Socio – Economic Impacts of Prolonged Little Dry Season (August Break) in a Climatic Changed Era in Agrarian Communities of Anambra River Basin, Anambra State, Nigeria

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Abstract
The food supply and demand situation for the 2020 fiscal year concerning the main seasonal crops in Nigeria was unpredictable due to the effect of Covid-19 pandemic. Federal and state governments laid much emphasis as a result on agriculture, especially crop production in order to produce food enough to ameliorate hunger, which is one of the negative effects of Covid-19. Nigeria been a rain fed dependent agricultural nation, follows the dictate of weather and other weather elements in her agricultural activities. With climate change and the effect of Little Dry Season, there was a reduction in rainfall in mid-July through August 2020. Rice and Maize which are among the staple foods in Nigeria requires about 750mm to 1200mm of rainfall to thrive. The mean monthly rainfall recorded in our study area (part of Anambra River Basin) consisting of Ayamelum, Anambra West, Anambra East, Oyi and Dunukofia local government areas are 21.15mm and 3.25mm for July, 2020 and August, 2020 respectively. As a result of the shortage of rainfall in these two months, the farmers and the authors observed these negative outcomes which are early maturity of crops; early harvesting of crops as well as poor yields for early season crops. While during the late season planting, farming was affected by the hardening of the ground as a result of absence of rainfall; undissolved fertilizers in farm lands; partial germination of scattered seedlings; Ant, Birds and Rodent infestation and stunted growth. Base on our observation, it was concluded that yields and harvest would be poor and subsequently there would be shortage of food and price hike in food items. The paper recommends for the revitalization of the moribund irrigation facility in Omor, Ayamelum local government area to provide for the shortfall in moisture that is likely to occur in the absence of rainfall.

Key-words: August Break, Socio-economic, Climate Change, Era, Anambra River Basin, Agrarian Communities.
1. Introduction

Background of the Study

The food supply and demand situation for the 2020 fiscal year concerning the main seasonal crops in Nigeria is unpredictable due to the effect of Covid-19 pandemic. Federal and state governments laid much emphasis as a result on agriculture, especially crop production in order to produce food enough to ameliorate hunger, which is one of the negative effects of Covid-19 (PTF, 2020). Nigeria being a rain fed dependent agricultural nation, follows the dictate of weather and other weather elements in her agricultural activities. In most African countries, crop farming is mainly subsistence and rain-fed, but due to climate change frequent, untimely rainfall and Little Dry Season (August Break) affects harvest of crops and thus, food production (Ozor and Nnaji, 2011).

Little Dry Season is a climatological phenomenon which occurs in West Africa (Ilesanmi, 1981). It manifests in form of declined amount of rainfall and frequency for a number of days in the middle of rainy season which starts from mid to late April to late October each year (Adejuwon and Odekunle, 2006). The reduction in rainfall is noticeable in mid-July through August (Adejuwon and Odekunle, 2006). Little Dry Season favours farmers in various ways like: it is a period in the planting season favourable for weeding; it is a period for the application of pesticides; it is a period of sun drying of early planted and harvested crops like cereals; it favours good yield of yam. However, when the Little Dry Season comes up too early during the planting season, it could affect early crops negatively. When it persists for too long, the length of planting season is reduced, the late planting season is negatively affected and generally, there will be widespread crop failure and low yield (Odekunle, 2007).

More rains are urgently needed to avoid significant decreases in the main cereal production season, but there are climatic implications in our study area resulting from the deforestation of over 5000 hectares of wooded land acquired by the federal government to pave way for the establishment of Lower Anambra Irrigation Project by Anambra, Imo River Basin Development Authority (AIRBDA). Ayadiuno (2011) found out that the deforestation has lead to the serious variation of the temperature and rainfall regime of the area from what it was before the project was established. Net rainfall amount has decreased and net temperature has increased. The recent trend of increased rainfall in amount and distribution as explained in the context of climate change, which appears to be eliminating the occurrence of the Little Dry Season (August Break) elsewhere in the same climatic zone however, is being altered by the pro-longed Little Dry Season (August Break) being experienced elsewhere in the same climatic zone.
in the study area. Should this little drought conditions persist, the food security situation is likely to further deteriorate. This, coupled with reduced water supplies for irrigation, due to precipitation deficits, lack of appropriate facility for irrigation and the unusually high temperatures being experienced from the month of July to August, could hinder the late sowing process of the staple crops (rice, cassava and maize), in the study area and could also adversely affect the yield potentials of early planted crops in area.

