



# USAID West Africa Trade and Investment Hub Baseline Survey Report

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# Table of Contents

<b>Table of Contents</b>	<b>2</b>
<b>Tables</b>	<b>4</b>
<b>Figures</b>	<b>6</b>
<b>Acronyms</b>	<b>7</b>
<b>Executive Summary</b>	<b>9</b>
<b>Background</b>	<b>12</b>
Goals and objectives of the survey	13
<b>Methodology</b>	<b>14</b>
Quantitative approach	14
Qualitative approach	15
Data Collection	16
Measurement of Parameters and Indicators	16
Limitations	18
<b>Findings</b>	<b>19</b>
Baseline sample characteristics	19
Educational status	21
Household Poverty Probability Index (PPI)	22
Household income and expenditure	24
Household food security	26
Categories of crop farmers	30
Gender and Youth inclusion	31
Yield of targeted agricultural commodities	41
Value of annual sales of smallholder farmers	45
Number of farmers who have applied improved agricultural practices	51
Number of hectares under improved practice/technology	54
Constraints and challenges faced by smallholder farmers	55
<b>Secondary Data Analysis</b>	<b>58</b>
<b>Overview</b>	<b>58</b>
Nigeria	58
Ghana	65
Senegal	70
Cote d'Ivoire (Ivory Coast)	73
Burkina Faso	77
Niger	78
West Africa Regional	80
<b>Discussion, Conclusion and Recommendations</b>	<b>82</b>
<b>Bibliography of References</b>	<b>85</b>
<b>Annex A: Outcome Indicators</b>	<b>88</b>
<b>Annex B: Logic model</b>	<b>92</b>
<b>Annex C: Point map of locations visited in each state</b>	<b>93</b>

<b>Annex D: Methodology</b>	<b>95</b>
<b>Annex E: Mean age of respondents by state and value chain</b>	<b>98</b>
<b>Annex F: Survey tools - Focus Group Discussion Guide</b>	<b>99</b>

# Tables

Table 1: Disaggregation of Respondents by Sex by location	19
Table 2: Disaggregation of Respondents by Sex by value chain	19
Table 3: Age group of respondents by value chain	20
Table 4: Mean age group of respondents by state	20
Table 5: Type of household head	21
Table 6: Education status of respondents	21
Table 7: Categorization of Household Poverty Index	22
Table 8: Income Categorization by state	25
Table 9: Income Categorization by Sex	26
Table 10: HDD categorized by tercile	29
Table 11: FCS by location and sex of household head	29
Table 12: Women's participation in household decision making	32
Table 13: Women's Access to Agricultural Land (by state)	33
Table 14: Youth Access to Agricultural Land (by state)	33
Table 15: Youth Access to Agricultural Land (by age group)	33
Table 16: Women equal access to agricultural services (extension, input)	35
Table 17: Farmers who received credit by State and Sex	35
Table 18: Availability of organization that supports women farmers	38
Table 19: Awareness on availability of support services	39
Table 20: Access of youths to farm equipment	40
Table 21: Access of youths to non-farming business equipment	40
Table 22: Mean yield for crop farmers by value chain (MT/ha)	42
Table 23: Yield by value chain disaggregated by sex (MT/ha)	42
Table 24: Yield for aquaculture farmers by state (kg/m2)	43
Table 25: Sales by value chain and state	45
Table 26: Value of crop farmer sales by location	46
Table 27: Value of aquaculture sales	46
Table 28: Value of sales by gender	46
Table 29: Production costs per hectare for crop farmers across locations	47
Table 30: Production costs per hectare across value chains	47
Table 31: Aquaculture production cost	47
Table 32: Profits of crop farmers by state	48
Table 33: Profits of farmers by value chain	48
Table 34: Profits of aquaculture farmers	48
Table 35: Profits per kg of fish	48
Table 36: Profits of farmers by sex	49
Table 37: Crop farmers' technology usage by value chain	51
Table 38: Crop farmers' technology usage by location	51
Table 39: Crop farmers' technology usage by sex	52
Table 40: Aquaculture farmers' technology usage	52
Table 41: Aquaculture farmers technology usage by sex (%)	53
Table 42: Number of hectares under improved technologies across locations (in hectares)	54
Table 43: Number of hectares under improved technologies by gender (in hectares)	55
Table 44: Constraints faced by crop farmers	55

Table 45: Constraints faced by aquaculture farmers	56
Table 46: Area of rice harvested (in '000 ha)	59
Table 47: Area of maize harvested (in '000 ha)	61
Table 48: Soybean produced, consumed, and imported in Nigeria (2010 to 2019)	62
Table 49: Export Quantity and Value of Key Value Chains	64
Table 50: Value of AGOA Imports by the United States (USD thousand)	65
Table 51: Maize production and consumption in Ghana	66
Table 52: Soybean production and importation in Ghana	66
Table 53: Groundnut production in Ghana	67
Table 54: Export Quantity and Value of Key Value Chains	67
Table 55: Value of AGOA Imports by the United States (USD thousand)	68
Table 56: Average Annual Sales Among Agricultural Households	69
Table 57: Cocoa production and exportation in Ghana	70
Table 58: Rice production and consumption in Senegal	71
Table 59: Millet production in Senegal	71
Table 60: Export Value and Quantity of Key Value Chains in 2019	72
Table 61: Export Value and Quantity of Key Value Chains in 2018 and 2017	73
Table 62: Value of AGOA Imports by the United States (USD thousand)	73
Table 63: Export Quantity and Value of Key Value Chains	74
Table 64: Cote d'Ivoire's production and export volumes (tons)	75
Table 65: Value of AGOA Imports by the United States (USD thousand)	76
Table 66: Average Annual Sales Among Firms	76
Table 67: Export Value and Quantity of Key Value Chains in 2019	77
Table 68: Export Value and Quantity of Key Value Chains in 2018 and 2017	77
Table 69: Export Value and Quantity of Key Value Chains in 2019	78
Table 70: Export Value and Quantity in 2018 and 2017	78
Table 71: Differences in regional trade in agricultural products with the US	79
Table 72: Investments (credit) to agriculture (million US\$)	80

## Figures

Figure 1: Map of study location and value chain	14
Figure 2: Map of study location and value chain	15
Figure 3: Age group of respondents by location	20
Figure 4: Per capita Poverty Index	22
Figure 5: Poverty Index by Gender	22
Figure 6: Poverty Index by Adult and Youth	23
Figure 7: Household main source of income	24
Figure 8: Other sources of household income	25
Figure 9: Three main areas of income spending	26
Figure 10: Household Hunger Score by state	27
Figure 11: Household Dietary Diversity Score	28
Figure 12: Households food consumption from each group in the last 24 hours	29
Figure 13: Categories of farmer by gender, value chain, and state	31
Figure 14: Membership in cooperatives or farmers' organizations	38
Figure 15: Yield of targeted agricultural commodities	41
Figure 16: Yield of targeted agricultural commodities	42
Figure 17: Proportion who sell smoked fish	45
Figure 18: Geographic visualization of improved technology applied	52
Figure 19: Quantity of rice produced and consumed in Nigeria from 2010 to 2019	59
Figure 20: Quantity of rice imports in Nigeria from 2010 to 2019 (in '000 MT)	60
Figure 21: Percent of smallholders' household growing rice per sq. km.	60
Figure 22: Maize production, consumption, and importation in Nigeria (in '000 tons)	61
Figure 23: Percent of smallholders' household growing maize per sq. km.	61
Figure 24: Percent of smallholders' household growing soybean per sq. km.	63
Figure 25: Fish production and importation trends in Nigeria from 2010 to 2017	63
Figure 26: Percent of smallholders' household growing cowpea per sq. km.	64
Figure 27: Map showing Maize Production in Ghana	66
Figure 28: Percent Change in Exports from 2017 to 2018	68
Figure 29: Map showing Cocoa Production in Ghana	70
Figure 30: Map showing Piped-in water in Senegal	72
Figure 31: Map showing locations with no water for hand washing in Senegal	72
Figure 32: Percent Change in Exports (2018 to 2019)	73
Figure 33: Percent Change in Exports (2017 to 2018)	76
Figure 34: Percent Change in Exports from 2017 to 2018	79

## Acronyms

ABP	Anchor Borrowers Programme
ADP	Agricultural Development Programme
AFAN	All Farmers Association of Nigeria
AFDB	African Development Bank
AGOA	African Growth and Opportunities Act
BNARDA	Benue Agriculture and Rural Development Authority
CAPL	Computer Assisted Personal Interview
CDCS	Country Development Cooperation Strategy
CEMAC	Central African Economic and Monetary Community
COMESA	Common Market for Eastern and Southern Africa
DCA	Dollar Cost Averaging
EA	Extension Agents
EAC	East African Community
ECOWAS	Economic Community of West African States
EOP	Economics of Production
FAO	Food and Organization of the United Nations
FAOSTAT	Food and Agriculture Organization Corporate Statistical Database
FCS	Food Consumption Score
FGD	Focus Group Discussion
GPS	Global Positioning System
HDDS	Household Dietary Diversity Score
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
IITA	International Institute of Tropical Agriculture
ITC	International Trade Centre
ITC	Investment Tax Credit
KARDA	Kebbi State Agricultural and Rural Development Authority
KII	Key Informant Interview
LGA	Local Government Area
MDD	Minimum Dietary Diversity
NDHS	Nigeria Demographic and Health Survey
NDDC	Niger Delta Development Commission
NGO	Non-governmental Organization
NIRSAL	Nigeria Incentive-Based Risk Sharing system for Agricultural Lending
NpopC	National Population Commission
OPM	Oxford Policy Management



OXFAM	Oxford Committee for Famine Relief
PowerBI	Microsoft Power Business Intelligence analytics software
PPI	Poverty Probability Index
PSU	Primary Sample Unit
QA	Quality Assurance
QCOs	Quality Control Officers
RIFAN	Rice Farmers Association of Nigeria
SACU	Southern African Customs Union
SADC	Southern African Development Community
SC	State Coordinator
SDGs	Sustainable Development Goals
SME	Small and Medium-sized Enterprises
SMEDAN	Small and Medium Enterprises Development Agency
TOC	Theory of Change
UDP	User Datagram Protocol
UNICEF	United Nations Children Fund
USA	United States of America
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
VCDP	Value Chain Development Programme

# Executive Summary

Nigeria's growing population of over 200 million people accounts for about half of the West Africa region's population and contains one of the largest youth populations in the world. Agriculture provides the main source of livelihood for much of the populace, employing two-thirds of the labor force. More than 80% of farmers in Nigeria are categorized as smallholder farmers, i.e. as farming on less than five hectares (ha) of arable land<sup>1</sup>. Despite the huge potential of the sector to reduce unemployment and contribute significantly to the economy, production hurdles continue to stifle the performance of the sector and majority of farmers live in poverty<sup>2</sup>. Poor economic growth in the past five years caused by the volatility of oil prices – the major source of revenue for the country – has further emphasized the need to diversify the economy and expand the agricultural sector.

The United States Agency for International Development (USAID) funded West Africa Trade and Investment Hub Activity (hereafter referred to as the Trade Hub) aims to catalyze economic growth in West Africa by attracting finance and investment, growing business linkages, and strengthening the capacity of the agriculture and trade sectors. This five-year activity will achieve its set objectives through a market-based approach. In Nigeria, its main objectives are: (i) increased productivity and profitability of farmers and firms; (ii) increased market linkages and smallholder farmer participation; and (iii) increased access to finance and investment. A baseline survey was commissioned to help identify potential issues and determine baseline values to compare the impact of the Trade Hub's relevant initiatives toward achieving the outcome indicators in Nigeria and other West Africa countries at the point of final evaluation. For the baseline survey in Nigeria, data was collected to measure six key performance indicators across seven states (Benue, Cross River, Delta, Ebonyi, Kaduna, Kebbi, and Niger) with a focus on five value chain commodities: maize, rice, cowpea, soybean, and aquaculture. These indicators are (i) value of targeted agricultural commodities exported at a national level (ii) Value and volume of exports in targeted agricultural commodities from supported firms/associations/entities (iii) Value of annual sales of producers and firms receiving USG assistance (iv) Yield of targeted agricultural commodities among program participants (v) Number of individuals in the agriculture system who have applied improved management practices or technologies and (vi) Number of hectares under improved management practices or technologies.

The baseline survey had two components: primary data collection and secondary data analysis. The primary data collection was conducted using a mixed-methods design. A quantitative household questionnaire was used to collect information across the seven focused states from 1,505 smallholder farmers within the target value chains on productivity and profitability of targeted agricultural commodities, while also assessing household nutrition status, access to finance, and the inclusion dynamics of women and youth in agricultural activities. Qualitative data was collected using focus group discussions (FGDs) and key informant interviews (KIs) with smallholder farmers and other key informants such as extension agents with the state ministry of agriculture, off-takers, aggregators, chairpersons of farmers associations, etc., as well as within the production and processing industries and regulatory bodies. This provided information on factors affecting productivity and profitability as well as barriers to production faced by smallholders in the target communities. The secondary data analysis was conducted to provide baseline contextual information on the production, consumption, importation and exportation of target commodities in the six focus countries in West Africa (Nigeria, Burkina Faso, Cote d'Ivoire, Ghana, Niger, and Senegal) to assess how production can be catalyzed to meet local demand and create export potentials.

The findings of the survey show that males were the dominant sex in the agriculture sector. Youth made up only a small proportion (26%) of the sampled farming population despite forming more than half of the country's population. Unsurprisingly, many of the households surveyed were male headed (90%), with very few female- and youth-headed households, indicating that household decision making is still

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<sup>1</sup> Riquet C, Musiime D, Collins M. National Survey and Segmentation of Smallholder Households in Nigeria Understanding Their Demand for Financial, Agricultural, and Digital Solutions [Internet]. 2017. Available from: [https://www.cgiar.org/sites/default/files/publications/Working%20Paper\\_CGAP%20Smallholder%20Household%20Survey\\_NGA\\_Oct%202017.pdf](https://www.cgiar.org/sites/default/files/publications/Working%20Paper_CGAP%20Smallholder%20Household%20Survey_NGA_Oct%202017.pdf)

<sup>2</sup> FAO. Nigeria at a glance | FAO in Nigeria | Food and Agriculture Organization of the United Nations [Internet]. 2020 [cited 2020 Jun 10]. Available from: <http://www.fao.org/nigeria/fao-in-nigeria/nigeria-at-a-glance/en/>

male-dominated in Nigeria. The levels of education of respondents differed across states as the majority of the northern states had a higher proportion of respondents with no formal education while the southern states had higher numbers of respondents who had completed secondary or tertiary education. In all seven focused states except for Delta and Cross River, crop growing was the main source of income for more than 80% of the respondents. According to income analysis, more than one-third of the respondents generated less than the national minimum wage (US\$ 1,000) annually. About a third of respondents live in poverty-- 10% in extreme poverty. Kebbi and Kaduna had the highest number of farmers living in poverty while women were disproportionately poorer than men-- 15% of women surveyed lived in extreme poverty compared to only 9% of men. The socioeconomic status of respondents was further reflected in the household food security assessment. While the household hunger scores showed that the majority of households (more than 85%) had little or no hunger, the household dietary diversity (HDD) and food consumption scores (FCS) reflected a poor diversity of food intake, with households consuming more starchy staples than nutritious fruits and animal products.

Our assessment of the inclusion of women and youths in agriculture revealed that these two groups are still being excluded from many activities that can help boost their productivity and expand the agriculture sector. With respect to access to agricultural land, even though quantitative findings demonstrated that women had access to farming lands, from the qualitative research we understand that the majority of women did not own that land. Traditional land tenure systems still serve as barriers to women owning land and many women who farm gained access to their lands only through their husbands or in-laws. Male youth were also reported to have better access to land compared to females because of certain traditional norms and beliefs. Women were also disproportionately affected in terms of access to finance-- the lack of assets such as land that can be used as collateral negatively impacts women's ability to secure loans. Moreover, for rural women, the cumbersome process of loan applications, high interest rates, and the distance required to access these resources discourages women from applying for these loans. Youth also face similar problems related to access to finance. More women also lacked information on where to access support when compared to men. Also, women's domestic roles often mean that they cannot access many agricultural extension services. Recognition of these issues has led to the establishment of organizations, for example 'Sister's keeper' in Benue State, and other government initiatives in agrarian communities to attempt to address these hurdles. These have provided some women and youth with focused assistance to increase access to other resources such as information, improved seeds, fertilizers, and access to credit. Notwithstanding these initiatives, concerted efforts need to be made by government and development partners to cover the existing gaps for women and youth.

Overall, in terms of productivity and profitability of smallholder farmers, rice farmers recorded the highest average yield and sales for crop farmers. Yield for rice farmers was 2.87 metric tons per hectare (MT/ha), which was higher than the national average of 2 MT/ha. Soybean farmers recorded the lowest yield of 0.9MT/ha which is lower than the national average of 1.6MT/ha. Average revenue from rice sales for individual farmers was the highest for crop farmers at NGN 429,398.30 (US\$ 1,192.70), followed by cowpea at NGN 148,704.80 (US\$ 413.06), maize NGN 138,386.20 (US\$ 384.27) and Soybeans at NGN 95,736 (US\$ 265). Similarly, rice farmers reported the highest profits for crop farmers. Profit of rice farmers averaged NGN 193,269 (US\$ 536), NGN 32,284 (US\$ 89) for cowpea farmers, NGN 27,846 (US\$ 77) for soybean farmers and NGN 17,535 (US\$ 48) for maize farmers. These findings correspond with findings at the national level that rice generates more profit for farmers than any other crop<sup>3</sup>. Aquaculture farmers had average profits of NGN 641,312 (US\$ 1,781) with farmers in Delta reporting higher profits than those in Cross River. Women, however, recorded lower yields and sales overall. The yield of a crop was generally affected by a lack of resources to purchase farm inputs and technology needed to boost productivity, as many farm operations are still done manually. In addition, infestation by pests, farmer–herder conflicts, and lack of information on improved practices have also been identified as contributing factors to farmers experiencing poor yields. Furthermore, profitability was grossly affected by exploitation from middlemen. The most common form of technology utilized was the inorganic fertilizer. However, lower quality fertilizer is sometimes used due to lack of finance to purchase better quality product. In terms of other value chains, aquaculture farmers reported average yield of 12.3kg/m<sup>2</sup>, and reported the highest sales and profits of NGN 846,203 (US\$ 2350) and NGN 641,312

<sup>3</sup> FAO. Nigeria at a glance | FAO in Nigeria | Food and Agriculture Organization of the United Nations [Internet]. 2020 [cited 2020 Jun 10]. Available from: <http://www.fao.org/nigeria/fao-in-nigeria/nigeria-at-a-glance/en/>

(US\$ 1781) respectively. Yield and sales reported in Delta state was more than two times higher than the values reported in Cross River state.

Findings from the secondary analysis revealed that agriculture is a critical sector of the West African economy, employing a large proportion of the population. However, farmers in the five target countries of Nigeria, Ghana, Cote d'Ivoire, Niger and Burkina Faso face similar challenges of poor funding and lack of government prioritization, as well as effects of climate change, which hamper their productivity and affect food security in each country. In Nigeria, even though production across different value chains has increased in the past decade, it is still insufficient to meet local demand, especially for rice. It remains a net importer of food. However, cocoa production in Cote d'Ivoire and Ghana have risen significantly in the past few decades, making both countries the first and second largest producers globally. Cashew nut production in Cote d'Ivoire has also risen to become a major export product. In Niger, onions constitute a major agricultural export, with the country exporting nearly two-thirds of its production. Favorable policies and prices in these countries drive production of these export commodities, further emphasizing that with appropriate policies and investment, the sector can thrive.

To drive productivity and harness the full potential of the agricultural sector, the provision of inputs and credits at affordable rates to farmers is important. There is also the need for programs to target women and youth as they are often excluded from major agricultural initiatives. Continuous exclusion of this sector of the population will mean that major drivers of change for West African agriculture will be left out, further hampering its growth.

Other recommendations to drive productivity, reduce poverty of smallholder farmers, and ensure social inclusion are as follows:

- (i) Financial institutions need to review policies regarding collateral and interest rates and make them more context-specific to suit the realities of rural smallholders. Availability of credit will drive production.
- (ii) There should be increased awareness and availability of improved farming practices and technologies to rural smallholders
- (iii) Financial institutions need to provide more loans/credits to female and youth farmers at reasonable interest rates to encourage their participation in the sector.
- (iv) More female extension workers should be employed and trained to reach female farmers with vital information and inputs as male extension workers often focus mostly on male farmers
- (v) Encourage the formation of female cooperatives or increase the female focus of existing cooperatives to ensure that women have better access to necessary information, credits and inputs
- (vi) Prices of commodities need to be regulated in various regulating bodies to reduce exploitation by middlemen
- (vii) Initiatives and programs should be tailored to meet the specific needs of rural farmers in various communities

Overall, increased investment in the agricultural/non-agricultural sector by government and development partners, in a manner that includes women and youth, will improve productivity, profitability, and competitiveness of the sector, and drive its growth.

## Background

Over the last few decades, the West African region has experienced impressive economic growth. While this has led to a reduction in poverty levels in a few countries, most West African countries are still burdened with widespread poverty and inequality. Nigeria, which is commonly referred to as the giant of Africa, has more than half of its population living below the poverty line<sup>4</sup>. Despite the prominence of oil in Nigeria's economic wealth, the agriculture sector employs approximately 75% of the country's labor force and has tremendous potential for growth as it is large, diverse, and plays a key role in food security in the West Africa sub-region. More than 80% of Nigeria's farmers are considered smallholder farmers and they depend on a diverse range of crops, livestock, and fish for survival. Despite their importance to the domestic economy, however, more than 70% of Nigeria's smallholders live below the poverty line of US\$ 1.90 a day.<sup>5</sup>

Having recognized the critical constraints and potential of economic growth in the region, the USAID-funded the West Africa Trade and Investment Hub Activity (referred to as the Trade Hub) aims to catalyze broad-based economic growth in West Africa. The Trade Hub activity is implemented by Creative Associates in partnership with five other subcontractors. The activity has a large grant component and will run for five years (until September 2024). Its overarching goal is to catalyze broad-based economic growth in West Africa. The Trade Hub seeks to achieve this through a market-based approach that includes attracting finance and investment, growing business linkages, and strengthening the capacity of agricultural and trade sectors in the six primary-focus countries of Nigeria, Senegal, Cote D'Ivoire, Ghana, Niger, and Burkina Faso, as well as other countries in West Africa.

By working in partnership with the private sector and fostering co-investment, the Trade Hub will improve companies' abilities to expand business operations, increase productivity, and create jobs that build on the talents and aspirations of West Africa's young and growing population. Over the five years, the Trade Hub will administer US\$ 60 million in co-investment funds to attract private-sector investment worth US\$ 300 million to improve business operations and capacity, tapping into export markets and enabling beneficiaries to do business with US and international companies. Activities in Nigeria will focus on expanding the agricultural production and profits of smallholder farmers to make them more food secure and to raise household incomes. This 'farms and firms' approach will improve farming practices by utilizing technology to boost production and strengthen the links between producers and markets across several value chains in Nigeria, with a focus on the maize, rice, soybean, cowpea, and aquaculture value chains. In the greater West African region, activities will promote inclusive economic growth, creating opportunities for West African women to raise their household incomes, gain new skills, and start and grow small businesses. It will also leverage investment in youth and women to co-create sustainable initiatives for long-term employment.

Given the specific FTF objectives of the Trade Hub's focus in Nigeria, a household survey was conducted to set a benchmark that will help measure progress toward achieving the activity outcome indicators and to improve the implementation of the activity interventions by providing appropriate tools and information to help the Trade Hub to more effectively tell its story. Since the Trade Hub will focus on a broader range of value chains and products in other West African countries, this analysis used secondary data to examine export data and domestic production.

Just like other focus countries, the Trade Hub has three main objectives in Nigeria which it intends to achieve over the life of the activity:

- (1) Increased productivity and profitability of farmers and firms.
- (2) Increased market linkages and smallholder farmer participation; and
- (3) Increased access to finance and investment.

With respect to components (1) and (3), which are aimed at increasing the productivity/profitability of smallholder farmers and medium/large enterprises' owners and increasing access to finance, it is

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<sup>4</sup> World Bank. Global\_POVEQ\_NGA.pdf [Internet]. 2020 [cited 2020 Jun 10]. Available from: [https://databank.worldbank.org/data/download/poverty/33EF03BB-9722-4AE2-ABC7-AA2972D68AFE/Global\\_POVEQ\\_NGA.pdf](https://databank.worldbank.org/data/download/poverty/33EF03BB-9722-4AE2-ABC7-AA2972D68AFE/Global_POVEQ_NGA.pdf)

<sup>5</sup> FAO. i9930en.pdf [Internet]. 2018 [cited 2020 Mar 23]. Available from: <http://www.fao.org/3/I9930EN/i9930en.pdf>

important to understand the key features that needs to be addressed in order to affect change: attitude and behaviors; knowledge of and access to improved technologies; value of sales and production; access to finance; gender and inter-generational relations; and perceptions of and attitudes toward women's and youth's control of productive resources within the target states. Component (2) is aimed at increasing market linkages and smallholder farmer participation and will also include an assessment of women and youths' status and conditions (challenges, barriers, opportunities, and comparative advantage) in the Nigerian agricultural sector, with a focus on the maize, aquaculture, rice, soybean and cowpea value chains.

The findings, conclusions, recommendations, and lessons learned from this study will, where relevant, inform decisions and provide feasible measures to support the implementation and sustainability of the outcome indicators in Nigeria and the West African region in general.

## **Goals and objectives of the survey**

The survey was conducted to objectively set benchmarks that the Trade Hub will measure its progress against and provide a reference point from which the Trade Hub's impact can be assessed. Specific objectives of the assessment are to:

1. Generate and measure in-depth evidence on the current state of agricultural productivity and profitability of smallholder farmers within the maize, aquaculture, rice, soybean and cowpea value chains in targeted states in Nigeria.
2. Provide a baseline on the status and conditions of gender and youth, including challenges, barriers, opportunities and comparative advantages, within the Nigerian agricultural sector.
3. Identify key challenges and opportunities for success in reaching targets. This will inform the implementation of the project and provide implementing partners with the appropriate tools and information to illustrate our progress
4. Provide baseline information on the productivity and trade of selected agricultural/non-agricultural commodities in the targeted countries. This information helps to understand existing gaps in production in the focus countries and how these constraints can be eliminated to catalyze domestic production to meet local demand, promote self-sufficiency, and generate more income via exports.

## Methodology

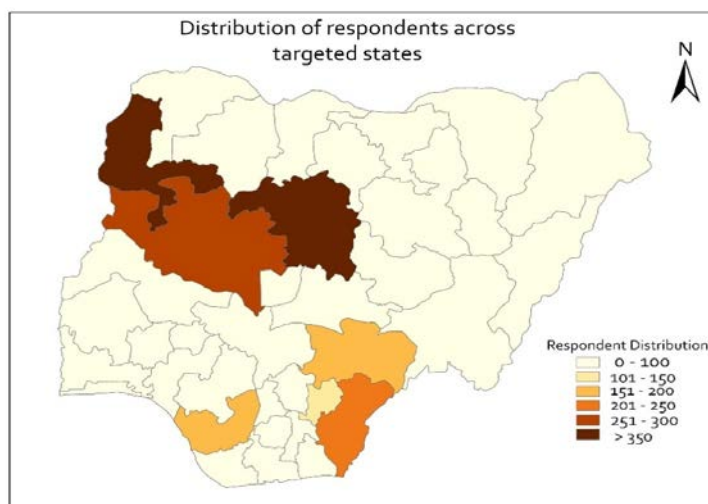
The Trade Hub Theory of Change (ToC) for Nigeria is articulated in the Logic Model (see Annex B). It is summarized as follows: **IF** the capacity of agricultural sector business service providers (including private firms, research institutions, and other stakeholders) is strengthened, **IF** the use of improved farming technologies is expanded, **IF** participation in agricultural markets is increased, and **IF** private sector investment to improve the productivity and profitability of smallholder farming is increased, **THEN** Nigeria's agricultural competitiveness will be strengthened, contributing to broad-based and inclusive growth. The West Africa ToC posits that **IF** successful partnerships with leading buyers and processors that expand production quantities and improve quality through upgrading of producer are built, **THEN** West Africa will successfully increase trade and investment and contribute to broad-based economic growth and resilience through increased job creation and improved incomes.

To generate ample evidence on activity outcome indicators, the baseline survey was conducted in two phases. The first phase consisted of a **secondary data analysis** to collate available data on production, consumption, investment and import on the selected value chains in the focus West African countries. This data were sourced from the African Growth and Opportunities Act (AGOA), the Food and Agriculture Organization of the United Nations (FAO), the International Trade Centre (ITC), the United States Department of Agriculture (USDA), the Economic Community of West African States (ECOWAS), and the World Bank, among others. The data collected helped to map out trends in production, consumption, imports and identify the value and volume of agricultural and non-agricultural commodities exported.

The second phase consisted of **primary data collection**, using a mixed-methods approach of both **quantitative** and **qualitative** research to ensure that the qualitative and quantitative methods build on each other's strengths and triangulate each other's findings. The quantitative survey was conducted across the seven focused states in Nigeria, among smallholder farmers, using a household questionnaire, to measure the current state of play in terms of agricultural productivity and the profitability of smallholder farmers, as well as assess the status of gender relations and youth in the Nigerian agricultural sector, with a focus on the five value chains of maize, soybean, cowpea, rice, and aquaculture.

### Quantitative approach

**Study population:** The study population was smallholder farmers who were interviewed at the household level and as actors in the value chain in selected clusters. Using CGAP definitions, smallholder farmers were defined as farmers who hold 5 hectares (ha) or less of arable land.<sup>6</sup> Every smallholder farmer farming the targeted value chain was a potential respondent for the survey. The household was used as the unit of selection for participants. According to the NDHS 2004 survey, household was defined as consisting of a person or group of related or un-related persons that usually live together in the same dwelling unit and share common cooking or



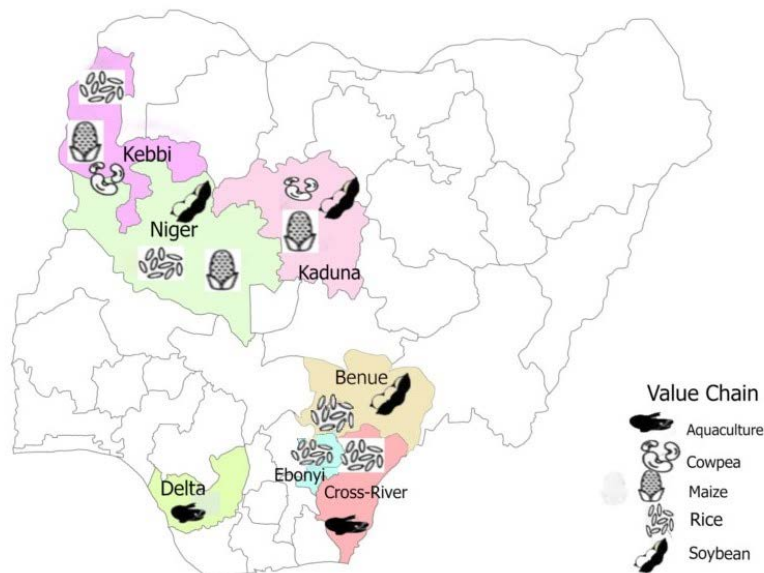
**Figure 1: Map of study location and value chain**

<sup>6</sup> Riquet C, Musiime D, Collins M. National Survey and Segmentation of Smallholder Households in Côte d'Ivoire Understanding Their Demand for Financial, Agricultural, and Digital Solutions [Internet]. 2017. Available from: [https://www.cgap.org/sites/default/files/publications/Working%20Paper\\_CGAP%20Smallholder%20Household%20Survey\\_NGA\\_Oct%202017.pdf](https://www.cgap.org/sites/default/files/publications/Working%20Paper_CGAP%20Smallholder%20Household%20Survey_NGA_Oct%202017.pdf)



eating arrangements<sup>7</sup>. Participants farming the targeted crops in selected states were included while households in institutionalized settings, such as prisons, students' hostels, hospitals, and nursing homes, were excluded. The Trade Hub Baseline activity was conducted across seven target states in Nigeria: Benue, Cross River, Delta, Ebonyi, Kaduna, Kebbi, and Niger.

**Sampling:** A multistage sampling approach of clustering, stratification, purposive and probability sampling was followed in the selection of clusters of smallholder farmer communities and participants. The multi-



**Figure 2: Map of study location and value chain**

approach sampling allowed for increased precision and allowed all potential respondents to have an equal chance of selection. The first level of sampling stratified the farm products by state to ensure that only states where the products are farmed in substantial quantities could be the focus of data gathering. The selected states were then divided into senatorial districts (see Annex D) and then Local Government Areas (LGAs), using the National Population Commission (NPopC) divisions to capture a widespread of participants in the state. LGAs with household farmers focused on the study value chain were purposively selected from each

district. The next stage of sampling involved area demarcation at ward/community level to serve as primary sampling units for each cluster. Where available, lists of eligible smallholders farmers were provided to the survey team members by Extension Agents of Agricultural Development Programme (ADP), community heads or group leaders in each community sampled in the LGAs. Where there were no available lists of farmers, the enumerators carried out listing of eligible farmers to create a sample frame for the survey. Respondents were then selected randomly for interview using a random number generator available on the tablet used for the survey. A target proportion of 25% each for minimum representation of women and youth was set to ensure inclusivity. In cases of refusal to participate, the enumerators replaced the farmer with the next selected farmer.

## Qualitative approach

The selection of participants for the FGD was done using respondents (smallholder farmers) who in most cases were different from those selected for the quantitative survey to ensure a diverse view from potential eligible farmers across the state. Two FGDs were conducted per state, with one group comprising females only and the other group comprising only males. Smallholder farmers aged 18 and above and resident in the selected community were recruited for the FGDs. Each group comprised 8–10 respondents of different age groups and ethnicities. The selected participants for the KIIs were managers of medium and large enterprises. Three key informants were identified for each state to represent the managers of agricultural input firms, agricultural output/processing firms, and a government regulatory body. Informants from agricultural input firms included managers of fertilizer companies, seed companies, and feed mills, etc., while informants from agricultural output firms included managers of rice processing firms and maize processing firms, etc. and the regulatory bodies included key decision makers in the Ministry of Agriculture. Key staff of the various state Agricultural Development Programme (ADP) assisted in identifying participants who fit the criteria for the interview.

<sup>7</sup> MDHS. 02Chapter02.pdf [Internet]. 2004 [cited 2020 Jun 10]. Available from: <https://dhsprogram.com/pubs/pdf/FR175/02Chapter02.pdf>



Prior to the field work, a central training session for 58 data collectors was conducted in Federal Capital Territory (FCT). The training sessions provided the enumerators with information about the program, the instruments to be administered, and how to administer them. The state coordinators and quality assurance (QA) persons for each state were provided with qualitative data collection training for the FGDs to help them know what to expect in the field, identify challenges, and proffer solutions before fieldwork. Facilitators monitored the enumerators to see how they conducted interviews and measurements and coded responses. On the last day of training, enumerators were deployed into teams and the state coordinators were named as team leads (see Annex D for team composition). Fieldwork commenced on Saturday 29 February and lasted for 10 days

## Data Collection

Data collection for the quantitative survey was done using SurveyCTO, which is a type of computer-assisted personal interviewing (CAPI) software. GPS programming was incorporated into the instruments for enumerators to record their location after completing an interview. Measurements for farmlands were taken using the Measurer app and then transferred to SurveyCTO. Smaller ponds were measured using tape measures in meters and the measurements entered in CAPI. FGDs and KIs were conducted in each state according to the protocol above, using a guide provided, and interviews were recorded with recorders. The state coordinators were the moderators while the teams' QA officers were the notetakers. The interviews were recorded, and reports were written using a pre-formed template and interviews transcribed. As a key part of the qualitative data analysis, the teams conducted some initial synthesis in the field. The aim was to conduct thorough debriefs and initial analysis in the field to both avoid any errors of interpretation of the qualitative data as well as to discuss interesting emerging issues for further exploration. Each researcher submitted a debrief report that fed into the overall report. All qualitative interview recordings were transcribed into English by translation experts. The transcripts helped the team transit from raw interviews to evidence-based discussions. Synthesis of notes was structured around an agreed methodological framework for analyzing issues to extract salient analytical insights. All quantitative data was analyzed using STATA, and a full record of all analysis has been kept using STATA syntax stored in do files. A further explanation of data quality control is provided in Annex B.

## Measurement of Parameters and Indicators

This section describes how certain socio-economic parameters and program indicators were measured. Household poverty was measured using the Poverty Probability Index tool while household food security was assessed using the Household Hunger Score, Household Dietary Diversity Score and Food Consumption Scores.

**Household Poverty probability Index (PPI):** The PPI is a poverty measurement tool that uses the Progress out of Poverty Index to estimate the likelihood of an individual falling below the poverty line. The PPI uses answers to 10 questions about a household's characteristics and asset ownership that are scored to compute the likelihood that the household is living below the poverty line. For this survey, the household poverty index was a calculated Simple Poverty Scorecard that used the standardized 10 verifiable indicators to assess the poverty status of a population as measured by Nigeria's 2012/13 General Household Panel Survey. After calculating the PPI scores, the PPI look-up table was used to convert the PPI score to a likelihood that the respondent's household is living below a poverty line.

**Household Hunger Score:** The HHS is a simple tool used to measure household hunger and short-term food deprivation. It consists of questions designed to represent varying levels of food insecurity while also reflecting three domains perceived as central to the experience of food insecurity, cross-culturally: 1) anxiety about household food supply; 2) insufficient quality, which includes variety, preferences, and social acceptability; and 3) insufficient food supply and intake and the physical consequences. Questions were asked about worrying about the lack of resources to get food, if any member of the household ever lacked food to eat, or if any went to bed hungry because there was no food in the previous four weeks. Household responses were scored and categorized into three groups based on their scores: 0 to 1 – little or no hunger; 2 to 3 – moderate hunger; 4 to 6 – severe hunger.

**Household Dietary Diversity Score (HDDS):** The HDDS has been validated as a useful approach for measuring household food access. It also provides a glimpse of a household's ability to access food as well as its socioeconomic status based on the previous 24 hours. It is defined about the number of unique foods consumed by household members over a given period.<sup>8</sup> Data was collected from respondents on consumption of foods from 12 food groups in the previous 24 hours. Household scores ranging from 0 to 12 were calculated for each household and the average HDDS for each population group was calculated. Since national dietary data is not available on mean DDS, terciles were used to classify the households into low, medium, and high diversity.<sup>9</sup> Terciles were used because there are currently no international guidelines or recommendations on what to base cut-offs on for low, average, and high. A score of equal to or lower than three was considered as poor dietary diversity (and by association poor food security) while a score of six and above represents a very varied diet. The percentage of households consuming each food group in each state was also calculated.

**Food Consumption Score (FCS):** The FCS is a proxy indicator of household caloric availability and is useful for tracking households' food security over time.<sup>10</sup> It is a composite score based on dietary diversity, food frequency, and the relative nutritional importance of different food groups. The FCS aggregates household-level data on the diversity and frequency of food groups consumed over the previous seven days, which is then weighted according to the relative nutritional value of the consumed food. Respondents were asked to state the frequency of consumption of the 12 food groups in the last seven days. The maximum score for each food group was 7. Each food group had a score based on the relative nutritional value. The sum of the weighted food group values was the FCS for each household. Based on these scores, a household's food consumption was further classified into one of three categories: poor, borderline, or acceptable. Households scoring 0–21 were categorized as poor, those scoring 21.5–35 were categorized as borderline, and those with scores greater than 35 were deemed to have an acceptable food consumption score.

**Yield of targeted agricultural commodities:** This indicator was calculated to enhance the Trade Hub's understanding of the productivity of smallholder farmers across value chains in target locations. For crop farmers, data on the total number of bags harvested was collected in kilograms and thereafter converted to metric tons (MT). Farmlands were also measured in hectares. Farmland greater than 5 ha were excluded from this analysis as they do not fit into the category of farmers the survey targeted. Hence the sample size (n) differed after the removal of these farms from analysis. Yield calculation for crop farmers= total number of bags harvested (MT)/ total number of hectares. For aquaculture farmers, data was collected on the number of fish harvested per pond and an average yield was calculated for all the farmers. However, due to inconsistency of the data, aquaculture yield was not presented in this report.

**Value of annual sales and profitability of farmers:** To gather information on annual sales, crop farmers were asked to provide information on number of harvested bags and price of each bag sold. Fish farmers were asked to provide information on the total number of fish sold, weight of fish sold, and price per kg of fish sold. Total sales were then extrapolated from this data. To determine the profits of smallholder farmers, data was collected on the production costs for the last planting season and then deducted from the total sales made. Production costs included costs of paid and unpaid labor and other costs such as cost of fertilizers, herbicides etc. Where unpaid labor was used, farmers were asked to estimate how much it would have cost if they were to pay for the services rendered. It is worth noting that many farmers do not keep records of production costs or sales and most information was from memory recall and thus may have been prone to errors/bias.

**Annual sales calculation:** Addition of sales of crop from measured farm, sales of the same crop from other farms and sales of by-products or total sales of fish sold from harvested fish per pond. Profits= Total sales (revenue) – Production costs.

**Number of farmers who have applied improved agricultural practices:** The USAID FTF

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<sup>8</sup> <https://index.nutrition.tufts.edu/data4diets/indicator/household-dietary-diversity-score-hdds>

<sup>9</sup> Food and Agriculture Organization (2008) *Guidelines for measuring household and individual dietary diversity*, version 4, Rome.

