

Proceedings of the Annual Conference of the Agricultural Extension Society of Nigeria

Number: Twenty-Sixth Annual Conference

Theme: Redefining Agricultural Extension Practice to Cope with Emergencies

Date: 26-29, April 2021

Venue: Federal University of Agriculture, Abeokuta, Nigeria

ISSN: 1595 – 1421. <http://aesonnigeria.org/ConfProc> . **Email:** editorinchief@aesonnigeria.org

Agricultural Extension Services amidst COVID-19 Pandemic in Nigeria: Policy Options

<https://dx.doi.org/10.4314/jae.v26i1.13S>

Issa, Fadlullah Olayiwola

National Agricultural Extension and Research Liaison Services,

Ahmadu Bello University, Zaria

Corresponding: issafola@gmail.com +2348033339312

Abstract

The paper explored the policy options targeted at preventing extreme hunger after surviving the COVID-19 pandemic. Multistage sampling procedure was used to select 15 key informants across five purposively selected Local Government Areas in Kaduna and Ogun States for this study. Checklist (administered through recorded telephone calls) was used to elicit responses (qualitative data) on the impacts of COVID-19 on the food system. This paper concludes that the COVID-19 pandemic has negatively impacted on the food system thus challenging the AES to employ more innovative and pragmatic approaches to reach the farmers. Major impacts of COVID-19 on food system were disruptions in agricultural production, limitation of field visit by extension personnel and distortion of technology delivery system. Major recommendations include: in response to the stay-at-home order in the wake of the COVID-19 pandemic, Agricultural extension services (AES) should explore virtual means to reach the clientele. To this end, farm operations and new techniques should be packaged into short clips and shared via various platforms. Also, legislative means to consider AEAS as essential services should be sought; and extensionists should be trained and provided with personal protection equipment (PPE) to enable them reach farmers. Such field officers should be insured and provided with adequate tangible mobility.

Keywords: Agricultural extension policy under COVID-19 pandemic

Introduction

The higher the number of contacts which farmers have with agricultural extension personnel and services, the better their knowledge, production and productivity. Farmers with better access to information in any emergency situation through extension services have a greater likelihood of adopting adaptation measures to mitigate the effects of such emergency (Solomon and Edet, 2018). Such adaptation measures are capable of dowsing tensions during crises or emergencies. Recognition of the need for agricultural extension services has not, however, been matched with corresponding capacity for extension professionals who require training to act as educators and information/service providers. This institutional capacity has been lacking as the efforts of the government and different agencies in Nigeria have been inadequate, especially in attending to emergency situations such as the COVID-19 pandemic.

Proceedings of the Annual Conference of the Agricultural Extension Society of Nigeria

Number: Twenty-Sixth Annual Conference

Theme: Redefining Agricultural Extension Practice to Cope with Emergencies

Date: 26-29, April 2021

Venue: Federal University of Agriculture, Abeokuta, Nigeria

ISSN: 1595 – 1421. <http://aesonnigeria.org/ConfProc> . **Email:** editorinchief@aesonnigeria.org

The struggle to fight the COVID-19 pandemic is compounded by lack of information, poor health services and poverty (FAO, 2020). This threatens both livelihood and national (and invariably, global) food supply by creating bottlenecks along the food supply chain. These bottlenecks according to FAO (2020) mostly concern logistics, labour, transportation and marketing of perishable and fresh products due to restricted mobility and lockdowns, the COVID-19 outbreak leaves the agriculture sector in an extremely difficult situation that puts food supply at serious risk for 2020 and beyond. However, the impact of COVID-19 is not uniform across the globe and all agricultural commodities. Different strategies and measures need to be taken to ensure food security and address bottlenecks along the food supply chains (Prokopy *et al.*, 2015). This implies a critical role for the AES.

Achieving the 2030 Development agenda (particularly SDG 2 that seeks to end hunger, achieve food security and improve nutrition and promote sustainable agriculture) will be a wild-goose chase if AES is not properly positioned for its noble role of rural transformation. The important roles of rural advisory services for inclusive development and rural transformation have indeed been recognized by the OECD, the UN, the G7 and G20 (Hussein, 2020). AES aim at instilling positive attitude that will encourage adoption of innovation by the farmers. Farmers need innovations that are not only technically feasible, but socially acceptable, economically viable and environmentally friendly to enable them operate in a commercial economy. Adequate performance of this role demands that AES should be properly resourced and have the right skills and capacities to enable producers to access the services and advice they need for improved skills, increased productivity, enhanced income and bettered standard of living especially in the face of emergencies such as COVID-19 pandemic.

