attenuated along food supply chains by various economic, political and infrastructural factors. Understanding these processes is central to reducing risks associated with periodic food shortages, price spikes and reductions in food quality.

An overview of Nigeria’s Agricultural value chain



Source: PwC Analysis

Impact of Population Dynamics on Agricultural Value Chain

Many effort and measures have been taken by Rivers state government to tackle the issues of population growth on agricultural food chain system in the state in other to ensure that the food production meet the timing population and also demand of its citizens.

In March 2021, “the Federal Government through the Minister of State for Agriculture and Rural Development, Hon Mustapha Shehuri, disclosed support to boost cassava production in Rivers State towards achieving food security and employment generation.” Rivers State Government and farmers have been gearing more effort towards agricultural exploits, especially cassava production as a major crop commodity. The state Government has established Rivers State Cassava Processing Company, Afam, Oyibo Local Government Area, where cassava flour is being produced and will create over 3, 000 jobs along the cassava value chain; the Agricultural Skill Acquisition Centres in Taabaa, Kana/Gokana Federal Constituency; and Egelebie in Okrika Local Government Area. The Federal Government through the Minister assured to continue to partner and support Rivers State with new technology, access to improved varieties of cassava cuttings, chemicals for treatment of seed and crop protection. In June 2021, “Benue and Rivers State Governments commenced discussions on collaboration in the area of agricultural and food value chain production.” The two state resolved to collaborate for food production starting with Benue-Rivers Rice. According to the Commissioner of Education Professor Dennis Ityavyar who led the state delegation to Rivers State, stated that the collaboration would not be limited to rice production alone but include other private investment opportunities in the agricultural and food value chain. An increase in an urban population of the youthful population will stimulate urban nuisance and growth of large urban agglomerates which means that the increase in migration of people from the rural villages to the urban areas negatively influences agricultural sector performance which may be accounted to be the reason behind the increase in the prices of agricultural output. Despite all this effort done there are many adverse effect of population dynamics on agricultural value chain in Rivers State, Nigeria. Population dynamics leads to environmental change due to population growth and extreme events are already leading to harvest losses and distribution disruptions each year in Rivers State. In many cases, these short-term impacts (that is, those occurring within the span of a production/growing season) have been shown to be stronger than those caused by slow-moving changes in climate. Such developments show that there is growing need to protect the stability of not only food production but also other steps in agricultural food supply chains in the face of rising environmental variability and risk. Population growth in Rivers State has also brought about some adverse effect on agricultural value/food chain. Below are some of the negative impact:

- (i) **Decrease in the Availability of Farmland:** Most of the land that are supposed to be use for agriculture are now used for other purpose such as building of church, schools, eateries, recreational centres, roads etc. which have affect the availability of land for farming in Rivers State.
- (ii) **Destruction of Farmlands:** Farmlands have been destroyed in other to build houses, schools, eateries, recreational centres roads just to shelter/satisfy the timing population.

- (iii) **Illegal food Importation:** As the population increases, the availability of lands for agricultural activities has reduce thereby leading to shortage of food supply which has make citizens of the State to smuggle both good/bad, banned and illegal food into the State.
- (iv) **Pollution of Farmlands:** When industries in the State carries out their activities, most of the farmlands are been polluted as a result of their activities e.g. shell pollution in 2020 that happened in Rukpokwu and that of Ogoni which have been existing for more than a decay.
- (v) **Excessive use of fertilizer:** Many farmers in Rivers State apply excessive fertilizer to their crop in order to improve the quality and quantity of their crop which will make the crop to grow/mature faster before their time of maturity as this may have side effect to the final consumer of the product.
- (vi) **Pollution of rivers:** Majority of the rivers in Rivers State as a whole has been polluted with waste by product of industries and household which have affected the habitat living in them. For example, the water pollution that happened in Bonny in 2020 that lead to the death of thousands of fishes and other habitat living in Bonny river. This is a major challenge and problem the LGA is facing up till date.
- (vii) **It Brings About Soil Erosion:** As a result of increase in population which has led to poor town planning, majority of the soil and crops planted on farmlands that are close to houses are washed away by water that rushes from the roof, compounds and gutters thereby leading to the destruction of crops, washing away of soil nutrient and reduction in the quantity and quality of crop that will be harvested.
- (viii) **Application of artificial nutrient:** It brings about the use of artificial nutrient such as fertilizer and chemicals in other to boost the quality of crops and also fasten their rate of maturity so as to meet up with the increasing demand which may be harmful to human health.
- (vii) **Change in Climate Condition:** Due to the numerus activities of industries in other to meet up with the increasing demand of the population in the State, several pollutions such as air pollution has affected the climate and has brought about change in climate condition. This change in climate condition has affect the planting season thereby affecting the growth, quality and quantities of the crop in the Rivers State.