<sup>10</sup> <https://index.nutrition.tufts.edu/data4diets/indicator/food-consumption-score-fcs>

Indicator Handbook measures the total number of farmers that have applied improved technologies anywhere within the food system. This includes agriculture-related innovations in efficiency, value addition, post-harvest management, sustainable land management, forest and water management, managerial practices, input supply delivery, and any significant improvement to existing technologies. Because the use of technology significantly impacts the productivity of farmers, it is important to understand the current levels of utilization of different technology types for both crop farmers and aquaculture farmers. Information on the usage of 29 different improved technologies during the last planting season was collected and then categorized into nine groups based on the disaggregates in the FTF Indicator Handbook. The groups were: (i) crop genetics; (ii) cultural practices; (iii) soil-related fertility and conservation; (iv) pest management; (v) irrigation; (vi) water management; (vii) post-harvest handling and storage; and (viii) others. Specific categorization of each technology type into groups is described in Annex F. These numbers were disaggregated by value chain, technology type, and gender. Beneficiaries who applied more than one improved technology during this period were counted under each technology type but only once when disaggregating by sex.

**Number of hectares under improved practices/technology:** This indicator measures the area (in hectares) of land cultivated using improved technologies or management practices by survey respondents in the last planting season. The technologies counted were land-based. Hence, the application of improved technologies under aquaculture was excluded based on the recommendation contained in the FTF Indicator Handbook. This indicator helps to track the successful application of technologies and management practices in a bid to increase agricultural productivity.

In calculating this, the total number of hectares across all beneficiaries for each technology type was aggregated. When more than one technology was applied on a hectare, the hectare was counted under each technology type to accurately track and count the uptake of each technology type.

## Limitations

**Security issues:** This was particularly serious in Benue, Kebbi and Kaduna states. Zuru LGA of Kebbi state, which was initially selected for the survey, had to be replaced with Ngaski LGA due to reported security concerns in the location. Furthermore, all LGAs listed as unsafe from the initial security assessment, especially in Benue and Kaduna, were excluded from the sampling pool before selection.

**Pond sharing:** In Cross River state, many fish farmers were organized into associations that share a communal pond. This created some difficulty in ensuring appropriate sample size for the pre-selected communities. As a result, the sampling methodology for aquaculture farmers was modified to using the snowballing approach to ensure the sample size target was met.

**Difficulty in reaching female and young farmers:** Some communities had very few or no female and youth farmers for targeted value chains. Some of women and youth work under the adult male household heads and do not possess their own farms. This made meeting the quota for them in certain communities a challenge.

**Varying bag sizes for measuring harvest:** As anticipated, some farmers were not sure about the actual sizes of the bags of produce they produced, and this posed a challenge for certain calculations. To standardize this measurement input of extension agents, collected information, and actual direct measurements were used to get the estimated size of bags used for packing different crops across different states.

# Findings

## Baseline sample characteristics

The Trade Hub Baseline Survey collected information on respondents' age, sex, gender, position in the household, crop farmed, and other household characteristics by value chain and location. Data relating to the household poverty index and perceptions on gender and youth opportunities were also collected. This was to better understand the relationship between household characteristics and farmers' productivity.

### Sex

**Table 1** below shows the percentage of male and female farmers sampled in each state. Overall, there were more male respondents compared to female. The male/female ratio was 3:1 on average except for Delta State where it was 4:1, indicating that there were very few female fish farmers in the state. The same trend was observed for the different value chains indicated in **Table 2** below.

**Table 1: Disaggregation of Respondents by Sex by location**

SEX	Benue n=152 (%)	Cross River n=186 (%)	Delta n= 157 (%)	Ebonyi n= 101 (%)	Kaduna n= 353 (%)	Kebbi n= 303 (%)	Niger n=253 (%)	Total n=1,505 (%)
Female N = 379	28.39	26.88	20.38	27.72	24.65	26.73	22.92	25.18
Male N = 1,126	71.71	73.12	79.62	72.28	75.35	73.27	77.08	74.82

**Table 2: Disaggregation of Respondents by Sex by value chain**

SEX	Rice n=305 (%)	Maize n=303 (%)	Cowpea n=302 (%)	Soybean n=303 (%)	Aquaculture n=292 (%)
Female N=379	26.89	22.44	25.83	27.39	23.29
Male N=1,126	73.11	77.56	74.17	72.61	74.71

Findings from a qualitative interview in a predominantly Muslim community in Kebbi State (Jega) affirmed that it is a taboo for women to be farmers as, according to their interpretation of their religion, women are meant to stay away from public eye (Purdah system) and not be seen by non-family members. In addition, youths aged between 15 and 29 in the community (Jega) were said to be mostly in school seeking education, with only a few engaged in farming.

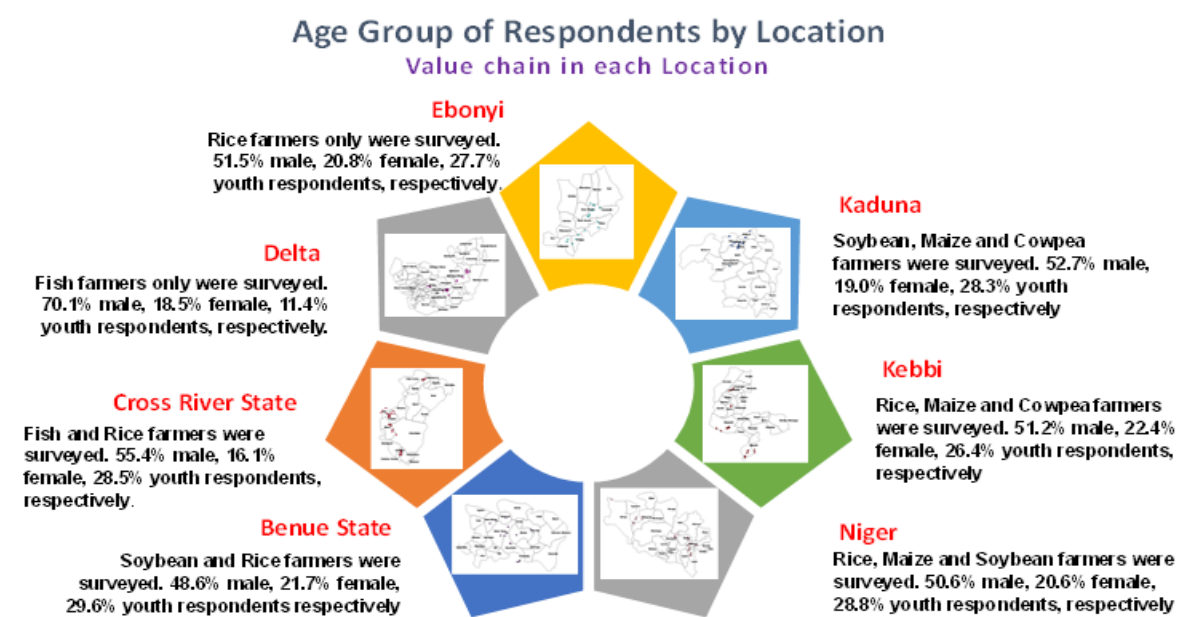
*'We do not have female farmers in this community; out of 100 farmers you might get just one who sells produce at home that has been harvested by her husband. I am surprised that you are asking if women farm.'* Male FGD respondent, Kebbi.

### Age

For this survey, a youth was defined as anyone within the age bracket of 15 to 29 as stipulated by the revised Nigerian National Youth Policy,<sup>11</sup> while an adult is anyone aged 30 and above. The survey data (see Table 3) showed that the dominant group was the adult male representing over 50% of the total population, followed by youths who formed 26% of the respondents and females were the least represented at 20%. For a country with the largest youth population in Africa, comprising 60% of the population, youths are underrepresented in this sector and this was demonstrated in this study. Indeed, the Consultative Group to Assist the Poor estimates that youth account for only 36% of smallholder

<sup>11</sup> [www.evanigeria.org/national-youth-policy-2019-2023/](http://www.evanigeria.org/national-youth-policy-2019-2023/)

households in Nigeria.<sup>12</sup> Benue State had the highest number of youth farmers, while Delta State – which had only aquaculture farmers – had the lowest youth population. When disaggregated by value chain, aquaculture farmers also had the lowest youth population at 19.8%. The average age of farmers across all locations was 39.3. Delta State had the highest average age of 42.1 while Niger State had the lowest average age of 37.5 (see Table 4). Except for Kebbi and Niger states, male farmers were older than female farmers (Table 4).



**Figure 3: Age group of respondents by location**

**Table 3: Age group of respondents by value chain**

Age Group	Rice (%) N= 305	Maize (%) N= 303	Cowpea (%) N= 302	Soybean (%) N=303	Aquaculture (%) N=292	Total (%) N= 1,505
Youth	27.87	28.38	27.15	28.38	19.86	26.38
Male Adult	50.82	54.66	51.32	49.50	62.67	53.69
Female Adult	21.31	17.16	21.52	22.11	17.47	19.93

**Table 4: Mean age group of respondents by state**

State	Male	Female
Benue	39.0	36.8
Cross River	40.9	37.3
Delta	42.2	41.6
Ebonyi	41.2	39.2
Kaduna	38.9	37.2
Kebbi	39.2	41.9
Niger	37.5	37.5

## Head of household

The results from **Table 5** below show that most households are male headed (91.6%) and female-headed households only constituted 3.9% of the survey population across all states surveyed. More than 95% of the households were adult headed. This is like the Nigeria Demographic and Health Survey 2018 data, which showed that 82% of households in Nigeria are male headed and is reflective of the patriarchal nature

<sup>12</sup> Consultative Group to Assist the Poor (2017) *National Survey and Segmentation of Smallholder Households in Nigeria*. Washington, DC.

of Nigerian society. Youth-headed households formed a smaller proportion of the sample respondents and even when disaggregated by gender, male youth-headed households were still more common than female youth-headed households.

**Table 5: Type of household head**

Type of Household head	Benue n=152 (%)	Cross River n=186 (%)	Delta n=157 (%)	Ebonyi n=101 (%)	Kaduna n=353 (%)	Kebbi n=303 (%)	Niger n=253 (%)	Total N=1,505 (%)
Male-headed household	92.11	89.25	89.91	83.17	96.32	92.41	90.51	91.69
Female-headed household	6.58	4.30	6.37	9.90	1.42	3.30	2.37	3.92
Young male-headed household	1.32	5.38	3.18	6.93	2.27	4.29	7.11	4.19
Young female-headed household	0.00	1.08	0.64	0.00	0.00	0.00	0.00	0.20

## Educational status

Observation of the educational status of respondents (see **Table 6**) shows that farmers who completed secondary school formed the largest group (23.7%) followed by those who only acquired Quranic education (17.74%), while only very few farmers had completed postgraduate degrees (1.4%). This shows that most farmers only had limited formal education. A closer look at the states shows that the northern states of Kebbi, Kaduna, and Niger had the highest proportion of respondents with little or no education while the southern states of Cross River, Delta, and Ebonyi had higher proportion of respondents who had either completed secondary education or tertiary education. Indeed, Cross River and Delta states with concentration of Aquaculture respondents had the highest number of farmers who had completed a postgraduate degree.

**Table 6: Education status of respondents**

Level of education	Benue n=152 (%)	Cross River n=186 (%)	Delta n=157 (%)	Ebonyi n=101 (%)	Kaduna n=353 (%)	Kebbi n=303 (%)	Niger n=253 (%)	Total n=1,505 (%)
None (%)	5.92	0.00	0.00	4.95	5.95	20.79	16.21	9.24
Quranic school	0.00	0.00	0.64	0.00	32.29	28.71	25.69	17.74
Some primary	6.58	0.54	1.91	8.91	5.67	3.96	3.56	4.25
Completed primary	18.42	4.30	5.10	21.78	17.00	6.93	9.09	11.30
Some secondary	19.74	7.53	6.37	6.93	10.76	4.29	9.49	9.04
Completed secondary	30.26	40.32	31.85	39.60	16.71	13.86	17.79	23.72
Some tertiaries	8.55	12.37	10.83	4.95	5.10	3.96	8.70	7.31



Completed tertiary	9.87	29.03	38.22	12.87	6.52	17.49	9.09	16.01
Postgraduate	0.66	5.91	5.10	0.00	0.00	0.00	0.40	1.40

## Household Poverty Probability Index (PPI)

Overall, 10.9% of the respondents fall below the 96.1 PPI likelihood estimate (that is, living on less than US\$ 1.90/day).

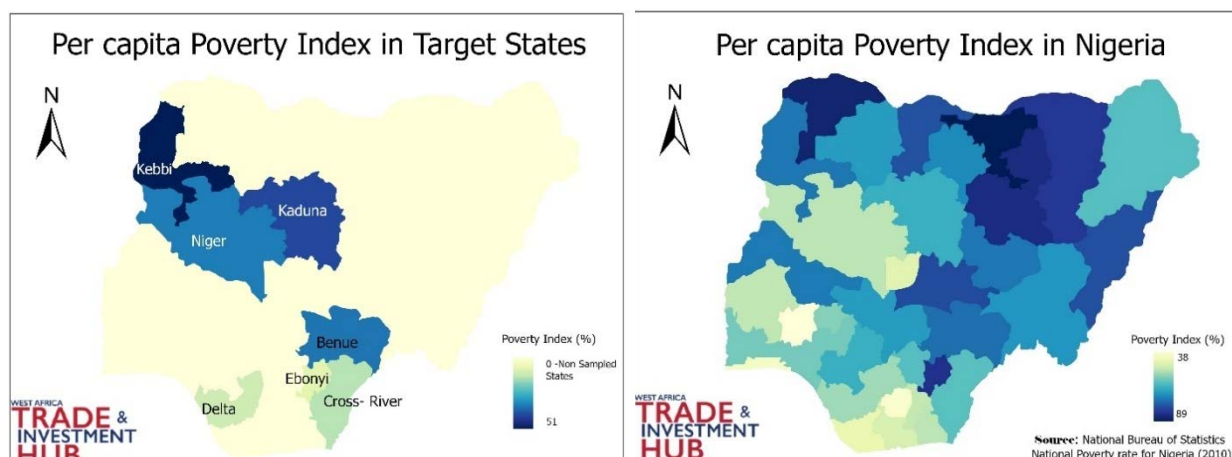


Figure 4: Per capita Poverty Index

Table 7: Categorization of Household Poverty Index

Likelihood Categories	Benue (%) n=152	Cross River (%) n=186	Delta (%) N=157	Ebonyi (%) N=101	Kaduna (%) N=353	Kebbi (%) N=303	Niger (%) N=253	Total (%) N=1,505
Less than \$1.90/day (extremely poor)	15.13	4.84	1.27	1.98	10.20	21.45	10.67	10.90
Less than \$3.10 (likely to be poor)	35.53	13.98	11.56	7.92	41.64	51.16	34.39	32.89

Our analysis of the selected farmers showed that the poverty level is still significant among farmers. About a third of farmers are still living in poverty across the states (based on the US\$ 3.10/day median poverty rate) while about 11% are living in extreme poverty (based on the US\$ 1.90/day absolute poverty rate). Overall, the northern states of Benue, Kebbi, Kaduna, and Niger had a higher proportion of respondents living in extreme poverty. In terms of individual states, Kebbi State had the highest number of farmers living in extreme poverty (21%) and more than half of its respondents living in poverty (51%). Delta State had the lowest number of respondents living in extreme poverty (1.3%).

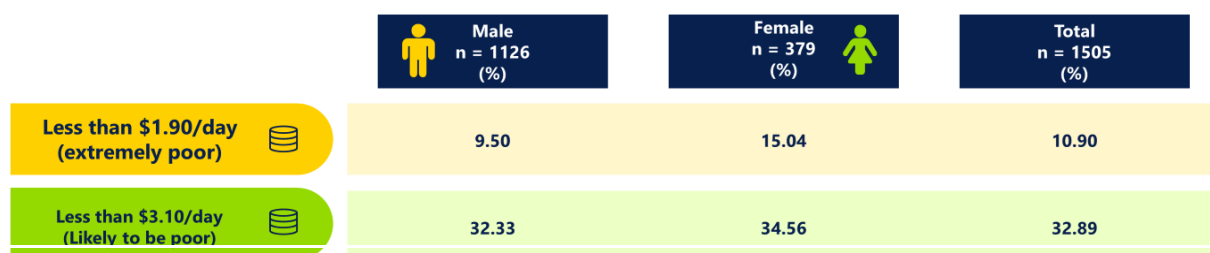
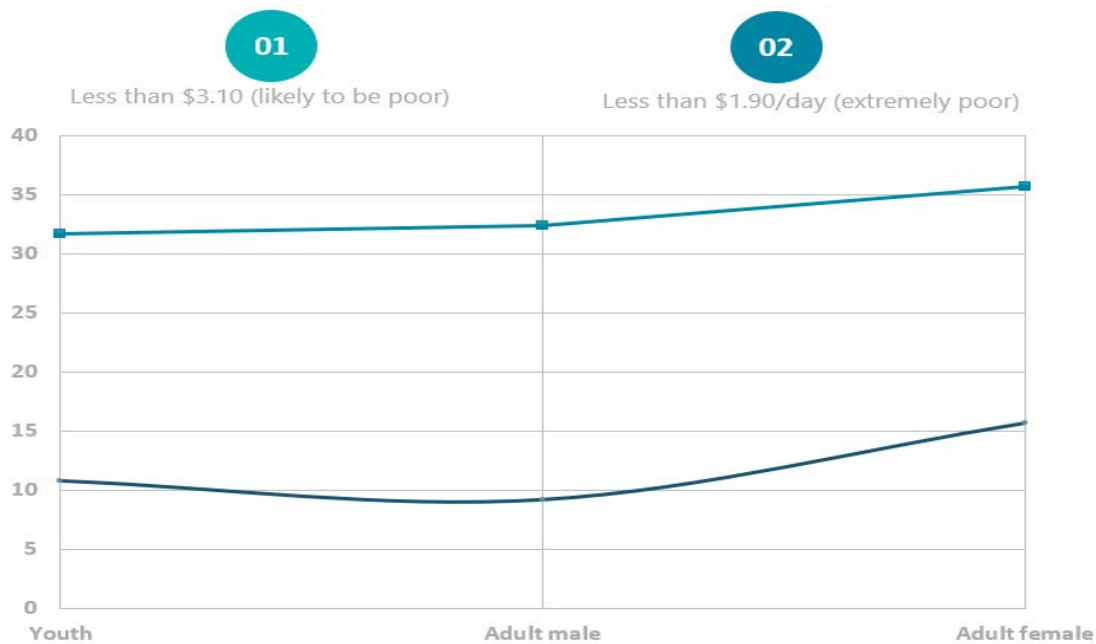


Figure 5: Poverty Index by Gender



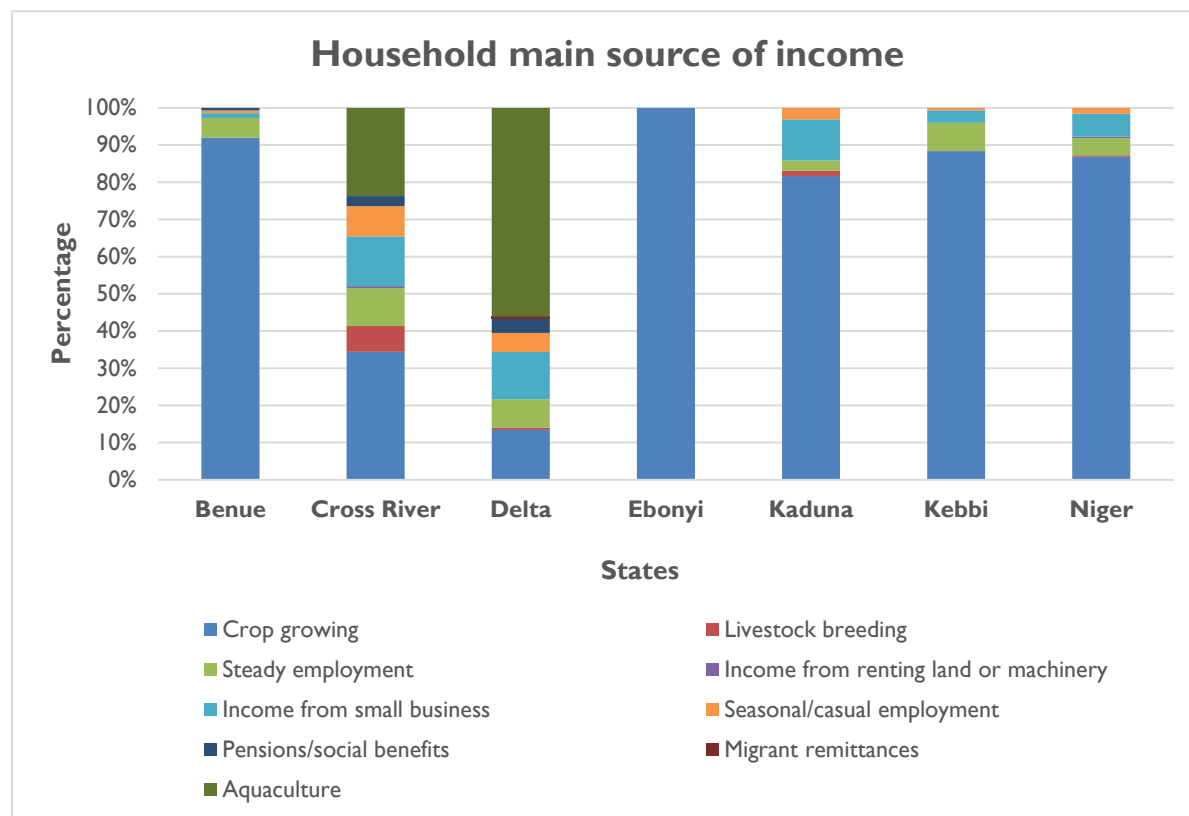
**Figure 6: Poverty Index by Adult and Youth**

When the household poverty index was disaggregated by gender (see **Figure 5**), we found that a higher proportion of females (15%) compared to males (9%) live in extreme poverty. Across all age groups (see **Figure 6**), adult females had the highest proportion of respondents living in absolute and relative poverty. Household wealth has implications for agricultural productivity and for investment. Apart from its impact on yield, it also plays a fundamental role in determining nutritional outcomes. As previously presented, a closer look at the states shows that the northern states of Kebbi, Kaduna, and Niger had the highest proportion of respondents with little or no education while the southern states of Cross River and Delta had the highest number of farmers who had completed a postgraduate degree, which potentially can increase the likelihood of a better source of income and a chance to earn higher wages.



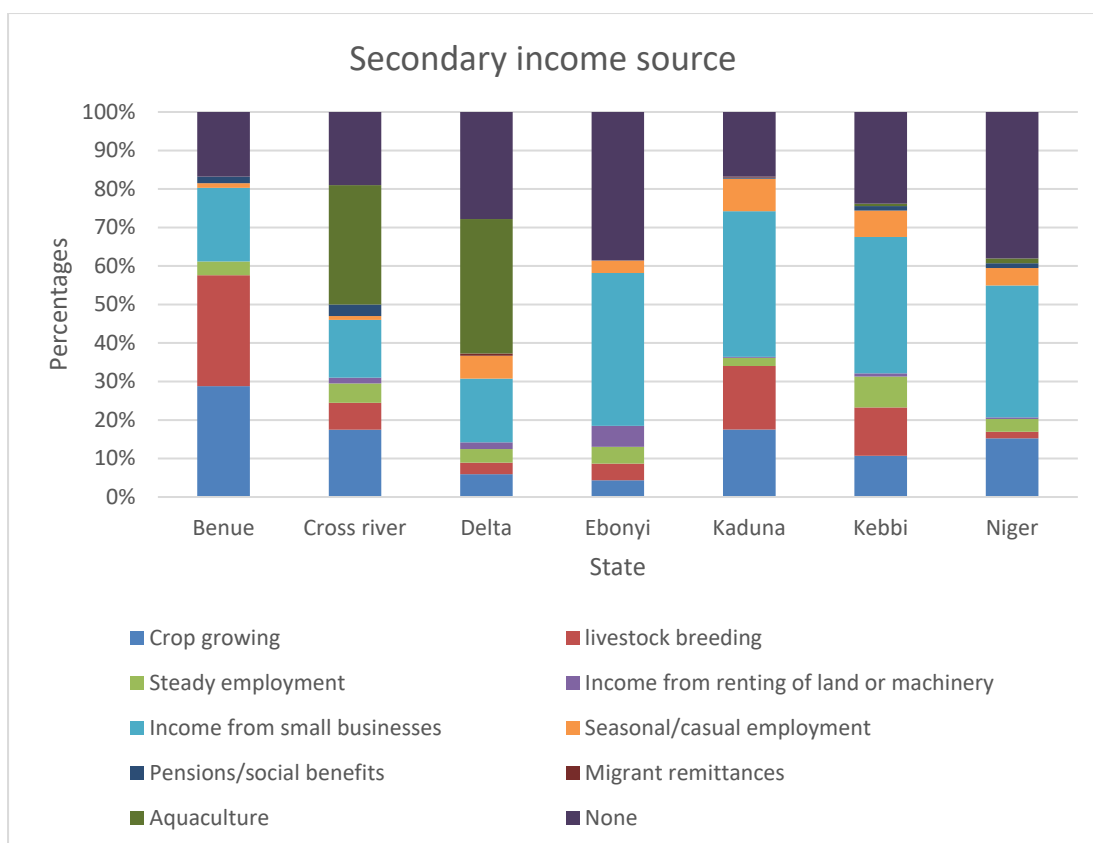
## Household income and expenditure

Respondents were asked questions about their main and supplementary sources of income and how much they earn from these sources annually. The information we gathered (**Figure 7**) shows that, in most of the states, crop growing was the major source of livelihood, apart from Delta State where aquaculture was the main income source for respondents. A lower percentage of respondents also had income from small businesses (such as petty trading, workshops and so on) and steady employment as their main income source.



**Figure 7: Household main source of income**

In addition, respondents were asked about their other sources of income and how much they generate from these sources. All states had respondents who have small businesses as a secondary income source, but this percentage was higher in Ebonyi, Kaduna, Kebbi, and Niger states. In Cross River and Delta states, 33% and 37% of respondents had aquaculture as their secondary income source, respectively (**Figure 8**). Many respondents also had no secondary income source. Lack of access to resources and services increases household vulnerability to shocks. Off-farm employment, in addition to complementing farm income, contributes toward food security and poverty alleviation. Therefore, diversifying income sources provides an important risk management tool in times of negative shocks that affect agriculture, such as droughts.



**Figure 8: Other sources of household income**

When asked how much income they generate from both their main and other income sources annually, more than a third of respondents (36%) reported receiving below the minimum wage of US\$ 1,000 (NGN 360,000) annually, with Benue and Kaduna states having the highest number of respondents generating less than the minimum wage annually. This corresponds with the high poverty index reported in these states. Meanwhile, Cross River, Delta and Ebonyi states had the largest percentage of respondents who earned above US\$ 2,000 per annum (**Table 7**), also corresponding with the low poverty index recorded in these two states.

Across all states, women constituted the higher percentage of those who earned below the minimum wage. This was more pronounced in Kebbi and Benue states, where 80% and 69% of women respectively earned below the minimum wage. Also, **Table 8** shows that male respondents generated higher income than females. Relating this to poverty, there is evidence to demonstrate that income levels are strongly related to poverty.<sup>13</sup> Since more women generate lower income than men, it therefore comes as no surprise that women had a higher percentage of those living in poverty.

**Table 8: Income Categorization by state**

Income Categorization	Benue (%) N=152	Cross River (%) N=186	Delta (%) n=157	Ebonyi (%) N=101	Kaduna (%) N=353	Kebbi (%) N=303	Niger (%) N=253	Total (%) N=1,505
Below US\$ 1,000	57.89	19.89	32.48	24.75	47.59	33.00	31.62	36.48
US\$ 1,000 to US\$ 2,000	23.68	20.43	24.20	15.84	24.36	29.37	29.25	25.05
Above US\$ 2,000	18.42	59.68	43.31	59.41	28.05	37.62	39.13	38.47

<sup>13</sup> Asogwa, B.C., Obinne, P.C., and Penda, S.T. (2017) 'Poverty and Income among the Smallholder Farmers in Nigeria'. *Journal of Human Ecology*.

Table 9: Income Categorization by Sex

Income Categorization	Benue N=152		Cross River N=186		Delta n=157		Ebonyi N=101		Kaduna N=353		Kebbi N=303		Niger N=253		Total N=1,505
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
Below US\$ 1,000	53.2	69.8	18.3	24.0	20.8	50.0	17.8	42.9	36.8	80.5	22.5	59.2	29.7	37.9	36.5
US\$ 1,000 to US\$ 2,000	24.8	20.9	21.3	18.0	20.8	21.9	16.4	14.3	29.3	9.2	31.1	22.2	31.3	22.4	25.0
Above US\$ 2,000	22.0	9.3	60.3	58.0	58.4	28.1	65.7	42.9	33.8	10.3	46.4	18.5	38.9	39.6	38.5

Subsequently, respondents were asked to enumerate the three main areas that they spend their income on. **Figure 9** below shows that, across all states, the three main areas were health, education, and food/household expenses.

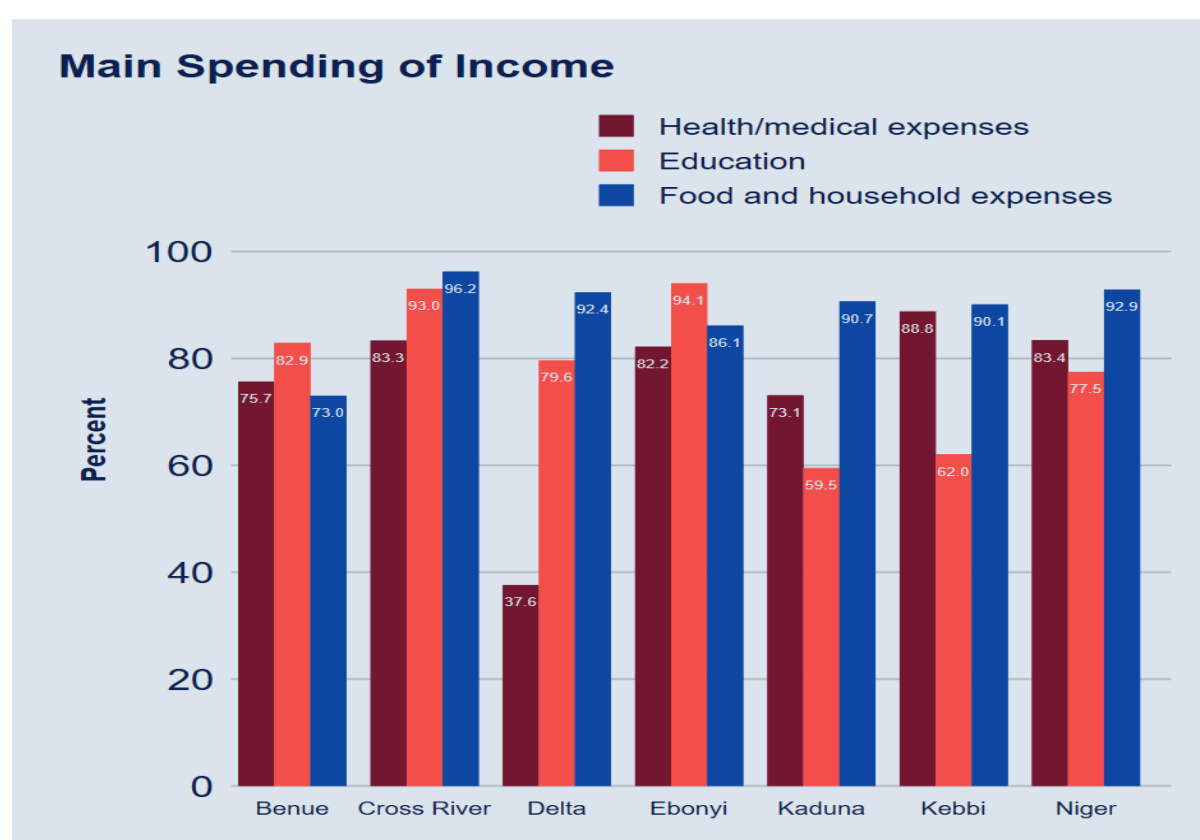


Figure 9: Three main areas of income spending

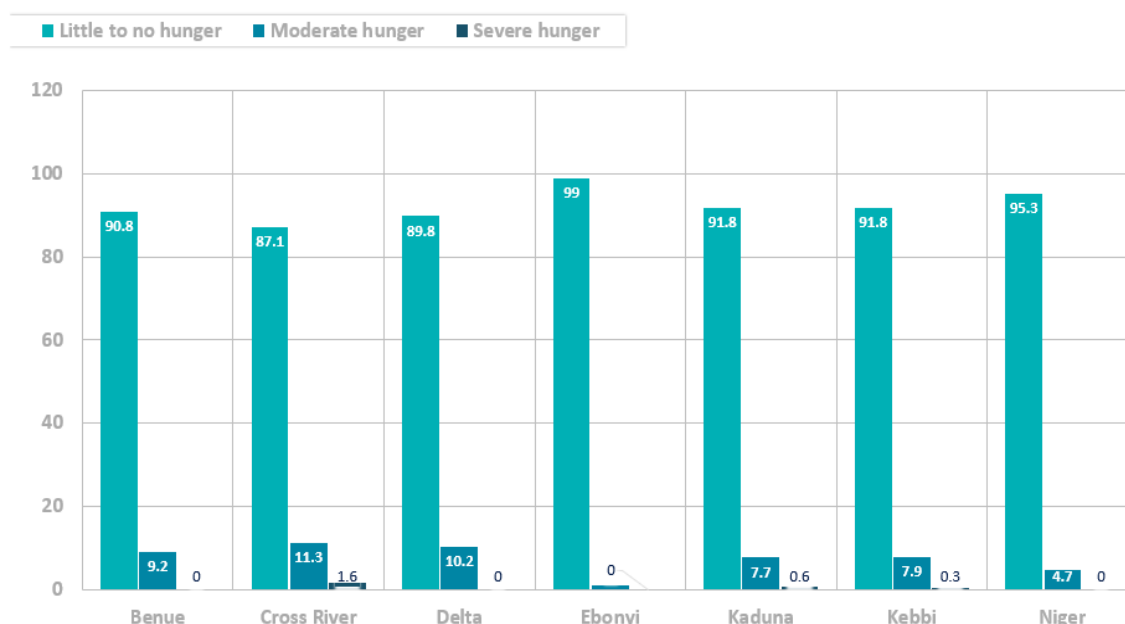
## Household food security

Food security is an important condition that must be achieved for an individual to be nutritionally secure and maintain good health. It comprises adequate access to food, stability of food supplies, and sustainability of food procurement. Rural smallholder farmers have been vulnerable to food insecurity and malnutrition because many of them do not have sufficient income to enable continued access to adequate supplies of safe and nutritious food.<sup>14</sup> Hence, this survey assessed household food security of smallholder farmers, using standard nutrition indicators – the Household Hunger Score (HHS)

<sup>14</sup> [www.fao.org/3/w0078e/w0078e04.htm](http://www.fao.org/3/w0078e/w0078e04.htm)

Household Dietary Diversity Score (HDDS), and Food Consumption Score FCS – to determine the nutritional status and levels of food security of the sample population.

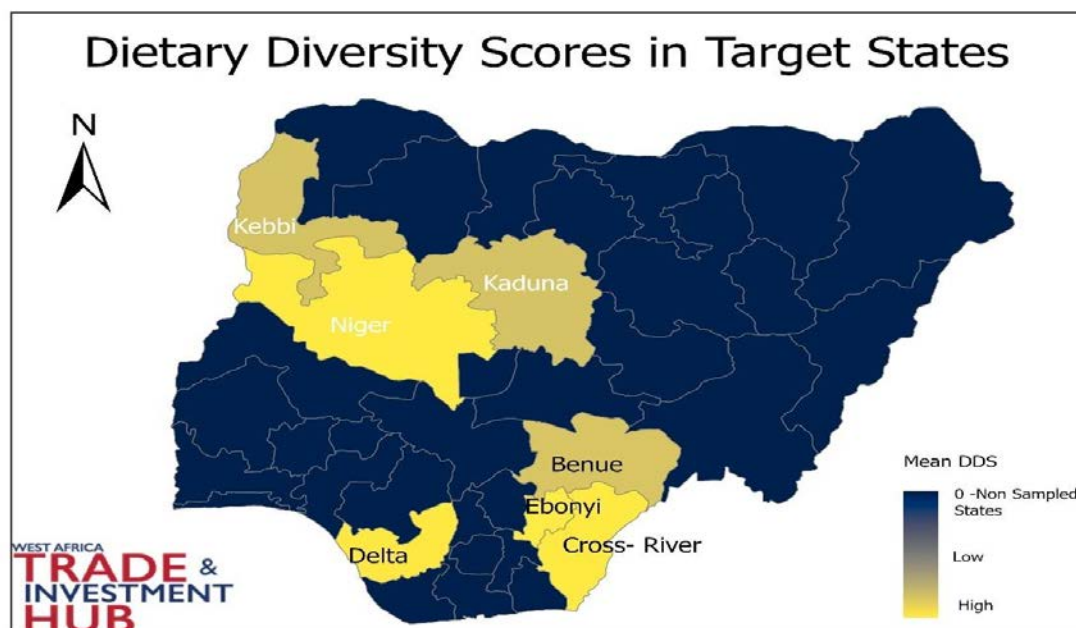
### Household Hunger Score



**Figure 10: Household Hunger Score by state**

**Figure 10** above shows the level of household hunger by location. Across many states, only a small proportion of households had moderate and severe levels of hunger. More than 85% of households had little or no hunger. As already presented above (see **Figure 10**), one of the three main areas of household spending is food/household related expenses. This may be a contributing factor to this trend. However, the southern states of Cross River and Delta had the highest levels of moderate hunger despite having reported a higher level of expenditure on food/household items, higher educational levels, and higher income levels. This can be explained by the higher cost of living in these two states when compared to other study states.

## Household Dietary Diversity Score (HDDS):



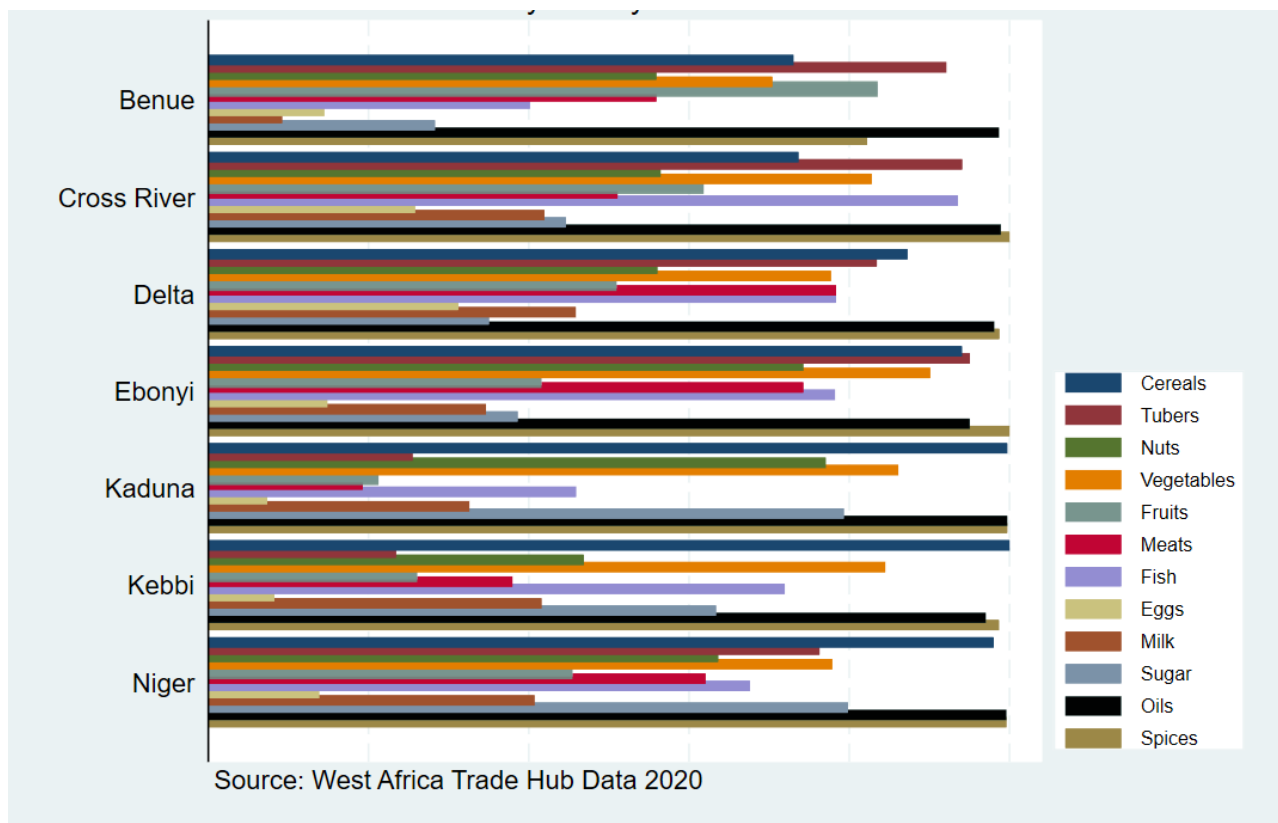
**Figure 11: Household Dietary Diversity Score**

The mean dietary diversity score was 7.5, with Benue, Kebbi, and Kaduna reporting lower scores than the other states (see **Figure 11**). The proportion of households who consumed food from each group in the previous 24 hours (see **Figure 12**) revealed that cereals constituted the major food group consumed by most households, especially in Kebbi (100%), Niger (98%), Kaduna (99%), and Ebonyi (94%). Tubers were mostly consumed in higher proportions in the southern states of Ebonyi (95%), Cross River (94%), and Delta (83%). Benue and Niger states had high percentages of households consuming tubers, compared to the two other northern states of Kebbi and Kaduna which had few households (23% and 35% respectively) consuming tubers.