However, AES have suffered over many years from inadequate policies, poor funding, weak poorly-coordinated institutions, limited opportunities for capacity development and learning across regions and an insufficient uptake of responsive, demand-driven approaches (Hussain, 2020). This has particularly been the case in lower income countries of which Nigeria is one.

Hence, FAO (2020) strongly advocated for strengthened AEAS to bring about desired development, including an overview of extension philosophies and methods, innovative financing, roles of the private sector and producer organizations, capacity development and professionalization, a review of advisory methods (from farmer-to-farmer approaches, farmer field schools, community knowledge workers to ICT and mobile phone extension) and key cross-cutting issues (such as gender and nutrition).

Nigeria Government's COVID-19 response

Nigeria's federal and state governments have acknowledged the devastating impact that COVID-19 will have on the food and livelihood sources of the most vulnerable Nigerians. The Presidential Task Force on COVID-19 eradication was inaugurated. However, the challenges remained tasking. Now, there is need to deploy more resources, creativity, and transparency to ensure the basic necessities of life for

Proceedings of the Annual Conference of the Agricultural Extension Society of Nigeria

Number: Twenty-Sixth Annual Conference

Theme: Redefining Agricultural Extension Practice to Cope with Emergencies

Date: 26-29, April 2021

Venue: Federal University of Agriculture, Abeokuta, Nigeria

ISSN: 1595 – 1421. <http://aesonnigeria.org/ConfProc> . **Email:** editorinchief@aesonnigeria.org

everyone. Alarmed by a potential rise in food insecurity during the COVID-19 pandemic, Nigerian government mounted efforts to keep agriculture safely running as an essential business, markets well supplied in affordable and nutritious food, and consumers still able to access and purchase food despite movement restrictions and income losses.

As the coronavirus crisis unfolds, disruptions in domestic food supply chains emerged as a pressing issue in Nigeria (Aromolaran and Muyanga, 2020). Labor shortages (due to morbidity, movement restrictions) started to impact processors, traders, trucking/logistics companies in food supply chains. Loss of income and jobs reduced people's ability to buy food and compensate farmers for their production. It was important that the federal and state governments should ensure the rights to food, shelter, and other basic necessities for people losing jobs or income during the COVID-19 pandemic. The economic assistance that the government announced in response to the virus had exposed inadequacies in Nigeria's social protection systems and risks excluding the country's poorest and most vulnerable people.

The President announced on April 13, 2020 that a lockdown, in place since March 30 in Lagos state, neighboring Ogun State, and the Federal Capital Territory (FCT), Abuja, for another 14 days. As of April 12, Nigeria had 343 confirmed cases. This figure increased to as much as 10,578 by June 1st, 2020. Several other state governments, including rivers, kaduna, and ekiti, also initiated full or partial lockdowns. Millions of Nigerians observing the COVID-19 lockdown lack the food and income that their families need to survive. The government needs to combine public health measures with efforts to prevent the pandemic from destroying the lives and livelihoods of society's poorest and most vulnerable people. The lockdown does not apply to those providing essential services, such as food distributors and retailers, including market stalls selling food and groceries, which the government has said can operate for four hours every 48 hours.

The lockdown, however, prevented many Nigerian working in informal sectors from traveling to work or conducting their business. Local food vendors and traders have expressed fears over their ability to feed their families during the lockdown, with their daily earnings their only source of sustenance. An increase in food prices as a result of the lockdown also means that many cannot stock up on necessities. The vast majority of people outside of the formal system are hit devastatingly by the lockdown. Any disruption to their daily livelihood has a huge and significant impact on their ability to meet their most basic needs.

On April 8, the government announced that 77,000 metric tons of food was to be distributed to vulnerable households affected by the lockdown in Lagos, Ogun, and Abuja, (UNDP, 2020), but the modalities for distribution were marred with some irregularities. The Humanitarian Affairs Ministry was directed to develop a strategy to maintain the school feeding program (expected to feed 9 million pupils), before

Proceedings of the Annual Conference of the Agricultural Extension Society of Nigeria

Number: Twenty-Sixth Annual Conference

Theme: Redefining Agricultural Extension Practice to Cope with Emergencies

Date: 26-29, April 2021

Venue: Federal University of Agriculture, Abeokuta, Nigeria

ISSN: 1595 – 1421. <http://aesonnigeria.org/ConfProc> . **Email:** editorinchief@aesonnigeria.org

schools closed on March 19. Lagos state government also said on March 27 that it would provide food packages to 200,000 households during the lockdown.