Some literatures show the potential impacts of climate variability on agriculture in developing countries, which are Eboh (2009), who exerts that the effects of climate variability on agriculture are projected to manifest through changes in land and water regimes, specifically changes in the frequency and intensity of drought, flooding, water shortages, worsening soil condition, desertification, diseases and pest outbreaks on crops and livestock. Schlenker and Lobell (2010), concludes that yields of some major staples such as maize, groundnut, millet, sorghum and cassava have been projected to decrease by 7to 27% in some parts of Sub-Saharan Africa by 2050 due to climate change and rainfall variability. Zierovogel et al. (2006), shows that crop yield is sensitive to variability in the time of onset and cessation of the rainy or growing season. Okorie, et al., (2012) opines that in southeast Nigeria, droughts have been relatively less persistent, while rainfall is observed to be increasing and temperature increases and reduces moderately over the years compared with Northern Nigeria. According to Nwalieji and Uzuegbunam (2012), the rice farmers in Anambra state suffered reduction in crop yield and grain quality, reduction of farm land by flood in 2012, high incidence of weeds, pests and diseases, decrease in soil fertility and the surge of human diseases such as meningitis, malaria and cholera. However, no literature has looked at the effects of prolonged Little Dry Season (August Break) in the agrarian communities of Anambra state especially in the Anambra River Basin.

**Study Area and Location**

The study area is part of Anambra River Basin in Anambra State (Figure 1 and 2), and has a total landmass of about 1972 km². It is situated within Ayamelum, Anambra West, Anambra East, Oyi and Dunukofia local government areas. The river basin lies between Latitude 5º 45’N to 6º 46’N and Longitude 6º 38’E to 7º 23’E. It lies wholly within Koppens Af climate region (Ayadiuno, 2014). Mean annual temperature is around 27°C with a mean rainfall of 1870mm per annum. The rainy season starts from mid to late March to late October every year. The rainy season is cool and wet. The dry season starts in late October and lasts till March to early April. The harmattan season lasts from
late November to February before the sun crosses Equator into the northern hemisphere (Ndulue, 2018).

Fig. 1 - Anambra River Basin

Source: Google Earth, Modified by Ndulue, (2020)
The study area is an undulating plain made up of the western reaches of the dip slope of the Nsukka Plateau. It has been described by Ofomata as part of the Anambra River plains lying above 125 metres above mean sea level. Two major residuals made of reddish brown lateritic materials are found in Ifite Ogwari and Igbakwu. A smaller one is found at Omor. The landscape is generally higher in the western side (Ofomata, 1978) as seen in (Figure 3).

The study area is drained by the following rivers which have their sources outside it – Omambala, Ezu, Du and Obina rivers. Some parts of the study area liable to flooding are usually inundated during high water regime known locally in the Igbo Language as “Iji” (flood) and lasts from August to October. The Anambra river plain is marked on the eastern side by a bluff which is about 15 metres to 20 metres in height, thus giving the impression that the surface of the study area must have been created before the river commenced carving its flood plains. The bluff lies between 200 metres to 500 metres away from the river channel in some places (Ofomata, 1978). See figure 3 below.
The population according to the 2006 population census shows that the study area has a population of about 908,914 persons. The people engage in agricultural activities due to the presence of the edaphic soil that covers almost the whole of the study area. The agricultural activities include; farming, rearing of domestic animals and other economic activities. They cultivate cocoyam, yam, cassava and their main agricultural products are rice and maize.