Malthusian Theory

Reverend Thomas Robert Malthus an English Political Economist was concern about the political and socio economic condition of Great Britain regarding to population growth and food production, that he came out with the following proposal on population as embodied in his first essay titled; “Essay On Population 1798”

That human nature and impulses undergo appreciable changes over time. That an equalitarian society is unnatural. Saying that in a given society, everybody cannot be equal. That nothing could be done to wipe out poverty which is inherent in a given society. That poverty can never be related to either good or bad government. That change of any government cannot therefore stop poverty. That human tendency could be traced as the source of poverty. That want would arise as human population grows above food production. That the power of human population could increase far greater than the power of earth to produce food. That if human beings are not check

in their natural form, human population will grow at a geometrical progression while food production increases at arithmetical progression. That population will grow at the rate of 1, 2, 4, 8, 16, 32, 64..... while food production will grow at the rate of 1, 2, 3, 4, 5, 6, 7,That if population still remains unchecked, human beings will double themselves in every 25 years and will increase 64 times in the next 150 years and that food will increase 7 times. That increase in food will lead to increase in population will lack of food will decrease population because many people will die of hunger.

Malthus went further in his essay to give a recipe on how to check rapid growing population. He divides the checks into two: positive and preventive checks. **Positive checks** are those factors that brings about deaths of existing lives like war, pestilence, child exposure, infanticide, vicious customs etc.; while **preventive checks** are known as the postponement of marriage and voluntary abstinence. Malthus concluded that the two above checks can only control population growth and not to stop it because, according to him the issue of poverty and having more people to feed will always remain as a general law of nature. (Adapted from Nathan Udoinyang 2022)

Literature Review

Ester Boserup (1965) “examine the conditions of agricultural growth.” The Economics of Agrarian Change Under Population Pressure. She investigates the process of agrarian change, cost and productivity under the main systems of primitive agriculture. She stated the problem of population explosion and concluded that technical, economic and social changes are likely to take place within primitive agriculture unless the rural community concern is exposed to the pressure of population growth. She took a very optimistic approach arguing activity. Rather, she argues the approach.

Killick (1981) “writing on the economic development in Kenya notes that agriculture development must take into account the manner in which increasing productivity is connected with the structure of agriculture which must ensure increased output to meet the demand of the population.”

Kulkani 1981 “seems to agree with Killick and observed that the challenge in less developed countries like Kenya is whether agricultural productivity will match the demographic requirements.”

Ominde 1981 also noted that Africa’s population increase has serious implications to the expected growth and development of agriculture and in particular its capacity to meet the basic needs of the population.

Kulkevin (1981 and 1983) “says that the relationship between population and agricultural development is important not only because it concerns one of the human basic needs but because economic planning cannot be successful without considering a balance between population and agriculture.” It is stated that in the developed world, industrialization was preceded by agricultural development hence the need for sound planning.

Oucho (1989) “noted that there is an impressive labour migration to the agricultural wage sector in the Kenya highland and coast province and western districts are the main source areas.” Rural to rural migration especially from the high potential regions to the arid and semi-arid regions may have serious consequences on the environment. This is because this area is very delicate and can be degraded very fast and made into a desert. Most writers seem to agree that rapid population growth rate will have a negative impact on the agricultural development especially in the developing countries which do not have enough capital to invest in modern technology. It is evidence that in the developed countries agricultural development proceeded industrialization, however fertility must be controlled so that economic development and population growth rate goes hand in hand.

Cleaver and Schreiber (1994) “found a declining trend among food productivity; population growth and natural resources, which deplete soil productivity resulting in vicious circle of population, poverty and environmental degradation.”

Rosero-Bixby and Palloni (1998) conducted a study in Costa Rica, the study shows that propensity of deforestation increases with accessibility as well as desirability of the land for agriculture. The same study further reveals that deforestation is found to be high in areas where there is high population concentration.