Fish and other seafood were mostly consumed by households in Cross River, Delta, and Ebonyi states. Benue State had the largest percentage of households consuming fruits (83%). Few households reported consumption of eggs (14%), milk or dairy products (36%), and fruit (42%), and these were especially low in Kebbi and Kaduna states.

When categorized into terciles, more than 87% of households had high dietary diversity and consumed six or more categories of food (**Table 10**). However, further observation shows that, aside from cereals (92%), vegetables (82%), pulses (62%), tubers (59.3%), oils and fats (98%) and spices (97%), which have less nutritional value, formed households' other most consumed groups. These findings are consistent with the observation that diets in developing countries are monotonous, based on starchy staples with inadequate fruit and animal products.<sup>15</sup>

<sup>15</sup> Mekuria, G., Wubneh, Y., and Tewabe, T. (2017) 'Household dietary diversity and associated factors among residents of finote selam town, north west Ethiopia: a cross sectional study'. *BMC Nutr*;3(1):28 [accessed 5 April 2020]. Available from: <https://doi.org/10.1186/s40795-017-0148-0>



**Figure 12: Households food consumption from each group in the last 24 hours**

**Table 10: HDD categorized by tercile**

Household dietary score category	Benue (%) N=152	Cross River (%) N=186	Delta (%) N=157	Ebonyi (%) N=101	Kaduna (%) N=353	Kebbi (%) N=303	Niger (%) N=253	Total (%) N=1,505
Low diet ( $\leq 3$ food groups)	0.00	0.00	0.64	0.00	0.28	1.65	0.40	0.53
Medium diet (4 to 5 food groups)	12.50	8.06	5.73	1.98	18.13	22.44	4.35	12.49
High diet ( $\geq 6$ food groups)	87.50	91.94	93.63	98.02	81.59	75.91	95.26	86.96

### Food Consumption Score (FCS):

**Table 11: FCS by location and sex of household head**

FCS category	Benue (%) N=152	Cross River (%) N=186	Delta (%) n=157	Ebonyi (%) N=101	Kaduna (%) N=353	Kebbi (%) N=303	Niger (%) N=253	Total (%) N=1,505
<b>Male-headed households</b>								
Poor	98.60	80.12	83.7	91.67	97.94	96.07	86.46	91.74
Borderline	1.43	19.88	16.31	8.33	2.06	3.93	13.54	8.26
<b>Female-headed households</b>								
Poor	100.0	62.50	70.00	100	100	100	100	89.3
Borderline	0	37.50	30.00	0	0	0	0	10.17

Based on the information in **Table 11**, we can see that most households sampled had poor FCS. This was especially high in Benue State, where 98% of male-headed households and all female-headed households had poor scores. Male-headed households had poorer FCS (91%) compared to female-headed households (89%). No household had acceptable FCS, indicating that most households had poor intake of nutrient-rich food groups. Although only a small proportion of households had moderate and severe levels of hunger, a further observation of the diet composition using the dietary diversity score and FCS is that nutrient-rich groups are grossly lacking.

Research has shown that increasing women's income is associated with improvements in household food security and nutrition as women tend to spend a more significant proportion of their income on food for the household than men.<sup>16</sup> Nutrition in farming households also depends on how well the markets function and who within the household controls the income from commercial farm sales and off-farm employment. As nutritional deficiencies are responsible for a large health burden in terms of lost productivity, impaired physical and mental human development, susceptibility to various diseases, and premature deaths, increasing agricultural productivity is thus an important strategy to improve nutrition and health.<sup>17</sup> Increasing the productivity and profitability of small-scale farmers in developing countries is critical to improving the food security and wellbeing of households and their communities. In the past few decades in sub-Saharan Africa, agriculture has been a contributor to reducing poverty.<sup>18</sup> Against this background, further diversifying production for smallholder farmers is often perceived as a useful approach to improve dietary diversity and nutrition, which may contribute to income growth and stability. A KII respondent in Kaduna said that, as part of their program, they deliver talks on the nutritional benefits of some crops to farmers to encourage farming of such crops for commercial and household consumption. If such awareness creation can be incorporated into the regular meetings that farmers hold, it might have an impact on nutrition.

*'Every month we used to have a subject specialist talk on the benefits of certain crops, like today we talked about okra production and the importance of okra to the body, encouraging them to produce okra for family consumption or at a large scale for sale.'* KII respondent, Kaduna.

## Categories of crop farmers

This data was collected to provide some insight into the types of farmer surveyed based on the season in which they plant crops. A wet season farmer is one who plants crops that require rain only during the rainy season and a dry season farmer is one who can plant crops all year-round using irrigation techniques. Most of the crop farmers surveyed were wet season farmers (95.30%), with only 17% of farmers engaging in dry season farming (**Figure 14**). Cross River had the highest percentage of dry season farmers (27%), followed by Kebbi State with 25% and Niger State with 18%.

However, it is important to note the varying sample sizes between Cross River and the other states when interpreting this result. In terms of absolute numbers, Kebbi State had the largest population of dry season farmers (77%), followed by Kaduna (61%) and Niger (46%). Most dry season farmers (60%) also engaged in wet season farming. When disaggregated by value chain and gender, rice farmers had the largest proportion of dry season farmers (26%) and a higher proportion of male farmers (11%) engage in dry season farming when compared to females (6%). From these findings, we can see that most farmers still

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<sup>16</sup> [www.fao.org/3/x0171e/x0171e02.htm](http://www.fao.org/3/x0171e/x0171e02.htm)

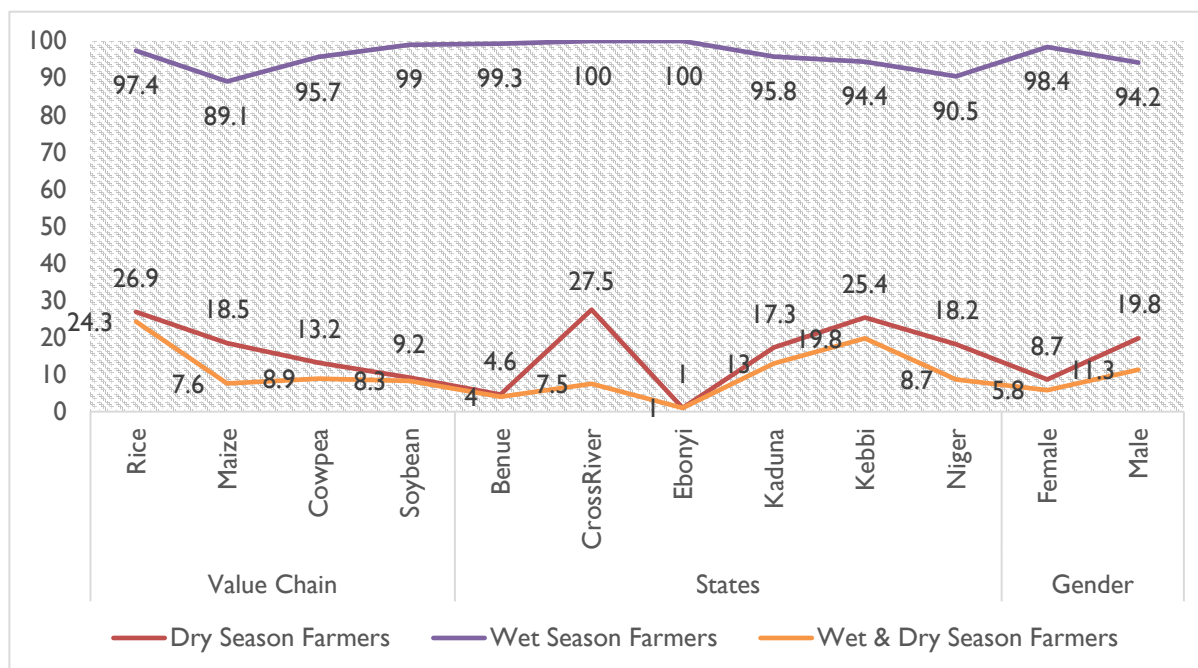
<sup>17</sup> Khoury CK, et al. (2014), Proc Natl Acad Sci U S A. 2014 Mar 18;111(11):4001-6. doi: 10.1073/pnas.1313490111. Epub 2014 Mar 3. PMID:24591623

<sup>18</sup> Davis et al., 2017; Ellis, 2000; Ellis and Allison, 2004; Manero, 2016  
Trade Hub Activity Baseline report

rely on natural seasons for crop farming and lack the capacity for dry season farming.

## Gender and Youth inclusion

Social inclusion is the process of improving the terms on which individuals and groups take part in society and improving the ability, opportunity, and dignity of those disadvantaged based on their identity.<sup>19</sup> Being disadvantaged is often based on social identity, which may be derived from gender, age, ethnicity, and religion among other factors. Although women's empowerment is vital to closing gender gaps and ensuring inclusive economic growth, gender inequality remains widespread in Nigeria, effectively



**Figure 13: Categories of farmer by gender, value chain, and state**

excluding women from certain socioeconomic activities. Also, for a country with one of the largest youth populations in the world, Nigeria has failed to harness the full potential of its youthful population, especially in the agricultural sector, leading to its high youth unemployment rate. High youth unemployment has also been found to be a form of exclusion.<sup>20</sup>

In order to determine gender and age gaps that may affect the productivity of women and young farmers, surveyors collected data on women's decision-making power in the household and women and youths' access to land, credit, and other resources to understand the prevailing conditions of these population groups in the agricultural sector.

## Household decision making

Information was collected on various aspects of household decision making, such as decisions on general spending and savings, food purchase and preparation, and ownership of farming assets. Data captured below (see **Table 13**) shows that, for many of the households sampled (65%), women have little or no decision-making power in their households. This was especially pronounced in the northern states of Kaduna, Kebbi, and Niger, which had 84%, 77%, and 79% of respondents reporting that women had little or no decision-making power in their households.

Ebonyi State had the highest percentage of households where women made the most decisions. Similar studies assessing women's household decision-making power in Nigeria have observed a comparable

<sup>19</sup> [www.worldbank.org/en/topic/social-inclusion](http://www.worldbank.org/en/topic/social-inclusion)

<sup>20</sup> Pohlen, L. (2019) 'Unemployment and social exclusion'. *Journal of Economic Behavior & Organization*; 164:273–99 [accessed 7 April 2020].



trend, whereby women in the north had less decision-making power compared to the south.<sup>21</sup> This was attributed to the restriction of many aspects of women's lives in these areas, including formal education. Farming households and their decision making are central to the challenge of alleviating rural poverty in developing countries.<sup>22</sup>

Households are faced with the daily challenge of deciding on how to distribute limited resources between investing in improved technology for their farms or on the upkeep of their household. Where individuals have different preferences and bargaining power, those with more bargaining power will have more control over assets. This illustrates how these dynamics can influence overall household income based on different gender roles.<sup>23</sup>

**Table 12: Women's participation in household decision making**

Household decision-making participation	Benue (%) N=158	Cross River (%) N=51	Delta (%) N=101	Ebonyi (%) N=353	Kaduna (%) N=303	Kebbi (%) N=253	Niger (%) N= 253	Total (%) N=1,505
<b>Little or None</b>	50.00	39.78	44.59	34.65	84.14	77.23	79.05	65.51
<b>Part of some</b>	27.63	16.13	19.11	19.80	6.80	8.91	12.25	13.55
<b>Part of most</b>	22.37	44.09	36.31	45.54	9.07	13.86	8.70	20.93

### Access to agricultural land

The Land Use Act, enacted in 1978, vests all land in the territory of each state (except for federal government land), solely in the governor of the state, who will hold such land in trust for the people and be responsible for allocation of the land in all urban areas to individuals resident in the state and to organizations for residential, agriculture, commercial, and other purposes. Similar powers also hold with respect to land in non-urban areas. While the urban land market is more formalized, the rural land market is relatively informal, failing to capture the prevailing realities around customary laws and informal markets in some instances. Land is the most critical economic resource for most of the rural poor who depend on agriculture for their livelihoods.<sup>24</sup> Women's land rights are fundamental to rural development outcomes, as women's ownership and control over land can affect their productivity and economic opportunities. A growing body of evidence has shown that secure land tenure is instrumental to securing loans and even decision making as regards production.<sup>25</sup> Therefore, the availability and accessibility of land for women and youth is important in terms of the expansion of Nigeria's agricultural productivity and profitability. Respondents for this study were asked if women and youth in their community have equal access to agricultural land. Access was defined as the ability to make use of land irrespective of whether it belongs to them or not. To further explore nuances around access to land, FGDs and KIs were conducted.

Across all states, an overwhelmingly high percentage of women from the quantitative study responded positively to this question (see **Table 13**). In fact, all female respondents in Delta State agreed that women had equal access to agricultural land. Male respondents also gave a largely positive response to this question. When asked about youth access to agricultural land, nearly all the respondents across all states and age groups agreed that youth in their community had access to usage of agricultural land (**tables 15 and 16**).

<sup>21</sup> [www.researchgate.net/publication/227096454\\_Determinants\\_of\\_Women's\\_Decision\\_Making\\_Authority\\_in\\_Nigeria\\_The\\_Ethnic\\_Dimension](http://www.researchgate.net/publication/227096454_Determinants_of_Women's_Decision_Making_Authority_in_Nigeria_The_Ethnic_Dimension)

<sup>22</sup> Booysen et al. 2013

<sup>23</sup> Meinzen-Dick et al., 2011 and Stern et al., 2016.

<sup>24</sup> [www.fao.org/3/ad683e/ad683e04.htm](http://www.fao.org/3/ad683e/ad683e04.htm)

<sup>25</sup> [www.ifad.org/documents/38714170/39148759/Land+tenure+security+and+poverty+reduction.pdf/c9d0982d-40e4-4e1e-b490-17ea8fef0775](http://www.ifad.org/documents/38714170/39148759/Land+tenure+security+and+poverty+reduction.pdf/c9d0982d-40e4-4e1e-b490-17ea8fef0775)

**Table 13: Women's Access to Agricultural Land (by state)**

Responses	Benue (%) N=43	Cross River (%) N=50	Delta (%) N=32	Ebonyi (%) N=28	Kaduna (%) N=87	Kebbi (%) N= 81	Niger (%) N= 58	Total (%) N=379
<b>Women's response</b>								
Yes	81.40	82.00	100.00	85.70	97.70	93.80	93.10	91.60
No	18.60	18.00	0.00	14.30	2.30	6.20	6.90	8.40
<b>Men's response</b>								
	N=109	N=136	N=125	N=73	N=266	N=222	N= 195	N=1,126
Yes	90.83	75.74	89.60	75.34	85.71	91.89	90.26	86.77
No	9.17	14.71	4.00	24.66	14.29	6.76	8.21	10.83
Do not know	0.00	9.56	6.40	0.00	0.00	1.35	1.54	2.40

**Table 14: Youth Access to Agricultural Land (by state)**

Responses	Benue (%) N=152	Cross River (%) N=186	Delta (%) N=157	Ebonyi (%) N=101	Kaduna (%) N=353	Kebbi (%) N= 303	Niger (%) N= 253	Total (%) N=1,505
<b>No: N=8</b>	0.00	2.15	1.27	0.99	0.00	0.33	0.00	0.53
<b>Yes: N=1,489</b>	100.00	97.31	94.27	99.01	100.00	99.67	100.00	98.94
<b>Do not know: N=8</b>	0.00	9.56	0.54	4.46	0.00	0.00	0.00	0.53

**Table 15: Youth Access to Agricultural Land (by age group)**

Responses	Youth (%) N=397	Adult male (%) N=808	Adult female (%) N=300	Total (%) N=1,505
<b>No: N=8</b>	0.25	0.74	0.33	0.53
<b>Yes: N=1,489</b>	99.75	98.27	99.67	99.94
<b>Do not know: N=8</b>	0.00	90.99	0.00	0.53

It must be noted that, even though most of the women had access to farmlands, most of them did not own the land. Women who received their farmlands by borrowing from their husbands could lose these lands if a divorce were instituted by one of the partners or in the case of death of the husband according to cultural norms. Qualitative research findings across all the states indicate that men are more likely to be farmers compared to women because of the constraint of land ownership or restriction of capital to acquire land. The traditional land tenure systems thus continue to be a major limiting factor to women's land use.

For example, a report from a female FGD session in Niger State showed that most women who are farmers have either gained access to the land from their father-in-law or husband and that their scale of production is totally dependent on the approval of their husbands. Access is not enough for adequate investment; for example, cash crops cannot be planted on borrowed land. One of the participants added that unmarried female farmers in the community are either lucky to get space to farm from their parents or can afford to rent.

'Men are majorly and traditionally the owners of farmlands. Women, however, can access their husband's farmland, and if they are not married, they use their father's land. They are also able to rent or even buy farmland for a fee. Women do not inherit land in the community; this is preserved for men.' Male FGD Participant, Benue.

That said, in Ebonyi and Cross River states women can inherit land. Youth were also said to be able to rent land or farm on the family land. One respondent added that it is easier for male youth to access

land for farming compared to women because women are often shaded under the umbrella of their husbands and may not individually own land. Among youth, males are said to have more right to ownership of land in the community than females.

A KII respondent with the Cross-River State Ministry of Agriculture reported that the agency rents out land to smallholder aquaculture and crop farmers who are interested at the rate of NGN 500–1,000 (US\$ 1.40 to 3.00) per pond monthly. In Bekwerra LGA, land is said to be given out to any community member willing to farm at a very small token fee. Also, based on the responses gathered, pond ownership in some location was through cooperative effort, although there were also individuals who own private fish farms. The State Agricultural Development Project, UNICEF, Markets II funded by USAID and the World Bank form part of their major support in Cross River State. In addition, these farmers are supported with technologies like pond fertilization, liming and introduction of new breeds, hatchery and rearing of fingerlings/juveniles. However, during an FGD session, the farmers reported that the Ministry of Agriculture only rents out land and provides loans to cooperatives and not to individual farmers, so farmers must come together to access these benefits. In Delta State, pond ownership was, for many of the aquaculture farmers sampled, association based, although there were other aquaculture farmers sparsely located who had individual fishponds in Delta. Members of the association are allocated space that has been acquired through the support of the government to construct ponds. A significant number of females and youths were reported to own ponds as well in such spaces, although, compared to women and youth, men were said to farm at a larger scale. Many of the respondents for the FGD sessions were gainfully employed in government services. They can invest part of their income into their farm, which they noted has been a major source of support.

In Birnin Kebbi, the capital of Kebbi State, women were reported to have some access to land. Farmers get support from Kebbi State Agricultural and Rural Development Authority to acquire farmlands, as was noted by the key informant at the state level. Male FGD respondents agreed that land ownership in their community can also be through inheritance, rent, liaising with the community head, or buying the land, although the latter is said to not be very common. When asked if women could also own land through inheritance, they all chorused in affirmation. They explained that women could own land but that according to Islamic rite, they can only get half the size of the land that is given to a man, i.e. if a man gets two plots, a woman will get one.

In Niger State, the government usually leases out land to any farmer who indicates interest and a token fee is paid to the government's account. At community level, respondents were of the view that land ownership is by inheritance, and for the youth their parents allocates a portion of their piece of land to them to cultivate. For women, husbands and/or male children were reported to also allocate a portion of their land to women.

Reports from an input provider in Kaduna State indicate that women and youth do not have equal access to productive resources like land, credit facilities, and others in the community. He said that, in order to access land, some women who rent out farmland sometimes pay back rental fees with crops, which further impacts their profitability.

*'Not all women have access to land. Land mostly belongs to husbands, so it is difficult for wives to access land if the husband has need for it. But some women go as far as renting land, which they pay back with produce instead of money.'* KII respondent, Kaduna State.

## Access to finance and other agricultural services

**Agricultural services:** To explore women and youths' access to agricultural services, respondents were asked if women and youth have equal access to services such as extension, and input. More than 90% of women in all states agreed that women in their communities had equal access to agricultural services, while 88% of men also shared similar opinions (see **Table 16**). When asked about youth access to agricultural services, nearly all respondents agreed that youth had equal access to agricultural services.

Timely and reliable information helps farmers decide on how to allocate inputs, find appropriate markets for products, or produce, and decide on the best post-harvest storage methods. Although there is a growing awareness of the need to reach female farmers, findings from the qualitative study revealed that agricultural extension workers were reported to be predominantly male and agricultural extension

services are biased toward men especially in the northern states. Indeed, the way the services are provided has been noted to not be gender-sensitive in many settings.<sup>26</sup> Women in rural areas who participate fully in food production and processing, combined with their traditional role of childbearing and home management, often struggle with time, particularly in terms of attending beneficial agricultural training. As a result, women are sometimes excluded from many agricultural extension services that may help boost their productivity.

**Table 16: Women equal access to agricultural services (extension, input)**

Responses	Benue (%) N=43	Cross River (%) N=50	Delta (%) N=32	Ebonyi (%) N=28	Kaduna (%) N=87	Kebbi (%) N= 81	Niger (%) N= 58	Total (%) N=379
<b>Women's response</b>								
<b>No</b>	0.00	0.00	0.00	0.00	6.90	4.94	3.45	3.17
<b>Yes</b>	97.67	96.00	96.88	100.00	90.80	93.83	93.10	94.46
<b>Do not know</b>	2.33	4.00	3.13	0.00	2.30	1.23	3.45	2.37
<b>Men's response</b>								
	N=109	N=136	N=125	N=73	N=266	N=222	N= 195	N=1,126
<b>No (why)</b>	4.59	3.68	0.00	0.00	14.29	6.31	5.64	6.48
<b>Yes</b>	93.58	83.82	88.80	100.00	81.95	89.19	89.74	88.01
<b>Do not know</b>	1.83	12.50	11.20	0.00	3.76	4.50	4.62	5.51
<b>Youth in your community have equal access to agricultural services (extension, input)?</b>								
	N=152	N=186	N=157	N=101	N=353	N=303	N= 253	N=1,505
<b>No (why)</b>	0.66	1.08	0.64	0.00	0.00	0.00	0.00	0.27
<b>Yes</b>	98.03	95.70	91.72	100.00	100.00	98.68	98.81	97.94
<b>Do not know</b>	1.32	3.23	7.64	0.00	0.00	1.32	1.19	1.79

**Financial services:** Including women and youth in financial services is important for alleviating poverty, and the FAO has highlighted women's financial empowerment as critical for the realization of the Sustainable Development Goal of Zero Hunger—when women are empowered, they spend their resources on items that increase household expenditure like food, improving the nutritional status of their families.

Respondents were asked if they had received any credit or loans for their farms in the last 12 months from either banks, friends, relatives, or other sources (**Table 17**). Here, only a small proportion of respondents used credit facilities. However, women did report receiving more credit than men on average (19% to 17%).

**Table 17: Farmers who received credit by State and Sex**

Responses	Benue N=152	Cross River N=186	Delta N=157	Ebonyi N=101	Kaduna N=353	Kebbi N= 303	Niger N= 253	Total N= 1,505
<b>Males</b>	30.28	12.50	7.20	8.22	22.93	16.22	20.15	17.9
<b>Females</b>	23.26	10.00	15.65	7.14	16.09	27.16	24.14	19.00

Although data from our quantitative findings suggest women have more access to financial services than their male counterparts, information gathered during the qualitative research suggest that financial inclusion – i.e. the capability to access a range of diverse financial services – remains a critical constraint for women and youth, especially in rural areas, which hampers their productivity. Financial institutions prefer to give loans and credit to men and often requires collateral that many women do not possess. Additionally, the high interests charged often discourage women from borrowing. The few women who obtained credit for farming obtained it through a variety of different sources, with the most important

<sup>26</sup> [www.fao.org/3/w5830e0b.htm](http://www.fao.org/3/w5830e0b.htm)

source being friends or neighbors. In Delta State, the participants of female FGD session in Ndokwa North LGA opined that no support exclusive to females is available from the government or any other organization. They mentioned microfinance banks, commercial banks, and other private financial institutions like Green Acre that can provide farmers with loans are available; however, the conditions for obtaining such loans from the mentioned sources included agreement to high interest rates and short payback times. Women from Warri South expressed a similar view in terms of the modality for accessing loans. They describe the process as cumbersome and cited the application procedure, paperwork, distance to financial institutions (for women in rural communities), fear of not being able to repay, and the fear of being refused credit as all factors impeding women's access to commercial bank credit. A female respondent added that, apart from the constraint to obtaining a loan, women are sometimes further limited by refusal from their husband to secure such loans. Others in the group also affirmed that, unless you have been granted explicit permission from your spouse, securing a loan might result in marital separation, in some instances.

*'Anywhere you go to borrow money, you must produce your passport, you will sign, your guarantor will sign, and they will visit your business place to confirm the information you provided before they give you money. If you want to loan NGN 100,000 (US\$ 274), they will tell you to pay 20% and bring a guarantor before they release the money.'* Female FGD participant 1, Delta State.

They advocated for fish feed to be sold to them on credit to be paid afterwards. *'If they can supply us feed, after we are done selling, we will pay them back their money for feed. In addition to the feed, if they can still give us loans and give us enough time to pay back the loans that also will make us happy.'* Female FGD participant 2, Delta State.

In our KII, the secretary to the All Farmers Association of Nigeria (AFAN) in Ughelli said that recently the Delta State Government, in a bid to empower fish farmers, had distributed 1,000 fingerlings and 10 bags of feed to farmers as starter packs for a new cycle. He said that last year, the Niger Delta Development Commission started a data-capturing procedure focused on all farmers in the state to initiate an empowerment program that is still ongoing. He noted that fishing is a very capital-intensive project, which requires huge investment to be able to get profit back, such that, if one is financially constrained, he/she will keep on struggling, get discouraged, and opt out of the business.

*'Fish farming is a very costly business. Its start-up capital is usually not less than NGN 500,000 (US\$ 1,370). Because of how capital intensive it is, if the government wants to embark on an empowerment scheme such as loans or grants, the beneficiaries should be given above NGN 1,000,000 (US\$ 2,750) to avoid the financial struggles to meet the running costs of fish farming.'* KII respondent, Delta State.

Receipt of a bank loan was the most common source of credit available to farmers in Ebonyi State. However, the interest rates on loans is reported to be high. According to a key informant, farmers, especially youth, are less inclined to use the numerous credit facilities available because of their previous unpleasant experiences with them.

A respondent in Cross River State narrated the ordeal some farmers in the community passed through some years ago when they were promised a grant from the state government. As a result, almost all the rice farmers opened an account with a bank and travelled from their village to the state headquarters to follow-up. In the end, nothing came of it and all the resources they invested were lost.

*'That was how some people told us to contribute money to open an account so that we could be given a loan in 2016. A lot of farmers contributed to open this account but, afterwards, nothing was heard.'* Male FGD participant, Cross River State.

In Benue State, a cooperative composed of women and youth called 'Sister's Keepers' was reported to act as a surety between farmers and manufacturers of farm inputs. They collect inputs from manufacturers and give them to farmers who redeem payment after harvest and sales of their farm produce. There are a few male members, especially in the executive arm, who provide support to the group. According to the respondent, the cooperative is also engaged in an activity called 'one man one hectare'. This initiative encourages farming in clusters and the support is targeted mainly at women and youth to reduce their dependence on men and reduce youth restiveness and crime in the state. In addition to this support, the state government also provides fertilizer annually at a subsidized rate. The challenge with this, however, is there is some diversion of these inputs such that they hardly ever reach the actual farmers or only

reach them when the application stage has elapsed. Furthermore, with the introduction of activities for the Women in Agriculture Development Programme, an increasing number of women are beginning to have some contact with extension agents.

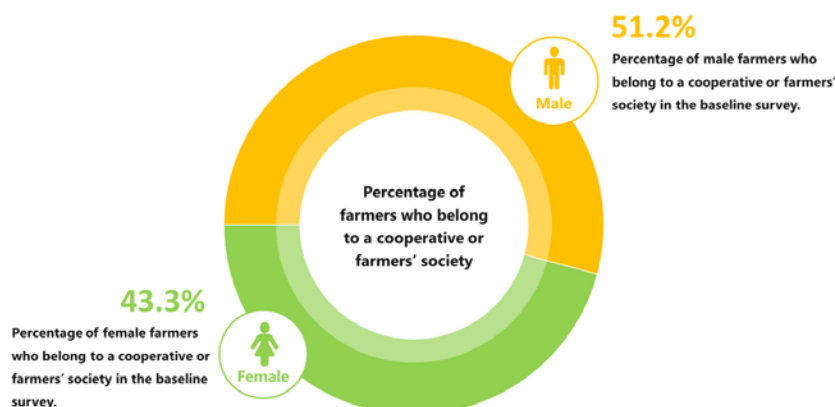
Our FGD session in Ebonyi State indicated that female rice farmers can access the same support network available to the male farmers within the same community without discrimination. According to the International Fund for Agricultural Development (IFAD) representative, women are perceived to be more reliable and better managers of resources. They are usually involved in most of the farm activities, and in most cases lead them. Some of these activities include weeding, transplanting, and cleaning of harvested grains. However, respondents stated that this support is not uniform across the state, hinting that it is less available in more remote areas. Farmers in Ikwo community in Ebonyi State disclosed that support for productivity is available to them. The only issue they have is that such assistance usually takes time to process, such that, before the requests are granted, the farming season has already passed. For instance, a male farmer said that:

*'It is true that sometimes the government do come to help us, but they don't come on time to help us; when they grant this help it is too late to utilize it for the farming season it was meant for. At times, if it is money you want, you apply in May but it takes up to August to get it.'* FGD participant, Ebonyi State.

As further stated by discussants of the FGDs in Ebonyi state, several means of support are available from both the government (at federal, state, and local level) and private-sector stakeholders for farmers in the State. Support includes loans (as offered by the Small and Medium Enterprises Development Agency, IFAD, and cooperative societies), grants and subsidies (as provided by the federal government and Fadama Scheme), cash transfer programs (as offered by the local and state government in some communities), and capacity development (as offered by USAID). For the government subsidies, a 50% payment is given for whatever request the farmers make. For instance, if a farmer requests 20 bags of fertilizer, they will be required to pay for 10 bags and then be given the other 10 for free. There was a consensus that the support received from both the government and private agencies is not discriminatory against women and youth if other eligibility criteria are met. Part of the support provided by IFAD include access to seed and subsequent provision of inputs at 50% of a set price. They also provide a reliable database that helps with farmer profiling in terms of identifying their specific problems and the provision of a tailored response. During the KII session with the IFAD representative, he reported that women are more likely to be found in cooperatives than youth, meaning that more women are likely to benefit from agricultural support programs compared to youth. To increase the number of youths in cooperative societies, the Ebonyi State Agricultural Development Programme is currently profiling the youth to benefit for loans that can only be accessed via membership of a cooperative society.

**Other support:** For many years, rural cooperatives and farmers' organizations have been identified as crucial in empowering smallholder farmers. However, the level of female participation in these organizations has been noted to be poor because of the same socioeconomic challenges that limit women's access to other resources. When respondents were asked if they belonged to any cooperative or farmers' society, only 43% of female farmers and 51% of male farmers belonged to cooperative societies (see Figure 10).





**Figure 14: Membership in cooperatives or farmers' organizations**

When asked if there was any organization in their communities that supported women farmers with information and other inputs, 70% of female respondents responded that there was no such organization in their communities. Responses from men followed a similar pattern as the women (see **Table 18**), thus confirming the low presence of such organizations in communities. This finding further underlines the lack of support that rural female farmers often face. Many women are seemingly at a disadvantage because many of these organizations are present in the urban and sub-urban areas that most women find difficult to access because of other domestic responsibilities and lack of awareness. However, according to a key informant in Kaduna State, while there are currently no agricultural programs that target women solely about three years ago there had been a program that trained women on site selection and other farming procedures. These women were also linked to off-takers so that they can sell their produce at premium price. Unfortunately, this program only ran for a year.

**Table 18: Availability of organization that supports women farmers**

Responses	Benue (%) N=43	Cross River (%) N=50	Delta (%) N=32	Ebonyi (%) N=28	Kaduna (%) N=87	Kebbi (%) N= 81	Niger (%) N= 58	Total (%) N=379
<b>Women's response</b>								
<b>Yes</b>	27.91	8.00	3.13	17.86	20.69	13.58	25.86	17.41
<b>No</b>	41.86	72.00	78.13	75.00	77.01	79.01	65.52	70.98
<b>Do not Know</b>	30.23	20.00	20.00	18.75	2.30	7.41	8.62	11.61
<b>Men's response</b>								
	<b>N=109</b>	<b>N=136</b>	<b>N=125</b>	<b>N=73</b>	<b>N=266</b>	<b>N=222</b>	<b>N= 195</b>	<b>N=1,126</b>
<b>Yes</b>	29.36	8.00	13.24	5.48	25.19	21.17	21.03	19.36
<b>No</b>	48.62	52.94	68.80	79.45	60.53	59.46	67.18	61.55
<b>Do not Know</b>	22.02	33.82	24.00	15.07	14.29	19.37	11.79	19.09

To bridge the gender gap in agriculture, the information gap also needs to be addressed and women need to know where they can access support services. To assess farmers' knowledge of available support services, respondents were asked if they knew where to get support for their farms if they needed it. The results were then disaggregated by gender to assess if there was a gender gap. **Table 19** below shows that, overall, more men (48%) knew where to access other support services compared to women (37%). Oftentimes, vital information is disseminated in farmers' organization and cooperatives but due to women's low levels of membership in these societies, information gaps persist.

**Table 19: Awareness on availability of support services**

Responses	Benue (%) N=43	Cross River (%) N=50	Delta (%) N=32	Ebonyi (%) N=28	Kaduna (%) N =87	Kebbi (%) N= 81	Niger (%) N= 58	Total (%) N=379
<b>Women's response</b>								
<b>No</b>	69.77	60.00	75.00	67.86	65.52	60.49	46.55	62.27
<b>Yes</b>	30.23	40.00	25.00	32.14	34.48	39.51	53.45	37.73
<b>Men's response</b>								
	<b>N=109</b>	<b>N=136</b>	<b>N=125</b>	<b>N=73</b>	<b>N =266</b>	<b>N =222</b>	<b>N= 195</b>	<b>N=1,126</b>
<b>No (why)</b>	51.38	61.03	63.20	45.21	48.50	49.10	48.72	51.87
<b>Yes</b>	48.62	38.97	36.80	54.79	51.50	50.90	51.28	48.13

In Niger State, a respondent claimed that the state government also renders technical knowledge support to farmers and that there are other forms of support from development partners, but that this requires counterpart funding. He said that farmers in the state struggle to obtain loans from financial institutions because of the high level of defaults common to rainfed agriculture. He also added that financial institutions now shy away from offering farmers cash loans, and instead provide inputs such as fertilizer, insecticide, and seeds.

In Kebbi State, a report from the female FGD session indicated that, although they had been repeatedly informed that government routinely distributes improved seeds to farmers on credit, only few women are beneficiaries of these arrangements because it is the men who are delegates of such meetings, making them privy to relevant information on such interventions and how to access them. One respondent added that when improved seeds and fertilizers are eventually distributed, it is rarely sufficient to go round enlisted male farmers let alone unlisted youths and women; thus, only influential people who are predominantly male benefit from such input subsidies. Only a few women benefit because their husbands are able to negotiate for them.

A non-governmental organization (NGO) representative cited Oxfam as providing subsidized fertilizers to farmers' cooperatives, with farmers being asked to pay a certain percentage of the total worth of items requested with the difference being remitted to the company after harvest. An off taker called Labana Rice Mill/Farms also provided improved rice seedlings to farmers based on a credit facility arrangement to be repaid after harvest. Unfortunately, the poor growth of the rice seedlings for over a year has made some farmers skeptical about receiving improved seeds from development partners.

The government of Kebbi State also introduced a scheme call 'Anchor Borrowers Programme' involving a credit facility for farmers. Farmers were said to have filled in forms and contributed money to register cooperatives and to open a bank account on the premise that loans of up to NGN 210,000 (US\$ 575) in cash per hectare would be given per farmer. In the long run, farmers were only able to access NGN 25,000 (US\$ 65) and a pumping machine. The scheme was said to have been hijacked by politicians who had no need to apply for the loan.

*'The number of times I have had to contribute to register for a cooperative in the hope of getting financial assistance is very frustrating. In fact, I will never apply for any credit facility or scheme from any government entity again because I have suffered filling in forms and travelling to the state headquarters spending valuable time and resources but all to no avail.'* Male FGD participant, Kaduna State.

A KII respondent in Kaduna said that, to his knowledge, no direct financial support to farmers is provided but, rather, they are mostly encouraged to form cooperatives where monthly/weekly contributions can be made to carry out bulk purchases of inputs such as fertilizers and improved seeds to be shared among them. Belonging to a cooperative is important for farmers because in doing so they can more easily access support from development partners and government. The extension agent gave an example of the government selling fertilizers to registered cooperatives at a reduced-price last year. Apart from being able to buy from the government at subsidized price, he also said that the inputs sold by the government are of much higher quality than the ones obtainable from the open market.



*'If farmers continue to wait on the government, nothing will be achieved so the first thing is that we educate them on how to come in groups to help themselves and get registered. When the government meets them as a serious group, they can get subsidized inputs occasionally.'* KII respondent, Kaduna State.

Another key informant in Kaduna said that a lot of development partners shy away from assisting farmers because of several cases of non-remittance that they have experienced. He cited an example that happened about two years ago when an organization called PAL ARK that operated in collaboration with the state government disbursed seeds and fertilizers to farmers on the condition that, after harvest, each farmer was to remit three bags of whatever seed they received. In the end, not all farmers fulfilled this condition. A couple of the farmers reported that they had had to abandon the farms due to insecurity while others reported crops being attacked by pests.

*'In the case of one agency called Anchor Borrowers Programme that gave loans to associations, I was a surety to one group, but they later defaulted on their payment. I got into trouble trying to get them to pay back the loan'* KII respondent, Kaduna State.

### Youth support

Finally, households who had youth members were asked whether *these members* had access to farmlands, farm implements, and non-farming business equipment such as sewing machines, carpentry equipment, welding equipment, etc. Over 85% of respondents across all states except for Delta (which had 55%) reported that youths in their household had access to farm implements (see **Table 20**). In regard to access to non-farming business equipment (see **Table 21**), most of the states had more than three-quarters of their respondents reporting youth access to non-farming equipment, with the exceptions of Benue (48%) and Delta states (50%).<sup>27</sup>

**Table 20: Access of youths to farm equipment**

Responses	Benue (%) N=132	Cross River (%) N=161	Delta (%) N=85	Ebonyi (%) N=94	Kaduna (%) N=303	Kebbi (%) N=257	Niger (%) N=235	Total (%) N=1,505
No N=114	3.79	11.18	44.71	2.13	4.62	10.89	3.83	9.00
Yes N=1,153	96.21	88.82	55.29	97.87	95.38	89.11	96.17	91.00

**Table 21: Access of youths to non-farming business equipment**

Responses	Benue (%) N=132	Cross River (%) N=161	Delta (%) N=85	Ebonyi (%) N=94	Kaduna (%) N=303	Kebbi (%) N=257	Niger (%) N=235	Total (%) N=1,505
No N=271	51.52	23.60	49.41	1.06	13.53	24.51	7.66	21.39
Yes N=996	48.48	76.40	50.59	98.94	86.47	75.49	92.34	78.61

<sup>27</sup> Farm equipment refers to machinery used on a farm to help with farming, such as tractors, sprayers, hoes, and other tools used for ploughing, tilling, harrowing, etc.

## Summary of qualitative findings on access to finance and other agricultural services

- Access to finance remains a challenge for farmers generally but female farmers disproportionately suffer lack of finances. FGDs across the states revealed that the process of obtaining loans is a cumbersome one as many financial institutions are in the faraway cities and require lots of paperwork. Moreover, the high interest rates, lack of collaterals and guarantors further discourage women and youths from applying for loans. However, some government and non-governmental initiatives are trying to support farmers by giving loans and subsidized agricultural inputs such as fertilizers and improved seeds. Examples include the Fadama scheme, IFAD and Small and Medium Enterprises Development Agency. In some states like Kaduna and Kebbi, farmers are encouraged to form cooperatives to assess loans and inputs from the government. This support is however limited, and many farmers have been unable to benefit from these programs. Also, politicians were said to have hijacked some schemes such as the Anchor Borrowers Scheme leaving out the farmers who are in dire need of such funds.
- Agricultural extension services are still biased towards men and do not consider the peculiarities of female farmers who also shoulder household responsibilities. <sup>28</sup>There is thus the difficulty of access, not only to information on new technologies but also to other essential production inputs and credit for women. This problem of women's limited access to services (which is worse for rural women) is further compounded by the competition between their time spent on farming activities and that spent on household chore and childcare. As a result, many women are left out of beneficial information and support services. Similarly, most women and youth are left out when the government distributes input such as fertilizers and seeds because men are typically the delegates when such meetings are attended. However, this is slowly changing as some initiatives such as the Women in Agriculture Development Programme and Sister's Keepers in Benue State have increased women's contact with extension workers and provided some farm inputs to women.
- To address some of the challenges that youth farmers face, some states like Ebonyi is profiling youths to benefit from loans. Also, the Sisters' Keeper Initiative in Benue state engages youth farmers via the 'one man one hectare' initiative.