Rice (Oryza sativa) is a popular cereal crop grown and consumed by nearly half of the world’s population. It is a member of the grass family (Gramineae). The seed/fruit of rice is a caryopsis, i.e it has its epicarp fused with the mesocarp (Iwena, 2012). Based on findings in the study area, land preparation for rice cultivation is done manually or mechanically. The varieties of rice planted include; the swamp rice (Toma BG79 and GFB 24) and the upland rice (Agbede). Rice requires a temperature of about 29°C and above and 750mm to 1200mm of rainfall for upland rice and over
2500mm for swamp rice. Rice is propagated by seed, which is done manually or mechanically, and is planted in Southern Nigeria around April and May and between August and September in the North.

Swamp rice requires nursery which is done in fertile, water soaked soil. Seeds are broadcasted and germination takes place after four to five days, and seedlings are transplanted at between seven to eight weeks. Seeds are sown in nursery around may/June and transplanted in July/August to the field.

Maize (Zea mays) also called corn is a member of the grass family (Gramineae). It is a cereal crop which produces grains that can be used as food by human beings as well as livestock (Iwena, 2012). According to farmers in the study area, land for planting maize is done by clearing manually or mechanically; making of heaps and or ridges also manually or mechanically. The varieties of maize planted are; dent maize, flint, flour, pop, sweet and pop corn. Maize requires a temperature of about 26°C to 30°C and a rainfall of about 750mm to 1500mm per annum and a well drained sandy loamy soil of PH 6 – 7. Early maize is planted between March and April, while late maize is planted between July and August especially in southern Nigeria.

Scope of the Study

This study looks at rainfall characteristics like intensity and frequency during the months of July and August (possible months of “Little Dry season” occurrence) for the period of thirty (30) years from 2020 to 1990 (excluding 1995 data that was not available) over part of Anambra River Basin. It looks closely at daily rainfall occurrence, frequency and amount as against what that is obtained in July and August 2020 in the agrarian communities of the study area vis-à-vis the socio-economic impacts of the prolonged Littlie Dry Season (August Break) in this climate change era.

Hypothesis

“There is no statistical significant difference between the mean of rainfall data of July and August for 30 years, from 2020 to 1990 (excluding 1995 data that was not available) and the mean of rainfall data of July and August, 2020”.

2. Materials and Methods

The data on which this work is based came from primary and secondary source. Primary data were obtained from direct field activities which include field work such as field observation,
photographs and oral discussions with knowledgeable persons conversant with the area. Secondary data consist of existing published materials including text books, articles in journals, published and unpublished thesis, material from the internet and libraries.

This study utilized daily rainfall data for July and August from 2020 to 1990 (excluding 1995 data that was not available), sourced from the archives of the Nigeria Meteorological Agency (NIMET) Awka, Anambra State. Descriptive and Inferential statistical techniques using Microsoft Excel were employed to summarize the characteristics of rainfall in the study area and the results were rendered in charts, and tables. The mean and standard deviation of the rainfall data were also computed, using the formulas:

\[ M(\mu)\bar{x} = \frac{\sum x}{N} \]  \hspace{1cm} (1)

Where; \( x \) is the variable
\( N \) is the number of days

\[ SD(\delta) = \sqrt{\frac{\sum(x - \bar{x})^2}{N}} \]  \hspace{1cm} (2)

Where;
\( x \) is the variable
\( \bar{x} \) is the mean
\( N \) is the number of days

A z-test was used to compare the mean of rainfall data of July and August for 30 years, from 2020 to 1990 (excluding 1995 data that was not available) and the mean of rainfall data of July and August, 2020 to determine if they are significantly different using the formula:

\[ Z = \frac{M - \mu}{\delta / \sqrt{n}} \]  \hspace{1cm} (3)

Where;
\( M \) is the variable
\( \mu \) is the mean
\( n \) is the number of days
Sampling Technique

Random sampling technique was used in selecting the 100 rice farmers that were interviewed for the study. These farmers confirmed the authors’ observation of the negative outcome of shortfalls in rainfall in the area, which are early maturity of crops; early harvesting of crops as well as poor yields for early season planted crops. While during the late season planting, farming was affected by the hardening of the ground as a result of absence of rainfall; undissolved fertilizers in farm lands; uneven germination of scattered seedlings; Ant, Birds and Rodent infestation and stunted growth (Figure: 4, 5 and 6).