Nigeria's other major economic responses to COVID-19 may not adequately protect the rights of the people most likely to lack adequate food, shelter, and other essentials. The Central Bank of Nigeria also announced a 50 billion Naira (US\$ 128.5 million) targeted credit facility to support households and micro, small and medium enterprises affected by the COVID-19 pandemic. The credit facility, through which households can potentially get up to 3-million-naira loans, requires proof of collateral, such as personal property, which many poor families are unlikely to have. The loans also come with five percent interest initially and nine percent after March 2021. The House of Representatives on March 24 passed the Emergency Economic Stimulus bill, 2020 to provide a 50 percent tax rebate for employers and business owners who agreed not to make staff cuts in 2020.

Under international human rights law, Nigeria's government has an obligation to protect people's right to an adequate standard of living, including adequate food and nutrition, the highest attainable standard of health, and the right to social security. In times of economic crisis, governments are obligated to ensure access to food, water, health care, and other basic needs for everyone at all times, and in particular those subject to lockdown and other severe restrictions on movement. The use of AEAS is one of the ways by which government can achieve access to food. Hence, the major objective of this paper is to explore the policy instruments and options available for AEAS to function efficiently in order to avert looming food crises. Specifically, the study:

- i. identified the impacts of COVID-19 on food system;
- ii. identified way forward, and
- iii. presented key policy options to serve as a way out of hunger crises when the pandemic would have been over.

Nigeria Situation

The COVID-19 scourge have compounded the already worsen food situation in Nigeria. The COVID-19 lockdown has forced the government to develop guidelines that can keep agricultural value chain alive while adhering to public health guidelines and precautions.

Nigeria has been severely hit by the spread of COVID-19 and the consequent sharp decline in oil prices. Government policy is responding to both these developments. The authorities reported 3912 cases of COVID-19 and 117 deaths as of May 8, 2020. A range of measures were implemented to contain the spread of the virus, including closure of international airports, public and private schools, universities, stores and markets, and suspension of public gatherings. Lockdown was declared in Lagos, Abuja and Ogun states. Work at home was also encouraged in several states and government institutions while isolation centers are being expanded in Lagos state. Testing capacity was increased to 1500 daily and was expected to reach 2500 by the end of second week of April, 2020.

Proceedings of the Annual Conference of the Agricultural Extension Society of Nigeria

Number: Twenty-Sixth Annual Conference

Theme: Redefining Agricultural Extension Practice to Cope with Emergencies

Date: 26-29, April 2021

Venue: Federal University of Agriculture, Abeokuta, Nigeria

ISSN: 1595 – 1421. <http://aesonnigeria.org/ConfProc> . **Email:** editorinchief@aesonnigeria.org

In order to contain the negative impacts of the pandemic, fiscal, monetary as well as exchange rate policy measures were put in place. ILO (2020) succinctly described the Nigeria scenario thus:

Fiscal Measures: Contingency funds of N984 million was released to Nigeria's Center for Disease Control (NCDC), and an additional ₦6.5 billion was distributed for purchasing more testing kits, opening isolation centers and training medical personnel. Grant of ₦10 billion was released to Lagos State to increase its capacity to contain the outbreak. The government reviewed its 2020 budget and, given the expected large fall in oil revenues, announced plans to cut/delay non-essential capital spending by ₦1.5 trillion (close to 1 percent of GDP). A fiscal stimulus package in the form of a COVID-19 intervention fund of ₦500 billion, was approved by the President to support healthcare facilities, provide relief for taxpayers, and incentivize employers to retain and recruit staff during the downturn. Import duty waivers for pharmaceutical firms were introduced. Regulated fuel prices were reduced, and an automatic fuel price formula introduced to ensure fuel subsidies were eliminated. The President also ordered an increase of the social register by 1 million households to 3.6 million to help cushion the effect of the lockdown. Other measures include monetary and macro-financial measures as well as exchange rate and balance of payments measure.