## Yield of targeted agricultural commodities

(Yield of targeted agricultural commodities among program participants)

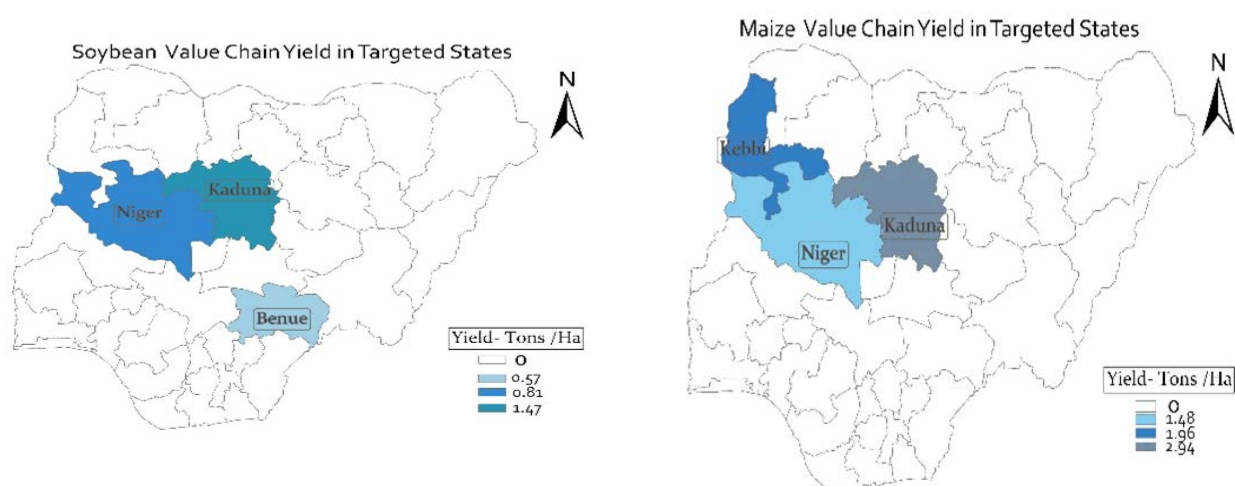


Figure 15: Yield of targeted agricultural commodities

<sup>28</sup> [www.fao.org/3/w5830e0b.htm](http://www.fao.org/3/w5830e0b.htm)

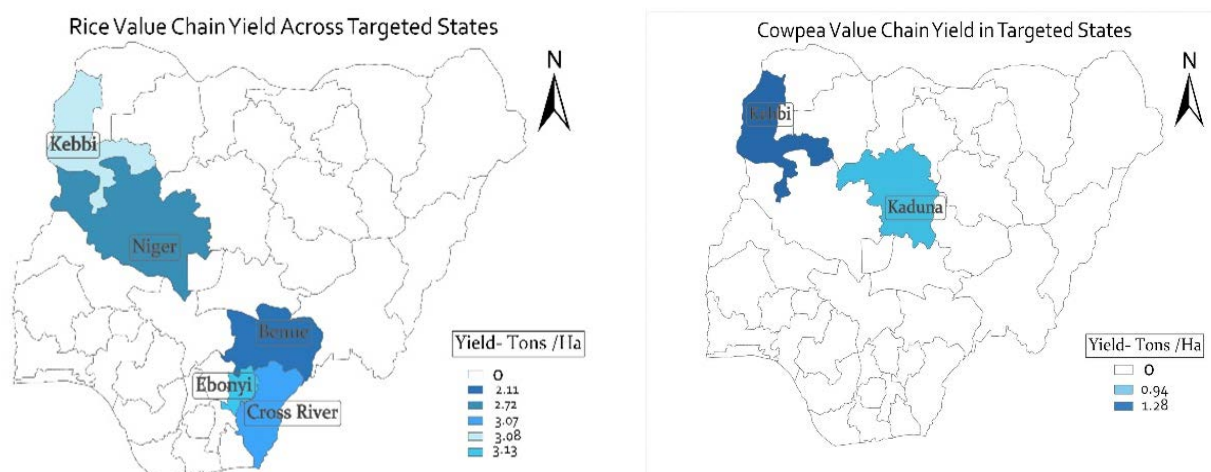


Figure 16: Yield of targeted agricultural commodities

Table 22: Mean yield for crop farmers by value chain (MT/ha)

Value chain	N	Mean	SD
Rice	305	2.87	1.43
Maize	301	2.12	1.89
Cowpea	298	1.11	1.23
Soybean	300	0.94	0.71

Table 23: Yield by value chain disaggregated by sex (MT/ha)

Crop	Sex	N	Mean	SD
Rice	Female	82	2.82	1.55
	Male	223	2.89	1.39
Maize	Female	68	1.71	1.65
	Male	233	2.24	1.94
Cowpea	Female	78	1.08	1.14
	Male	220	1.11	1.27
Soybean	Female	83	0.84	0.63
	Male	217	0.98	0.73

**Table 24: Yield for aquaculture farmers by state (kg/m<sup>2</sup>)<sup>29</sup>**

State	N	Mean	SD
Cross river	126	8.92	22.43
Delta	151	6.85	12.52
Total	277	7.79	17.54

**Table 23** shows the average yield by crop among the sampled farmers. Rice farmers recorded the highest yield per hectare with a mean yield of 2.9 MT/ha. This is above the national average of 2.0MT/ha reported by USDA<sup>30</sup> and FAO<sup>31</sup> in 2018. Rice is an important food crop in Nigeria and production has increased in recent decades to meet domestic demand. The increased rice yield among survey participants may also be a result of more rice farmers engaging in dry season farming compared to other farmers. Dry season farming has been shown to boost the yield of rice farms because the farmers can exercise control over numerous variables such as water quantity, humidity, and fertilizer application. The three rice production environments and their coverage in Nigeria reported in 2013 are rainfed lowland (69.0%), irrigated lowland (2.7%), and rainfed upland (28.3%). Terrain in the country includes southern lowlands, central hills and plateaus, mountains in the southeast, and plains in the north. Upland rice is generally less stable, and production is lower than that of lowland rice.<sup>32</sup> Rice farming in this study was mostly lowland rainfed. However, 26% engaged in lowland irrigated, which is much higher than the nation average of 2.7% cited above. Although production costs are higher in dry season farming, the benefits outweigh the risks in terms of the significantly higher yield when compared to wet season farming. When disaggregated by state (**Table 24**), rice yield was lowest in Benue State (2.11 MT/ha) and highest in Ebonyi State (3.13MT/ha).

Similarly, the average maize yield reported by respondents was 2.1 MT/ha, which is higher than the national average of 1.7 MT/ha. Reported average yield for soybean and cowpea was 0.9 MT/ha and 1.0 MT/ha respectively, which is similar to the national average of 0.98 MT/ha and 1.1 MT/ha respectively.<sup>33</sup> Although maize production in the country is mostly rainfed, a small number of respondents engaged in dry season farming. Additionally, maize farmers also utilized some improved practices and technologies. Worthy of note is the high percentage of maize farmers who use fertilizers, improved seeds, and pest and disease control technologies. Soybean farmers on the other hand had fewer people practicing dry season farming and utilizing fertilizers and pest and disease control technologies. Similar to observations for rice, soybean farmers in Benue State also recorded the lowest yield (0.57 MT/ha) compared to Niger (0.81 MT/ha) and Kaduna (1.43 MT/ha). Female farmers reported lower yields across all value chains (**Table 25**).

Aquaculture farmers in this survey reported an average yield of 7.8kg/m<sup>2</sup>. Aquaculture farmers in Cross River state reported an average yield of 8.9kg/m<sup>2</sup> which was 25% higher than the average yield of 6.85kg/m<sup>2</sup> reported by farmers in Delta State.

One primary factor that can be associated with yield for farmers in Benue, Kaduna, Kebbi and Ebonyi (Ikwo LGA) states were cases of farmer–herder conflicts that have resulted in loss of crop yield and income, displacement, loss of lives and property, and loss of products in storage.

A session with female FGD participants in Naka, Gwer West LGA, Benue State revealed that, despite having received robust support and guidance from a female agriculture extension agent in the community as well as them having access to a rice mill company where improved seedlings were purchased, a poor

<sup>29</sup> The Trade Hub internal review team expressed concern on the validity of the data due to the exceptionally high yield per surface area reported in the survey. Therefore, the data will not be used to set baseline of yield for aquaculture. Benchmark for aquaculture yield will be determined after triangulation of this data against data that will be collected in the first year of the intervention.

<sup>30</sup> [www.indexmundi.com/agriculture/?country=ng&commodity=milled-rice&graph=yield](http://www.indexmundi.com/agriculture/?country=ng&commodity=milled-rice&graph=yield)

<sup>31</sup> [www.fao.org/faostat/en/#data/QC](http://www.fao.org/faostat/en/#data/QC)

<sup>32</sup> Kikuta M, Yamamoto Y, Pasolon Y, Rembon F, Miyazaki A, Makiyara D. How Growth and Yield of Upland Rice Vary with Topographic Conditions: A Case of Slash-and-burn Rice Farming in South Konawe Regency, Southeast Sulawesi Province, Indonesia. Tropical Agriculture and Development. 2016 Sep 1;60:162–71

<sup>33</sup> [www.fao.org/faostat/en/#data/QC](http://www.fao.org/faostat/en/#data/QC)

yield was still recorded for the last season because they later realized that the soil was not suitable for rice cultivation. The female rice aggregator interviewed in Benue State added that finance and inputs are also factors affecting productivity in the state. She explained that without inputs such as fertilizer, herbicides, pesticides, and improved seeds, productivity will be low. She identified agricultural financing as the main challenge to productivity in the state. In regard to other factors such as bad roads, drought, pests, etc., while she stated that they do exist she regarded them as being of secondary importance.

In Delta State, several factors were identified in regard to the low productivity among fish farmers in the state. Among all key groups, the lack of capital to run the business adequately was a predominant concern. Other factors mentioned included the type of fingerlings used, cost and quality of feed, low number of off-takers, sales price irregularities, bad roads between farms and the market, the high acidity level of the ponds during the rainy season, and seeping of oil from spillage into the ponds impacting fish mortality.

Farmers in Ndokwa North also complained that the lack of quality fish feed contributes to a low protein content that negatively affects fish growth. They advocated that a regulatory body be instituted that can sanction feed producers who sell feed of low quality for a high price.

*'They should talk to the producers of the feeds so that they can include proteins in the fish. Even if they cannot reduce the price of the feed, they should add enough protein to it because if the feed quality is right, buying the feed will not be a problem. If they do that, we will be happy.'* Female FGD participant, Delta State.

In Ebonyi and Cross River states, there were complaints about pests destroying crops (particularly for early farmers in the planting season), the poor state of storage facilities available to farmers, the lack of irrigation for rice farms, and scarcity of technical guidance on the proper application of pesticides and farming practices. The farmers expressed the need for mechanization of the farming process to increase yield, the need for deforestation of certain lands in the community to convert them to agricultural lands, and the need for access to a bigger pool of buyers. They also stressed the importance of timely government interventions, unlike their previous approach, which usually ran contrary to farming seasons and practices. They also cited a multi-phase approach being run by IFAD, which is enabling dry season farming of rice in six local governments in Ebonyi (Ezza North, Ikwo, Ohaozara, Ishielu, Izzi, and Ivo).

A key informant in Kebbi State reported that, because of the use of improved seed, rice farmers can harvest more from the same plot of land where they previously only had minimum yield. For example, farmlands that previously yielded about 50 bags of rice were reported to now be producing up to 100 bags because of the use of improved seeds. However, maize farmers identified a kind of disease that affects their commodity and, although they could not provide a name for the disease, described the effect it has on their crops. They said that affected maize will be stunted and turns white and dries off, which affects the desired or anticipated yield for that season. Indeed, in some cases they said that, if affected with the disease, the plants die and do not produce any yield at all. Participants also complained that birds and monkeys are some of the pest that affect the process of growth for the maize. The birds suck on the juice of the cub maize, which affects the growth of the maize. One respondent said that lack of funds to buy inputs such as fertilizer, pesticides, and insecticides affects productivity because if there is no fertilizer to aid the growth of the maize then production will be low and if there are no herbicides and pesticides to control insects and weeds, then the crops will get damaged and productivity will be very low.

*'There are farmers who have more than one farmland but the lack of money to attend to these farmlands poses a major challenge to productivity. Getting the required amount of fertilizers, a pumping machine, buying fuel to power the pumping machine, irrigating the farm – all of these activities are always capital intensive.'* FGD participant, Kebbi State.

In Niger State, a respondent was of the view that, since the establishment of the Out grower Scheme, farmers that have been using the improved certified seeds (i.e. 'Faro 44') have been getting double the yield compared to when they were using local grains. He also said that the farmers were getting three to four tons of harvest, unlike before. Another organization from the state capital, known as 'True Blue', was reported to have supported women with soybean seeds and insecticide

## Value of annual sales of smallholder farmers

Value of annual sales of producers and firms receiving United States Government (USG) assistance

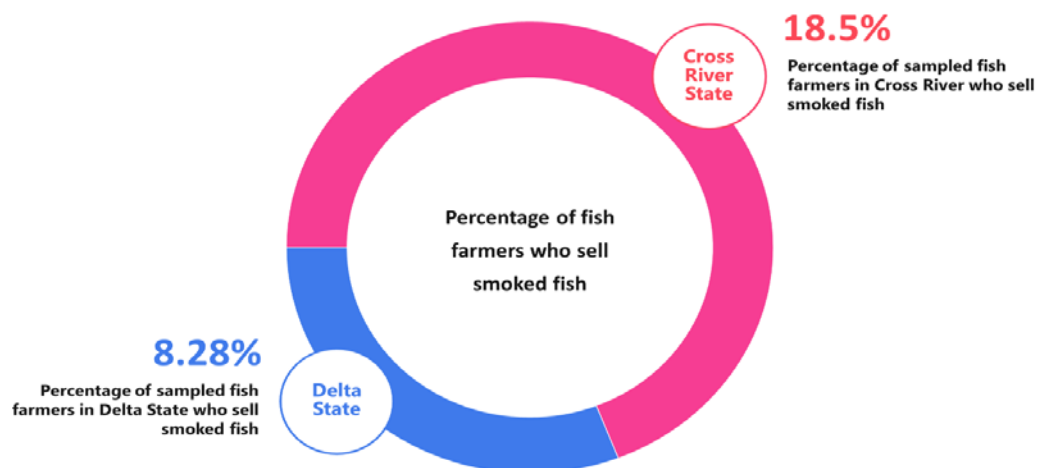


Figure 17: Proportion who sell smoked fish

Table 25: Sales by value chain and state

Value chain	N	Mean (NGN)	Mean (US\$) *
Rice	305	429,398.30	1,192.70
Maize	303	138,386.20	384.27
Cowpea	302	148,704.80	413.06
Soybean	303	95,736.30	265.90
Aquaculture	292	704,670.10	1,957.42

Crop	State	N	Mean	Mean (US\$)
Rice	Benue	51	198,372.5	551.0
	Cross River	51	533,152.9	1,536.5
	Ebonyi	101	565,389.6	1,570.5
	Kebbi	51	431,478.4	1,198.5
	Niger	51	418,598.0	1,162.7
Maize	Kaduna	101	86,127.7	239.2
	Kebbi	101	184,019.8	511.2
	Niger	101	145,015.8	402.8
Cowpea	Kaduna	151	91,105.8	253.0
	Kebbi	151	206,304.6	573.0
Soybean	Benue	101	60,039.6	166.7

Kaduna	101	76,866.3	213.5
Niger	101	148,304	411.9

**Table 26: Value of crop farmer sales by location**

State	N	Mean (NGN)	Mean (US\$)
Benue	152	106,453.90	295.70
Cross River	51	146,187.10	406.07
Ebonyi	101	565,389.60	1,570.52
Kaduna	353	67,038.73	186.22
Kebbi	303	249,974.90	694.37
Niger	253	201,477.50	559.65
Total	1,213	206,807.10	574.46

**Table 27: Value of aquaculture sales**

State	N	Mean (NGN)	Mean (US\$)
Cross River	135	470,941.10	1,308.17
Delta	157	752,666.00	2,090.74
Total	292	704,670.10	1,957.42

**Table 28: Value of sales by gender**

Sex	N	Mean (NGN)	Mean (US\$)
Female	379	108,599.30	301.66
Male	1,126	186,232.60	517.31
Total	1,505	166,682.40	463.00

Annual sales calculation: Addition of sales of crop from measured farm, sales of the same crop from other farms and sales of by-products or total sales of fish sold from harvested fish per pond. Profits: Total sales (revenue) – Production costs

**Table 25** above shows that fish farmers reported higher sales compared to crop farmers. Among crop farmers, rice farmers reported the highest average annual sales with a value of NGN 429,398.30 (US\$ 1,192.70). This is in line with data from FAO, which reports that rice generates more income for Nigerian farmers than any other cash crop.<sup>34</sup> Meanwhile, soybean farmers recorded the lowest average annual sales of NGN95,736.30 (US\$ 265.90). Overall, farmers in Ebonyi reported the highest average annual sales across all the states (see Table 26) and this may be because only rice farmers were surveyed in the state unlike other states that a mix of crop farmers. Maize and cowpea farmers in Kebbi state farmers reported higher sales compared to their counterparts in other states. Kaduna state farmers reported the lowest sales for cowpea and maize and Benue state farmers reported the lowest for Soybeans. Aquaculture farmers in Delta State reported double the value of sales compared to those in Cross River State. When disaggregated by gender, females reported lower sales than men by over 70% (see **Table 28**). This flows from earlier findings of females having lower yields and the expectation that products from their farms should be for household consumption. As a result, they generate less revenue from their farming activities. Information collected also shows that only few farmers process fish. The only type of processing encountered during this survey was smoking and only a few fish farmers produce and sell smoked fish:

<sup>34</sup> [www.fao.org/nigeria/fao-in-nigeria/nigeria-at-a-glance/en/](http://www.fao.org/nigeria/fao-in-nigeria/nigeria-at-a-glance/en/)



18.5% (N:25 of all the 135 sampled) of fish farmers in Cross River and 8.3% (N:13 of all the 157 sampled) of fish farmers in Delta State.

Production costs across the states and value chain were very high when compared to the sales made. Farmers in Ebonyi State incurred the highest cost per hectare at NGN 294,020 (US\$ 816.72) while Kaduna State farmers incurred the lowest cost per hectare at NGN 56,564 (US\$ 157.12) (see **Table 29**). Rice farmers also had the highest production costs (see **Table 30**). This may be a result of costs incurred for irrigation since rice farmers are most likely to engage in dry season farming. A similar study conducted in northern Nigeria in 2017 found production cost of a hectare of rice paddy to be NGN 199,400 (US\$ 554).<sup>35</sup> This is 30% lower than the average cost incurred by rice farmers in this study. Inflation rates may be a contributing factor to this trend. Compared to the value of sales made, aquaculture farmers incurred relatively lower costs and costs were higher in Delta State compared to Cross River (**Table 31**). Table 30 below also shows that men incurred higher production costs across all value chains. Considering that more men practice farming, utilize more technologies, and have bigger farmlands, it is to be expected that their production costs would be higher.

**Table 29: Production costs per hectare for crop farmers across locations**

State	N	Mean (NGN)	Mean (US\$)
Benue	152	79,092.12	219.70
Cross River	51	104,744.60	290.95
Ebonyi	101	294,020.20	816.72
Kaduna	353	56,564.96	157.12
Kebbi	303	183,834.40	510.65
Niger	253	149,768.80	416.02
Total	1,213	116,120.5	322.55

**Table 30: Production costs per hectare across value chains**

Value chain	Sex	Mean (NGN)	Mean (US\$)
Rice N=305	M	284,774	791.00
	F	189,244	525.70
Maize N=303	M	141,627	393.40
	F	97,048	269.60
Cowpea N=302	M	128,734	357.60
	F	76,322	212.00
Soybean N=303	M	76,592	212.75
	F	50,803	141.12
Aquaculture N=292	M	208,558	579.33
	F	199,633	554.54

**Table 31: Aquaculture production cost**

State	N	Mean (NGN)	Mean (US\$)
Cross River	135	150,535.30	418.15
Delta	157	205,685.90	571.35
Total	292	206,480.30	573.55

Data calculated on profits revealed that crop farmers recorded very low profits, averaging NGN 54,782

<sup>35</sup> [www.eajournals.org/wp-content/uploads/Cost-and>Returns-of-Paddy-Rice-Production-in-Kaduna-State.pdf](http://www.eajournals.org/wp-content/uploads/Cost-and>Returns-of-Paddy-Rice-Production-in-Kaduna-State.pdf)



(US\$ 152.17). Profit was as low as NGN 16,649 (US\$ 46.25) in Kaduna State while Ebonyi State recorded the highest profit of NGN 275,663 (US\$ 765.73) (see **Table 32**). Although this correlates with the distribution of income and poverty level observed in the states, it is important to reiterate that many farmers do not keep records of production costs and sales and this may have affected the accuracy of information given. Production costs included farmers' estimated costs of unpaid labor, which may have been grossly overstated. Also, many farmers in the north cultivate other commodities unlike the farmers in the southern part of Nigeria.

Aquaculture farmers recorded the highest average profits of NGN 641,312 (US\$ 1,781.42), while aquaculture farmers in Delta State recorded higher profits than farmers in Cross River (see **Table 34**). For crop farmers, rice farmers recorded the highest profits of NGN 193,269 (536.85) while maize farmers recorded the lowest profits of NGN 17,535 (US\$ 48.70) (see **Table 33**). The trend for rice is corroborated by findings from the FAO, which has observed that rice generates more income for farmers more than any other food crop.<sup>36</sup> Similarly, in the study on profitability of rice farmers cited above, respondents made average profits of NGN 179,600 (US\$ 499), which is in the same range of what farmers in this study made. **Table 36** shows that men had 120% higher profits than women.

**Table 32: Profits of crop farmers by state**

State	N	Mean (NGN)	Mean (US\$)
Benue	152	30,536.00	84.82
Cross River	51	41,878.00	116.33
Ebonyi	101	275,663.00	765.73
Kaduna	353	16,649.00	46.25
Kebbi	303	76,709.00	213.08
Niger	253	51,600.00	143.33
Total	1,213	54,782.00	152.17

**Table 33: Profits of farmers by value chain**

Value chain	N	Mean (NGN)	Mean (US\$)
Rice	305	193,269.00	536.85
Maize	303	17,535.00	48.70
Cowpea	302	32,284.00	89.68
Soybean	303	27,846.00	77.35
Aquaculture	292	641,312.00	1,781.42

**Table 34: Profits of aquaculture farmers**

State	N	Mean (NGN)	Mean (US\$)
Cross River	135	339,044.00	941.79
Delta	157	791,090.00	2,197.00
Total	292	641,312.00	1,781.42

**Table 35: Profits per kg of fish**

State	N	Cost/kg (NGN)	Sales Rice/kg (NGN)	Profit/kg (NGN)
Cross River	135	457.2	694.3	237.1
Delta	157	437.6	673.8	236.2
Total	292	447.4	681.6	234.2

<sup>36</sup> [www.fao.org/nigeria/fao-in-nigeria/nigeria-at-a-glance/en/](http://www.fao.org/nigeria/fao-in-nigeria/nigeria-at-a-glance/en/)

**Table 36: Profits of farmers by sex**

Sex	N	Mean (NGN)	Mean (US\$)
Female	379	28,352.00	78.75
Male	1,126	63,679.00	176.88
Total	1,505	54,782.00	151.17

The qualitative findings showed that most respondents reported exploitation from off-takers or middlemen in the agricultural value chain as one factor that determines profit. Farmers are compelled to use these middlemen because of the poor state of infrastructure, limited direct access to off-takers, and effects of poverty. Farmers are said to either make profits or losses depending on the amount the middlemen are willing to offer for their farm produce.

According to an input supplier in Kebbi State, although rice farmers in the state do not have a problem with sales because there are readily available off-takers from other states, farmers sell their produce to these off-takers through middlemen. Companies such as Labana, Wacot, and others were cited as their buyers. The market has its rules and a farmer cannot sell directly but through these agents. According to them, this way everyone gets to profit and the burden of storage and getting a buyer are borne by the agents. Respondents, however, complained that some of the company's bureaucracy is tedious, in that they have to re-weigh the bags, check the quality of the produce and can insist on certain prices that are not favorable to farmers. Farmers also pointed to the fact that the market price usually fluctuates, especially when there is a bumper harvest, and that this impacts on farmers who have borrowed or taken out a formal credit facility because he/she will not be able to make a profit as projected, considering that such loans have to be paid back and funds still have to be reserved to fund the next planting cycle.

*'When the market is saturated with the product, the price will fall and the marketers will take advantage of the availability of the situation and crash the price. The farmer has no monopoly and will be compelled to sell at the prevailing market price. Secondly, the government is not a player in the marketability of the product. The government does not regulate the price of the products and thus leaves all this in the hands of the middleman and the off-takers.'* FGD respondent, Kebbi State.

In Niger State, an interview with an extension agent highlighted that there is a ready rice market compared to maize. He stressed that farmers often complain that, after applying all the technologies and new method of farming for maize with resultant high yield, they struggle to sell their produce. As a result of this, the government in conjunction with some development partners is leasing their fertilizer stores through a program tagged 'AGRA Project' so that farmers can aggregate their farm produce in the store house before sales are completed. Storage is a major problem for farmers in the state, he noted, and there are no large-scale buyers except for the middlemen and small aggregators. For rice produce, a company called Technique Seed Limited supports farmers through what they call their Outgrower Scheme. The scheme provides farmers with seeds, fertilizer, chemicals, and all the inputs they need apart from labor. At the end, the company buys the farm produce and deducts 20% of the total sales made, leaving the farmers with 80% gain. The company also helps to link farmers who have 1–2 ha of land with substantial yield who are not part of the Outgrower Scheme to aggregators like rice processing mills to buy directly from the farmers. On the other hand, farmers with very poor yields sell to the market directly.

There are large-scale buyers for different crops in Benue State. For example, OLAM and SERAPH Oil are off takers for rice and soybean and they come from Lagos, Nasarawa, Kano, and Oyo states to purchase produce. Several off-takers who also undertake processing that are situated outside the state also patronize them. Companies like Olam and Hule and Sons and an unnamed agro-processor are the large-scale off-takers reported to buy at a relatively fair price from farmers. To curb exploitation by off-takers, a price regulatory union was formed called Benue Agriculture and Rural Development Authority, which acts as an intermediary between farmers and buyers. This union usually determines the price of farm produce in the market. The arrangement was said to have worked for some time, after which the traders' union leader betrayed the farmers by taking bribes from the buyers, thereby forcing farmers to sell at lower prices. Farmers who take their produce to the open market explained how little profit is

made despite the amount of work and investment involved in farming rice. Middlemen from a particular market are the only buyers these sets of farmers know. The farmers who have no choice accept the middlemen's prices so that they do not have to spend extra to transport the produce to other markets or back home. Another issue for them is the size of the bags used by these middlemen. They use bigger bags than the farmers' bags in packaging the soybean at the market, so when a farmer takes one bag to the market thinking he or she will sell one bag, when the middlemen transfer it into their bag, the quantity will no longer be 'one bag' and they then pay farmers based on the quantity in their own bag, thereby reducing the money the farmer thought he/she would have made.

*'We cannot begin to narrate our ordeal when you have spent money transporting the goods to the market, and you lose all bargaining power in the eyes of the buyers because they know that you either sell to them or incur additional cost transporting the goods back home again.'* Male FGD respondent, Benue State.

In Ebonyi State, IFAD has helped significantly improve the pool of buyers and the market available to rice farmers. Female farmers also confirmed that there is a ready market for the sale of their rice products. Buyers include direct consumers and resellers that buy unprocessed rice in large quantities to process elsewhere. This has been encouraged as a result of the ban on importation of rice into the country. A female respondent in Delta state reiterated that their preferred customers are the off takers who buy in large quantities because their prices are more reasonable. She further explained that sales also depend on the rice variety because each is priced differently – *"Even market union price differs by seed species."*

In Kaduna State, during an FGD session, farmers are reported to sometimes hoard their products, monitoring the market price and selling only when they are sure of maximum profit. Price instability particularly for maize is a major challenge: *'you will spend money putting in your time and resources but, in the end, the price at which a bag of maize will be sold is nothing to compare to cost.'*

For aquaculture, our KII with an association chairman with over 4,000 aquaculture farmers in Delta State revealed that, some years ago, sales were low. The number of middlemen who were available to buy produce were less than what they were harvesting per cycle. The situation is different now because they have been able to construct a road leading to the farm as well as contacting large off takers in other states who now patronize them. Despite this, he said that their day-to-day buyers remain the middlemen from the local market.

*'Because of the population of farmers here, we will produce fish and struggle to sell. We had to reach out to the head of agriculture in Asaba who suggested that we should transport the fish to Asaba where there is a market for it. His response was very discouraging, so we had to on our own reach out to off-takers in other states like Port Harcourt, Bayelsa, and Osun. Now, we have people who come with trucks to buy our fish.'* KII respondent, Delta State.

Another aquaculture association chairman in Delta State believed that the exploitation of farmers by middlemen was the main cause of lack of profit in farming. He noted that, regardless of the important role middlemen play, there are some disadvantages to having intermediaries in the distribution channel who ruthlessly exploit farmers. For example, middlemen factor in the cost of expenditures such as transportation, warehousing, and insurance when pricing the goods from farmers. Other respondents added that, during the rainy season, other members of the community fish in the wild and sell at lower prices than aquaculture farmers, affecting the prices of fish and hence profits for aquaculture farmers.

*'The middlemen/up-takers are always cheating farmers who utilize their energy and resources to produce food and sell to them at a cheaper rate.'* Male FGD participant, Delta State. The same respondent stressed that it is almost impossible in the current circumstances to eliminate off-takers from the food distribution chain.

As was touched on above, the information we collected also shows that few farmers process fish. The only type of processing encountered during this survey was smoking and only few fish farmers produce and sell smoked fish: 18.5% (25 in number) of fish farmers in Cross River and 8.3% (13) of fish farmers in Delta State. The secretary of AFAN in Delta State said that it is only one of the largest fish farms in Delta State, located in Warri, that is involved in processing on a small scale. Here they utilize dead fish to produce feed. Fish are also smoked and sold, although buyers prefer to buy fresh fish compared to the smoked ones.

## Number of farmers who have applied improved agricultural practices

### EG.3.2-24: Number of individuals in the agriculture system who have applied improved management practices or technologies with USG assistance

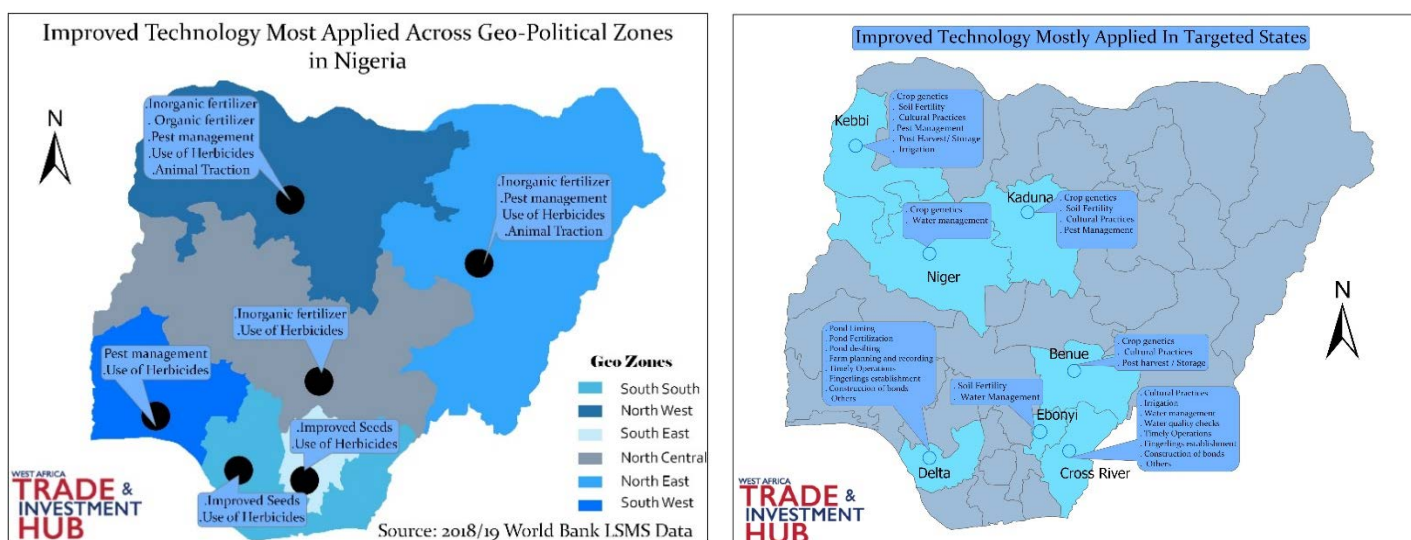
The information gathered revealed that all crop farmers used at least one form of improved technology (see **Table 37**). Across all value chains, the most used improved technology were those related to soil fertility and conservation (84%), which included use of fertilizers, urea deep placement technology, and organic farming. This was followed by crop genetics technology (78%), which included usage of improved seeds and seed technology. Rice farmers used irrigation technologies the most. This supports the earlier finding that rice farmers had the highest proportion of dry season farmers. The least used technology was water management, with only 2% of farmers reporting using this technology. Usage of technology across states followed a similar pattern (see **Table 38**). Kebbi and Kaduna states had high rates of utilization of many technology types. Water management remained the least used technology type among farmers across all the states. When disaggregated by gender, females had lower rates of utilization of all groups of technology compared to the men (see **Table 39**).

**Table 37: Crop farmers' technology usage by value chain**

Improved farm practice	Rice (%) N= 305	Maize (%) N= 303	Cowpea (%) N= 302	Soybean (%) N= 303	Total (%) N=1,213
Soil-related fertility and conservation	87.54	87.79	97.75	72.28	83.84
Crop genetics	67.21	80.20	87.75	75.91	77.74
Cultural practices	65.90	76.57	84.11	71.29	74.44
Pest management	59.34	76.24	89.74	43.23	67.11
Other	52.13	49.17	62.91	61.39	56.39
Post-harvest handling and storage	31.48	35.97	51.66	28.05	36.77
Irrigation	21.97	6.27	8.28	1.32	9.48
Water management	5.25	0.66	1.32	0.66	1.98

**Table 38: Crop farmers' technology usage by location**

Improved farm practice	Benue (%) N= 152	Cross River (%) N= 51	Ebonyi (%) N= 101	Kaduna (%) N= 353	Kebbi (%) N= 303	Niger (%) N= 253	Total (%) N=1,213
Soil-related fertility and conservation	77.63	50.98	98.02	92.35	92.08	66.80	83.84
Crop genetics	87.50	49.02	44.55	82.15	91.42	69.38	77.74
Cultural practices	76.32	76.47	57.43	81.02	79.21	64.82	74.44
Pest management	44.74	39.22	62.38	73.94	87.13	54.55	67.11
Other	48.03	52.94	43.56	47.59	69.98	64.43	56.39
Post-harvest handling and storage	38.82	21.57	13.86	32.86	65.68	18.58	36.77
Irrigation	0.66	17.65	0.00	7.37	19.47	7.91	9.48
Water management	0.00	13.73	5.94	0.28	1.32	2.37	1.98



**Figure 18: Geographic visualization of improved technology applied**

**Table 39: Crop farmers' technology usage by sex**

Improved farm practice	Female (%) N=311	Male (%) N= 902	Total (%) N= 1 213
Soil-related fertility and conservation	81.67	84.59	83.84
Crop genetics	74.60	78.82	77.74
Cultural practices	66.24	77.27	74.44
Pest management	65.59	67.63	67.11
Other	52.73	57.65	56.39
Post-harvest handling and storage	34.73	37.47	36.77
Irrigation	5.79	10.75	9.48
Water management	1.93	2.00	1.98

For aquaculture farmers (see **Table 40**), pond liming and fertilization were the most used technology, with Delta State having a higher proportion of farmers who utilize such technologies. Soil and water conservation and construction of bunds were the least used technologies by aquaculture farmers. Female aquaculture farmers reported lower usage of technology types except for pond desilting and post-harvest handling technologies, which females utilized more by 22% and 9% respectively

**Table 40: Aquaculture farmers' technology usage**

Improved practice/technology	Cross River (%) N=135	Delta (%) N=157	Total (%) N=292
Pond liming	54.81	75.80	66.10
Pond fertilization	48.15	71.34	60.72
Water quality checks (for iron concentration, nitrites, acidity, etc.)	65.93	59.04	56.85
Pond desilting	41.48	54.78	48.63
Farm planning and record keeping	36.30	47.77	42.47
Pest and disease management	24.44	28.66	26.71
Timely operations	39.26	14.65	26.03
Water harvesting	17.78	19.75	18.84
Post-harvest handling	17.78	17.83	17.81

Fingerling establishment/management	21.48	11.46	16.10
Tidal monitoring	17.04	13.38	15.07
Soil and water conservation	14.81	5.10	9.59
Construction of bunds	7.41	4.46	5.82

**Table 41: Aquaculture farmers technology usage by sex (%)**

Improved practice/technology	Female (%) N=68	Male (%) N=224	Total (%) N=292
Pond liming	63.24	66.96	66.10
Pond fertilization	55.88	62.05	60.62
Water quality checks (for iron concentration, nitrites, acidity, etc.)	57.35	56.70	56.85
Pond desilting	58.82	45.54	48.63
Farm planning and record keeping	48.53	40.63	42.47
Timely operations	19.12	28.13	26.03
Pest and disease management	17.65	29.46	23.71
Water harvesting	14.71	20.09	18.84
Post-harvest handling	19.12	17.41	17.81
Fingerling establishment/management	13.24	16.96	16.10
Tidal monitoring	13.24	15.63	15.07
Soil and water conservation	7.35	10.27	9.59
Construction of bunds	4.41	6.25	5.82

According to a KII respondent in Ebonyi State, the technology being applied in farming communities includes nursery facilities, selective herbicides, fertilizers, scarecrows that mimic the noise of a bird, nets and covers, mechanical threshers, and knowledge on cross planting in rows. However, not all farmers implement the enlisted procedures due to financial constraints. Youth are especially constrained by a lack of capital and are thus unable to procure the necessary tools and undertake some best farming practices.

In Kebbi State, farmers reported having applied technologies such as the use of tractors for farming, application of fertilizer to boost production, herbicides to reduce manual labor on weeding, and pesticides to control insects that destroy plants. In Niger State, during a KII session an extension worker attested that the government through the ADA and Petroleum Task Force had in the past supported farmers with new technology such as mechanized farming. The government also provides tractors at a subsidized price to farmers.

*'Tractors and animal-drawn carts are only accessible to the rich. We mainly use our strength, as was said earlier. We go in groups of about 10 people to a farmland and rotate afterwards. Seeds can be used as in-kind payment, to be returned after harvest.'* FGD participant, Kebbi State.

Our KII with a government employee with the Ministry of Agriculture in Kaduna revealed that the ministry plays some role in aiding farmers to use improved technology in farming. The ministry is reported to work with extension workers to supply fertilizer at a reduced price, provide knowledge on how and when to apply this, and expose them to zero tillage (i.e. a crop or pasture production technique that does not disturb the [soil](#) through [tillage](#). No-till farming decreases the amount of [soil erosion](#) tillage causes in certain soils, especially in sandy and dry soils on sloping terrain). However, he revealed that one area where farmers have not been using improved method is harvesting, where they mostly rely on human labor. The ministry also sensitizes farmers on the danger of some chemicals like phostoxin tablet to preserve grains: *'The chemicals are dangerous both to man and livestock, it produced phosphine, which is harmful'*. KII, respondent, Kaduna State.



Many farmers complain that they do not have the capital to buy improved seeds. One of the improved seeds varieties is NGN 1,000 per kg. The 719 seed variety is rated as good but, because of its high price, some prefer to plant from their grains, which does affect their harvest.

Another extension worker in Kaduna said that some women are known to cultivate large tracts of land without adding fertilizer or weeding due to a lack of capital and most spend their profit on family members' education, health, and welfare, which impacts on the reserves they have to invest in mechanized and improved farming techniques.

Qualitative findings from Benue State showed that the farmer's cooperative called 'Sisters' Keepers', which operates across eight LGAs, has promoted a campaign against the use of inorganic fertilizer. They also encourage women to see farming as a business rather than just for consumption. Last year in the state, farmers were supplied with inputs such as herbicides, seeds, and fertilizer from IFAD/Value Chain Development Programme to cultivate rice, after which they sold the harvest to the off taker from IFAD (OLAM).

In Delta State, similar to what was reported by farmers at the FGD sessions, during regular trainings they have been exposed to improved farming practices, and a key informant from the government attested to the fact that the government provides support to farmers through regular training on new technologies for improved fish farming and the provision of feeds and fingerlings to boost production. On the part of the respondents, they alluded to the fact that some of the training on new technologies received has not been put into practice due to the expensiveness of such practices. Although they have been able to incorporate the use of pumping machines and the regular cultural practices of liming, fertilization, and desilting of ponds before stocking, some of the improved methods are too expensive to even try. For example, an electric feeder device was introduced to them that can be programmed to feed the fishes at stipulated times to save manpower. However, they reported that the cost of installation of this device would consume the whole capital investment a farmer would put into their farm.

*'In this business, when you introduce some of these technology to farmers, you have to factor in the cost. Just building that electronic feeder will take my profit for a full year so, for common farmers like us, I think we do not need it for now'* FGD participant, Delta State.