Data Analysis

Monthly rainfall data for July and August 2020 to 1990 (excluding 1995 data that was not available), extracted from the daily rainfall data of the same period were used for the analysis while the rainfall data for July and August 2019 and 2020 were extracted and used for comparison. The Rainfall Data for July and August 2020 to 1990 (excluding 1995 data that was not available) was presented in the chart below as well as subjected to analysis in descriptive statistics using Micro soft Excels and the outcome was presented in the tables below.

Fig. 4 - Line Chart of Mean Monthly Rainfall for July and August 2020 to 1990 (Minus 1995)

Source: Nigeria Meteorological Agency (NIMET) Awka, Anambra State
Table 1 - The result of the Descriptive analysis of monthly rainfall data for July and August 2020 to 1990 (Minus 1995)

| July 2020 to 1990 | August, 2020 to 1990 | July and August, 2020 to 1990 |
|------------------|----------------------|-------------------------------|
| Mean             | 11.63521             | 9.992288                      | 10.81374997                  |
| Standard Error   | 1.017798             | 0.766978                      | 0.640778483                  |
| Median           | 10.26833             | 10.09615                      | 10.09614943                  |
| Mode             | #N/A                 | #N/A                          | #N/A                         |
| Standard Dev     | 5.574708             | 4.200911                      | 4.963448784                  |
| Sample Variance  | 31.07737             | 17.64765                      | 24.63582384                  |
| Kurtosis         | -0.30187             | 0.48964                       | 0.314259309                  |
| Skewness         | 0.806207             | 0.461359                      | 0.812457281                  |
| Range            | 19.45345             | 18.35355                      | 19.56344828                  |
| Minimum          | 3.15                 | 3.04                          | 3.04                         |
| Maximum          | 22.60345             | 21.39355                      | 22.60344828                  |
| Sum              | 349.0564             | 299.7686                      | 648.8249981                  |
| Count            | 30                   | 30                            | 30                           |

Source: Microsoft Excel Output

Fig. 5 - Line Chart for July, 2019 Rainfall

Source: Nigeria Meteorological Agency (NIMET) Awka, Anambra State
**Fig. 6 - Line Chart for August, 2020 Rainfall**

**Source:** Nigeria Meteorological Agency (NIMET) Awka, Anambra State

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**Table 2 - Rainfall and Mean Temperature Data for July and August 2019 and 2020**