Methodology

Multistage sampling procedure was used to select one agrarian state from northern and southern Nigeria based on high involvement in agriculture and report of high incident of COVID 19 cases. Two states were selected (Kaduna and Ogun). Second, five LGAs where there were reported cases of COVID-19 incidences were purposively selected. Third, three key informants were purposively selected per LGA (based on the perceived good knowledge of the subject matter within the community and beyond). Checklist was used to elicit responses (qualitative data) on the impacts of COVID-19 on the food system from selected informants. The checklist was administered through telephone calls (at different dates in July, 2020) which were audio-recorded. To buttress the responses from key informants, issues relating to impacts COVID-19 were followed (for four weeks) on two programmes in two e-media (television) selected based on convenience. The programmes were National Centre for Disease Control (NCDC) daily update on the Nigerian Television Authority (NTA) and Journalist Hangout on Television Continental (TVC) channels.

Results and Discussion

Impacts of COVID-19 on Food Systems

Reports reveal the following impacts of COVID-19 on the food system:

Disruptions in crop production: While the planting season was beginning in most part of the country, the lockdown made it difficult for farmers to give their full attention on the farm. There is possibility of reduction in the hectare cultivated thereby leading to lower output during harvesting time. Lockdown caused low

Proceedings of the Annual Conference of the Agricultural Extension Society of Nigeria

Number: Twenty-Sixth Annual Conference

Theme: Redefining Agricultural Extension Practice to Cope with Emergencies

Date: 26-29, April 2021

Venue: Federal University of Agriculture, Abeokuta, Nigeria

ISSN: 1595 – 1421. <http://aesonnigeria.org/ConfProc> . **Email:** editorinchief@aesonnigeria.org

production, restriction of movements and hike in transportation of farm products. No laborers, no vehicle to convey inputs to farm and produce from farm.

Limitation of field visit by extension personnel: The lockdown policy did not recognize extension personnel as essential workers. Though few organizations and projects were using alternative means to reach the farmers but the majority of this efforts was targeted at cautioning the farmers and extension workers by providing and resounding the precautionary measures for safety (i.e. personal hygiene, use of face mask, social/physical distancing and stay at home) rather than packaging technology into short video clips for sharing to farmers.

Distortion of technology delivery system: The impact of COVID-19 on intergenerational knowledge transfer, and dependency ratios remain challenges in Nigeria. Most extension delivery institutions lack the resources to effectively deliver proven technologies to farmers and agro-processors

Poor recovery of lending and credits lines: Despite the difficulties being faced by credit institutions to make loans available to farmers, the few efforts being made by some lending institutions have not paid off as expected. This is due to the fact that farmers could not make adequate returns from farming business for effective repayment.

Poor access to quality inputs (labour, seed, fertilizer and agrochemicals): Farmers require quality input at the right time, place and price. The chains of most farm inputs were distorted, thereby making it very difficult for local farmers.

Disruption in produce marketing: There was disruption in agricultural produce marketing. Drones and other digital extension tools can help farmers adopt labor- and input-saving practices, while digital agriculture solutions that link farmers to buyers and logistics services could help reduce the impacts of control measures related to COVID-19 on aggregators and supply chains. Sales of agricultural drone have skyrocketed in China to address labor constraints and to reduce human contact amid COVID-19.

Food shortage and wastage: The inability to transport agricultural produce easily from one region to the other has led to food shortage in some areas while some products are being wasted in other places. Also, farmers whose farms are far away could not easily get to their farms due to restriction of movement.

Disruption of key agricultural activities: Movement restriction negatively impacted on land preparation, planting and harvesting. Looming scarcity of food remains the biggest concern of people about the forthcoming season. This is due to anticipated low productivity resulting from the lockdown (Carreras, Saha and Thompson, 2020; IFPRI, 2021).

Way forward

Leveraging on the use of ICT tools: Public extension systems face difficulty in reaching all farmers due to the lack of financial capacity and staff to physically meet all farmers and communities. This is exacerbated by the fact that farmers are sparsely populated across large areas and oftentimes isolated. Strong public extension services only manage to directly reach about 10% of the farmer

Proceedings of the Annual Conference of the Agricultural Extension Society of Nigeria

Number: Twenty-Sixth Annual Conference

Theme: Redefining Agricultural Extension Practice to Cope with Emergencies

Date: 26-29, April 2021

Venue: Federal University of Agriculture, Abeokuta, Nigeria

ISSN: 1595 – 1421. <http://aesonnigeria.org/ConfProc> . **Email:** editorinchief@aesonnigeria.org

population, and this is even less if operating funds are limited (Bell, 2015). Even farming systems in relatively homogenous agricultural areas differ in type of crops cultivated, inputs, ratio/labour machinery and quality standards used. In order to be truly effective, information and knowledge has to be tailored to meet the needs of the individual farmer.