Agatha and Bako, (2012), “examined the impact of environmental pollutions on agricultural sector productivities in Nigeria.” Relying on the descriptive expositions of the studies related to this work. The result revealed the presence of a negative relationship between environmental quality and agricultural sector performance. Also, that the solution to environmental pollution lies in the policy of sustainable development and the evolution of sound environmental management principles by all stakeholders at all levels.

Adindu Symbol Kemjika (2014) “investigated the consequences of population growth on agricultural production in Obingwa local government area in Nigeria.” The finding show that population growth has a significant effect on food production which is based on the pattern of land system the locality practice.

Comfort Chigozie.G. and Jonadab Ubochioma.C. (2016) “investigated the Consequences of environmental pollution on agricultural productivity in developing countries:” A case study of Nigeria finds out that environmental pollution affects agricultural productivity negatively which may hinder sustainable development.

Godson-Ibeji, and Ubochioma, (2016), “examined the consequences of environmental pollution on agricultural productivity in developing countries environmental. pollution is a widespread problem that influences both human health and agricultural productivity.” To ascertain the aim and objectives of the study, questionnaires were administered to elicit information on soil fertility, crop growth, and crop productivity. A total of 360 questionnaires were administered using a multistage sampling technique and analyzed using frequency tables and percentages. Results show that environmental pollution reduces the level of soil nutrients and fertility (82%). Crop growth and crop yield are negatively affected by pollution (80%); therefore, agricultural productivity is negatively affected in Nigeria. Thus. It was recommended, that efforts be made to

immediately address the environmental problems of the country if any meaningful development is to be sustained.

Mulatu, et al., (2016), “examined the impact of CO2 emissions on agricultural productivity and household welfare in Ethiopia.” Employing multiple regression analysis, the study revealed that CO2 emissions negatively affect agricultural productivity and household welfare. Compared to the baseline, real agricultural gross domestic product is projected to be 4.5% lower in the 2020s under a no-CRGE scenario. Also, that CO2 emissions lead to a decrease in the production of traded and non-traded crops, but not livestock.

Nathan Udoinyang (2022), “examine population dynamics and environmental degradation in Akwa Ibom State, Nigeria”. Using 5 point Likert scale and SPSS analysis, the study revealed that population growth brings about environmental degradation which in turn affect agricultural productivity in Akwa Ibom State, Nigeria.

Methodology

This study adopts ex-post facto, explanatory and predictive research because the investigation begins after the event has occurred without the interference of the investigator in order to draw conclusion and make predictions about the future population of Rivers State and also investigating possible cause effect relationship by observing an existing condition or state of affairs of population dynamics and agricultural value chain in Rivers State.

Population of the Study

The population for this study consists of all the local government that made up Rivers State. There are twenty-three local governments that made up Rivers State. Its total population was estimated at 5,198,716 as of 2006 census, and was projected 7,303,900 as of 2016 by national bureau of statistics at a rate of 3.5% increase per annum making it one of the largest state in Nigeria.

At 3.5% increase per annum = $3.5/100 = 0.035$

Annual population rate X 2006 population = $0.035 \times 5,198,716 = 181,955.06 = 181,955$

Annual population growth = 181,955

Population growth rate from 2016-2020 = $181,955 \times 4 = 727,820$

Add 4 years' population growth rate to 2016 population

$727,820 + 7,303,900 = 8,031,720$

2020 population = 8,031,720

Sampling Size and Sampling Technique

Sample Size

The sample size for this study was determined with the aid of Taro Yamane formula.

The formula of Yamane (1979) is presented as follows:

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

Where :

n = population of study

e = degree of freedom/significance at 5% (0.05)

1= constant

Substituting numbers in to the formula we have:

$$n = \frac{8,031,720}{1+8,031,720(0.05)^2}$$

$$n = 399.9 = 400.$$

Sampling Techniques

Purposive sampling techniques were adopted for the study. For the purpose of clarity, two (2) local government from the 3 senatorial district making it a total of six (6) local government (Etche; Ikwerre; Eleme, khana, Bonny, and Ogba/Egbema/Ndoni) out of the twenty-three (23) Local Government Area in Rivers State were purposively selected as the sample of this study. The choice of using Purposive sampling techniques in this research work is that it provides non-probability samples which receive selection based on the characteristics which are present within a specific population group and the overall study. It also helps the researchers to identify the extreme perspectives that are present in each population group as well.