| DAY | Jul-19 Ave. Temp (°C) | Rain Data (mm) | Aug-19 Ave. Temp (°C) | Rain Data (mm) | Jul-20 Ave. Temp (°C) | Rain Data (mm) | Aug-20 Ave. Temp (°C) | Rain Data (mm) |
|-----|----------------------|----------------|-----------------------|----------------|----------------------|----------------|-----------------------|----------------|
| 1   | 24.5                 | 4.5            | 24                    | 76.5           | 24.5                 | 0.001          | 24                    | 0              |
| 2   | 24.5                 | 0              | 22.5                  | 24.5           | 24.5                 | 0.2            | 23.5                  | 22.1           |
| 3   | 24.5                 | 9              | 24                    | 21.3           | 24.5                 | 1              | 24                    | 0              |
| 4   | 24.5                 | 0              | 23.5                  | 3.1            | 24                    | 0              | 23.5                  | 0              |
| 5   | 24.5                 | 0.001          | 24                    | 0              | 24.5                  | 36.2           | 23.5                  | 0              |
| 6   | 24.5                 | 0              | 24                    | 0              | 23.5                  | 74.5           | 23.5                  | 0              |
| 7   | 22.5                 | 19.4           | 23.5                  | 12.5           | 24.5                  | 2.2            | 24                    | 0              |
| 8   | 23                   | 11.2           | 23.5                  | 17.2           | 24                    | 0.3            | 24.5                  | 0              |
| 9   | 23                   | 0              | 24                    | 0              | 23                    | 20.9           | 24                    | 1.4            |
| 10  | 23.5                 | 73.1           | 24                    | 0.001          | 22.5                  | 0.6            | 24                    | 0              |
| 11  | 23.5                 | 18.8           | 24                    | 0.001          | 24                    | 0              | 25                    | 0              |
| 12  | 24                   | 0              | 24                    | 0              | 24.5                  | 86.5           | 25                    | 0              |
| 13  | 24                   | 99.2           | 24.5                  | 0              | 22.5                  | 59             | 25                    | 0              |
| 14  | 23.5                 | 0              | 25                    | 0              | 23                    | 47.1           | 24.5                  | 3.7            |
| 15  | 23.5                 | 0              | 24.5                  | 0              | 24                    | 14.4           | 25                    | 0              |
| 16  | 24.5                 | 0              | 24.5                  | 0              | 23                    | 11.2           | 24.5                  | 0              |
| 17  | 24.5                 | 0              | 24.5                  | 0              | 23                    | 1.3            | 25                    | 0              |
| 18  | 24                   | 15.2           | 24.5                  | 0.3            | 24                    | 1.3            | 25                    | 0              |
| 19  | 23.5                 | 10.6           | 24                    | 33.4           | 23                    | 24.8           | 25.5                  | 0              |
| 20  | 24                   | 2.5            | 24.5                  | 5.2            | 23                    | 58.4           | 24.5                  | 0              |
| 21  | 23.5                 | 49.2           | 24.5                  | 7.8            | 23.5                  | 1.3            | 23.5                  | 39.6           |
| 22  | 23.5                 | 2.4            | 24.5                  | 91.3           | 24                    | 33.9           | 24.5                  | 0              |
| 23  | 23.5                 | 0.001          | 23.5                  | 36.5           | 23.5                  | 33.7           | 24                    | 0.2            |
| 24  | 24                   | 0              | 23.5                  | 27.3           | 24                    | 0.4            | 23                    | 0              |
| 25  | 24                   | 2.6            | 24.5                  | 43.6           | 23.5                  | 20             | 24.5                  | 0              |
| 26  | 24                   | 151.8          | 24                    | 14.8           | 23.5                  | 16.5           | 25                    | 0              |
| 27  | 23                   | 2.2            | 24                    | 0              | 23                    | 18.2           | 24.5                  | 0.8            |
| 28  | 23.5                 | 64.7           | 24.5                  | 23.9           | 23.5                  | 60.9           | 24                    | 4.5            |
| 29  | 23.5                 | 0.001          | 24.5                  | 0              | 23                    | 0.001          | 24                    | 20.3           |
| 30  | 24.5                 | 3.1            | 24.5                  | 0              | 23.5                  | 14.5           | 24.5                  | 3.2            |
| 31  | 24.5                 | 0              | 24.5                  | 3.5            | 23                    | 13.1           | 24.5                  | 5              |

**Source:** Nigeria Meteorological Agency (NIMET) Awka, Anambra State
The Rainfall and Mean Temperature Data for July and August 2019 and 2020 were subjected to analysis in descriptive statistics using Microsoft Excel and the outcome were presented in the tables below.

Table 3 - The Result of the Descriptive Analysis of Rainfall and Mean Temperature Data for July and August 2019

|       | Jul-19 | Aug-19 |
|-------|--------|--------|
| Ave. Temp. | Rain Data (mm) | Ave. Temp. | Rain Data (mm) |
| Mean | 23.85483871 | 17.40332258 | 24.08064516 | 15.77748387 |
| Standard Error | 0.104195712 | 6.288595691 | 0.090091871 | 4.203029001 |
| Median | 24 | 2.4 | 24 | 3.5 |
| Mode | 24.5 | 0 | 24.5 | 0 |
| Standard Dev. | 0.580137173 | 35.01341898 | 0.50161031 | 23.40147509 |
| Sample Var. | 0.336559194 | 1225.939509 | 0.251612903 | 547.6290362 |
| Kurtosis | -0.67616317 | 7.194179901 | 1.827291482 | 3.803130653 |
| Skewness | -0.480544169 | 2.649797206 | -0.97894269 | 1.941358748 |
| Range | 2 | 151.8 | 2.5 | 93.3 |
| Minimum | 22.5 | 0 | 22.5 | 0 |
| Maximum | 24.5 | 151.8 | 25 | 93.3 |
| Sum | 739.5 | 539,503 | 746.5 | 489.102 |
| Count | 31 | 31 | 31 | 31 |