In the past ICTs were not being frequently used by extension agents (Sennuga, Conway and Sennuga, 2020), nowadays there is a growing awareness and usage among extension agents in Nigeria. Due to inadequate number of extension agents, ICTs have become an attractive option for delivery of extension information (Sennuga, Oyewole and Emeana, 2020). ICT tools should be used to further access the impact of COVID-19 on agriculture. Cutting-edge remote-sensing tools, combined with machine learning, offers a promising approach to map disruptions in crop production, and hence should be deployed efficiently. Data collection using cellphones and social media can be deployed at scale to monitor the global impacts of COVID-19 on farmers and consumers. In China, during the outbreak of COVID-19, over 200 extension agents in Caohu city of Anhui province provided advisory services to farmers via We-chat, mobile phones, telephones, and apps, as well as site visits to ensure the production and marketing of vegetables (FAO, 2020).

Support farmers to continue producing and marketing food: Finding ways of supporting farmers to keep producing food and to remain connected to markets is essential. For example, farms can be assisted with labor-saving practices, increase access to personal protective equipment (such as masks and gloves that are in high demand due to needs in the health care system) and reduce contact with packaging of produce. Taking measures such as these can reduce the spread of COVID-19 and promote continued production of food. Helping farmers adopt labor-saving practices that compensate for reduced labor availability (caused by sick family members, limitations on collective labor, and restrictions on the movement of people to the farms) is also important (Choularton and Mallory, 2020).

Encourage the deployment of relevant agricultural technologies and digital agriculture solutions: Agricultural technologies, especially digital agriculture solutions, offer a range of important opportunities to address the impacts of COVID-19 on agricultural production, labor availability, input supply, and logistics. Shared mechanization services, such as Hello Tractor, can mitigate reductions in cropped areas caused by labor shortages while increasing per-hectare productivity. Public-private partnerships and investments in existing agricultural technology programs could help scale up these solutions faster to help more people manage the impacts of COVID-19.

Ensuring adequate support for agribusinesses: Recovery lending, credit lines, grants, and other tools could all help SMEs weather the impacts of COVID-19 and be in a stronger position to support broader economic recovery. AEAS actors should be well-positioned to work with private sector partners to support business continuity planning, develop digital marketing platforms, and devise other measures that help SMEs keep afloat and become more resilient.

Proceedings of the Annual Conference of the Agricultural Extension Society of Nigeria

Number: Twenty-Sixth Annual Conference

Theme: Redefining Agricultural Extension Practice to Cope with Emergencies

Date: 26-29, April 2021

Venue: Federal University of Agriculture, Abeokuta, Nigeria

ISSN: 1595 – 1421. <http://aesonnigeria.org/ConfProc> . **Email:** editorinchief@aesonnigeria.org

Enhance Innovative measures in supply chains and markets: Disruptions to supply chains and markets have widespread impacts on the food system. Digital logistics, both in rural and urban areas, can reduce the impacts of control measures related to COVID-19 on transport, aggregation, and retail systems.

Support regional policy dialogues to help relevant stakeholders address food shortages: Governments need to innovate and collaborate around food security and agriculture policy. This will allow for better management of agri-food imports and export, reduce the risks of food trade bans, and ultimately ensure access to food by the populace. Extension should encourage investments in sanitary and phytosanitary controls and good practices in transport and food safety in order build confidence in regional and global trade systems and help improve the flow of food from rural to urban areas.

Conclusion and Recommendations

The COVID-19 pandemic has negatively impacted on the food system thus challenging the AES to employ more innovative and pragmatic approaches to reach the farmers.

As the spread of COVID-19 outbreak in Nigeria interacts with a low healthcare infrastructure and multiple pre-existing fragilities - it is of outmost importance that all actors double efforts to ensure safety. Deliberate and concerted efforts is needed on the part of all stakeholders so as to ensure food security. Pragmatic steps recommended to be taken include:

Food prices and markets should be closely monitored. Government management over the food market can be strengthened to prevent people from panicking, and guide farmers to make rational production decisions. This can be achieved through transparent dissemination of information. Also, market speculation over supply can be fundamentally addressed through the strengthening of market regulation by the government.