## Number of hectares under improved practice/technology

### EG.3.2-25: Number of hectares under improved management practices or technologies with USG assistance

**Table 42: Number of hectares under improved technologies across locations (in hectares)**

Improved farm practice	Benue N= 152	Cross River N= 51	Ebonyi N= 101	Kaduna N= 353	Kebbi N= 303	Niger N=253	Total
Crop genetics	107.84	32.07	74.43	204.06	441.34	310.64	1,170.38
Cultural practices	88.19	43.49	84.76	206.74	379.37	311.79	1,114.38
Soil fertility and conservation	107.66	30.74	135.79	228.87	452.06	311.99	1,266.94
Pest management	72.02	25.28	90.16	174.69	423.79	266.48	1,052.42
Irrigation	1.12	8.52	0	16.57	76.68	37.49	140.38
Other	0.00	5.62	12.08	0.73	3.76	15.98	38.17
Total	376.83	145.72	379.22	831.66	1,777.12	1,254.37	4,780.17

The table above shows that the number of hectares under improved practice for this survey was 4,780 ha. Also, soil fertility and conservation technologies had the largest land coverage. They were used on 1,267 ha of land, followed by crop genetics technologies on 1,170 ha of land, and cultural practices on 1,114 ha of land. Kebbi State had the highest number of ha under improved practices/technology (1,777 ha), followed by Niger (1,254 ha), Kaduna (831 ha), Ebonyi (379 ha), Benue (376 ha), and Cross River (145 ha).

**Table 43: Number of hectares under improved technologies by gender (in hectares)**

Improved farm practice	Female N= 379	Male N=1,126
Crop genetics	215.79	954.59
Cultural practices	189.55	924.79
Soil fertility and conservation	233.42	1033.70
Pest management	193.87	858.56
Irrigation	13.29	127.09
Other	9.3	28.87
Total	855.22	3,927.60

**Table 43** shows that 3,927 ha of male farmers' cultivated land were under improved technology compared to 855 ha of female farmers' cultivated land. This further buttress the above finding that women have less access to improved practices and technology, affecting their productivity and ultimately their income.

## Constraints and challenges faced by smallholder farmers

Crop and aquaculture farmers were asked to describe challenges and constraints they face in their farm operations, productivity, and sales. Lack of finance ranked highest among the challenges that both crop and aquaculture farmers highlighted. Around 98% of farmers in Ebonyi and 90% of farmers in Kebbi cited finances as a major constraint, while 93% of fish farmers in Cross River State and 89% of fish farmers in Delta State mentioned lack of finance as a major challenge. The poor road network and its effect on the transportation of inputs and outputs was another major challenge for over half of Cross River respondents, while lack of discounted prices for agricultural inputs ranked high for Kebbi (52.5%) and Benue farmers (46.7%). This again ties to the findings above. Lack of finance was cited as a critical constraint to the productivity of smallholder farmers as it hinders their capacity to purchase or rent the inputs that are necessary to improve their yield.

**Table 44: Constraints faced by crop farmers**

Constraints/ challenges	Benue (%) N= 152	Cross River (%) N=186	Ebonyi (%) N= 157	Kaduna (%) N=353	Kebbi (%) N=303	Niger (%) N=253	Total (%) N= 1,213
Lack of finance	84.87	78.43	98.02	48.73	90.10	73.12	74.03
Lack of discounted/subsidized prices for agricultural input	46.71	25.49	15.84	28.33	52.48	33.99	36.69
Poor road network to transport inputs and harvest	22.37	50.98	32.67	3.97	24.42	17.00	18.47
Trucks for transportation of farm produce	3.29	33.33	8.91	0.7	16.17	11.86	9.23
Others	1.97	3.92	0	18.98	2.31	5.93	7.75
Insecurity	6.62	15.68	31.68	12.55	9.96	20.55	16.17
Lack of water for irrigation	4.61	27.45	19.80	1.13	1.32	4.35	4.95



**Table 45: Constraints faced by aquaculture farmers**

Constraints/ challenges	Cross River (%)	Delta (%)	Total (%)
Lack of finance	93.33	89.81	91.44
Lack of discounted/ subsidized prices for agricultural input	38.52	29.30	33.56
Insecurity	39.26	28.66	33.85
Poor road network to transport inputs and harvest	40.0	10.83	24.32
Trucks for transportation of farm produce	27.41	3.18	14.38
Water scarcity	10.37	5.10	7.53
Others	0	0.60	0.34

The qualitative findings corroborate the information above. Farmers in different communities highlighted the lack of finance as a major constraint to productivity. In a community in Kaduna State, for example, respondents reported that farming in this community is largely manually done as most respondents did not practice mechanized farming. They said that tractors and other farm equipment were not available in the locality and, in instances where they were available, were too expensive. Thus, they continue to rely on manual labor, which they say is a challenge in terms of scale of production. However, they did report knowing of some farmers who use tractors to farm rice in nearby communities. The main challenge is lack of money to purchase inputs such as fertilizer and herbicides, as other inputs are usually available in the markets. Respondents also reported that improved rice seeds are available, but the challenge is once again the lack of money to buy them.

According to another respondent from Kaduna State, agricultural financing – especially from government and the private sector – is grossly lacking, so farmers source funds locally within their communities through informal means such as contributions and *adashe* (Piggybank). They also do so by storing some of their yield and selling it later in the farming season to fund inputs. However, some of these inputs are not applied optimally because of insufficient funds. For instance, one female farmer would typically apply one bag of fertilizer on a farm where three bags or more were needed, and she explained that this contributes to her low yield. However, there are a few NGOs in the state that support farmers, while there is also the FADAMA 3 grant in some communities. With such grants, farmers are asked to organize themselves into cooperative societies to receive funds to carry out their farm activities with the aim of improving their standard of living in the long run.

*‘Sometimes there used to be droughts, which affects the crops but which we cannot avoid. Even when the crop is on the field, the problem of theft and herdsmen arises. This issue of herdsmen means farmers do not go to the farm when they are supposed to, especially to weed and harvest.’ KII respondent, Kaduna State.*

*In Delta State respondents pointed out that a lot of farms in the state have folded because of the high cost of feed. Although they use both imported and locally made feed, the local one is still expensive.*

*‘Feeds are very expensive. The commonest one we use is top feed which is locally made in Nigeria; it helps us so much, but it is still costly. A bag of top feed now is NGN 5,700–6,200 (US\$ 16–17) and, at the end of the day, when you calculate what you spend on feed and all your expenditure, you are at a loss in the business.’ FGD participant, Delta State.*

*Among the challenges also reported by respondents in Delta State is difficulty in getting fingerlings that are of higher breed. To address this, they end up spending a lot of money on feed without a commensurate yield from the fish as it takes as long as seven months before such breeds start to attain maturity.*

*‘Sometimes it is wickedness. I said it is wickedness because they will give us fish that have problems and*

lie to you about the quality but you might not know until you feed it for 5–6 months and learn the type of fish that was supplied to you. And if you sell it, there is no gain, no profit – even the money you invested will not be recovered’. *FGD respondent, Delta State.*

*They added that, oil spillage has also been a challenge:* ‘If it starts raining now, the underground water overflows and comes up so it affects the fish in the sense that the fish refuse to feed. When you feed it, it will not eat the feed and after a while you will discover that the tail of the fish becomes white because of too much acid in the water. We are doing it as our strength can carry us because, during that rainy season, we buy enough drugs, we also reduce the rate of our stocking, so that we can be able to manage the little one we want to farm.’ *FGD respondent, Delta State.*

‘Yes, like you see the water now, you can see it for yourself. The water is muddy, and you know the clean water is the ones fishes prefer. So, if the water remains muddy like this, it means breathing is difficult for the fish.’ *KII respondent, Delta State.*

‘Most times during the raining season, many people experience a big shortage in income. We should not even use the word shortage; it is big loss. You will keep feeding it and it will not grow. It will look healthy but will remain stunted. So that is also what affects us to have low productivity. Maybe you buy 500 bags of feed, that you plan to use for 1,000 pieces of fish, and after spending the 500 bags and still buy another 500 bags and the fish remain the same, your money is wasted.’ *Female FGD participant, Delta State.*

‘Here in Ughelli, Delta State, the challenge we are having is the PH condition of the water. A lot of people have carried out testing of this water to know what the problem is and they said that, because of the oil, our water contains irons and if you watch very well now on the surface of this pond, you will see oil floating on the surface. This thing kills the fish.’ *KII respondent, Delta State.*

# Secondary Data Analysis

## Overview

This section presents the findings and trends from secondary data analysis on domestic production, consumption, importation, and exportation of the target commodities of the five focus West African countries – Nigeria, Cote d'Ivoire, Burkina Faso, Niger, and Senegal – over a ten-year period from 2010 to 2019. This information helps us to understand existing gaps in production in the focus countries and how these constraints can be eliminated to catalyze domestic production to meet local demand in these countries.

## Nigeria

In recent years, the Nigerian economy has witnessed a contraction due to volatility in oil prices, as oil remains its main source of revenue. Agriculture has, however, contributed in terms of buoying up the economy by employing 36.5% of the labor force and contributing 24% to the nation's GDP.<sup>37</sup> However, increases in food production rates have been insufficient to meet the domestic needs of the rising population, and therefore Nigeria has become a net importer of food.<sup>38</sup>

## Rice

Rice is one of the most consumed staples in Nigeria, having increased tremendously over the past three decades, and has become an increasingly important crop grown in the country. Consequently, Nigeria has become one of Africa's leading producers and importers of rice. Of the 6 million hectares of land reportedly available for rice cultivation, only 3.6 million hectares is currently under use;<sup>39</sup> however, these 3.6 million hectares represents a 50% increase from the 2.4 million hectares used in 2010 according to FAOSTAT and USDA Foreign Agriculture Service (FAS) databases. Similarly, production has also increased in a non-linear manner within the same time, from 2.8 million metric tons (MMT) to 4.9 MMT of milled rice (see **Figure 19**).

Despite the increased production over the years, it has been insufficient to meet the demand. Consumption of rice has steadily been on the increase, as a result of population growth, urbanization, and the ease of its preparation compared to other cereals.<sup>40</sup> In the last decade, consumption of rice has increased by 45% to reach the current rate of 7 MMT.<sup>41</sup> **Figure 19** below shows the trends in rice production and consumption over the last 10 years.

As a result of the production deficits, rice imports surged to meet domestic demand, making Nigeria the second largest importer of rice after China. Moreover, the lower prices of imported rice, as well as it being better milled and easier to prepare, continues to fuel the demand for imported rice. At its peak, importation of rice reached 3.2 MMT in 2011. However, the drain on the nation's foreign reserves and the further impoverishment of smallholder farmers (who incur losses because their products compete poorly with heavily subsidized imported rice) led the government to restrict the importation of rice by raising tariffs on imported rice. This led to an increase in the price of imported rice compared to locally milled rice. Despite this, available data from USDA shows that importation of rice has witnessed only a 25% reduction in the last 10 years from 2.4 MMT to 1.8 MMT. Moreover, the country's porous borders still serve as entry channels for rice through informal means.

Rice productivity in Nigeria continues to suffer because of the general lack of infrastructure, limited access to finance for smallholder farmers, and usage of low-yielding seeds. Focus on these areas can help to increase productivity and the competitiveness of local rice.

<sup>37</sup> [www.fao.org/3/I9930EN/i9930en.pdf](http://www.fao.org/3/I9930EN/i9930en.pdf)

<sup>38</sup> [www.fao.org/nigeria/fao-in-nigeria/nigeria-at-a-glance/en/](http://www.fao.org/nigeria/fao-in-nigeria/nigeria-at-a-glance/en/)

<sup>39</sup> [https://apps.fas.usda.gov/newgainapi/api/report/downloadreportbyfilename?filename=Grain%20and%20Feed%20Annual\\_Lagos\\_Nigeria\\_4-12-2018.pdf](https://apps.fas.usda.gov/newgainapi/api/report/downloadreportbyfilename?filename=Grain%20and%20Feed%20Annual_Lagos_Nigeria_4-12-2018.pdf)

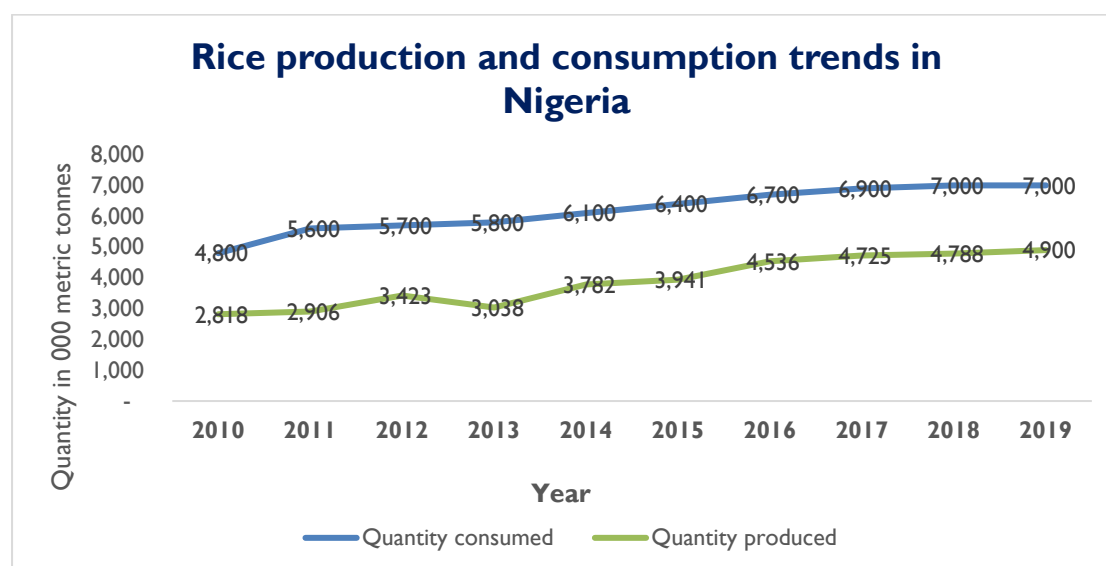
<sup>40</sup> <https://unep.ch/etb/etp/events/Agriculture/nigeria.pdf>

<sup>41</sup> [www.indexmundi.com/agriculture/?country=ng&commodity=milled-rice&graph=domestic-consumption](http://www.indexmundi.com/agriculture/?country=ng&commodity=milled-rice&graph=domestic-consumption)

**Table 46: Area of rice harvested (in '000 ha)**

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Area harvested (USDA)	2,433	2,269	2,864	2,931	3,082	3,122	3,300	3,600	3,600	3,600
Area harvested (FAOSTAT)	2,433	2,269	2,864	2,931	3,082	3,122	3,745	3,309	3,345	N/A
Average	2,433	2,269	2,864	2,931	3,082	3,122	3,525	3,454	3,472	3,600

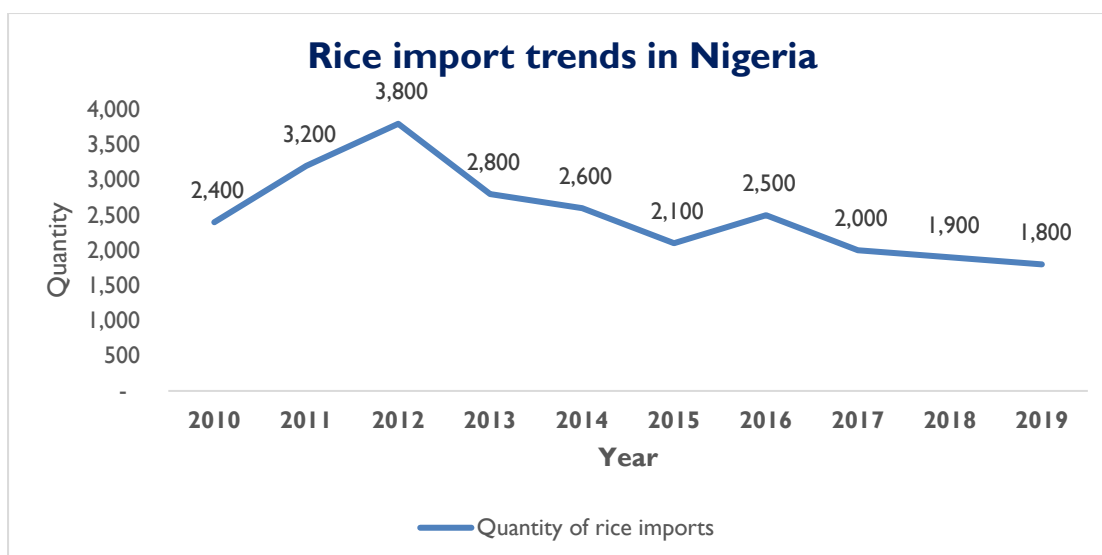
Source: FAOSTAT and USDA FAS database



**Figure 19: Quantity of rice produced and consumed in Nigeria from 2010 to 2019**

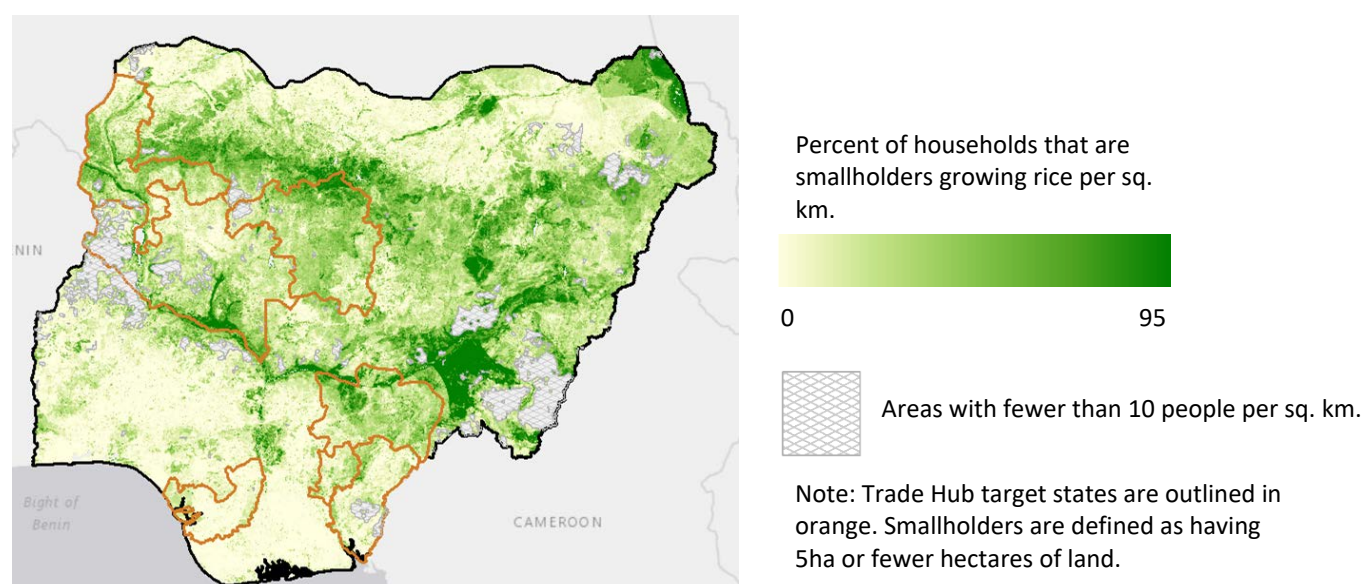
Source: USDA FAS<sup>42</sup>

<sup>42</sup> USDA FAS. PSD Online [Internet]. 2020 [cited 2020 Apr 23]. Available from: <https://apps.fas.usda.gov/psdonline/app/index.html#/app/downloads>



**Figure 20: Quantity of rice imports in Nigeria from 2010 to 2019 (in '000 MT)**

Source : USDA FAS database Maize



**Figure 21: Percent of smallholders' household growing rice per sq. km.**

## Maize

According to the International Institute of Tropical Agriculture (IITA), maize is the most important cereal crop in sub-Saharan Africa and an important staple food for many people living in Nigeria.<sup>43</sup> Nigeria is the largest African producer, producing over 11 MMT in 2019. The area harvested has increased from 4 million ha in 2010 to 6.5 million ha in 2019.<sup>44</sup> The majority of maize production is for domestic consumption, as formal exports form a negligible proportion of harvested quantity. Data presented below (see **Figure 22**) from USDA<sup>45</sup> shows that maize production has steadily increased in the last 10 years, from 7.7 MMT to 11 MMT.

All parts of the maize crop can be used for different food and non-food purposes. Hence, it has a variety of uses including food, fish/poultry feed, and as a raw material in some food and beverage industry products. As a result of increasing population and industrialization, domestic consumption from 2010 to

<sup>43</sup> [www.iita.org/cropsnew/maize/](http://www.iita.org/cropsnew/maize/)

<sup>44</sup> [www.indexmundi.com/agriculture/?country=ng&commodity=corn&graph=area-harvested](http://www.indexmundi.com/agriculture/?country=ng&commodity=corn&graph=area-harvested)

<sup>45</sup> [www.indexmundi.com/agriculture/?country=ng&commodity=corn&graph=domestic-consumption](http://www.indexmundi.com/agriculture/?country=ng&commodity=corn&graph=domestic-consumption)

2019 has increased from 7.6 MMT to 11.4 MMT; this created a deficit of 0.4 MMT, which was covered via imports. IITA estimates that 60% of maize produced is used for industrial purposes for consumption by both humans (beer, malt, flour, cornflakes, starch, etc.) and animals (mainly poultry).<sup>46</sup>

Trade data for maize from the FAOSTAT and USDA database shows that the maize imports into the country have been very low. The government initially placed a ban on maize imports from 2005 to 2008. However, this ban was lifted and a 5% tariff imposed on imports. Despite this, available data shows that import quantities remain negligible.

**Table 47: Area of maize harvested (in '000 ha)**

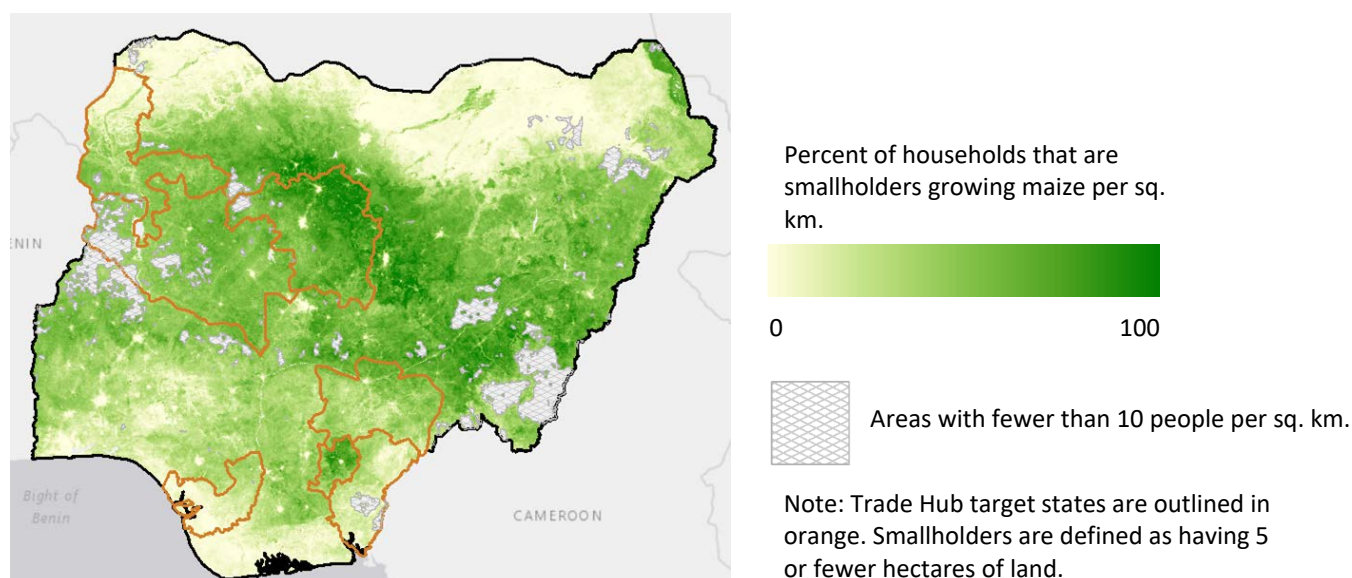
Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Area harvested (USDA)	4,149	5,457	5,751	5,763	6,347	6,771	6,601	6,540	6,500	6,500
Area harvested (FAOSTAT)	4,149	5,457	5,751	5,763	6,347	6,771	6,579	6,540	4,853	N/A
Average	4,149	5,457	5,751	5,763	6,347	6,771	6,590	6,540	5,676	6,500



**Figure 22: Maize production, consumption, and importation in Nigeria (in '000 tons)**

**Figure 23: Percent of smallholders' household growing maize per sq. km.**

<sup>46</sup> [www.iita.org/cropsnew/maize/](http://www.iita.org/cropsnew/maize/)



## Soybean

Nigeria is the largest producer and consumer of soybean in sub-Saharan Africa.<sup>47</sup> Soybean is an important crop for the production of edible oil, an inexpensive source of high-quality protein for humans and a high-protein animal feed.<sup>48</sup> There is a growing trend for soybean consumption fueled by the increased use in the poultry industry and edible oil industry. Soybean meal is a vital and preferred source of protein in compound feed and accounts for 20–30% of poultry feed and 20% of fish feed composition. However, production has not increased enough to match local demands. Production as at 2018 was 758,000 MT, which failed to meet the local demand of 1.1 MMT. A major factor limiting soybean productivity has been the limited use of improved seed. The usual practice of farmers reusing the same seeds for multiple planting seasons has contributed to low yield of soybean. Nonetheless, **Table 47** shows that production did increase substantially from 2010 to 2019.

There is paucity of reliable data on soybean imports from both FAOSTAT, USDA, and ITC. Data for a few years were missing and there was no precise pattern visible. However, data from Sahel Capital and USDA show that a considerable proportion of local demand is met by importation, partly due to insufficient production and partly due to the cheaper prices of imported produce.

**Table 48: Soybean produced, consumed, and imported in Nigeria (2010 to 2019)**

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Quantity produced ('000 tons)	365	492	650	518	624	588	615	730	758	N/A
Quantity consumed ('000 MT)	420	499	555	575	776	860	1,114	1,064	1,127	N/A
Quantity of imports (MT)	9	9	5,721	12,757	71,822	111,186	70,000	20,939	N/A	N/A

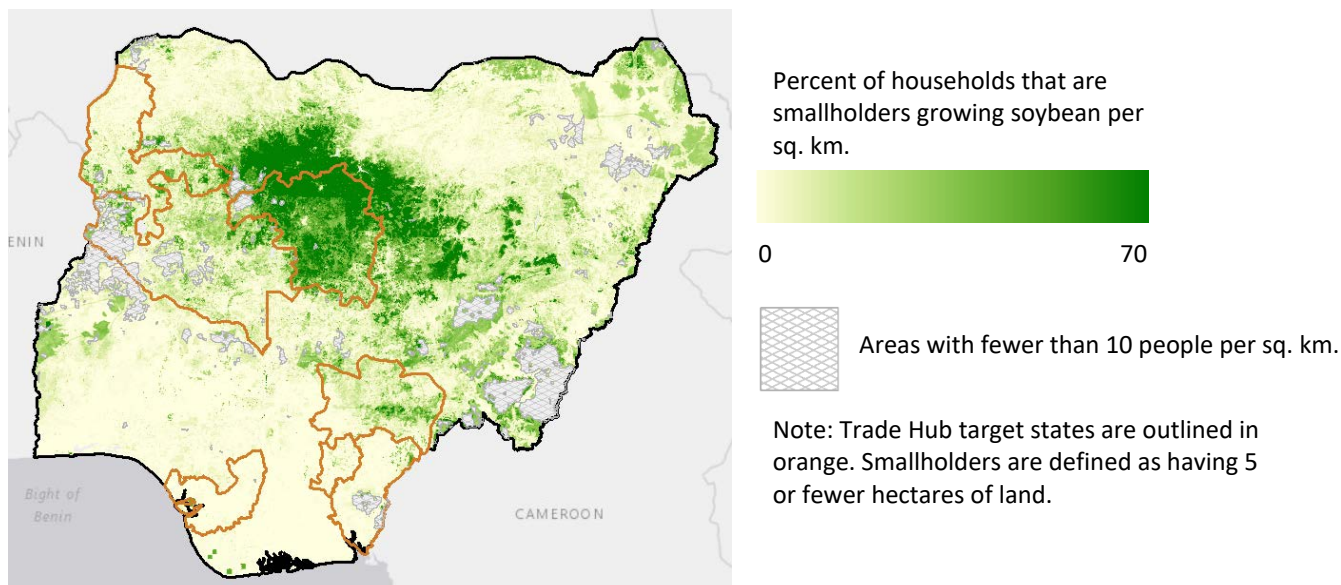
Source: USDA FAS and FAOSTAT databases<sup>49</sup>

<sup>47</sup> [www.iita.org/cropsnew/soybean-3/](http://www.iita.org/cropsnew/soybean-3/)

<sup>48</sup> <http://sahelcp.com/wp-content/uploads/2017/10/Sahel-Capital-Newsletter-Volume-16.pdf>

<sup>49</sup> FAOSTAT. FAOSTAT [Internet]. 2019 [cited 2020 Apr 23]. Available from: <http://www.fao.org/faostat/en/#data>

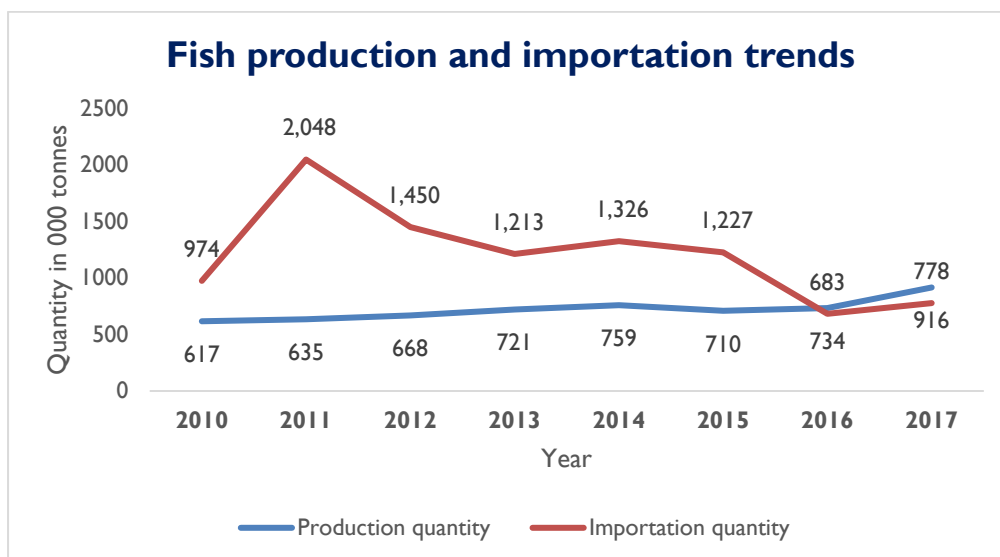




**Figure 24: Percent of smallholders' household growing soybean per sq. km.**

### Aquaculture

Fish is an important part of the diet in Nigerian households, accounting for 40% of the country's protein intake, and Nigeria is the largest aquaculture fish producer in sub-Saharan Africa, accounting for 52% of farmed fish production in the region.<sup>50</sup> Freshwater fish is the focus of aquaculture in Nigeria, with Catfish species accounting for over 60% of aquaculture production. Available data from FAO show that Nigeria produced about 1 MMT of fish in 2017, of which aquaculture constituted about 300,000 tons.<sup>51</sup> Meanwhile annual consumption is about 1.8 MMT, leaving a deficit of over 800,000 MT that is imported annually. Increasing demand caused net imports to increase, as was seen in 2011. However, an increase in local production of fish caused a reduction in the net imports from 2 MMT in 2011 to 778,000 MT in 2017 (see **Figure 25**).



**Figure 25: Fish production and importation trends in Nigeria from 2010 to 2017**

Source: FAOSTAT database

The trends shown above show that consumption of food commodities has been on the increase in the past decade because of the increasing population, urbanization, and industrialization. Subsequently,

<sup>50</sup> [http://pubs.iclarm.net/resource\\_centre/2018-09.pdf](http://pubs.iclarm.net/resource_centre/2018-09.pdf)

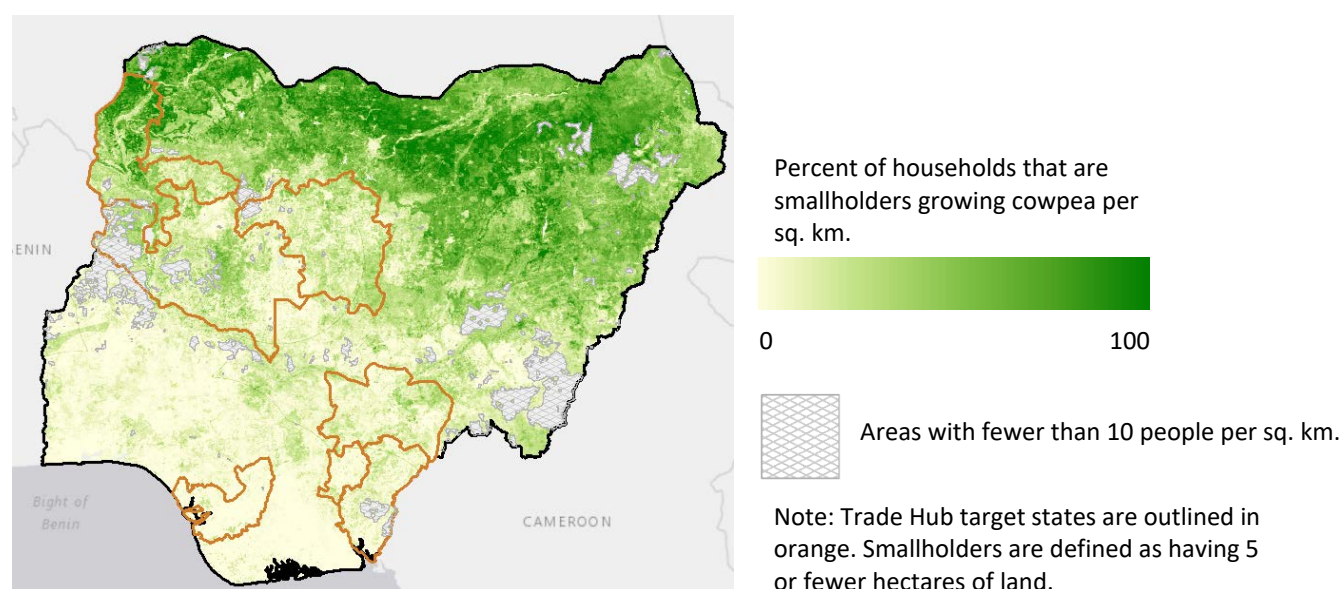
<sup>51</sup> [www.fao.org/fishery/facp/NGA/en](http://www.fao.org/fishery/facp/NGA/en)



production of these commodities has increased, albeit at a lower rate than consumption. Nigerian farmers still face critical constraints with productivity owing to lack of finance, infrastructure, and improved technology. As a result, imports have continued over the years to shore up local demand. The lower prices of imported products due to subsidization from their respective governments further puts local goods at risk. This has led the government to put policies in place such as bans and tariffs on some imported goods. However, poor policy implementations and porous land borders continue to allow the inflow of imported goods and farmers still face critical constraints in terms of productivity.

## Cowpea

Cowpea is an important leguminous food crop in Nigeria and grown mainly in the northern part of the country. Nigeria is the largest producer and consumer of cowpea in Africa, and accounts for 48% of the 7.1 million metric tons of the grain produced in the continent. Cowpea is a high protein grain which contain 25% crude protein and several vitamins and minerals. The grain is inexpensive, available year-round and a popular source of protein. The crop's high adaptability to different soils and intercropping systems, resistance to drought, and ability to improve soil fertility and prevent erosion makes it an important economic crop in Nigeria and many developing countries. The sale of the crop residue as fodder also makes it a crop of choice to farmers especially in the northern part of Nigeria where mixed farming is mostly practiced. Cowpea production is limited by pests during every stage of its life cycle. The plants are also attacked by diseases caused by fungi, bacteria, and viruses. Cowpea farmers in the dry savanna areas of sub-Saharan Africa obtain low yields, estimated at about 350 kg per hectare (IITA, 2019). Africa exports and imports negligible amounts.



**Figure 26: Percent of smallholders' household growing cowpea per sq. km.**

## Exports

As shown in Table 2A, in 2019, aquaculture exports (including fish, crustaceans, mollusks, and other aquatic invertebrates) totaled about 32 million US Dollars and 5 million kilograms, a decrease of about 28% in value or 14% in quantity from exports in 2018. Apparel exports accounted for about 259 thousand US Dollars and rice exports for 193 thousand US Dollars in 2019. The value and quantity of soybeans and shea exported in 2019 also decreased relative to 2018 exports. While no export data for maize was available in 2019, the value of maize exports increased from 28 thousand US Dollars in 2017 to 52 thousand in 2018.

**Table 49: Export Quantity and Value of Key Value Chains**

Value Chain	2019 Value (USD Thousand)	2019 Quantity (Kg)	2018 Value (USD Thousand)	2018 Quantity (Kg)	2017 Value (USD Thousand)	2017 Quantity (Kg)
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<b>Maize</b>	-	-	52	127,000	28	NA
<b>Soybean</b>	46	115,000	16,717	42,959,000	25,714	NA
<b>Rice</b>	193	218,000	-	-	-	-
<b>Aquaculture</b>	32,266	5,176,000	44,981	6,040,000	45,760	NA
<b>Apparel</b>	259	NA	-	-	-	-
<b>Shea</b>	73	270,000	112	336,000	-	-

Source: International Trade Center – Trade Map, Nigeria National Bureau of Statistics

**Note 1:** No export data for cowpea was available. A dash denotes that no export values were recorded for the value chain each year. NA indicates that quantity exported was not available despite data on export values.

**Note 2:** Aquaculture data includes fish and crustaceans, mollusks, and other aquatic invertebrates.

**Table 48** shows that AGOA imports of select value chains have varied between 2016 and 2019. While no AGOA imports of maize were reported in 2017 and 2019, the value increased from 22 thousand US Dollars in 2016 to 34.5 thousand US Dollars in 2018. AGOA imports of soybean were reported only in 2017, with a value of 3.9 million US Dollars. Finally, AGOA imports of rice and apparel totaled 5 thousand US Dollars each in 2019.

**Table 50: Value of AGOA Imports by the United States (USD thousand)**

<b>Value Chain [1]</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
<b>Maize [2]</b>	22.048	0	34.5	0
<b>Soybean [3]</b>	0	3,886	0	0
<b>Rice [4]</b>	3.78	2.2	14.5	5
<b>Apparel [5]</b>	0	0.644	2	5

Source: US Department of Commerce, Census Bureau

**Note 1:** No AGOA data was available for cowpea, shea, or aquaculture value chains.

**Note 2:** Maize includes corn flour, groats and meal of corn, and corn starch.

**Note 3:** Soybeans includes oilcake and other solid residues resulting from the extraction of soybean oil.

**Note 4:** Rice includes semi-milled or wholly milled rice, and cereals NESOI including wild rice.

**Note 5:** Apparel includes hand-loomed fabrics of cotton, footwear, hairnets, and headgear other than safety headgear.

## Ghana

Agriculture is a crucial part of the Ghanaian economy, contributing 54% of the country's GDP, 40% of its export earnings, and employing 52% of its labor force.<sup>52</sup> It provides over 90% of the country's food needs. As with Nigeria, most farmers in Ghana are smallholder farmers.

### Maize

Maize is the most important cereal crop produced and consumed in Ghana, accounting for 50% of the country's cereal production.<sup>53</sup> Although production has seen an increasing trend in the past three decades, from 553,000 MT in 1990 to over 2 MMT in 2019, the International Food Policy Research Institute has stated that the maize yield in Ghana remains one of the lowest in the world.<sup>54</sup> Yield over the last 10 years averaged 1.85 tons per hectare, yet South Africa and Ethiopia have an average yield of 4.5 and 3.4 tons per ha, respectively.

The rising population, urbanization, and the growth of the fish and poultry industries led to an increase in the demand for maize. Domestic consumption increased by 16% from 1.8 MMT to 2.1 MMT between 2010 and 2018 (see **Table 50**). Meanwhile, feed consumption increased by 75% from 200,000 to 300,000 MT. Feed companies prefer yellow maize, which accounts for almost all maize imports, according to the FAO. Although production increased at an almost similar rate to consumption, minor deficits still exist. This gap is filled via imports, which have increased from 1,000 tons to 40,661 tons over the same period.

<sup>52</sup> [www.fao.org/ghana/fao-in-ghana/ghana-at-a-glance/en/](http://www.fao.org/ghana/fao-in-ghana/ghana-at-a-glance/en/)

<sup>53</sup> Ragasa C. MAIZE PRODUCTIVITY IN GHANA. 2014;4. Available from:

<http://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/128263/filename/128474.pdf>

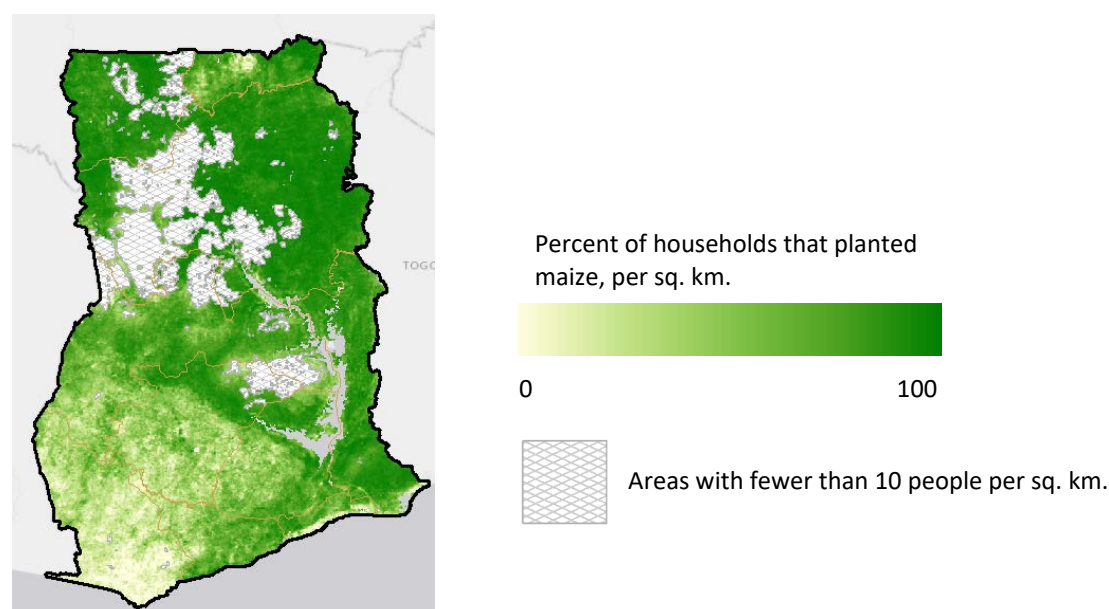
<sup>54</sup> <http://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/128263/filename/128474.pdf>

In a bid to increase the productivity of maize farmers, fertilizers are subsidized by the government. However, credit constraints continue to cause sub-optimal usage of fertilizers and low adoption of modern and hybrid seeds, thus hampering the productivity of maize farmers.