Table 1: Sectorial Distributions of the Questionnaires

Senatorial District	No. of L.G.A	Names of L.G.A	No. of L.G.A	Names of Selected L.G.A
Central Senatorial District	8	Emohua Ikwerre Etche Omuma Port Harcourt Obio/Akpor Ogu/Bolo Okirika	2	Etche Ikwerre

West Senatorial District	8	Bonny Degema Asari-Toru Akuku Toro Ogba/Egbema/Ndoni Ahoada East Ahoada West Abua/Odual	2	Bonny Ogba/Egbema/Ndoni
South East Senatorial District	7	Andoni Opobo/Nkoro Gokana Khana Eleme Oyigbo Tai	2	Eleme Khana

Source: author’s compilation (2023)

Method of Data Collection

The research instrument adopted for this study was a self-structured questionnaire titled: “The impact of Population Dynamics on Agricultural value chain (P.D.A.V.C)”. It enabled the researcher obtained relevant data for the research. The questionnaire was designed to elicit information from the respondents, and to suit the need and purpose of the study. The questionnaire was designed in four (4) sections. The first section looked at demographic data of the respondents such as; gender, age, occupation, state of origin. The second section analyze research question one which is centered on the impact of population dynamics on agricultural value chain in Rivers State. The questionnaire adopted a 4-point Likert scale of Strongly agreed (SA), Agreed (A), Strongly Disagreed (SD), and Disagreed (D). The instrument is made up of a total of 13 items.

Method of Data Analysis

Descriptive statistics and non-parametric statistical tools were used as the instruments of data analysis to analyze responses from the respondents. The descriptive statistical tools of: tables, percentages, averages and more were also used for data presentation. On the other hand, 4 Linkert scale with the use of Mean and Standard Deviation in Statistical Package for Social Science (SPSS) were used in analyzing the three research questions.

The research questions were analyzed using a mean criterion of 2.50 for the research questions, an aggregate mean below 2.50 means the respondents disagree with the stated research question while an aggregate mean of 2.50 and above means the respondents agree with the stated research questions.

Presentation of Data

Table 2: the breakdown of Questionnaires Administered and Returned

State of Resident	Numbers Distribute	Numbers Returned	Percentage
Bonny	35	35	8.75
Eleme	35	35	8.75
Ikwerre	75	71	17.75
Ogba/Egbema/Ndoni	75	72	18
Khana	90	87	21.75
Etche	90	85	21.25
Total	400	385	96.25

Source: Researcher's Fieldwork, 2023.

Table 3: Sex of the Respondents

Sex	Frequency	Percentage (%)
Male	195	48.75
Female	205	51.25
Total	400	100

Table 4: Age of the Respondents

Age	Frequency	Percentage (%)
18-30yrs	60	15
31-45yrs	75	18.75
46-60yrs	195	48.75
61 and above	70	17.5
Total	400	100

Source: Field Work, 2023.

Table 5: Occupation of the Respondents

Occupation	No of Respondents	Percentage (%)
Retired Civil servants	65	16.25
Farmers	185	46.25
Students	55	13.75
Traders	95	23.75
Total	400	100

Source: Field work (2023).

Table 6: Area of Residents of the Respondents

Residential Area	Frequency	Percentage (%)
Rural	250	62.5
Semi-Urban	150	37.5
Total	400	100

Source: Field Work, 2023

Table 7: Academic Level of the Respondents

Academic level	Frequency	Percentage (%)
FSLC	75	18.75
WAEC	185	46.25
B.SC	115	28.75
Postgraduate	25	6.25
Total	400	100

Source: Field Work, 2023

Data Analysis

The data for this study is hereby presented and analyzed below using simple percentage and Statistical Package for Social Sciences (SPSS) software to test the level of significance of the research question.

Research Question

What is the impact of population dynamics on agricultural value chain in Rivers State?