Furthermore, it is necessary to ensure that agricultural and food supply chains function normally. Roadblocks created to prevent unnecessary spread of the virus should be well managed to prevent unnecessary delay that can lead to wastage of perishable agricultural produce.

Innovative methods to keep agricultural sales going and growing: No doubt, lockdown measures have increased the demand for home delivery of goods through in-app feature thereby ruling out person-to-person contact. The intricate linkage between nutritional level and mortality rates underscores the need to make food available for the citizen. Also, more investment should be made by the Federal Government through the Federal Ministry of Agriculture and Rural Development (FMARD) to build an even more resilient food system. This will enhance the capacity of Nigeria to prevent or contain a food security crisis.

Procurement of personal protection Equipment (PPE): More PPE should be made available to cater for the need of field extension workers.

Proceedings of the Annual Conference of the Agricultural Extension Society of Nigeria

Number: Twenty-Sixth Annual Conference

Theme: Redefining Agricultural Extension Practice to Cope with Emergencies

Date: 26-29, April 2021

Venue: Federal University of Agriculture, Abeokuta, Nigeria

ISSN: 1595 – 1421. <http://aesonnigeria.org/ConfProc> . **Email:** editorinchief@aesonnigeria.org

Adequate training of extension personnel: Extension personnel should be trained on precautionary measures so as to ensure their protection while performing their civic responsibilities.

References

- Aromolaran A. B and Muyanga, M. (2020). Impact of COVID-19 on Food systems and rural livelihoods in Nigeria. *APRA COVID-19 Report 2-* December, 2pp.
- Bell, M. (2015). *Powering behaviour change for a brighter agricultural future. MEAS Discussion Paper*, University of California, Davis
- Carreras, M.; Saha, A. and Thompson, J. (2020) Rapid Assessment of the impact of COVID-19 on food systems and rural livelihoods in Sub-Saharan Africa. *APRA COVID-19 Synthesis Report 1*, Brighton: Future Agricultures Consortium.
- Choularton, R. and Mallory, M. (2020). Opinion: How to address the impact of Covid-19 on global food systems. *Global Views (TETRA TECH)*, 5pp.
- Food and Agriculture Organization (FAO) (2020). Extension and advisory services: at the frontline of the response to COVID-19 to ensure food security. Rome. <https://doi/10.4060/ca8710en>
- Hussein, K. (2020). Strengthening extension and rural advisory services to contribute to reaching the 2030 Development Agenda: What works in rural advisory services? *Inter press Service News Agency*, Monday, April 20, 2020
- International Food Policy Research Institute (IFPRI) (2021). Impacts of the Covid-19 Pandemic and associated policy responses on food systems in Sub-Saharan Africa: A synthesis of evidence. Pp60.
- International Labour Organization (ILO) (2020). Policy responses to COVID-19 <https://www.ilo.org/global/topics/coronavirus/country-responses/lang-en/index.htm> Retrieved 29th May, 2020
- Prokopy, L. S., Carlton, J. S., Arbuckle, J. G., Jr., Haigh, T., Lemos, M. C., Mase, A. S., . . . , Power, R. (2015). Extension' s role in disseminating information about climate change to agricultural stakeholders in the United States. *Climatic Change*, 130(2), 261–272.
- Sennuga, S. O., Conway, J. S. and Sennuga, M. A. (2020). Impact of information and communication technologies (ICTs) on agricultural productivity among smallholder farmers: Evidence from Sub-Saharan African communities, *International Journal of Agricultural Extension and Rural Development Studies*, (7)1, 27-43.
- Sennuga, S. O., Oyewole, S. O. and Emeana, E. M. (2020). Farmers' perceptions of agricultural extension agents' performance in Sub-Saharan African Communities, *International Journal of Environmental & Agriculture Research (IJOEAR)*, 6(5): 1-12.
- Shenggen, F. A. N. (2020). Preventing global food security crisis under COVID-19 emergency (IFPRI) March 6.
- Solomon, E. and Edet, O. G. (2018). Determinants of climate change adaptation strategies among farm households in Delta State, Nigeria. *Current Investigations in Agriculture and Current Research*, 5(3). 13-22.
- United Nations Development Programme (UNDP) (2020). The covid-19 pandemic in Nigeria: Potential impact on the North-east. Brief 2, April 3, 10pp.