**Table 51: Maize production and consumption in Ghana**

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Yield (MT/ha)	1.9	1.6	1.9	1.7	1.7	1.9	1.9	2.0	1.9
Production quantity (in '000 MT)	1,872	1,684	1,949	1,764	1,762	1,691	1,721	2,011	2,306
Domestic Consumption (in '000 MT)	1,800	1,800	1,800	1,900	1,800	1,800	1,800	1,900	2,150
Feed domestic consumption (in '000 MT)	200	200	200	200	300	250	300	300	350
Import qty (in '000 MT)	955	11,25	113,213	3,172	2,641	98,754	72,059	40,661	N/A

Source: FAOSTAT and USDA FAS databases



**Figure 27: Map showing Maize Production in Ghana**

## Soybean

Soybean production is still relatively new in Ghana and is mainly used by farmers for crop rotation with maize.<sup>55</sup> Recently, it has been promoted by the Ministry of Food and Agriculture as a means of increasing cash income and improving the nutritional status of rural households. However, production and consumption levels remain low. Poor production practices, low adoption of technology, and poor harvest and post-harvest handling practices all combine to reduce the productivity of soybean farmers.

Production levels between 2010 and 2017 show no precise pattern, but there was an overall increase from 146,000 tons to 170,490 tons. Import data from FAOSTAT show that only a small quantity of soybean was imported within the same timeframe, suggesting that soybean consumption in Ghana is still low.

**Table 52: Soybean production and importation in Ghana**

	2010	2011	2012	2013	2014	2015	2016	2017	2018
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<sup>55</sup> <http://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/127095/filename/127306.pdf>

Import qty (in tons)	169	109	25	118*	62**	15**	150	236	N/A
Production qty (in tons)	146,000	164,511	151,709	138,700	141,470	142,360	143,220	170,490	N/A

Source: FAOSTAT database

## Groundnuts

Groundnuts play a major role in Ghanaian diets as one of the major sources of vegetable protein.<sup>56</sup> The northern region of Ghana accounts for over 85% of the national output, and the majority of groundnut production is by smallholder farmers with less than 2 ha of arable land. The available data shows that the production of groundnuts in the past decade has been fluctuating, with an overall decrease from 530,000 tons in 2010 to 520,000 tons in 2018. Similarly, a reduction in average yield was recorded within the same period, from 1.5 MT/ha to 1.3 MT/ha. Yield averages however fall within the West African average of 1 MT per hectare.

Groundnuts and related products have a crucial contribution in ensuring food security and meeting the nutritional needs of rural people in Ghana. It is harvested for its seed and the oil extracted from it. It is also processed to make other foods for human consumption and animal feed. The demand for groundnut products in Ghana has been driven by population growth as well as its competition with other seed oils such as soybean oil, sunflower oil, etc.<sup>57</sup> However, the lack of reliable consumption, import, and export data make it difficult to compare consumption trends in the past decade.

**Table 53: Groundnut production in Ghana**

	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Yield (MT/ha)</b>	1.5	1.3	1.3	1.4	1.3	1.2	1.3	1.3	N/A
<b>Production qty (in tons)</b>	530,887	465,103	475,056	408,814	426,280	417,199	425,825	433,772	521,032

## Exports

The value and quantity of cocoa exports far exceed the other value chains. In 2018, Ghana exported roughly 844 million kilograms, totaling about 2.4 billion US Dollars in value. This represents a 48% increase in value and a 47% increase in quantity compared to 2017. As shown in **Table 53**, Ghana also exported relatively more in fresh fruits and apparel, relative to other value chains. The value of fresh fruits exported exceeded 595 million US Dollars, and the value of apparel exported was about 22.7 million US Dollars in 2018. In addition, the value of apparel exports increased by about 119% compared to 2017.

**Table 54: Export Quantity and Value of Key Value Chains**

Value Chain	Description	2018 Value (USD Thousand)	2018 Quantity (Kg)	2017 Value (USD Thousand)	2017 Quantity (Kg)
<b>Cowpea [1]</b>	Dried leguminous vegetables, shelled, whether skinned or split	121	101,289	26	66,298
<b>Maize</b>	Maize or corn	197	192,437	404	3,975,170
<b>Groundnut [2]</b>	Groundnuts, whether shelled or broken	9	45,344	1,885	1,274,539
<b>Soy</b>	Soya beans, whether broken	2,580	5,948,645	1,622	4,724,289
<b>Shea [3]</b>	Other oil seeds and oleaginous fruits, whether broken	18,810	45,599,002	8,567	26,485,222
<b>Cocoa [4]</b>	Cocoa beans, whole or broken, raw or roasted	2,437,194	843,641,394	1,642,052	573,333,767
<b>Apparel</b>	Articles of apparel and	22,669	N/A	10,352	N/A

<sup>56</sup> [www.fao.org/3/a-at549e.pdf](http://www.fao.org/3/a-at549e.pdf)

<sup>57</sup> Ellen Owusu-Adjei, Richard Baah-Mintah, and Baba Salifu, "Analysis of the Groundnut Value Chain in Ghana." *World Journal of Agricultural Research*, vol. 5, no. 3 (2017): 177-188. doi: 10.12691/wjar-5-3-8..

	clothing accessories				
<b>Horticulture [5]</b>	Edible vegetables and certain roots and tubers	11,669	19,193,072	9,836	17,579,694
<b>Fresh fruits [6]</b>	Edible fruit and nuts; peel of citrus fruit or melons	595,252	422,129,066	409,416	388,998,885

Source: International Trade Center – Trade Map, UN Com trade Database

**Note 1:** This is an aggregated category not restricted to cowpea because no export value for cowpea was listed.

**Note 2:** This excludes roasted or otherwise cooked.

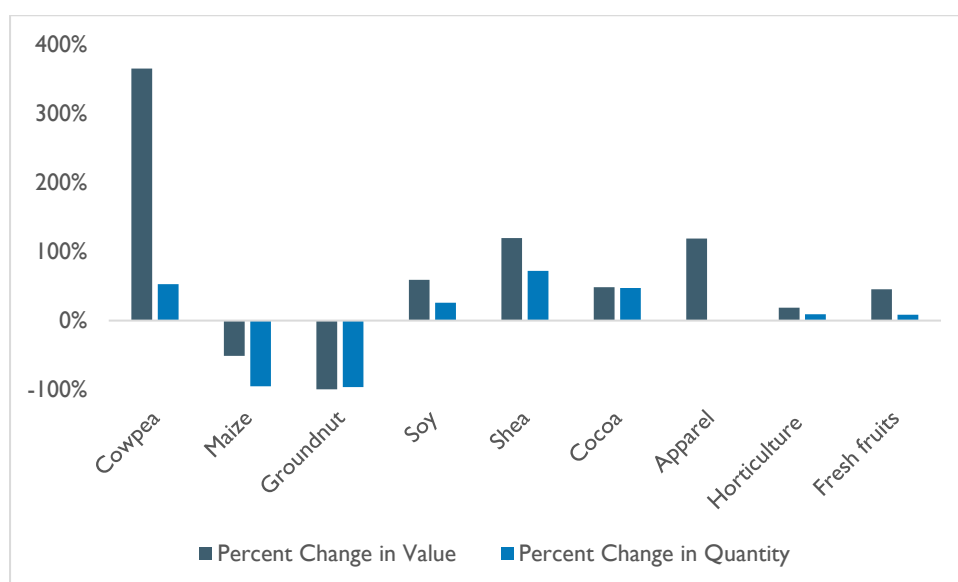
**Note 3:** This is an aggregated category nor restricted to shea because no export value for shea was listed. Excludes edible nuts, olives, soya beans, groundnuts, copra, linseed, rape or colza seeds and sunflower seeds

**Note 4:** This definition excludes processed cocoa products.

**Note 5:** This definition excludes leguminous vegetables and provisionally preserved vegetables.

**Note 6:** A large portion of this value comes from coconuts, Brazil nuts, and cashew nuts.

As shown in *Chart 1A*, the value and quantity of maize and groundnut exports decreased between 2017 and 2018. Groundnut exports declined by about 100% compared to 2017 in terms of both value and quantity. For maize, the value exported decreased by about 51% while the quantity exported decreased by about 95% compared to 2017. In contrast, the value of dried leguminous vegetables (including cowpea) exported increased by about 365% in 2018, compared to 2017.



**Figure 28: Percent Change in Exports from 2017 to 2018**

According to the US Department of Commerce, the value of AGOA imports of agricultural products to the US from Ghana was 12,473,000 USD in 2018, an increase from 4,293,000 USD in 2017 and 189,000 USD in 2016. As shown in **Table 54**, AGOA imports of apparel from Ghana have steadily increased over the past four years, from about 6 million US Dollars in 2016 to 17 million US Dollars in 2019. AGOA imports of fruit and horticulture have varied, ranging from 50 thousand US Dollars in 2016 to about 3.5 million US Dollars in 2017. Similarly, AGOA imports of cocoa from Ghana were about 1.1 million US Dollars in 2018, compared to about 3 thousand US Dollars in 2019.

**Table 55: Value of AGOA Imports by the United States (USD thousand)**

VALUE CHAIN [1]	2016	2017	2018	2019
<b>Maize [2]</b>	-	4	10	-
<b>Groundnut [3]</b>	-	-	3	5
<b>Cocoa [4]</b>	-	-	1,130	3
<b>Apparel [5]</b>	6,133	8,324	13,912	17,131
<b>Fruits and horticulture [6]</b>	50	3,475	1,355	192

Source: Census Bureau, US Department of Commerce



**Note 1:** No AGOA imports of cowpea, shea, or soy from Ghana were reported.

**Note 2:** Maize includes maize flour, grains of maize, and corn starch.

**Note 3:** Statistics for groundnut reflect peanuts, blanched or otherwise prepared or preserved, NESOI, subject to add. US note 2 to Chap 12, not GNI5.

**Note 4:** Cocoa includes paste (wholly or partly defatted), powder (unsweetened), and preps (not filled) in slabs or bars weighing 2kg or less.

**Note 5:** Apparel includes clothing, footwear, articles composed of leather, flags made of textile materials, and headgear other than safety headgear.

**Note 6:** Fruit and horticulture includes peppers, vegetables NESOI (dried, uncooked, cooked by steaming or boiling in water, or frozen), dried and fresh fruit (including pineapples, guavas, mangoes, mangosteens, and papayas), tomatoes and coconuts (prepared or preserved), and juice of citrus or other fruit.

## Average Sales

This study used the 2017 Ghana Living Standards Survey to calculate average sales value for households producing the selected value chains. There was not an adequate sample size to calculate this value for cowpea, soya, or shea, and apparel was excluded from this analysis. Note that this analysis did not examine firm-level sales data because the most recent Enterprise Survey for Ghana is more than five years old.

**Table 56: Average Annual Sales Among Agricultural Households**

VALUE CHAINS	AVERAGE SALES (2018 Cedis) [1]	AVERAGE SALES (2018 USD)
Maize	828	\$181
Groundnut	1,407	\$307
Cocoa	5,031	\$1,097
Fresh fruits and horticulture [2]	1,305	\$284

Source: 2017 Ghana Living Standards Survey

**Note 1:** This is defined as average sales value for households that reported harvesting and selling any quantity of the selected value chain.

**Note 2:** This category includes beans, leafy vegetables, okra, tomatoes, eggs, bananas and plantains, oranges and tangerines, pineapples, and watermelons.

As shown in **Table 55**, average annual sales per household from cocoa are more than triple the average value of sales for groundnut and fresh fruits or horticulture. Among cocoa-growing households, the average sales value for cocoa was just over one thousand US Dollars. By comparison, the average sales value for maize was about 180 US Dollars.

## Cocoa beans

Ghana is the second largest producer of cocoa in the world after Cote d'Ivoire. Cocoa contributes significantly to the Ghanaian economy, generates foreign exchange, and provides employment for hundreds of thousands of people in the country.<sup>58</sup> The available data from 2010 to 2019 show that cocoa production increased by almost 50% from 632,000 MT to almost a million MT in 2018. The increased production over the past two decades has been attributed to increased use of fertilizers, better pest and disease control, and the adoption of hybrid cocoa varieties. More than half of cocoa farmers are utilizing fertilizers, which represents a huge increase from the 9% who were utilizing fertilizers in 1991.<sup>59</sup> The majority of farmers have also adopted planting of improved hybrid varieties that bear fruits in three years compared to the traditional varieties that bear fruits in five years. In addition, the pricing system, set by Cocobod – Ghana's cocoa quality control agency – encourages farmers to adopt best practices to boost their yield.

Ghana's cocoa export quantity and revenue generated in the past decade have also increased. Exportation increased from 281,000 tons in 2010 to 573,000 tons in 2017. Its high-quality cocoa beans receive a premium price in the global market. As a result of this, Ghana can sell most of its annual production and its export earnings from cocoa beans doubled between 2010 and 2017 (see **Table 57**). In the same vein, the establishment of processing facilities in Ghana by international firms because of the value placed on

<sup>58</sup> Laven A, Boomsma M. Incentives for sustainable cocoa production in Ghana. 2012;49. Available from: <http://www.fao.org/3/a-at220e.pdf>

<sup>59</sup> <http://siteresources.worldbank.org/AFRICAEXT/Resources/258643-1271798012256/Ghana-cocoa.pdf>

Ghana's cocoa has led to an increase in the processed cocoa products exported by the country. Although there is a paucity of accurate data for processed cocoa products, a report by the World Bank estimates that processed cocoa products such as cocoa butter and cocoa paste form a substantial portion of cocoa exports in Ghana.<sup>60</sup>

**Table 57: Cocoa production and exportation in Ghana**

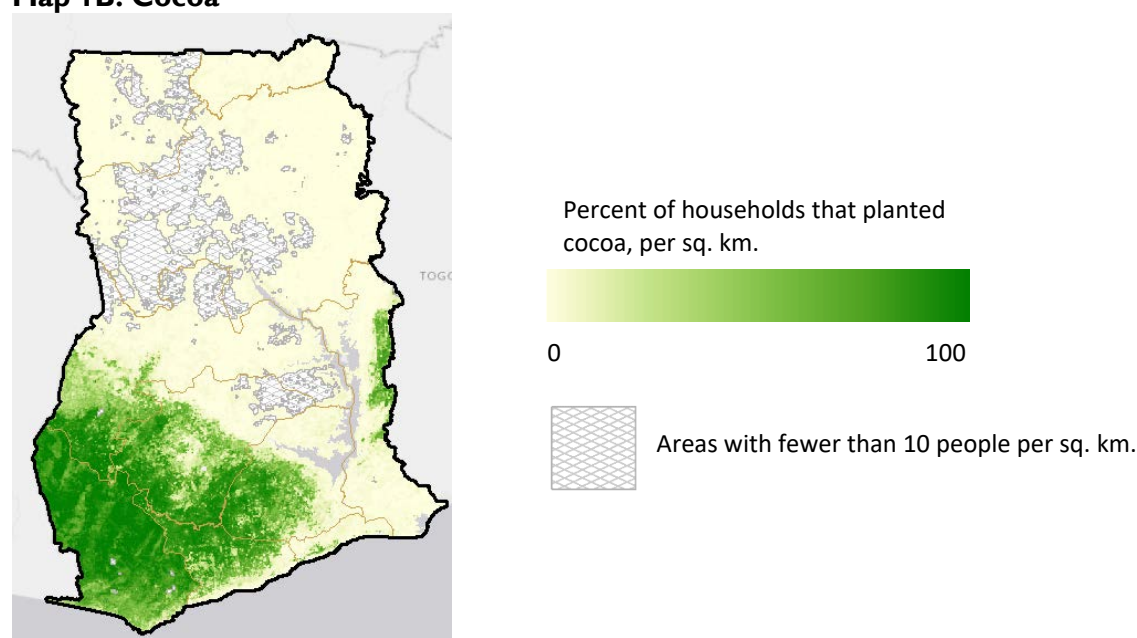
	2010	2011	2012	2013	2014	2015	2016	2017	2018
Export value (in 000 US\$)	847,395	2,200,000	1,973,913	1,380,613	2,046,346	1,675,503	1,886,219	1,642,052	N/A
Export quantity (in tons)	281,437	697,394*	585,929	526,187	747,612**	572,624**	581,375	573,334	N/A
Production quantity (in tons)	632,037	700,020	879,348	835,466	858,720	858,720	858,720*	893,598**	947,632

Source: FAOSTAT database

\*Unofficial data/figure.

\*\*FAOSTAT estimates/Estimated data using trading partners database/FAO data based on imputation methodology

**Map 1B. Cocoa**



**Figure 29: Map showing Cocoa Production in Ghana**

## Senegal

The agriculture sector in Senegal employs 70% of the country's labor force but contributes only 17% of the country's GDP, which is lower than the sub-Saharan African average of 24%.<sup>61</sup> Only 12% of the land is arable. The country's agriculture sector has faced challenges in recent decades because of desertification and climatic shocks such as drought and flooding, which have limited productivity.<sup>62</sup> As a result, Senegal remains a net importer of food. The main cash crops grown are groundnuts, cotton, and sugarcane, while the main food crops include rice, maize, millet, sorghum, and wheat.

### Rice

Rice production in Senegal is largely dominated by smallholder farmers. Irrigated rice occupies 70% of

<sup>60</sup> Kolavalli S, Vigneri M. Cocoa in Ghana: Shaping the Success of an Economy [Internet]. World Bank; 2011. Available from: <http://siteresources.worldbank.org/AFRICAEXT/Resources/258643-1271798012256/Ghana-cocoa.pdf>

<sup>61</sup> [www.fao.org/3/a-i4841e.pdf](http://www.fao.org/3/a-i4841e.pdf)

<sup>62</sup> [www.nationsencyclopedia.com/economies/Africa/Senegal-AGRICULTURE.html](http://www.nationsencyclopedia.com/economies/Africa/Senegal-AGRICULTURE.html)



national production, with men dominating this sector, while rainfed rice occupies the remaining 30%, with women dominating this sector.<sup>63</sup> Official data from the FAO shows that the area harvested increased from 147,000 ha in 2010 to 237,000 ha in 2015 before declining to 174,000 ha in 2018. Although a non-linear growth in rice paddy production was observed between 2010 and 2018, from 604,000 tons to 762,000 tons, a closer look reveals fluctuations in production over this period. A decrease was observed from 2010 to 2014, followed by a 62% increase in 2015 before the gradual decrease to the final values seen in 2018 (see **Table 54**). This trend was attributed to droughts experienced within these years. However, the yield remained constant at an average of 4 MT/hectare over the same period of time. Rice production in Senegal continues to face critical challenges such as timely access to quality inputs, drought, high production costs, and lack of improved water management and water harvesting techniques.

However, rice consumption has continued to increase in Senegal, owing to its increasing population and urbanization. Rice is the staple food of the Senegalese population. Rice by-products are used by the livestock sector, particularly by poultry farmers. Rice consumption increased by 72% from 1.1 MMT in 2010 to 1.9 MMT in 2018. Local production only caters to 40% of domestic needs and the rest is met via imports. Senegal imports over 1 MMT of rice annually. The importation values reported in the last decade (see **Table 54**) are much higher than the values reported in the previous decade. This demonstrates that rice consumption has indeed increased at a much higher rate than domestic production.

**Table 58: Rice production and consumption in Senegal**

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Area harvested ('000 ha)	147	109	117	108	134	237	162	167	174
Production qty	604	405	469	436	559	906	633	710	762
Yield (MT/ha)	4.1	3.7	3.9	4.0	4.1	3.8	3.9	4.2	4.4
Consumption (in '000 tons)	1,131	1,300	1,309	1,391	1,505	1,650	1,750	1,835	1,900
Import qty (in '000 tons)	707	808	1,041	1,123	1,111	1,159	973	1,180	N/A

Source: FAOSTAT and USDA FAS

## Millet

Millet is a dominant staple cereal crop for smallholders in Senegal. It has high adaptability to drought and low soil fertility, making it a model species in terms of the adverse effects of climate change.<sup>64</sup> Its high levels of protein, iron, and zinc make it a potential candidate crop to address nutritional deficiencies in malnourished populations. Aside from its consumption as a food crop for humans, it is also used as fodder for livestock.

Production data shows a reduction in production from 2010 to 2018 from 813,000 tons to 574,000 tons. Similarly, yield also reduced over the same time. However, there is limited data on consumption and importation trends.

**Table 59: Millet production in Senegal**

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Yield (in MT/ha)	0.78	0.62	0.81	0.68	0.57	0.81	0.71	0.70	0.70
Production in ('000 tons)	813	480	662	515	408	749	607	569	574

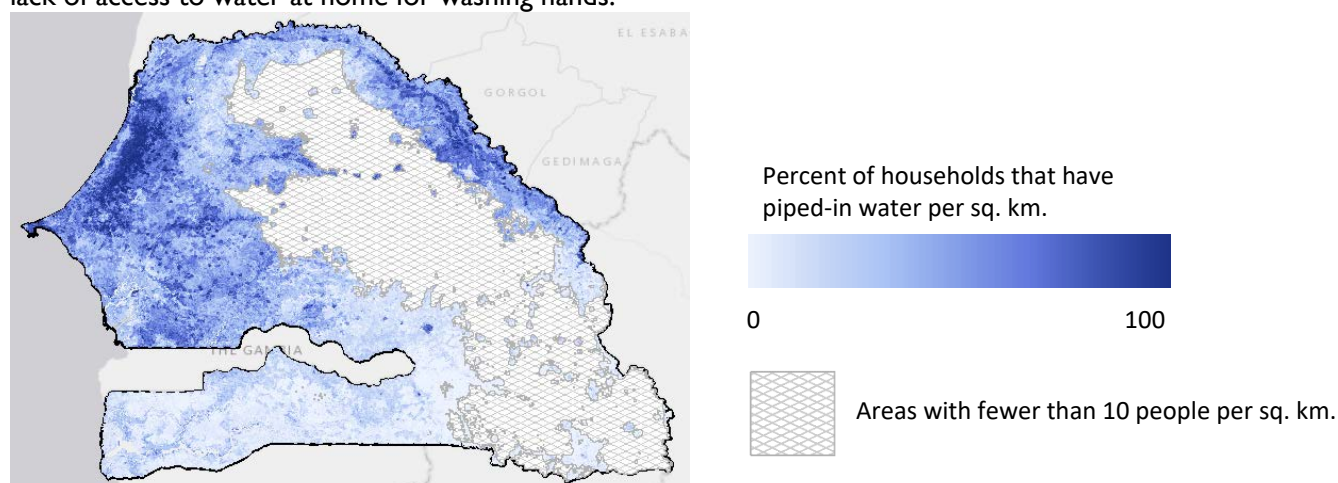
Source: FAOSTAT

## WASH Sector

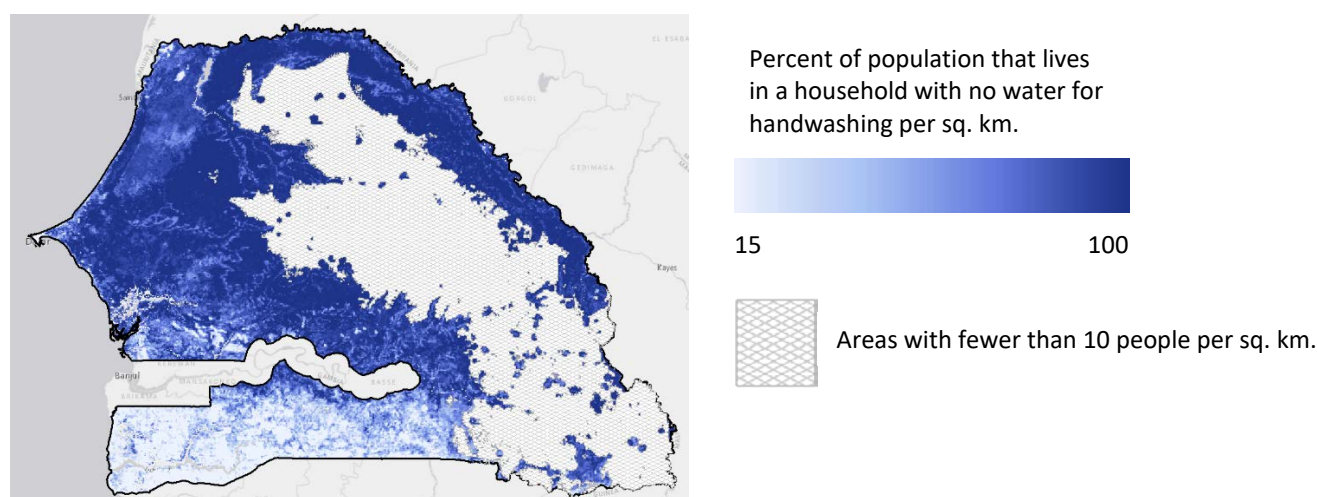
<sup>63</sup> <http://ricepedia.org/senegal>

<sup>64</sup> Zoclanclounon, Y.A.B., Kanfany, G., Kane, A., Fonceka, D., Ehemba, G.L., and Ly, F. (2019) 'Current Status of Pearl Millet Downy Mildew Prevalence across Agroecological Zones of Senegal'. *The Scientific World Journal*. Hindawi.

Using data from the 2016 Demographic and Health Survey, Fraym produced estimates of two WASH-related indicators across Senegal at the 1 square kilometer level to illustrate how access varies sub-nationally. Specifically, Map 4B shows household access to piped-in water and Map 4C shows individual lack of access to water at home for washing hands.



**Figure 30: Map showing Piped-in water in Senegal**



**Figure 31: Map showing locations with no water for hand washing in Senegal**

## Exports

In 2019, Senegal exported over 130 million kilograms of rice, totaling 50.8 million US Dollars, as shown in **Table 59**. Rice exports have steadily increased in both value and quantity since 2017, as shown in **Table 60**. Compared to 2018, *Chart 4A* shows that Senegal rice exports increased by 14% in value and 15% in quantity.

Senegal exports of mango (including guavas and mangosteens) have ranged between 13.6 million and 16.4 million US Dollars in value, and between 16 million and 18.5 million kilograms in quantity. Compared to 2018, the quantity of mangoes exported by Senegal fell by 13% and the value decreased by 4% in 2019.

Of the past three years, apparel exports were highest at 1 million US Dollars in 2017 before declining in 2018. In 2019, the value of apparel exports increased by 46% compared to 2018.

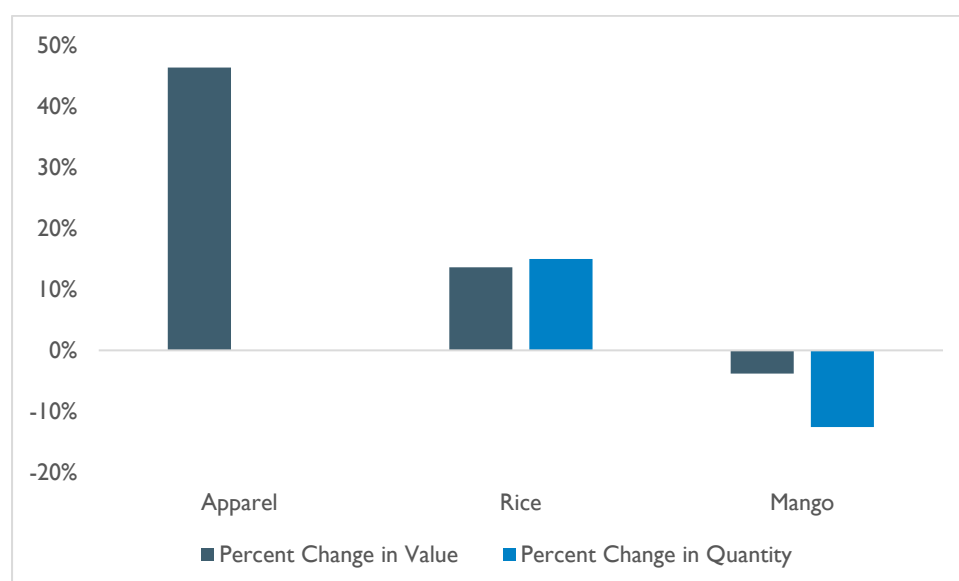
**Table 60: Export Value and Quantity of Key Value Chains in 2019**

Value Chain	Description	2019 Value (USD Thousand)	2019 Quantity (Kg)
<b>Apparel</b>	Apparel and clothing accessories	641	NA
<b>Rice</b>	Rice	50,822	130,290,633
<b>Mango</b>	Fruit, edible; guavas, mangoes and mangosteens, fresh or dried	15,802	16,187,270

**Table 61: Export Value and Quantity of Key Value Chains in 2018 and 2017**

Value Chain [1]	Description	2018 Value (USD Thousand)	2018 Quantity (Kg)	2017 Value (USD Thousand)	2017 Quantity (Kg)
<b>Apparel</b>	Apparel and clothing accessories	438	NA	1,162	NA
<b>Rice</b>	Rice	44,738	113,316,031	31,441	84,215,151
<b>Mango</b>	Fruit, edible; guavas, mangoes and mangosteens, fresh or dried	16,427	18,510,938	13,664	16,366,579

Source: International Trade Center – Trade Map, UN Comtrade Database

**Note 1:** There were no export values reported for millet or WASH technologies.**Figure 32: Percent Change in Exports (2018 to 2019)**

According to the US Department of Commerce, the value of AGOA imports of agricultural products to the US from Senegal was 32,541,000 US Dollars in 2018, an increase from 5,058,000 US Dollars in 2017 and 77,000 US Dollars in 2016. More detailed statistics on AGOA imports from Senegal are provided in **Table 61**. In 2019, AGOA imports of apparel from Senegal totaled 646 thousand US Dollars. By comparison, AGOA imports of rice and millet peaked at 13 thousand US Dollars in 2017 and 15 thousand US Dollars in 2018, respectively.

**Table 62: Value of AGOA Imports by the United States (USD thousand)**

VALUE CHAIN [1]	2016	2017	2018	2019
<b>Rice [2]</b>	4	13	2	0
<b>Millet [3]</b>	0	0	15	0
<b>Apparel [4]</b>	0	0	0	646

Source: Census Bureau, US Department of Commerce

**Note 1:** No AGOA imports by the US from Senegal of mangoes were reported from 2016 to 2019.**Note 2:** This category includes cereals NESOI, such as wild rice.**Note 3:** Millet excludes seed.**Note 4:** Apparel includes clothing, national flags from textile materials, and footwear.

## Cote d'Ivoire (Ivory Coast)

Agriculture is the main economic activity of Cote d'Ivoire<sup>65</sup>. The sector employs two-thirds of the population and represents 30% of the country's GDP and 70% of its export earnings<sup>66</sup>. Rice, yam, cassava, plantain, maize and vegetables are the main food crops grown, predominantly by smallholder farmers. Coffee, cocoa, cashew nuts and tobacco are important export commodities in the country. Among the key value chains, Côte d'Ivoire exported more than 1 billion US Dollars in cocoa and cashew in 2018. As Table 3A shows, cocoa exports equaled about 3.2 billion US Dollars and totaled about 1.5 billion kilograms in 2018. This reflects a 1% increase in quantity and a 7% decrease in value compared to 2017, as shown in Chart 3A. Similarly, Côte d'Ivoire exported 8% more cashews (by net weight) for a 5% decrease in value, relative to 2017. While the value of apparel and mango exported was relatively less, both value chains saw an increase in export value between 2017 and 2018. The value of apparel exports increased by 52% and the value of mango exports increased by 18%.

**Table 63: Export Quantity and Value of Key Value Chains**

Value Chain	Description	2018 Value (USD Thousand)	2018 Quantity (Kg)	2017 Value (USD Thousand)	2017 Quantity (Kg)
<b>Apparel</b>	Apparel and clothing accessories	2,332	N/A	1,537	N/A
<b>Cocoa</b>	Cocoa beans; whole or broken, raw or roasted	3,253,067	1,522,964,787	3,505,214	1,508,130,215
<b>Cashew</b>	Nuts, edible; cashew nuts, fresh or dried	1,153,520	664,063,247	1,219,647	615,447,179
<b>Mango</b>	Fruit, edible; guavas, mangoes and mangosteens, fresh or dried	26,559	40,301,117	22,484	41,138,526

Source: International Trade Center – Trade Map, UN Comtrade Database

### Cocoa beans

Cote d'Ivoire has long been at the forefront of global cocoa production. Despite the industry being fraught by occasional challenges, it has steered the global output for more than 30 years. Ivory Coast supplies 30% of the cocoa beans for the chocolate market. The cocoa sector accounts for about 40% of the country's exports, is a vital component of the country's GDP, and the engine of the Ivorian agricultural industry. The country is also renowned as the biggest producer of cashew nuts.

Although there was some inconsistency in the export volumes of cashew and cocoa beans, Cote d'Ivoire's targeted commodities, production of both products consistently grew over the period 2010 to 2017. Cocoa bean production fluctuated between 2010 and 2017. Production volume fell in 2012 and 2016 from 1,511,255 tons in 2011 to 1,485,882 in 2012 and from 1,796,000 tons in 2015 to 1,634,000 tons in 2016. Over the same period, exports of cocoa beans rose from 790,912 tons in 2010 to 1,510,082 tons in 2017. Among the targeted commodities, cocoa beans are Cote d'Ivoire's biggest export, with over 70% of production exported.

Although Cocoa is grown in other West African countries, none has surpassed the production levels of Cote d'Ivoire and the country continues to dominate global cocoa production. Several factors account for this. First, Cote d'Ivoire has the most favorable of soil and temperature conditions relative to other West African countries and the Central American countries (from whence it came)<sup>67</sup>. Cocoa is a tropical plant that needs to be planted in a forest area and requires a relatively stable temperature of at least 20°C in a mildly windy area. Also, it requires a loose surface soil in areas with fewer rocks to allow the cocoa roots to spread out further and deeper to encourage a considerable yield. This also coupled with favorable export policies, beneficial premium sale agreements with cocoa buyers, competition among growers, deforestation, and prevalence of child labor, has ensured cocoa production increased over time.

### Cashew nuts

After cocoa and refined petroleum products, cashews are Cote d'Ivoire's third-ranking export. Ivory Coast's cashew nut production accounts for 23% of the world's cashew supply. Cashew nut production

<sup>65</sup> <http://www.fao.org/3/y4632e/y4632e0b.htm>

<sup>66</sup> <http://www.new-ag.info/en/country/profile.php?a=2317>

<sup>67</sup> De Planhol (1947) 'Le cacao en Côte d'Ivoire: Etude de géographie régionale'. *L'information Géographique* 11(2) :50–57.

increased gradually from 380,000 tons in 2010 to 711,000 tons in 2017, although production fell in 2016 to 650,000 tons from 703,000 in the previous year. Exports of cashew rose from none to 8,141 tons between 2010 to 2017. A major contributing factor behind the sustained growth in cashew nut production has been the competitiveness of the product market structure. The crop has continuously received promotion from the country's reforestation agency since democratic independence.<sup>68</sup> The industry initially benefitted from the government's regional development policies, which brought development to the northern part of the country (where most of the country's cashew farming is done). The upward trend in the volume of production evident between 2010 and 2017 can be attributed to a host of factors, including favorable price incentives, which encouraged more farmers to enter the industry, as well as the time lag between the time of planting and the time when the tree comes into production. Depending on tree density and orchard maintenance, a cashew tree reaches peak production between its 10th and 15th years.<sup>69</sup> Furthermore, the cashew industry experienced a reform in 2013, which took a market-oriented approach with regards to pricing. It focused on improving the quality and quantity of cashew nuts, increasing transparency in marketing, and enforcing floor prices. To ensure enforcement of the floor price policy, the regulatory authority established a comprehensive receipt system, which traces revenue paid, and a stabilization fund to guarantee producers the floor price when market conditions drive the price down below the floor price.<sup>70</sup>

**Table 64: Cote d'Ivoire's production and export volumes (tons)**

Cote d'Ivoire		2010	2011	2012	2013	2014	2015	2016	2017
Cashew nuts	Export qty	0**	1,490	2,514	4,440	5,921	6,661	8,182	8,141
	Production qty	380,000	393,000	450,000	513,289	550,000**	703,000**	650,000	711,000
Cocoa beans	Export qty	790,912	1,073,282	1,011,631	813,891	1,117,000	1,285,988	1,055,636	1,510,082
	Production qty	1,301,347	1,511,255	1,485,882	1,448,992	1,617,841*	1,796,000	1,634,000	2,034,000

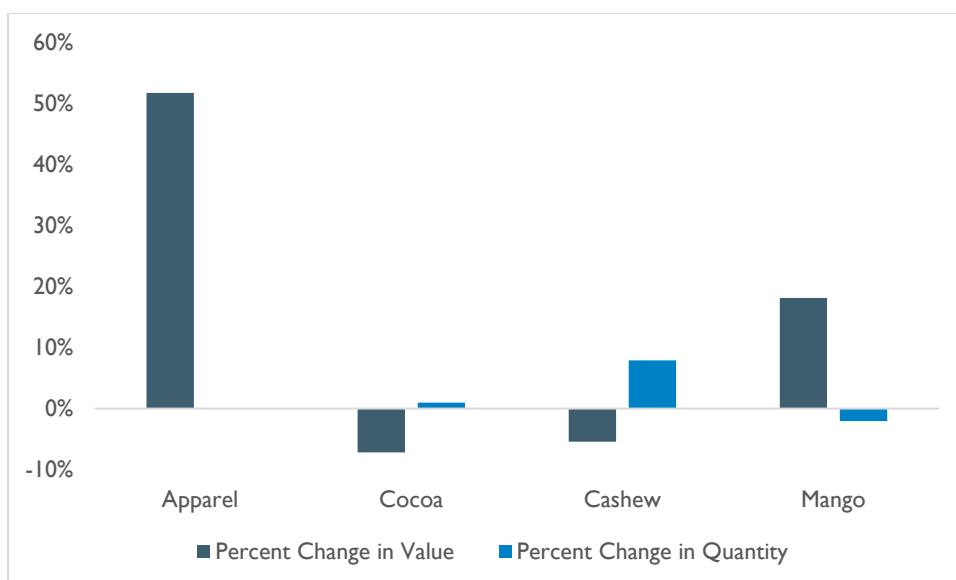
\*Unofficial data/figure

\*\*FAOSTAT estimates/Estimated data using trading partners database/FAO data based on imputation methodology

<sup>68</sup> Sama, M. and S. Koné (2002), 'Cultures de rapport et économies urbaines. Diversification et opportunités nouvelles dans la zone cotonnière'. In Y-F Fauré & P.

<sup>69</sup> Koné, M. (2010), *Analysis of the Cashew Sector Value Chain in Côte d'Ivoire*. Eschborn, GTZ. Available at: <https://agriknowledge.org/downloads/5q47rn75s>.

<sup>70</sup> Bassett Thomas, J. (2017) 'Le boom de l'anacarde dans le bassin cotonnier du Nord ivoirien. Structures de marché et prix à la production'. *Afrique contemporaine* (No. 263–264), pp. 59–83 Available at: [www.cairn.info/revue-afrique-contemporaine-2017-3-page-59.html](http://www.cairn.info/revue-afrique-contemporaine-2017-3-page-59.html)



**Figure 33: Percent Change in Exports (2017 to 2018)**

According to the US Department of Commerce, the value of AGOA imports of agricultural products to the US from Côte d'Ivoire was 7,465,000 USD in 2018, an increase from 819,000 USD in 2017 and 89,000 USD in 2016. More detailed statistics on AGOA imports from Côte d'Ivoire are provided in **Table 64**. As with overall exports, AGOA imports of cocoa and cashew were higher than for apparel and mango in recent years.

**Table 65: Value of AGOA Imports by the United States (USD thousand)**

Value Chain	2016	2017	2018	2019
Apparel [1]	5	-	3	-
Cocoa [2]	-	249	6,632	270
Cashew [3]	-	-	168	240
Mango [4]	-	-	31	-

Source: Census Bureau, US Department of Commerce

**Note 1:** This includes: Printed certified hand-loomed plain weave fabrics of cotton, 85% or more cotton by weight, weighing more than 100 g/m<sup>2</sup> but not more than 200 g/m<sup>2</sup>; Products NESOI of plaiting materials (not vegetable), bound together in parallel strands or woven, in sheet form, NESOI.

**Note 2:** This includes: Cocoa paste, wholly or partially defatted; Cocoa powder, not containing added sugar or other sweetening matter; Chocolate and preps with cocoa, NESOI, over 2Kg but not over 4.5kg and not over 65% sugar, NESOI.

**Note 3:** This includes more than just cashew. Specifically, these statistics reflect AGOA imports for fruit and nuts NESOI, including mixtures containing nuts, provisionally preserved, but not for immediate consumption.