Source: Microsoft Excel Output

Table 4 - The Result of the Descriptive Analysis of Rainfall and Mean Temperature Data for July and August 2020

|       | July 2020 | Aug 20 |
|-------|----------|--------|
| Ave. Temp. | Rain Data (mm) | Ave. Temp. | Rain Data (mm) |
| Mean | 23.62903226 | 21.145 | 24.25806452 | 3.251613 |
| Standard Error | 0.111122673 | 4.4462 | 0.108437008 | 1.542487 |
| Median | 23.5 | 14.4 | 24.5 | 0 |
| Mode | 24 | 0.001 | 24.5 | 0 |
| Standard Dev. | 0.618704856 | 24.756 | 0.603751711 | 8.588204 |
| Sample Var. | 0.382795699 | 612.84 | 0.364516129 | 73.75725 |
| Kurtosis | -1.07172242 | 0.5378 | -0.64347459 | 11.33735 |
| Skewness | -0.07702533 | 1.2063 | -0.04030843 | 3.313829 |
| Range | 2 | 86.5 | 2.5 | 39.6 |
| Minimum | 22.5 | 0 | 23 | 0 |
| Maximum | 24.5 | 86.5 | 25.5 | 39.6 |
| Sum | 732.5 | 655.5 | 752 | 100.8 |
| Count | 31 | 31 | 31 | 31 |

Source: Microsoft Excel Output
Fig. 7 - Partially Germinated Scattered Seedlings in the Field

Source: Authors’ Fieldwork, (2020)

Fig. 8 - Stunted Rice Stalks

Source: Authors’ Fieldwork, (2020)
3. Result and Discussions

The result of the statistical analysis carried out with the July and August 2020 to 1990 rainfall data extracted from the rainfall data of the study area for that same period as presented in table 1 above shows that the number of observations is 30 representing the 30 years rainfall data (2020 to 1990 (minus 1995 which has no rainfall data record)).

The mean rainfall for July and August of same period is 10.81. The implication here is that if the rainfall over the study area is spread evenly, all the study area will have 10.81mm of rainfall which far below the required rainfall for rice and maize cultivation. This explains the establishment of Lower Anambra Irrigation Project in 1982. However, the irrigation facility stopped working in 1992, ten (10) years later and has been moribund since then (Ayadiuno, 2014).

The standard deviation is 4.96. This explains the observed distance from both side of the mean. The minimum rainfall is 3.04 and maximum is 22.60. The minimum rainfall of 3.04 was recorded in August, 2020 and is the least for a period of thirty (30) years.

Table 3 shows the result of July and August 2019 and 2020 respectively. The mean rainfall for July and August of same period is 17.40, 15.78 and 21.15, 3.25. The implication here is that if the rainfall over the study area is spread evenly, all the study area will have 17.40mm of rainfall for July
2019, 15.78mm of rainfall for August 2019 and 21.15mm of rainfall for July 2020, 3.25mm of rainfall for August 2020 respectively.

The standard deviation is 35.01 for July 2019, 23.40 for August 2019 and 24.76 for July 2020, 8.59 for August 2020. This explains the observed distance from both side of the mean.

The minimum rainfall is 0mm for July 2019, 0mm for August 2019 and 0mm for July 2020, 0mm for August 2020 and maximum is 151.8mm for July 2019, 93.3mm for August 2019 and 86.5mm for July 2020, 39.6mm for August 2020 respectively. The number of variables is 31 (the days of the month of July and August).

Test of Hypothesis

Statistical analysis was carried out to test for the hypothesis which states that “there is no statistical significant difference between the mean of rainfall data of July and August for 30 years, from 1990 to 2020 and the mean of rainfall data of July and August, 2020”.

A z-test was used to compare the mean rainfall of July and August, 2020 (M = 0.37) to the mean rainfall of July and August, 1990 to 2020 (\(\mu = 10.81, SD = 4.96\)).

\[
Z = \frac{M - \mu}{\delta / \sqrt{n}}
\]

\[
Z = 0.37 - 10.81 / 4.96 / \sqrt{1}
\]

\[
Z = -2.10
\]

The table value of -2.1, under zero is 0.0179 (analystprep.com, 2019).