Table 8: Respondents' Perceptions on the Impact of Population Dynamics on Agricultural Value Chain in Rivers State

S/N	Factors	Mean	Decision
1	Increase in population brings about increase in labor/manpower available to work in agricultural farmland thereby leading to increase in the production of agricultural product in Rivers State.	2.42	Disagreed
2	Population dynamics brings about increase in the demand for agricultural product in Rivers State.	3.59	Agreed
3	Increase in the demand for agricultural product lead increase in farmers' revenue as a result of increase in population in Rivers State.	3.59	Agreed
4	Due to increase in the demand for agricultural product, farmers apply modern means of technology in order to meet up its demand in Rivers State.	2.59	Agreed
5	Increase in population brings about increase in the application of storage facilities for the preservation of agricultural product in Rivers State.	3.11	Agreed
6	Population increase brings about decrease in the availability of agricultural farmlands in Rivers State.	3.46	Agreed
7	Increase in population lead to destruction of farmlands in Rivers State.	3.53	Agreed
8	Population growth brings about illegal food importation in order to cater for the timing population in Rivers State.	3.21	Agreed
9	Majority of farmlands are being polluted by the activities of industries in Rivers State.	3.42	Agreed
10	Most of the rivers in Rivers State are being polluted by the activities of industries in the state	3.47	Agreed

11	Soil nutrient and crops planted on farmlands that are close to houses are washed away by water that rushes from the roof, compound and gutters of these houses in Rivers State.	2.99	Agreed
12	Increase in population leads to the use of artificial nutrient such as fertilizers and chemicals in order to fasten the rate of crop maturity to meet up its demand in Rivers State.	3.20	Agreed
13	Population growth brings about several pollutions such as air pollution and climate change which sometimes affect planting season in Rivers State.	3.10	Agreed
	Aggregate mean	3.21	Agreed

Source: Field Work, 2023

Discussion of Findings

The findings from table 8 research questions revealed the impact of population dynamics on agricultural value chain in Rivers State. According to table 8, the impact of population dynamics on agricultural value chain which are; Increase in population brings about decrease in labor/manpower available to work in agricultural farmland thereby leading to increase in production of agricultural product in Rivers State, population dynamics brings about increase in the demand for agricultural product thereby leading to increase in farmers' revenue as a result of population growth in Rivers State, application of modern technology in order to meet up the demand for agricultural product as a result of increase in population in Rivers State, Increase in the application of storage facilities for the preservation of agricultural product in Rivers State, increase in population brings about decrease in the availability of farmlands in Rivers State, destruction of farmlands in Rivers State, illegal food importation in order to cater for the timing population in Rivers State, pollution of farmlands and rivers as a result of industrial activities in Rivers State, washing away of soil nutrient and crops by water that rushes from the roof, compound and gutters of houses that are close to farmlands, increase in population brings about artificial use of nutrient such as fertilizers and chemicals in order to fasten the rate of crop maturity so as to meet up its demand in Rivers State, and finally population growth brings about several pollutions such as air pollution and climate change which have affected planting season in River State.

Consequently, through the findings of the research question and the associated empirical literatures evidences, this study has been able to highlight and demonstrate the impact of population dynamics on agricultural value chain in Rivers State.

Conclusion

The economy of every states and nation of the world is determined by its population and agriculture. The level and quality of its population and agriculture couple with good government policies will determined the level of development in any given state. Rivers State population in urban and semi urban areas are beginning to outweigh the level and rate at which it environment can produce food as a result of increase in population thereby causing divers agricultural problem. The rural residence is busy clearing forest and burning bushes in the name of fetching

fuel wood for domestic energy purpose as such in return cause flooding, erosion, degradation, loss of habitats and desertification. Conclusively, agricultural value chain problems are not caused only by population dynamics, but by the absence of effective public policy design to reduce these problems. There is nothing incompatible with population and agricultural value chain protection as long as policies are in place that control the rate of child birth, population and the environmental impacts of the products and services people make and use. With those policies in place, a concern for agricultural sustainability environment can and will permeate everyday decision-making of residents, indigene, non-indigene and government of Rivers State thereby leading to a friendly agricultural sustainable environment which in turns will benefit all of the citizens in the state.

Recommendations

Base on the findings above, the following are recommended to Rivers State government to adopt in order to achieve optimum population that will be agricultural friendly in the state:

- i) Government of Rivers State should establish a law that will help to reduce the number of family size to at most three children.
- ii) Government of Rivers State should adopt the use of PIGOVIAN TAX which assessed against private individuals, business and industries in the state for engaging in activities that create adverse side effects for the environment. This means that tax per unit of the economic activities of individuals, business and industries that course damages to the agricultural farm land and anything related to it should be implemented.
- iii) Government and NGOs should encourage farmers and industries in the state to use modern technology and techniques of production by providing this technology for them or by given them loans that will enable them to afford this technology.
- iv) More good and quality roads should be created in the rural areas of the state in order to enable farmers in these areas to easily move their agricultural surplus to areas of high demand in the state.

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