**Note 4:** These statistics reflect dried guavas and mangosteens, in addition to mango.

### Average Sales

To estimate average annual sales among firms working in the target sectors, this report used data from the 2017 World Bank Enterprise Survey. It is important to note that the estimates presented below for food, apparel, and cocoa had small sample sizes and wide confidence intervals. Overall, the average firm (with at least 5 employees) in Côte d'Ivoire makes about 4.3 million US Dollars in annual sales, though it is worth emphasizing there is considerable variation among sampled firms. Average annual sales were much lower – 256 thousand US Dollars – among the sampled firms engaged in apparel. The average sales figure was much higher – more than 24 million US Dollars – for sampled firms engaged in cocoa, including the production, retail sale, and export of raw cocoa, and finished or semi-finished products.

**Table 66: Average Annual Sales Among Firms**

VALUE CHAIN	AVERAGE ANNUAL SALES (USD)
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<b>National [1]</b>	4,353,671
<b>Food [2]</b>	25,900,000
<b>Apparel [3]</b>	256,168
<b>Cocoa [4]</b>	24,200,000
Source: World Bank Enterprise Survey, 2017	

**Note 1:** The Enterprise Survey is designed to focus on small, medium, and large firms. As a result, this average does not reflect micro firms (firms with fewer than 5 employees).

**Note 2:** There are a few firms in the sample that reported extremely high sales values, such as a large beverage firm manufacturing and selling beer, water, and other bottled beverages. The sample size is relatively small and reduces the precision of this estimate.

**Note 3:** This includes retail sale and manufacturing of clothing. The sample size of firms in apparel that reported sales is small (fewer than 10), so this value is unweighted and reflects the sample only and may not provide a precise estimate of average sales among apparel firms more broadly.

**Note 4:** This includes production, retail sale, export, and semi-finished products. The sample size of firms in cocoa that reported sales is small, so this value is unweighted and reflects the sample only and may not provide a precise estimate of average sales among cocoa firms more broadly.

## Burkina Faso

In 2019, Burkina Faso exported more than 152.5 million kilograms of edible nuts, oil seeds, and oleaginous fruits, including shea, value at about 66.5 million US Dollars, as shown in **Table 66**. The value of dates, figs, pineapples, avocados, guavas, mangoes, and mangosteens exported was 23.3 million US Dollars in 2019, a slight decrease compared to 2018, as shown in **Table 67**.

In terms of livestock, Burkina Faso exported 991 thousand US Dollars of live bovine animals, sheep, and goats in 2019, as well as 19 thousand US Dollars of meat and related products.

Lastly, the value of onion exports has increased steadily from 443 thousand US Dollars in 2017 to 651 thousand US Dollars in 2019. Over this period, the quantity of onion exports has fluctuated from a high of 5.7 million kilograms in 2018 to a low of 5.3 million kilograms in 2017.

**Table 67: Export Value and Quantity of Key Value Chains in 2019**

VALUE CHAIN	DESCRIPTION	2019 VALUE (USD thousand)	2019 QUANTITY (Kg)
<b>Mangoes</b>	Dates, figs, pineapples, avocados, guavas, mangoes and mangosteens; fresh or dried	23,338	8,931,000
<b>Onions</b>	Vegetables, alliacious; onions and shallots, fresh or chilled	651	5,486,000
<b>Meat [1]</b>	Meat and edible offal, salted, in brine, dried or smoked; edible flours and meals of meat/meat offal	19	95,000
<b>Livestock</b>	Live bovine animals, sheep, and goats	991	1,797,000
<b>Shea [2]</b>	Other oil seeds and oleaginous fruits, whether broken	66,535	152,509,000
Source: International Trade Center - Trade Map			

**Note 1:** No data was available for meat, livestock, or shea in 2018 or 2017.

**Note 2:** No export data was available for shea specifically. These statistics exclude edible nuts, olives, soya beans, groundnuts, copra, linseed, rape or colza seeds, sunflower seeds, cotton seeds, melon seeds, palm nuts and kernels, and sesamum seeds.

**Table 68: Export Value and Quantity of Key Value Chains in 2018 and 2017**

Value Chain	Description	2018 Value (USD Thousand)	2018 Quantity (Kg)	2017 Value (USD Thousand)	2017 Quantity (Kg)
Mangoes	Dates, figs, pineapples, avocados, guavas, mangoes and mangosteens; fresh or dried	24,100	8,949,045	15,052	7,328,746
Onions [1]	Vegetables, alliacious; onions and shallots, fresh or chilled	595	5,700,000	443	5,345,100
Source: UN Comtrade Database					

**Note 1:** For 2017, statistics for onions also includes: onions, whole, cut, sliced, broken or in powder but not further prepared, dried



In 2018, AGOA imports by the United States of agricultural products from Burkina Faso totaled 587 thousand US Dollars. This represents a slight decrease compared to the 720 thousand US Dollars in AGOA imports of agricultural products in 2017, but a large jump from the 17 thousand US Dollars imported in 2016. Note that a more detailed breakdown of AGOA imports by the United States across the targeted value chain was not available for Burkina Faso.

## Niger

Besides the rainfed crops produced in the Republic of Niger, the government has endeavored to grow onions, most notably using irrigation. Most of Niger's onion production is an irrigation-fed farming activity taking place in the Agadez, Diffa, Dosso, Maradi, Niamey, Zinder, Tahoua, and Tillabery regions of the country. Onions constitute the country's second most important export product after uranium, making Niger the largest exporter of onions in West Africa. Niger exports roughly two-thirds of its harvests. The country grows mostly violet De Galmi, the red onion, and exports mainly to Ghana and Asia.

Onion production rose consistently over the last eight years, from 366,840 tons to 1,159,035 tons, unlike shea nuts, over the same period. Onion importation increased from 17 tons in 2010 to 103 tons in 2016. The onion importation was highest in 2014 at 210 tons. Only 2017 data was available for shea nut importation at 692 tons. Onions remain Niger's biggest export among its targeted commodities, with close to 30% of the produced quantity exported. An increase in onion prices has provided favorable price incentives for local producers, which in turn has attracted more farmers and fueled more production.

## Exports

According to the International Trade Center, the value and quantity of exports by Niger across key value chains were lower in 2019 compared to 2018. As shown in **Table 68**, among the targeted value chains, onion exports were highest at 27 thousand US Dollars or 1.2 million kilograms in 2019. Comparing 2019 exports to those in 2018 and 2017, onion exports are consistently relatively higher than exports for the other value chains, as shown in **Table 69**.

**Table 69: Export Value and Quantity of Key Value Chains in 2019**

VALUE CHAIN	DESCRIPTION	2019 VALUE (USD thousand)	2019 QUANTITY (Kg)
<b>Shea [1]</b>	Oil seeds and oleaginous fruits, whether broken	1	6,000
<b>Livestock [2]</b>	Live sheep, goats, and poultry	6	1,000
<b>Onion</b>	Fresh or chilled onions and shallots	27	1,211,000
Source: International Trade Center – Trade Map			

**Note 1:** This excludes edible nuts, olives, soya beans, groundnuts, copra, linseed, rape or colza seeds, sunflower seeds, palm nuts and kernels, cotton, castor oil, sesamum, mustard, safflower, melons, and poppy seeds.

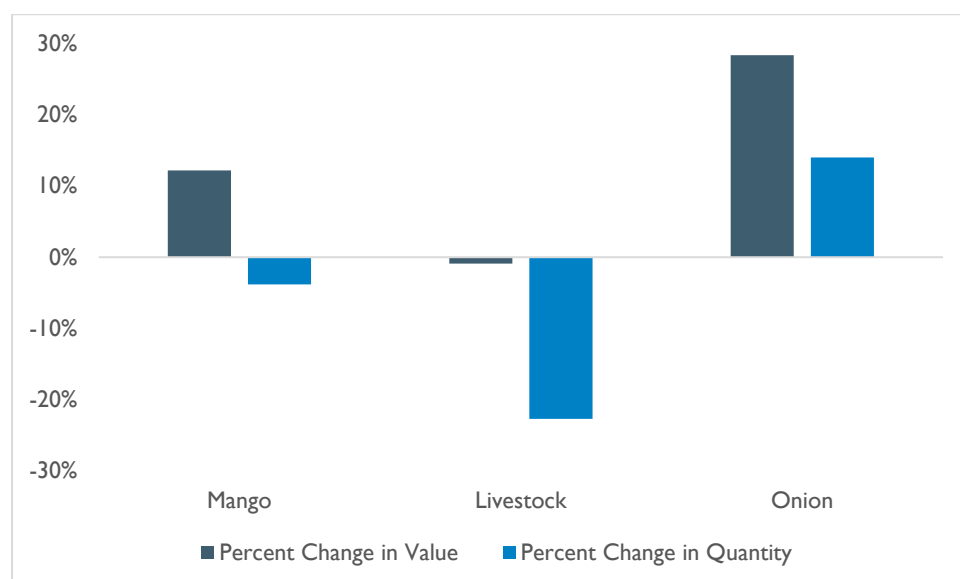
**Note 2:** No values for meat exports of poultry, eggs, goats, or sheep were reported for 2017 – 2019.

**Table 70: Export Value and Quantity in 2018 and 2017**

Value Chain	Description	2018 Value (USD Thousand)	2018 Quantity (Kg)	2017 Value (USD Thousand)	2017 Quantity (Kg)
<b>Shea</b>	Oil seeds and oleaginous fruits, whether broken	59	652,000	2	4,000
<b>Mango [3]</b>	Fresh or dried guavas, mangoes and mangosteens	46	126	41	131
<b>Livestock</b>	Live sheep, goats, and poultry	1,886	2,240,000	1,903	2,898,000
<b>Onion</b>	Fresh or chilled onions and shallots	16,011	116,768,000	12,472	102,416,000
Source: International Trade Center – Trade Map					

**Note 3:** No values for mango exports were reported for 2019.

The percent increase in value and quantity exported is particularly high for oil seeds and oleaginous fruits (including shea) between 2017 and 2018. *Chart 6A* shows the percent change between 2017 and 2018 for the other value chains. For mango, the value of exports increased by 12% while the quantity decreased by 4% over this period. Livestock exports decreased by 1% in value and 23% in quantity. Lastly, onion exports increased by 28% in value and 14% in value from 2017 to 2018.



**Figure 34: Percent Change in Exports from 2017 to 2018**

The US Department of Commerce did not report any AGOA imports by the United States from Niger of agricultural products, forest products, or textiles and apparel between 2017 and 2019.

### Comparison of trade in African regions

Despite being responsible for approximately 35% of the region's GDP, making up 60% of the active labor force, and having an abundance of numerous natural and human resources, the agricultural sector of the West African region lags behind its peers in Africa and also across the globe. A comparison of the regional agricultural trade between the different parts of the continents with one of their biggest trading partners, the US, highlights the issue at hand.

**Table 71: Differences in regional trade in agricultural products with the US**

Regions	Category	2016	2017	2018	2018	2019
<b>BNLS</b>	Import by US	302	494	964	324	717
<b>CEMAC</b>	Import by US	35,716	35,214	29,393	9,961	13,790
<b>COMESA</b>	Import by US	463,779	551,568	535,821	240,458	238,225
<b>EAC</b>	Import by US	226,155	289,346	273,264	122,950	101,492
<b>ECOWAS</b>	Import by US	9,790	16,714	40,926	17,101	30,125
<b>SACU</b>	Import by US	309,965	362,693	402,586	134,750	177,061
<b>SADC</b>	Import by US	479,698	527,981	567,586	216,994	267,048

Source: AGOA

\* Value in US\$ ('000s)

Although West African agricultural trade with the US has increased over the last half a decade, the figures show that the region still lags in terms of value compared to trade between the US and other African regions. Exports of agricultural products to the US from ECOWAS rose from US\$ 9,790,000 in 2016 to US\$ 30,125,000 in 2019 year-to-date, which represents an approximately 207% increase in trade. Early trade volume as of 2016 shows how impressive the turnaround is. However, despite this turnaround and fall in trade with the US for most African regions, West African agricultural trade with the US still lags behind the COMESA, EAC, SACU, and SADC regions.

A host of factors affects the agricultural sector in the region, most notably the neglect and lack of attention in previous years, and this all ultimately impacts the productivity of the industry. Agricultural productivity in the area has been low and often worsened by the purchasing power imbalance, persistent vulnerability to natural and human-made disasters, over-dependence on other sectors of the economy for growth, increased competition from other large emerging economies, and increasing volatility of the international market environment. The region's agricultural productivity is impeded by limited access to affordable and high-quality inputs, lack of information on best practices and improved agricultural technologies, and a neglected and underdeveloped linkage between farmers and the markets.

The US government, through the FTF Initiative, supports the CAADP 2014 Malabo Declaration, which aims to sustain the annual agricultural sector GDP growth rate of 6% among all signatory member states to 2025. The FTF Initiative aligns with the ECOWAS regional agricultural plan focusing on increased agricultural productivity, improved regional trade, and enhanced institutional capacity.

## West Africa Regional

**Table 72: Investments (credit) to agriculture (million US\$)**

Country	2010	2011	2012	2013	2014	2015	2016	2017
Burkina Faso	0	62.38	40.17	82.20	89.35	58.37	124.08	164.91
Ghana	342.25	355.31	351.53	353.87	326.62	315.21	33,0.13	353.09
Cote d'Ivoire	0	79.33	81.90	160.08	223.34	272.28	319.04	413.39
Niger	0	5.72	6.60	8.39	11.19	4.61	5.13	14.09
Senegal	0	82.64	65.64	69.18	103.12	93.47	82.06	113.38

In West Africa, farming is rain-reliant, mostly rudimental, uses seeds of poor quality, and suffers from an inadequate water supply and management, as well as low soil fertility and fertilizer use. One way to transform agricultural productivity and increase production is increased access to credit to farmers as well as the volume (variety of credit options) available to farmers. Investment in the West African agricultural sector has risen in the last decade, and this could explain the increase in production and subsequent increase in export/trade capacity over the previous five years. Over the previous eight years, investment in agriculture has increased in Burkina Faso, Ghana, Cote d'Ivoire, Niger, and Senegal. However, this was by no means a year-on-year increase, except for Cote d'Ivoire. For Burkina Faso, investment fell in 2012 and 2015 relative to the previous years. Similarly, agricultural investment fell in 2012, 2014, and 2015 in Ghana, while in Niger, a reduction was only recorded once, in 2015. Senegal's investment in agriculture fell three times over the eight years, in 2012, and a year-on-year fall in 2015 and 2016. Cote d'Ivoire had the most increase in credit available to the agriculture sector over the eight years, while Niger had the least growth in investment.



# Discussion, Conclusion and Recommendations

Analysis of the survey data collected illustrated certain challenges affecting smallholder farmers in Nigeria. These challenges, and recommendations for addressing these challenges, will be discussed in the next section.

## Poverty among smallholder farmers

The African Development Bank (AfDB) notes that agriculture supports the livelihoods of 90% of Africa's population,<sup>71</sup> and that the slow growth rate of agricultural productivity has been widely considered a key cause of poverty among smallholder farmers in rural areas of sub-Saharan Africa. Despite being a major employer of labor in Nigeria, the agricultural sector still faces numerous challenges and poverty remains rampant among many farmers. A substantial percentage of sampled farmers live in poverty, especially in the northern states of Benue, Kaduna, Kebbi, and Niger, which have between a third and half of their respondents living in poverty. Many respondents reported receiving below Nigeria's minimum wage annually.

Different factors were observed to contribute to this situation. Key among them is education. The inverse relationship between education and poverty is well established and research shows that education has a strong relationship with the earnings of farmers.<sup>72</sup> During this survey, the states that recorded the highest levels of poverty also had the highest numbers of farmers with little or no education. A similar survey done in southern Nigeria by Akpan and colleagues in 2016 noted the same trend: farmers with higher levels of formal education were less poor than those with lower levels of formal education.<sup>73</sup> Since many of the farmers surveyed were in rural communities, it is therefore important to consider educating the inhabitants of these areas as a method of alleviating poverty in the area. Evidence suggests that even adult education can have a significant impact on agricultural productivity.<sup>74</sup>

Lack of infrastructure such as storage facilities and good road networks, as well as the absence of standardized pricing for products, means that farmers usually rely on middlemen to buy and transport their goods. As a result, they are more susceptible to exploitation, causing farmers to make very little profit and sometimes run at a loss. A study conducted by the News Agency of Nigeria (NAN) observed similar trends as middlemen were noted to maximize profits by underpricing farmers and over-charging consumers.<sup>75</sup>

## Social inclusion

As with many other sectors, gender inequality is still pervasive among farmers in Nigeria. According to Anderson and colleagues, men dominate the majority of smallholder households in Nigeria, leaving little room for women and youth to participate in decisions regarding agriculture.<sup>76</sup> This was also observed in this study, where only 20% and 26% of respondents were women and youths, respectively. Despite accounting for half the agricultural labor force, women's contribution to agriculture largely goes unnoticed and, for the majority of the women sampled, their harvests are expected to be for household consumption.<sup>77</sup> As observed above, women have lower socioeconomic status and their productivity is significantly hampered by limited access to land, credit facilities, and technology, as well as a lack of

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<sup>71</sup> Mukasa AN, Woldemichael AD, Salami AO, Simpasa AM. Africa's Agricultural Transformation: Identifying Priority Areas and Overcoming Challenges. 2017;8(3):16.

<sup>72</sup> [www.interestjournals.org/articles/impact-of-education-on-farmers-earning-a-house-hold-survey-data-analysis.pdf](http://www.interestjournals.org/articles/impact-of-education-on-farmers-earning-a-house-hold-survey-data-analysis.pdf)

<sup>73</sup> Akpan, S., Udoh, E., and Patrick, I. (2016) 'Sustaining Small Scale Farming: Evidence of Poverty and income Disparity among Rural Farming Households in South-South Region of Nigeria'.

<sup>74</sup> Okpachu, A.S., Okpachu, O.G., and Obijesi, I.K. (2013) 'The Impact of education on agricultural productivity of small-scale rural female maize farmers in Potiskum LG, Yobe State: A panacea for rural economic development in Nigeria'. Available from: [http://ijsk.org/uploads/3/1/1/7/3117743/3\\_agricultural\\_productivity.pdf](http://ijsk.org/uploads/3/1/1/7/3117743/3_agricultural_productivity.pdf)

<sup>75</sup> <https://nnn.com.ng/how-middlemen-undermine-nigerias-food-security-programme-nan-survey/>

<sup>76</sup> Anderson, J., Collins, M., Musiime, D., and Thiam, M. (2017) 'National Survey and Segmentation of Smallholder Households in Nigeria'.

<sup>77</sup> Ogunlela, Y. and Mukhtar, A. (2009) 'Gender Issues in Agriculture and Rural Development in Nigeria: The Role of Women'. ResearchGate [accessed 23 March 2020]. Available from: [www.researchgate.net/publication/237662696\\_Gender\\_Issues\\_in\\_Agriculture\\_and\\_Rural\\_Development\\_in\\_Nigeria\\_The\\_Role\\_of\\_Women](http://www.researchgate.net/publication/237662696_Gender_Issues_in_Agriculture_and_Rural_Development_in_Nigeria_The_Role_of_Women)

bargaining power. This is a result of formal and traditional rules and exacerbated by the fact that intervention programs have failed to prioritize women and youth. Because many women do not own land or other assets, it is difficult to secure bank loans due to lack of collateral. Moreover, evidence shows that financial/credit markets are not gender or youth neutral, especially in rural areas.<sup>78</sup> Furthermore, the interest rates on loans have also been reported to discourage farmers (especially women) from taking such risks. Our findings also showed that women disproportionately lack access to resources and information because extension agents are overwhelmingly male. Consequently, women report lower productivity and sales when compared to men, leading to more poverty. Although there are limited studies around female smallholder farmers, a few are able to corroborate these findings. For example, studies in Ethiopia and Burkina Faso found that women's yield was 35% and 40% (respectively) lower than men.<sup>79</sup> The authors also note that restricted access to productive resources such as land, finance, and technology were the most likely reasons for the difference in productivity. The AfDB noted that women smallholder farmers in sub-Saharan Africa tend to be 25–30% less productive than men because they have limited access to quality inputs and financing and limited knowledge of modern agricultural practices.<sup>80</sup> Without intentional effort by the government and development partners to ensure gender equality in agriculture, the vicious cycle will continue.

Available data on the population of youth smallholder farmers suggest that the population is gradually declining. This survey had only 26% youth respondents, and other studies have shown that many youth are losing interest in agriculture because of the poverty associated with it and are fast migrating to urban areas in search of white-collar jobs.<sup>81</sup> This negatively impacts an already struggling agricultural sector. While youths generally face some of the same constraints of access to land and lack of finance as women do, female youths seem to be at an even further disadvantage when compared to their male counterparts. For a country with more than 60% of its population classed as youths, engaging the youth population in agriculture is critical to the transformation of the agriculture sector. By leveraging the size, energy, and enthusiasm of its youth, Nigeria could enjoy increased productivity, boost trade, and experience economic growth.

With a dire need for intensified efforts toward closing the social gap in agriculture, the picture is not all gloomy. Results from the qualitative study indicate that there is a gradual increase in awareness of the need to empower women and youth. Government and development partners have rolled out some initiatives promoting this gender and youth promotion in agriculture, such as some reported especially in Benue, Niger, Kebbi, and Ebonyi states, but there are far from enough. Since women make up about half of the agricultural workforce, eliminating the barriers that limit women's productivity will help to empower women, increase food security and income, reduce poverty, and contribute to the nation's economic growth.

## Other challenges

Another major challenge that farmers have noted is lack of finance and credit facilities to purchase the farm inputs and technology necessary to improve productivity. Many farmers do not have the capacity to practice mechanized farming due to lack of funds. According to the AfDB, this challenge cuts across other sub-Saharan African countries, undermining the emergence of a strong agriculture sector<sup>82</sup>. As highlighted above, farmers in rural areas are disadvantaged in terms of access to information and credit facilities. Lack of collateral and high interest rates continue to serve as a barrier to farmers accessing credit. As a result, farming is still largely done manually instead of mechanically. Lack of funds to purchase other inputs such as fertilizers, pesticides, improved seeds, and irrigation technology significantly affects productivity. For example, many farmers surveyed were wet season farmers, indicating the lack of ability to employ technologically advanced irrigation systems that can consistently guarantee yield. Even though our data showed that all farmers employed the use of at least one form of technology, the most common

<sup>78</sup> AfDB (2015) 'Economic Empowerment of African Women through Equitable Participation in Agricultural Value Chains'.

<sup>79</sup> Mukasa, A. and Salami, A. (2015) 'Gender productivity differentials among smallholder farmers in Africa: A cross-country comparison'. Available from: [www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/WPS](http://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/WPS)

<sup>80</sup> AfDB (2015) 'Economic Empowerment of African Women through Equitable Participation in Agricultural Value Chains'.

<sup>81</sup> Adekunle, O.A., Adefalu, L.L., and Oladipo, F.O. (2009) 'Constraints to Youths' involvement in Agricultural Production in Kwara State, Nigeria'. ResearchGate.

<sup>82</sup> <https://www.afdb.org/fileadmin/uploads/afdb/Documents/Knowledge/25120395-FR-ISSUES-AND-CHALLENGES-IN-FINANCIN-FINAL.PDF>

being the usage of fertilizer, the qualitative findings showed that many do not have access to mechanized farming.

Finally, in recent years, farmer–herder conflicts have become rampant in Nigeria. This had led to destruction of farmlands and products and even to loss of lives. Some respondents reported major losses because of such security issues. While the government has put some measures in place, insecurity continues to be a challenge for farming communities.

Interventions should explore how the government’s efforts in reducing if not eliminating farmers losses due to conflicts and security challenges can be enhanced. There are a few peace and conflict interventions and leveraging on these may be integral to a successful activity in at-risk states.

## **Conclusion**

More widespread recognition of some of these constraints has resulted in some improvements. NGOs have started to focus on addressing constraints by providing technologies and certain inputs and the government has kickstarted several initiatives to help farmers. However, most farmers remain left out in terms of accessing these initiatives. Ultimately, the government needs to take more definitive steps toward ensuring that credit facilities are made available for farmers and that these facilities are inclusive of women and youth to ensure inclusive sector growth. Efforts need to be geared toward ensuring access to land for women and youth and providing inputs and technologies for farmers at subsidized rates. Finally, purchasing prices across different value chains need to be standardized across different value chains to avoid middlemen exploiting farmers.

After a long period of neglect, West Africa’s agricultural sector seems to be back on the policy agenda of both governmental and non-governmental institutions. Although these policy pivots have not revolutionized the sector, they do signal an acceptance of the sector’s crucial role and impact on economic growth among policymakers across West Africa. These policy transformations have seen an increase in agricultural investment and credit available to farmers and an agricultural in production (albeit slowly) and international trade, most notably with the US. Nonetheless, production increases have varied among the states sampled, as well as across the target commodities of each country. For instance, on the one hand, maize and rice production in Nigeria has seen a marked increase in production capacity and volumes as a result of favorable government policy over the previous five years; other commodities, on the other hand, have seen a more gradual increase. Consumption of these target commodities remains high, establishing the need to supplement local production with imports. Although importation of agricultural commodities remains high because of the limited capacity of the sector to meet local demands adequately, exports of certain commodities such as cocoa and cashews have gradually risen.

The agricultural sector has enormous potential for alleviating poverty and boosting economic growth, but it continues to face critical challenges that stifle its potential. Low use of technology, low-quality fertilizer use, inadequate water supply, and low soil fertility are some of the largest constraints faced by farmers in the region. To ensure that the upward trend of transformation in the region’s agricultural sector continues and food insecurity is addressed, both governmental and non-governmental bodies must continue to strengthen agricultural institutions and increase investment and financial credit available to farmers. As data on the target commodities across the five West African countries in focus reveals, there is a correlation between investment over the last eight years and the volume of production.



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# Annex A: Outcome Indicators

Indicator Tabulation By State									
Indicators	Benue	Cross River	Delta	Ebonyi	Kaduna	Kebbi	Niger		
	N=152	N=186	N=157	N=101	N=353	N=303	N=253		
<b>EG.3.2-26:</b> Value of annual sales of producers and firms receiving USG assistance (in USD)	295.70	*406.07 **1,358.85	**2,761.90	1,570.52	186.22	694.37	559.65		
<b>EG.3.2-26:</b> Value of annual cost of production and firms receiving USG assistance (in USD)	219.70	*290.95 **418.15	**571.35	816.72	157.12	510.65	416.02		
<b>EG.3.2-26:</b> Value of annual profitability of firms receiving USG assistance (in USD)	84.82	*116.33 **941.79	**2,197.0	765.73	46.25	213.08	143.33		
<b>EG.3-10:</b> Yield of targeted agricultural commodities among program participants (tons/ha)									
<b>Rice</b>	2.11	3.07	-	3.13	-	3.08	2.72		
<b>Maize</b>	-	-	-	-	2.94	1.96	1.48		
<b>Cowpea</b>	-	-	-	-	0.94	1.28	-		
<b>Soybean</b>	0.57	-	-	-	1.43	0.81	-		
<b>Aquaculture</b>	-	18.18	7.32	-	-	-	-		
<b>EG.3.2-24:</b> Number of individuals in the agriculture system (crop farmers) who have applied improved management practices or technologies with USG assistance									
<b>Soil related fertility and conservation (%)</b>	77.63	50.98	-	98.02	92.35	92.08	66.80		
<b>Crop genetics (%)</b>	87.50	49.02	-	44.55	82.15	91.42	69.38		
<b>Cultural practices (%)</b>	76.32	76.47	-	57.43	81.02	79.21	64.82		
<b>Pest management (%)</b>	44.74	39.22	-	62.38	73.94	87.13	54.55		
<b>Other (%)</b>	48.03	52.94	-	43.56	47.59	69.98	64.43		
<b>Post-harvest handling and storage (%)</b>	38.82	21.57	-	13.86	32.86	65.68	18.58		
<b>Irrigation (%)</b>	0.66	17.65	-	0.00	7.37	19.47	7.91		
<b>Water management (%)</b>	0.00	13.73	-	5.94	0.28	1.32	2.37		
<b>EG.3.2-24:</b> Number of individuals in the agriculture system (aquaculture) who have applied improved management practices or technologies with USG assistance									
	<b>Pond fertilization (%)</b>	-	48.15	71.34	-	-	-	-	
	<b>Water quality checks (%)</b>	-	65.93	59.04	-	-	-	-	
	<b>Pond desilting (%)</b>	-	41.48	54.78	-	-	-	-	
	<b>Farm planning and record keeping (%)</b>	-	36.30	47.77	-	-	-	-	
	<b>Timely operations (%)</b>	-	24.44	28.66	-	-	-	-	
	<b>Pest and disease management (%)</b>	-	39.26	14.65	-	-	-	-	
	<b>Water harvesting (%)</b>	-	17.78	19.75	-	-	-	-	
	<b>Post-harvest handling</b>	-	17.78	17.83	-	-	-	-	
	<b>Fingerlings establishment/management (%)</b>	-	21.48	11.46	-	-	-	-	
	<b>Tidal monitoring (%)</b>	-	17.04	13.38	-	-	-	-	
	<b>Soil and water conservation (%)</b>	-	14.81	5.10	-	-	-	-	
	<b>Construction of bunds (%)</b>	-	-	-	-	-	-	-	

<b>EG.3.2-25:</b> Number of hectares under improved management practices or technologies with USG assistance (hectares)	<b>Crop genetics (ha)</b>	107.84	32.07	-	74.43	204.06	441.34	310.64
	<b>Cultural practices (ha)</b>	88.19	43.49	-	84.76	206.74	379.37	311.79
	<b>Soil fertility and conservation (ha)</b>	107.66	30.74	-	135.79	228.87	452.06	311.99
	<b>Pest management (ha)</b>	72.02	25.28	-	90.16	174.69	423.79	266.48
	<b>Irrigation (ha)</b>	1.12	8.52	-	0	16.57	76.68	37.49
	<b>Other (ha)</b>	0.00	5.62	-	12.08	0.73	3.76	15.98
	<b>Total (ha)</b>	376.83	145.72	-	379.22	831.66	1,777.12	1,254.37

Indicator Tabulation By Value Chain						
Indicators	Rice N=305	Maize N=303	Cowpea N=302	Soybean N=303	Aquaculture N=292	
1. <b>EG.3.1-c</b> Volume of imports of targeted agricultural commodities exported at a national level (based on latest available data) in 000 metric tons	1,800	400	NA	20,939	778	
2. <b>EG.3.2-26:</b> Value of annual sales of producers and firms receiving USG assistance (in USD)	1,254.70	384.27	389.56	264.08	2,350.56	
3. <b>EG.3.2-26:</b> Value of annual cost of production of firms receiving USG assistance (in USD)	719.69	365.62	319.99	193.13	573.55	
4. <b>EG.3.2-26:</b> Value of annual profitability of firms receiving USG assistance (in USD)	536.85	48.70	89.68	77.35	1,781.42	
5. <b>EG.3.10:</b> Yield of targeted agricultural commodities among program participants (tons/ha)	2.87	2.12	1.11	0.94	12.26	
6. <b>EG.3.2-24:</b> Number of individuals in the agriculture system who have applied improved management practices or technologies with USG assistance						
	87.54	87.79	97.75	72.28	-	
(a) Soil related fertility and conservation (%)						
(b) Crop genetics (%)	67.21	80.20	87.75	75.91	-	
(c) Cultural practices (%)	65.90	76.57	84.11	71.29	-	
(d) Pest management (%)	59.34	76.24	89.74	43.23	-	
(e) Other (%)	52.13	49.17	62.91	61.39	-	
(f) Post-harvest handling and storage (%)	31.48	35.97	51.66	29.05	-	
(g) Irrigation (%)	21.97	6.27	8.28	1.32	-	
(h) Water management (%)	5.25	0.66	1.32	0.66	-	

Indicator Tabulation By Gender		
Indicators	Male	Female
1. <b>EG.3.2-26:</b> Value of annual sales of producers and firms receiving USG assistance (USD) (in USD)	<b>N=1,126</b> 517.31	<b>N=379</b> 301.66

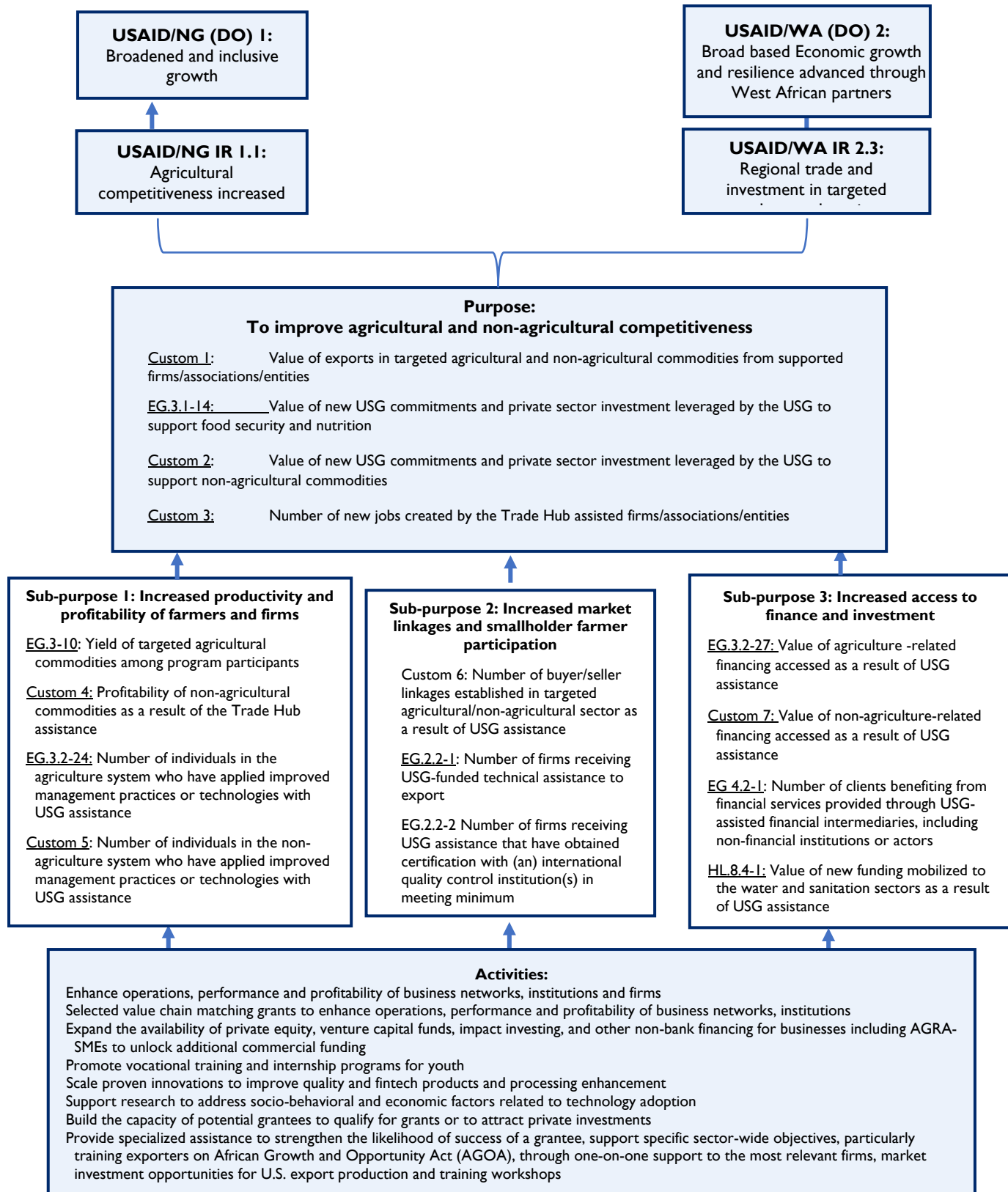
2.	<b>EG.3.2-26:</b> Value of annual cost of production and firms receiving USG assistance (in USD)	115.25	99.49
3.	<b>EG.3.2-26:</b> Value of annual profitability of firms receiving USG assistance (in USD)	176.88	78.75
4.	<b>EG.3-10:</b> Yield of targeted agricultural commodities among program participants (tons/ha) <b>Rice</b>	2.89	2.82
5.	<b>EG.3-10:</b> Yield of targeted agricultural commodities among program participants (tons/ha) <b>Maize</b>	2.24	1.71
6.	<b>EG.3-10:</b> Yield of targeted agricultural commodities among program participants (tons/ha) <b>Cowpea</b>	1.11	1.08
7.	<b>EG.3-10:</b> Yield of targeted agricultural commodities among program participants (tons/ha) <b>Soybean</b>	0.98	0.84

EG.3.2-24: Number of individuals in the agriculture system who have applied improved management practices or technologies with USG assistance Crop farmer	Soil related fertility and conservation (%)	84.59	81.67
	Crop genetics	78.82	74.60
	Cultural practices (%)	77.27	66.24
	Pest management (%)	67.63	65.59
	Other(%)	57.65	52.73
	Post-harvest handling and storage (%)	37.47	34.73
	Irrigation (%)	10.75	5.79
	Water management (%)	2.00	1.93
EG.3.2-25: Number of hectares under improved management practices or technologies with USG assistance. (Hectares) Crop farmers	Soil related fertility and conservation (ha)	1033.70	233.42
	Crop genetics (ha)	954.59	215.79
	Cultural practices (ha)	924.79	189.55
	Pest management (ha)	858.56	193.87
	Other (ha)	28.87	9.3
	Post-harvest handling and storage (ha)	-	-
	Irrigation (ha)	127.09	13.29
	Water management (ha)	-	-
EG.3.2-24: Number of individuals in the agriculture system who have applied improved management practices or technologies with USG assistance. Aquaculture farmers		N=224	N=68
	Pond liming (%)	66.96	63.24
	Pond fertilization (%)	62.05	55.88
	Water quality checks (for iron concentration, nitrites, acidity, etc.) (%)	56.70	57.35
	Pond desilting (%)	45.54	58.82
	Farm planning and record keeping (%)	40.63	48.53
	Timely operations (%)	28.13	19.12
	Pest and disease management (%)	29.46	17.65
	Water harvesting (%)	20.09	14.71
	Post-harvest handling (%)	17.41	19.12
	Fingerlings establishment/management (%)	16.96	13.24

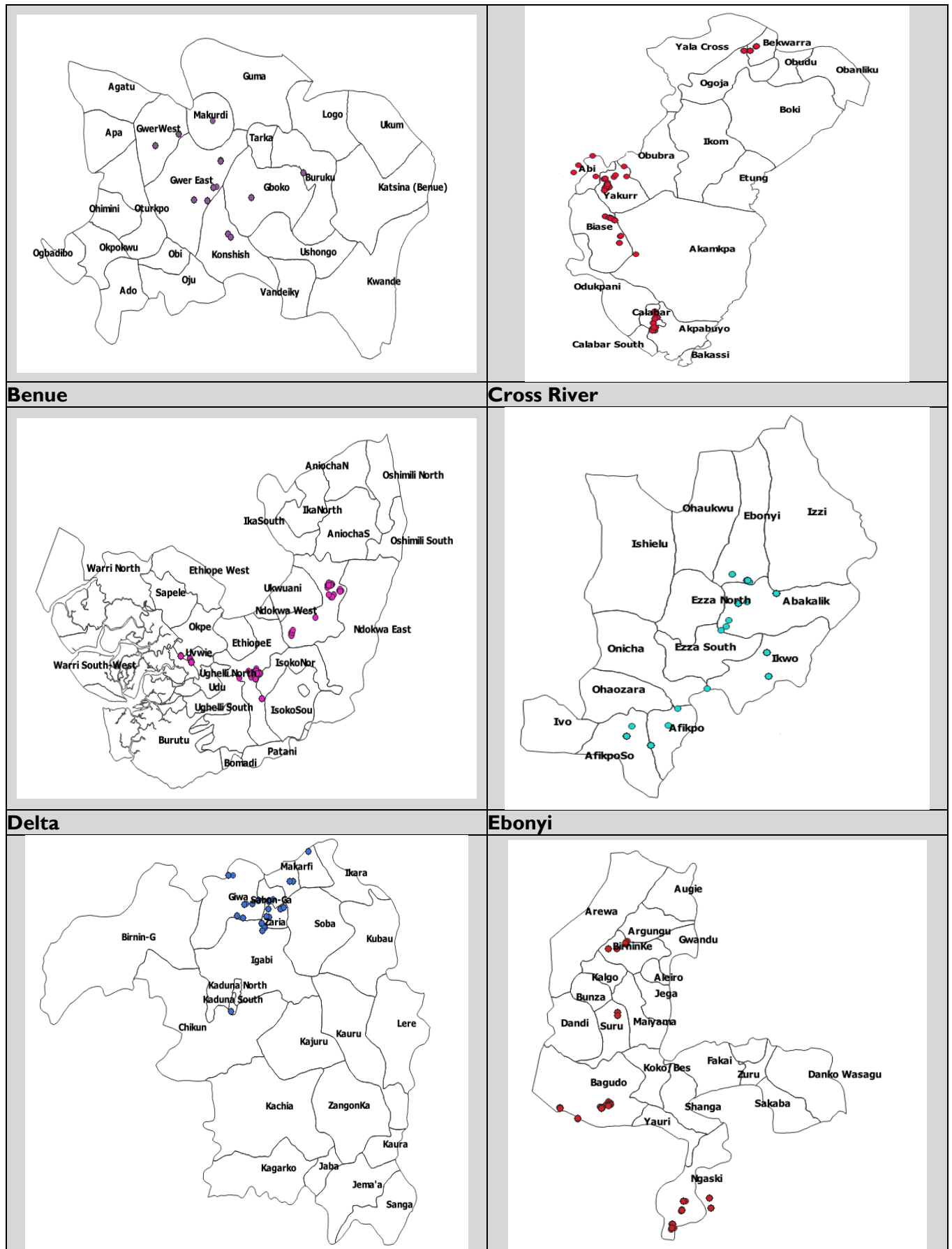
EG.3.2-24: Number of individuals in the agriculture system who have applied improved management practices or technologies with USG assistance Crop farmer	Soil related fertility and conservation (%)	84.59	81.67
	Tidal monitoring (%)	15.63	13.24
	Soil and water conservation (%)	10.27	7.35
	Construction of bunds (%)	6.25	4.41

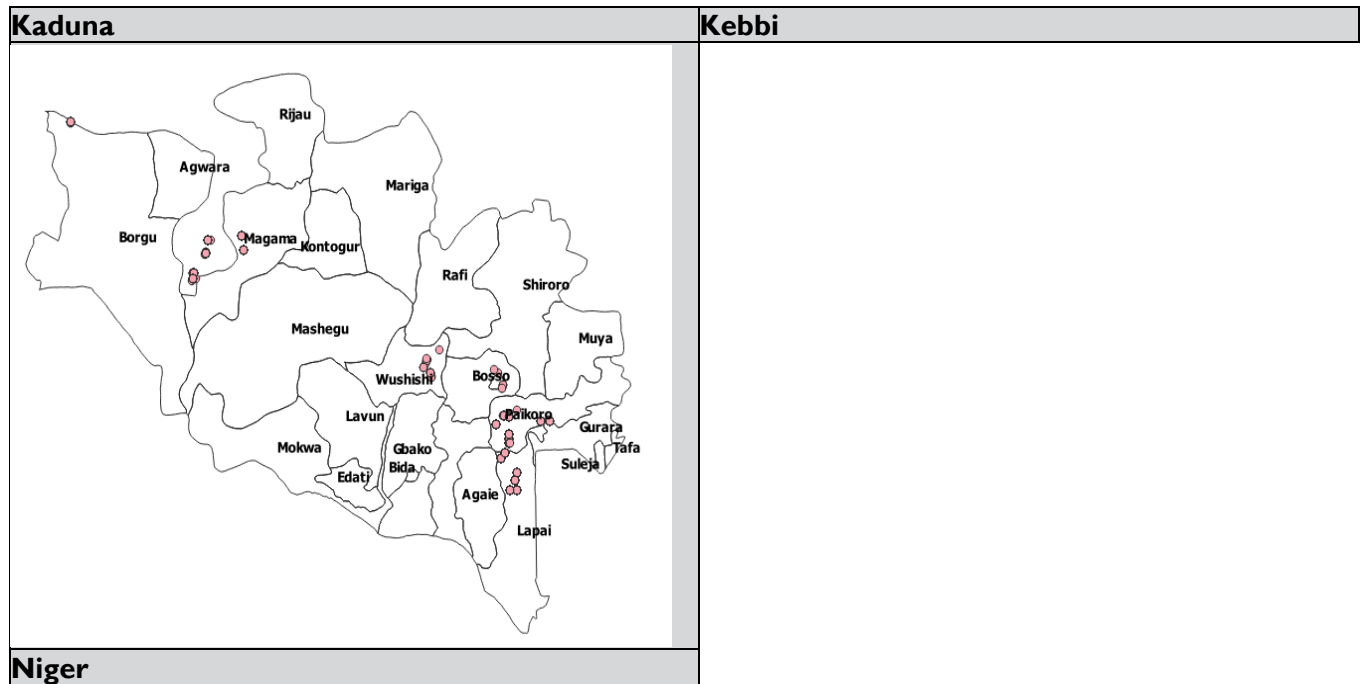


# Annex B: Logic model



## Annex C: Point map of locations visited in each state





## Annex D: Methodology

States	Aquaculture			Cowpea			Maize			Soyabean			Rice		
Districts	D1	D2	D3	D1	D2	D3	D1	D2	D3	D1	D2	D3	D1	D2	D3
Benue										101	-	-	51	-	-
Cross River	51	51	51										26	25	-
Delta	51	51	51												
Ebonyi													34	34	33
Kaduna				76	75	-	50	51	-	51	50	-			
Kebbi				75	76	-	50	51	-				25	26	-
Niger							50	51	-	50	-	51	26	25	-

**Table 2: Quantitative Sample Size Distribution by Districts**

- D1 – Senatorial District 1
- D2 – Senatorial District 2
- D3 – Senatorial District 3

The LGAs with more household farmers farming the specific products had more representation than those with less. The table below gives details of targeted value chains for specific LGAs.