Compare with P – value = 0.05.

Since P – value (0.05) is greater than the table value (.0179), H_o is rejected which states that “there is no statistical significant difference between the mean of rainfall data of July and August for 30 years, from 1990 to 2020 and the mean of rainfall data of July and August, 2020”.

The Effects of 2020 Little Dry Season (August Break)

There are negative outcomes that affected crop production especially rice and Maize in the study area. Some of these outcomes were listed and farmers were asked to rate them in a 5-point likert scale to show to what extent they agree or disagree to the dangers they pose to crop production especially rice and maize. The 5-point rating scale availed the farmers the opportunity to grade the outcomes. The rating were in the order: Strongly Agree (SA) = 5; Agree (A) = 4; Neutral (N) = 3; Disagree (D) = 2 and Strongly Disagree (SD) = 1. The mean score value based on the five-point scale
is $5(100) + 4(100) + 3(100) + 2(100) + 1(100) = 1500$. $1500 \div 5 = 300/100 = 3$ Mean value (MV).

Using the interval scale of 0.05, the upper limit cut-off point will be $3.00 + 0.05 = 3.05$. The lower limit was $3.00 – 0.05 = 2.95$, (Likert, 1932). Based on these, mean values below 2.95 (i.e. MV < 2.95) were regarded as the impact is not too hard. The mean values between 2.95 and 3.05 are considered as the impact is hard and mean values greater than 3.05 (i.e. MV >3.05) were considered as the impact is hard and very dangerous to farmers and farming.

Table 5 - The Responses of Farmers to the Negative Outcome of 2020 August Break, the Corresponding Mean Values and Decisions

| Negative outcomes                                      | No of Respondents | SA (5) | A (4) | N (3) | D (2) | SD (1) | MV | Decision |
|--------------------------------------------------------|-------------------|--------|-------|-------|-------|--------|----|----------|
| Early Season Planting                                  |                   |        |       |       |       |        |    |          |
| Early Maturity of Crops                                | 100               | 500    | 0     | 0     | 0     | 0      | 5  | Agreed   |
| Early Harvesting of Crops as well as Poor Yields       | 100               | 500    | 0     | 0     | 0     | 0      | 5  | Agreed   |
| Late Season Planting                                   |                   |        |       |       |       |        |    |          |
| Farming Affected by the Hardening of the Ground        | 100               | 500    | 0     | 0     | 0     | 0      | 5  | Agreed   |
| Undissolved Fertilizers in Farmlands                   | 100               | 500    | 0     | 0     | 0     | 0      | 5  | Agreed   |
| Partial Germination of Scattered Seedlings             | 100               | 500    | 0     | 0     | 0     | 0      | 5  | Agreed   |

[Decision rule: <2.95= Reject and ≥ 2.95 Accept]

Source: Fieldwork, 2020

4. Conclusion and Recommendation

The study area is endowed with good edaphic soil suitable for rice, maize and other crops production. However, scanty rainfall and prolonged dry season have been affecting farming activities in the area for a long time, hence the establishment of Lower Anambra Irrigation Project by Anambra, Imo River Basin Development Authority (AIRBDA) in 1982 at Omor, Ayamelum local government area, to ameliorate the effects of shortfalls in rainfall. The irrigation project, which stopped working in 1992, ten years after its establishment led to the farmers’ dependence on rain alone for crop production. In 2020, there was a short drought which started in late July through to August. The short drought caused great discomfort and harms to the socio-economic activities of the people of the study area as well as other areas of same category.

Consequently, there was poor yields and harvest of crops and as a result, there will be shortfall in the supply of crops especially rice and maize, increase in prices due to shortage and scarcity.
The paper therefore recommends the revamping of the structures that once existed as Lower Anambra Irrigation Project in Omor, Ayamelum Local Government Area and make it functional again. Establish irrigation facilities in other agrarian communities in Anambra river basin and other agrarian communities with similar terrain and soil type.

The climate is changing, with its characteristics of short heavy rainfall and long drought, hence the need to put in place structures, laws and policies that will ameliorate the harsh effect of the climate change to the people and environment of the study areas.

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