**Table 3: Selection of LGAs**

States	Commodities			
	Rice		Soybean	
<b>Benue State</b>	<ul style="list-style-type: none"> <li>•Gboko</li> <li>•Gwer West</li> </ul>		<ul style="list-style-type: none"> <li>•Gwer East</li> <li>•Konshisha</li> </ul>	
<b>Cross River</b>	<b>Aquaculture</b> <ul style="list-style-type: none"> <li>•Biase</li> <li>•Yakkur</li> <li>•Calabar South</li> </ul>		<b>Rice</b> <ul style="list-style-type: none"> <li>•Bekwarra</li> <li>•Yakurr</li> </ul>	
<b>Delta</b>	<b>Aquaculture</b> <ul style="list-style-type: none"> <li>•Ughelli North</li> <li>•Ndokwa West</li> <li>•Warri South</li> </ul>			
<b>Ebonyi</b>	<b>Rice</b> <ul style="list-style-type: none"> <li>•Abakaliki</li> <li>•Ikwo</li> <li>•Afikpo South</li> </ul>			
<b>Kaduna</b>	<b>Cowpea</b> <ul style="list-style-type: none"> <li>•Zaria</li> <li>•Igabi</li> </ul>		<b>Maize</b> <ul style="list-style-type: none"> <li>•Giwa</li> <li>•Zaria</li> </ul>	<b>Soybean</b> <ul style="list-style-type: none"> <li>•Giwa</li> <li>•Makarfi</li> </ul>
<b>Kebbi</b>	<b>Cowpea</b> <ul style="list-style-type: none"> <li>•Zuru</li> <li>•Bagudo</li> </ul>		<b>Maize</b> <ul style="list-style-type: none"> <li>•Zuru</li> <li>•Bagudo</li> </ul>	<b>Rice</b> <ul style="list-style-type: none"> <li>•Suru</li> <li>•Birnin-Kebbi</li> </ul>
<b>Niger</b>	<b>Maize</b> <ul style="list-style-type: none"> <li>•Paikoro</li> <li>•Lapai</li> </ul>		<b>Rice</b> <ul style="list-style-type: none"> <li>•Paikoro</li> <li>•Wushish</li> </ul>	<b>Soybean</b> <ul style="list-style-type: none"> <li>•Paikoro</li> <li>•Lapai</li> </ul>

## Team Composition

After critical appraisal of training participants, a final list of 57 enumerators was compiled and divided into seven teams. Field teams were balanced based on the varying strengths and skills of each enumerator. Participants with exemplary track record of leadership during field work in previous activities, who also demonstrated good

understanding of the tools were selected to be state coordinators. Each team covered a state for the entire duration of field work. Each field team comprised of:

1 State Coordinator (SC)

1 Quality Assurance Personnel (QAP)

3-7 Enumerators

Each team member roles and responsibilities are described below.

**Table 5: team member responsibility**

Team member	Responsibilities
State Coordinator	<ul style="list-style-type: none"> <li>Conduct advocacy and establish rapport with the community leaders</li> <li>Collate list of smallholder farmers from community leads</li> <li>Randomly select farmers to be interviewed and schedule interview date and location for the team</li> <li>Conduct FGDs and KIs.</li> <li>Manage team logistics</li> </ul>
Quality Assurance Personnel	<ul style="list-style-type: none"> <li>Conduct back checks on respondents. At least, 10% of enumerators daily interviews (i.e. 2 interviews).</li> <li>Together with the state coordinators, conduct FGDs and KIs</li> <li>Supervise team and carry out and follow quality control measures, daily, through the entire course of the fieldwork</li> </ul>
Enumerators	<ul style="list-style-type: none"> <li>Sample respondents</li> <li>Take consent and conduct interviews</li> <li>Measure farmlands</li> <li>Debrief with other team members daily</li> </ul>

There was an OPMN consultant present with each team to provide guidance and support and supervision for the first few days of field work.

## Data collection techniques, quality control and analysis

### Data collection

Data collection for the quantitative survey was done using Survey CTO on CAPI. GPS programming was incorporated into the instruments for enumerators to record their location after completing an interview. Measurements for farmlands were taken using the Measurer app and then transferred to Survey CTO. Smaller ponds were measured using tape measures provided and the measurements entered into CAPI.

FGDs and KIs were conducted in each state according to the protocol above, using a guide provided and interviews recorded with recorders. The SCs were the interviewers while the QAPs were the note takers. The interviews were recorded, and reports were written using a pre-formed template and interviews transcribed.

### Data transfer and data cleaning

After completing each day's work, enumerators were asked to upload their data on a designated cloud server daily. This data was externally monitored throughout the field work. The electronic data collection system allowed for cleaning to be carried alongside data collection due to in-built checks for unlikely data points which allowed enumerators to rectify any errors while still on the field. Thereafter, the data manager carried out consistency, completeness and clarity checks to quality assure the data cleaning process.

### Quality control

#### CAPI built-in routing and validations

One important quality control means in CAPI surveys is the use of automatic routing and checking rules built into the CAPI questionnaires. These rules flag simple errors during the interview, that is, early enough for them to be corrected during the interview. In addition to having automatic skip patterns built into the design in order to eliminate errors resulting from wrong skips; the CAPI validations also checked for missing fields, out of range values and

inconsistencies within instruments. The latter checks were for, if any related information collected in different questions of the instrument are consistent. A warning or error message was given if an entry was out of range, inconsistent or left empty. The interviewer would then try to understand why a warning or error message is showing up and reconfirm the information with the respondent.

### **Back checks**

The QA officers for each team conducted at least two back-check interviews daily, using a back-check questionnaire programmed on CAPI for either crop or aquaculture farmers. In total, 5.4% of all interviews were backchecked. This was to ensure that information was collected and properly coded. The back-check questionnaire was an abridged version of the main household questionnaire made up of questions on key indicators that would not change significantly if asked by different interviewers at different times. This helps as one of the ways to check for consistencies and correctness of completed interviews. A comparison of the back-check data with the main data was done to determine if primary data collected was accurate or not. The % accuracy of the data determined the actions to be taken.

### **Spot Checks and live observations**

OPM staff were present on the field as quality control officers (QCOs), to independently monitor and supervise the field teams in each state during the first stages of data collection. The QCOs observed all the enumeration teams to see how questionnaires were administered, responses were coded, farmland measurements were taken and FGDs were conducted. They also monitored field work protocol and participant selection to ensure that all protocols were duly observed. QCOs observed at least 5% of interviews conducted

### **Monitoring of field work progress and data collector's performance**

A visual dashboard was designed using the PowerBI application in order to monitor the general progress of the fieldwork and specific indicators revealing the performance of teams and data collectors over time. The dashboard showed how many interviews have been completed so far in each LGA and whether the survey will be completed on time given the current rate of completion. The dashboard was monitored on a daily basis by the survey management team. If issues were flagged for any of the indicators, the team investigated the data and then the feedback was communicated to the interviewers through the state coordinators and supervisors.

## Annex E: Mean age of respondents by state and value chain

Mean age of respondents in Benue State by value chain		
Value chain	Mean	SD
Rice	39.10	12.30
Soybean	38.01	11.83
Mean age of respondents in Cross River State by value chain		
Value chain	Mean	SD
Rice	38.35	10.10
Aquaculture	40.53	14.40
Mean age of respondents in Delta State by value chain		
Value chain	Mean	SD
Aquaculture farm	42.05	11.23
Mean age of respondents in Ebonyi State by value chain		
Value chain	Mean	SD
Rice	40.63	12.03
Mean age of respondents in Kaduna State by value chain		
Value chain	Mean	SD
Maize	38.33	12.84
Cowpea	38.50	12.74
Soybean	38.54	12.70
Mean age of respondents in Kebbi State by value chain		
Value chain	Mean	SD
Rice	40.72	12.45
Maize	40.51	12.84
Cowpea	9.33	12.28
Mean age of respondents in Niger State by value chain		
Value chain	Mean	SD
Rice	39.47	13.19
Maize	38.64	11.80
Soybean	5.34	10.52



# Annex F: Survey tools - Focus Group Discussion Guide

Probes	Core area
<b>1. Introduction and warm up</b>  Let us start by introducing ourselves. Please tell us your name, we will do this by going around each person in the group.  <b>Icebreaker:</b> Explore discussion options-	
<b>2. Key local features within and around community</b>  1. Please tell us a little about this community? what are the sources of information about agriculture in this community? What sort of info are available?	
<ul style="list-style-type: none"> <li>How is land ownership operated in this community? Probe for how people can access land for farming. How do these affect different social groups? (probe specifically for women and youth)</li> <li>What supports are available to farmers (<i>Probe for farming cooperatives/association/union Subsidies, grant, loans, labor, land size et, accessing land inputs</i>)</li> <li><i>is membership to associations/cooperatives crop based? what was the rationale for this?</i></li> <li>Is this support equally accessible to female farmers and youth in this community? Why is this so? (what factors promote this trend?)</li> <li>What are the key factors affecting productivity of this commodity in your community?</li> </ul>	<b>Core area:</b> <ul style="list-style-type: none"> <li>General background</li> <li>Production, sale, investment etc.</li> </ul>
2. How do you/others perceive female farmers in this community? (scale, productivity, investment etc.? what is the level of support female farmers get in this community? Is this different from youth? What are the constraints?  Do women and youths have equal access to productive resources (Land, credit, market, etc.) in your community?  Is agricultural extension available? What are the levels of government involvement in these?	
<b>2. Production and sales</b>  Please tell us about the challenges farmers like yourself face in this community. (Drought, famine, bad road network, common pests and disease outbreaks etc.) <i>(Probe specifically for)</i>	
i. <i>Productivity - What influences the decision of the type of farming (crops/aquaculture) people engage in this community? Is this any different for women and youth? Why?</i> <ul style="list-style-type: none"> <li>(probe for marketability, profitability, land size, soil type, yield, maturity, security etc.)</li> </ul>	

- ii. Sales (who are the buyers – individual, large scale buyers, produce processor or all? What are the issues, what impact does any of these sources have on profit? what are the challenges?
- iii. Investment
- iv. What type of technologies do farmers mainly utilize in this community? What are they? Why? What are the constraints? (probe for inputs -seeds, feed, etc.)
- v. what challenges are peculiar to female and youth (15-29 yrs.) farmers? Why is this so? How can this be addressed?
- vi. Do you usually sell as a cooperative/association or via intermediaries? What informed this decision?
- vii. What is your level of engagement with private sectors? E.g. () please provide examples of this sorts of engagement

### 3. Access to finance and key challenges

- I. What are the main sources and types of credit/financial aids for farming in this community? (probe for Source and seasonality)
  - What are the conditions for obtaining credit for crop/livestock production?
  - What are the constraints to accessing finance? Why?
  - Is the constraint different for women and youth? Why is it different? If not different, what is the community doing differently that makes that possible?
  - What products are available to women and youth.
2. Tell us about a time you or someone you know tried to access credit in this group
  - In your opinion, how can farmers be assisted to access finance for agricultural production in your community?
4. Recommendation

#### Core area:

Sources of finance

Conditions

Challenges

Possible solutions

#### I. What are major recommendations to improve

- a. Productivity of (targeted value chain) in your location
- b. Profitability of (targeted value chain) in your location

#### Closure

##### I.I.I.I.I Conclusion

- What is the community's 's biggest challenge? How long has this challenge existed?
- 
- Do you have any questions for us?

**Moderator:** Check guide to ascertain you have covered all indicators.

## Key informant interview– guide

Probes	Core area
<p><b>4. Introduction and warm up</b></p> <p>Let us start by introducing ourselves. Try an appropriate</p> <p><b>Icebreaker:</b> Explore discussion options-</p> <p><b>2. Key local features within and around community</b></p> <p>1. Please tell us a little about the work you do and the type of support you provide to farmers? what are the sources of information about agriculture in this community? What sort of info are available?</p> <ul style="list-style-type: none"> <li>• In your opinion, are information readily available to female and youth? What are the challenges?</li> <li>• What supports are available to farmers (<i>Probe for farming cooperatives/association/union Subsidies, grant, loans, labor, land size et, accessing land inputs</i>). Are these different for females and youth? Why?</li> <li>• Is this support equally accessible to female farmers and youth in this community? Why is this so? (what factors promote this trend?) Probe for if women and youths have equal access to productive resources (Land, credit, market, etc.) in communities) Why?</li> </ul> <p>2. How are female farmers perceived in communities? (scale, productivity, investment etc.? What are the constraints)</p> <p><b>5. Production and sales</b></p> <p>Productivity - What influences the decision of the type of farming (crops/aquaculture) people engage in? Is this any different for women and youth? Why?</p> <p>viii. (probe for marketability, profitability, land size, soil type, yield, maturity, security etc.)</p> <p>ix. Sales (who are the buyers – individual, large scale buyers, produce processor or all? What are the issues, what impact does any of these sources have on profit? what are the challenges?</p> <p>x. Investment</p> <p>xi. What type of technologies do farmers mainly utilize in this community? What are they? Why? What are the constraints? (probe for inputs -seeds, feed, etc.)</p> <p>xii. what challenges are peculiar to female and youth (15-29 yrs.) farmers? Why is this so? How can this be addressed?</p> <p>xiii. How do farmers sell their produce? (probe if as a cooperative/association or via intermediaries? What informed this decision?</p> <p><b>6. Access to finance and key challenges</b></p> <p>2. What are the main sources and types of credit/financial aids for farmers? (probe for Source and seasonality)</p> <ul style="list-style-type: none"> <li>• What are the conditions for obtaining credit for crop/livestock production?</li> <li>• What are the constraints to accessing finance? Why?</li> <li>• Is the constraint different for women and youth? Why is it different? If not different, what is the community doing differently that makes that possible?</li> <li>• What products are available to women and youth.</li> </ul>	<p><b>Core area:</b></p> <ul style="list-style-type: none"> <li>• General background</li> <li>• Production, sale, investment etc.</li> </ul> <p><b>Core area:</b></p> <p>Sources of finance</p> <p>Conditions</p> <p>Challenges</p> <p>Possible solutions</p>

#### 4. Government support

1. What are the existing programmes/support of government on agricultures in this area? (probe for extension services)

2. what type of supports are available? (probe for off-take, storage inputs, etc.)

#### 5. Recommendation

1. *What are major recommendations to improve*

a. *Productivity of (targeted value chain) in your location*

b. *Profitability of (targeted value chain) in your location*

#### Closure

##### 1.1.1.2 Conclusion

- What is the community's 's biggest challenge? How long has this challenge existed?
- 
- Do you have any questions for us?

**Moderator:** Check guide to ascertain you have covered all indicators.

# Quantitative Instrument

## Consent and Introduction

Hello. My name is \_\_\_\_\_. Thank you for the opportunity to speak with you. We are a research organization called Oxford Policy Management doing a survey for the West Africa Trade and Investment Hub. The project aims to Increased productivity and profitability of farmers and firms in Nigeria as well as catalyze economic growth in West Africa. We are conducting a survey to learn about and try to improve agriculture, and livelihood of households in this area. Your household has been selected to participate in an interview that includes questions on topics such as your household background, household expenditures and assets and your agricultural practices. The survey includes questions about the household generally, and questions about individuals within your household, if applicable. The questions will take about 45 to 60 minutes to complete. We may be measuring your farmland (or fishpond for aquaculture farmers) if your household is randomly selected for that module. Your participation is entirely voluntary. If you agree to participate, you can choose to stop at any time or skip any questions you do not want to answer.

Your privacy is important to us. Private information like your name or address will not be shared with anyone. We may share information such as the name of this village with the organization sponsoring this study or other researchers, who are legally required to protect this information. When survey responses are shared with the public, no information will be included that can link you to the study. After entering the questionnaire into a data base, we will remove all information such as your name that could link these responses to you before sharing with others for the sake of research.

Do you have any questions about the survey or what I have said? If in the future you have any questions regarding the survey or the interview, or concerns or complaints, we welcome you to contact Oxford Policy Management by calling Terdoo on 08033205755.

Would you like to participate?

1 = Yes

2 = No

If 'No', interviewer should inform the team leader for proper documentation

## Questionnaire Identification

	Question	Answer	Skip Logic
	Time stamp	Started Ended	
	GPS Coordinates	Latitude N:                      Longitude E:	
1.	Questionnaire number		
2.	Name of the enumerator	Select	All
3.	State	a. Benue b. Cross River c. Delta d. Ebonyi e. Kaduna f. Kebbi g. Niger	All
4.	LGA	List of LGA	All
5.	Community	Select	All
6.	Targeted Value Chain	a) Rice b) Maize c) Cowpea d) Aquaculture e) Soybean	All
7.	Do you sell any of your farm harvest?	a. Yes b. No	
8.	Are you a dry or wet season farmer or both?	a) Dry season farmer b) Wet season farmer	
9.	What type of cropping system do you practice? <i>Mixed cropping means no specific crop is planted per plot or different plants are planted on the same plot</i>	a. Monocropping b. Mixed cropping	
10.	What is the size of your farm for the targeted value chain crop?	a. Less than 1 hectare b. 1 to 5 hectares c. More than 5 hectares	If option c, ask if they have a smaller farm with the targeted crop. Code as appropriate.

## Module One: Household Demographics

hd01	What is the name of the respondent?	Text	Optional
hd02	Respondent's contact number	Text	Optional
hd03	Sex of respondent	1. Female 2. Male	
hd04	How old are you? <b>PROBE: HOW OLD WERE YOU AT YOUR</b>	Age (in completed years) ____	Numerical

Hd05	<b>LAST BIRTHDAY?</b> What is the highest level of school you attended?	No education	00
		Quranic school.....	1
		Some primary	2
		Completed primary	3
		Some secondary	4
		Completed Secondary	5
		Some Tertiary	6
		Completed Tertiary	7
		Postgraduate	8
		Do not know	98
hd06	What is your <u>current</u> marital status?	Single, no partner	1
		Married	2
		Cohabiting	3
		Widowed	4
		Divorced/separated	5
hhd07	Is the respondent the head of the household?	Refused	97
		1. Yes	
		2. No	
hd08	Status of Respondent in the household	1. Husband	
		2. Wife	
		3. Adult son/daughter	
		4. Others	
		Specify others	
hd09	Type of Household	1. Male headed household	
		2. Female headed household	
		3. Youth male headed household (15 – 29 years)	
		4. Youth female headed household	
		5. Child male headed household (Below 15 years)	
hd10	How old is the Head of Household as at the Last birthday?	6. Child female headed household (Below 15 years)	
Hd11	<b>PROBE: HOW OLD WERE YOU AT YOUR LAST BIRTHDAY?</b> What is the highest level of school the HOUSEHEAD attended?	No education	00
		Qur'anic school	1
		Some primary	2
		Completed Primary	3
		Some secondary	4
		Completed Secondary	5
		Some Tertiary	6
		Completed Tertiary	7
		Postgraduate	8
		Do not know	98
hd12	Major Occupation of the head of the household	1. Agriculture (own farm)	
		2. Agriculture (wage laborer)	
		3. Government worker/ Skilled professional	
		4. Private entrepreneur/ private business/Trader	
		5. Unskilled laborer (temporary, non-permanent employed)	
		6. Unemployed	
		7. Student, pupil	
		8. Housewife	
		9. Retired	
		10. Other	
<b>Poverty Index</b> Pi01	How many persons live in the household?  (A household is defined as a person or a group of persons, related or unrelated, who live together in the same dwelling unit, who make common provisions for food and regularly take their food from the same pot or share the same grain store, or who pool their income for the purpose of purchasing food)	98. Refused to answer	
		Ten or more	10
		Eight or nine	8
		Seven	7
		Six	6
		Five	5
		Four	4
		Three	3
		One or two	1

Pi02	Of all these members, how many are 15 years and above	Ten or more Eight or nine Seven Six Five Four Three One or two	10 8 7 6 5 4 3 1
pi03	How many separate rooms do the members of the household occupy (do not count bathrooms, toilets, storerooms, or garage)?	One Two Three Four Five or more	1 2 3 4 5
pi04	The roof of the main dwelling is predominantly made of what material?	Grass, clay tiles, asbestos or plastic sheets, or others Concrete, zinc, or iron sheets	1 2
pi05	What kind of toilet facility does the household use?	None, bush, pail/bucket, or other Uncovered pit latrine, or V.I.P. latrine Covered pit latrine, or toilet on water Flush to septic tank, or flush to sewage	1 2 3 4
Pi06	Does the household handwashing station have soap and water available? <i>Ash covers for soap</i>	None.....0 Water only.....1 Soap and Water.....2	
pi07	Does the household own a gas cooker, stove (electric, gas table, or kerosene), or microwave?	Yes No	1 2
Pi08	How many mattresses does the household own?	None One Two Three or more	0 1 2 3
Pi09	Does the household own a TV set?	Yes No	1 2
Pi10	How many mobile phones does the household own?	None One Two Three or more	0 1 2 3
Pi11	Does the household own a motorbike or a car or other vehicle?	No Only motorbike Car (regardless of motorbike)	1 2 3
Pi11	Does any member of this household practice any agricultural activity such as crop, livestock, or fish farming, or own land that is not cultivated? If so, does the household own any sprayers, wheelbarrows, or sickles?	Farms or has uncultivated land, but no sprayers, wheelbarrows, or sickles Farms or has uncultivated land, and has sprayers, wheelbarrows, or sickles Does not farm nor has uncultivated land..... 3	1 2
<b>Intervention received</b>			
Ir01	What kind of interventions has your HH or any member of the HH benefitted from in the last one year (Multiple Selection)	1. None 2. Agriculture 3. Nutrition 4. Livelihoods 5. Health and Hygiene 6. Credit Specify Others	If not agriculture, skip to Li01
Ir02	If its Agric related, please describe the intervention and the organization who provided the services	Text	
<b>LIVELIHOOD QUESTIONS</b>			
Li01	What is the MAIN source of your household income in the last one year?	1. Crop growing 2. Aquaculture 3. Livestock breeding 4. Steady employment	



	Only one option should be filled.	5. Income from renting out land or machinery 6. Income from small business examples: small shops, trading etc. 7. Seasonal/Casual employment 8. Pensions/social benefits 9. Migrant remittances 10. Others (specify)_____	
Li02	How much income from MAIN source do you generate in Naira Annually?	Integer	
Li03	Aside from the main source of income, what are other sources of income in your household?  Multiple options can be filled.	1. Crop growing 2. Livestock breeding 3. Steady employment 4. Income from renting out land or machinery 5. Income from small business examples: small shops, trading etc. 6. Seasonal/Casual employment 7. Pensions/social benefits 8. Migrant remittances 9. Aquaculture 10. Others (specify)_____	Put 999 for those who do not have secondary income source
Li04	How much income do you generate from your secondary source in Naira?	Integer	Skip if no secondary income source
Li05	Does your HH spend ALL the income you generate?	1. Yes 2. No	
Li06	If yes or some above, what are the MAIN three areas you spent your income on last 12 months	1. Rent 2. Health/ Medical expenses 3. Education 4. Debt repayment 5. Funeral expenses 6. Marriage 7. Food and household expenses 8. Other 9. None	Add a check to ensure total income does not exceed income spent on these three areas so enumerators can probe further.

#### AGRICULTURAL PRODUCTION

B. HOUSEHOLD DECISION MAKING			
dm01	In your HH, who makes the decision on what food to buy?	1. Man (Husband) 2. Women (Wife) 3. Both (Husband and Wife) 4. Others (Male) 5. Others (female))	All
Dmo2	In your HH, who decides on the food to be prepared?	1. Man (Husband) 2. Women (Wife) 3. Both (Husband and Wife) 4. Others (Male) 5. others (female)	All
Dmo3	In your HH, who owns the farming assets (e.g. land, pond, equipment, etc.)?	1. Man (Husband) 2. Women (Wife) 3. Both (Husband and Wife) 4. Others (Male) 5. others (female)	All
Dmo4	In your HH, who decides on the crop to plant or fish to breed?	1. Man (Husband) 2. Women (Wife) 3. Both (Husband and Wife) 4. Others (Male) 5. others (female)	All
Dmo5	In your HH, who decides on how much the HH will save?	1. Man (Husband) 2. Women (Wife) 3. Both (Husband and Wife) 4. Others (Male) 5. others (female)	All
Dmo6	In your HH, who decides on what to invest in?	1. Man (Husband) 2. Women (Wife) 3. Both (Husband and Wife) 4. Others (Male) 5. others (female)	All
Dmo7	In your HH, who decides on how much the HH will invest?	1. Man (Husband) 2. Women (Wife)	All

		3. Both (Husband and Wife) 4. Others (Male) 5. others (female)	
Dmo8	In your HH, who decides on how much the HH will spend?	1. Man (Husband) 2. Women (Wife) 3. Both (Husband and Wife) 4. Others (Male) 5. others (female)	All
<b>C. SOCIAL AND GENDER</b>			
sg01	Do women in your community have equal access to ownership of agricultural land?	1. Yes 2. No (why)	All
sg02	Do youths in your community have equal access to agricultural land? <b>Access is when someone can make use of a thing irrespective of if it belongs to them or not.</b>	1. Yes 2. No (why)	All
sg03	Do women have equal access to agricultural services (extension, input, credit, market, etc.) with men <b>Access is when someone can make use of a thing irrespective of if it belongs to them or not.</b>	1. Yes 2. No (why)	All
sg04	Do youths have equal access to agricultural services (extension, input, credit, market, etc.) with adults	1. Yes 2. No (why)	All
sg05	Do women in your household engage in any other type of business?	1. Yes 2. No	All
sg06	If yes, mention the types of business	Text	Q43 = 1
sg07	Do women have equal opportunity to hold leadership positions in your community as the men <i>Note that this is irrespective of other women leadership positions e.g. women leader</i>	1. Yes 2. No (why)	All
sg08	Do youths have equal opportunity to hold leadership positions in your community as the adults <i>Note that this is irrespective of other youth leadership positions</i>	1. Yes 2. No (why)	All
Sg09	Do you belong to any cooperative society/ farmer's association	1. Yes 2. No	If no, skip to sg11
Sg10	If you need loans/credits, can you access it from your cooperative or farmer's society	1. Yes 2. No 3. I don't know	
Sg11	If you need other support, with your business, do you know where you can get this support?	1. Yes 2. No	
	Is there any organization in this community that support women farmers?	1. Yes 2. No 3. I don't know	
<b>D. Access to Credit</b>			
Ac01	Has anyone in your household taken any loans in cash/in-kind in the past 12 months?	1. Yes 2. No	If no, skip to Ac07
Ac02	If yes, what was the lending source	1. Non-governmental organization 2. Informal lender 3. Formal lender (bank/financial institution) 4. Group based micro-finance or lending including Village Savings and Loan Association (VSLAs)/ Savings and Credit Cooperative Organization (SACCOs) 5. Informal credit/savings groups such as merry-go-rounds, tontines, funeral societies, etc. 6. Family, friends and relatives 7. Others please specify	
Ac03	Mode of lending	1. In cash 2. In kind 3. Cash and in-kind 4. Others	
Ac04	Who made the decision to borrow?	1. Self 2. Husband 3. Wife 4. Husband and Wife 5. Other household members 6. Other non-household members	
Ac05	Who makes the decision about what to do with the money/item borrowed	1. Self 2. Husband 3. Wife 4. Husband and Wife 5. Other household members	

		6. Other non-household members	
<b>Ac06</b>	Have you received credits, loans for maintenance of/investment in your farm for the last 12 months? (this includes both bank loans and loans from relatives, friends, etc.)	1. Yes 2. No	
	From what sources did you obtain your credit/loan?	1. Banks, microfinance institutions (MFI) 2. Self-help/credit group e.g. esusu 3. Credit Union 4. Loans from relatives/friends 5. Other (specify) 98. Refuse to answer 99. Don't know	
<b>E. Access of youths to items that can be used to generate income</b>			
<b>Ay01</b>	Is there any youth (anyone aged 15 to 29 years) in your household?	1. Yes 2. No	<b>If no, skip to dd01</b>
<b>Ay02</b>	Does s/he have access to use any farmland or farm implement for personal use?	1. Yes 2. No	
<b>Ay04</b>	Do they have access to use other non-farming business equipment (such as grinding machine, motorcycle, grinding machine, sewing machine, house for rent etc.)	1. Yes 2. No	
<b>F. HOUSEHOLD DIETARY DIVERSITY SCORE</b>			
<b>Dd01.</b>	Which of the following food items/groups have the adults in your HH eaten (in the last 24 hours) during the day and night?		
a)	Cereals	Integer (1 = Yes, 0 = No)	All
b)	Tubers or Roots	Integer (1 = Yes, 0 = No)	All
c)	Pulses/Nuts	Integer (1 = Yes, 0 = No)	All
d)	Vegetables and Leaves	Integer (1 = Yes, 0 = No)	All
e)	Fruits	Integer (1 = Yes, 0 = No)	All
f)	Meat and Poultry	Integer (1 = Yes, 0 = No)	All
g)	Fish and other seafood	Integer (1 = Yes, 0 = No)	All
h)	Eggs	Integer (1 = Yes, 0 = No)	All
i)	Milk/Dairy Products	Integer (1 = Yes, 0 = No)	All
j)	Sugar, Honey, Jam	Integer (1 = Yes, 0 = No)	All
k)	Oil/Fats	Integer (1 = Yes, 0 = No)	All
l)	Spices and Condiments	Integer (1 = Yes, 0 = No)	All
<b>Fc01. FOOD CONSUMPTION SCORE</b>			
Within the last 7 days, how many of the days did your household members eat any of the following?			

a)	Cereals	Integer (0-7)	All
b)	Tubers or Roots	Integer (0-7)	All
c)	Pulses/Nuts	Integer (0-7)	All
d)	Vegetables and Leaves	Integer (0-7)	All
e)	Fruits	Integer (0-7)	All
f)	Meat and Poultry	Integer (0-7)	All
g)	Fish and other seafood	Integer (0-7)	All
h)	Eggs	Integer (0-7)	All
i)	Milk/Dairy Products	Integer (0-7)	All
j)	Sugar, Honey, Jam	Integer (0-7)	All
k)	Oil/Fats	Integer (0-7)	All
l)	Spices and Condiments	Integer (0-7)	All
<b>Hs01. HOUSEHOLD HUNGER SCORE (HHS)</b>			
<b>A</b>	In the past 4 weeks/30 days, did you worry that any member of your household would not have food to eat of any kind because of lack of resources to get food?	1. Yes 2. No	
<b>B</b>	In the past [4 weeks/30 days], was there ever no food to eat of any kind in your house because of lack of resources to get food?	1. Yes 2. No	<b>If no, skip to hs01 e</b>
<b>C</b>	How often did this happen in the past [4 weeks/30 days]?	1. Rarely 2. Sometimes 3. Often	<b>A = Yes</b>
<b>D</b>	In the past [4 weeks/30 days], did you or any household member go to sleep at night hungry because there was not enough food?	1. Yes 2. No	<b>All</b>
<b>E</b>	How often did this happen in the past [4 weeks/30 days]?	1. Rarely 2. Sometimes 3. Often	<b>C = Yes</b>
<b>F</b>	In the past [4 weeks/30 days], did you or any household member go a whole day and night without eating anything at all because there was not enough food?	1. Yes 2. No	<b>All</b>
<b>G</b>	How often did this happen in the past [4 weeks/30 days]?	1. Rarely 2. Sometimes 3. Often	<b>E = Yes</b>

CROP FARMER MODULE			
cf01	Which crop did you majorly plant last planting season?	1. Rice 2. Maize 3. Cowpea 4. Soybean Others, please specify -----	
Cf02	Do you farm any other agricultural commodity than (Q1) above	1. Yes 2. No	All
Cf03	If yes, which commodity?	1. Rice 2. Maize 3. Cowpea 4. Soya bean 5. Others (specify)	Multiple selection
cf04	<b>What farming practices/technologies did you use to improve crop production last farming season? (multiple selection)</b> <i>Read options</i>	1. Seed technology (seed selection) 2. Use improved seeds/crop varieties 3. Use of recommended spacing of crops 4. Use of inorganic fertilizer 5. Timely operations (plant/harvest), 6. Nursery establishment/management 7. Pest and Diseases management 8. Soil and water conservation e.g. terraces 9. Organic farming 10. Irrigation 11. Water harvesting 12. Farm planning and record keeping. 13. Post-harvest handling 14. Urea Deep Placement (UDP) methodology 15. Crop rotation 16. Construction of bunds 17. None 18. Others (specify)	Multiple response
cf05	<b>HIRED (Paid) Labor (Last season)</b>		
3.	<b>Operations</b>	<b>Cost (NGN)</b>	
	Land Clearing		
	Land preparation		
	Planting		
	Weeding (manually)		
	Herbicide application		
	Fertilizer application		
	Bird scaring for rice		
	Insecticide application		
	Pesticide application		
	Transporting inputs		
	Harvesting*		
	Transportation of harvest		
	Storage		
Cf00	Did you use an unpaid Labor last cycle or season? (An Unpaid Labor is an activity you would have paid for, but someone like your friend or family	1. Yes 2. No	
cf06	<b>Unpaid Labor (Last season)</b>		
	<b>Operations</b>	<b>Cost (NGN) Estimated value???</b>	
	Land Clearing		
	Land preparation		
	Planting		
	Weeding (manually)		
	Herbicide application		
	Fertilizer application		
	Bird scaring for rice		
	Insecticide application		
	Pesticide application		
	Transporting inputs		
	Harvesting*		
	Transportation of harvest		
	Storage		
Cf06	Do you have other (calc_cf01 label} farms?	1. Yes	

		2. No			
cf07	<b>Other costs (last season)</b>				
	<b>Operations</b>				
	Seeds				
	Fertilizer				
	CPP (crop protection products)				
	Herbicides				
	Insecticides				
	Pesticides				
	Seed dressing				
	CPP (crop protection products)				
	Transporting inputs				
	Transport				
	Land Rent				
	Farm implement				
	Hired tractor/ machines				
	Irrigation				
<b>Yield information (yi01-yi03)</b>					
Farm size	Weight per bag harvested	Quantity harvested (Total number of bags)	Quantity harvested (Total weight of bags in kg)		
<b>Sales information of commodity from this farm (si01 to si05)</b>					
Date	Item Sold	Quantity Sold (Number of bags)	Quantity Sold (Weight of bags in kg)	Price received per bag	Money Received (Naira)
Of00. Do you have any other farm where you plant the same commodities					
<b>Cf09. Sales information for the same commodity from other farms</b>					
Date	Item Sold	Quantity Sold (Number of bags)	Quantity Sold (Weight of bags in kg)	Price received per bag	Money Received (Naira)
Bp00. Did you sell any by products from the farm? (e.g. maize chaff, rice hulls)	1. Yes 2. No				
<b>Cf10. Sales information from by-products from this index farm (e.g. maize chaff, rice hulls)</b>					Indicator addressed 3
Date	Item Sold	Quantity Sold (Number of bags)	Quantity Sold (Weight of bags in kg)	Price received per bag	Money Received (Naira)
<b>Cf11. Value of commodity consumed</b>					
cc00. Did you consume any of the commodity (targeted value chain)		1. Yes 2. No			
Date	Item consumed	Quantity consumed (Number of bags)	Quantity consumed (Weight of bags in kg)	Price per bag	Total value (Naira)
<b>Cf12. Value of commodity given out</b>					
Cg00. Did you give out any commodity (targeted value chain)?		1. Yes 2. No			
Date	Item given out	Quantity (Number of bags)	Quantity (Weight of bags in kg)	Price per bag	Total value (naira)
<b>Cf13. Value of commodity stored</b>					
Date	Item given out	Quantity (Number of bags)	Quantity (Weight of bags in kg)	Price per bag (assuming they sold the bag)	Total value (naira)
<b>D01. What are the Major constraints you encounter in this investment?</b>					
<ul style="list-style-type: none"> <li>b. Lack of finance</li> <li>c. Poor road network to transport input and output</li> <li>d. Trucks for transportation of farm produce</li> <li>e. lack of discounted/subsidized prices for agricultural input</li> <li>f. herders' disturbance</li> <li>g. insecurity</li> <li>h. lack of water for irrigation/ usage in ponds</li> <li>i. other(specify)</li> </ul>					

j. None

THANK YOU VERY MUCH FOR YOUR TIME

Aquaculture farmers			
Background information for farm			
Indicator	NAME OF FARM (if any)		Indicator addressed
Bi01.	FARM GPS POSITION (in decimal degrees i.e. N: xx. xxxx E: xx. xxxx)	Latitude N: Longitude E:	
Bi03	What Main type of pond do you use? (Choose one)	1. Excavated earth ponds 2. Concrete ponds 3. Hard plastic 4. Collapsible tanks 5. Other (Specify)	
Bi04	TOTAL # OF PONDS		
Bi05	Total pond area utilized last cycle (measured in Meter)		
Bi06	Total number of ponds utilized last cycle		
Bi07	Total number of ponds harvested last cycle		
Bi08	Total number of production cycle stock in the last one year		
Bi09	Total area of ponds harvested last cycle (measured in Meter)		
Bi10	Type of fish species		
Bi11	What fishing <b>CULTURE SYSTEM</b> do you use?	1. Monoculture 2. Polyculture 3. Integrated	
Bi12	<b>FISH CULTURE/PRACTICE</b>	1. Extensive 2. Semi- intensive 3. Intensive	
Bi13	<b>TYPE OF FARMING SYSTEM</b>	1. Earthen pond 2. Concrete Pond 3. Tanks (Plastic wooden) 4. Cage culture	9
Bi14	<b>PRODUCTION TECHNIQUES</b>	1. Static (standing water) 2. Flow-through 3. Water recirculation	9
Bi15 bi13a.	<b>Feed type</b>  <b>Other Feed type</b>	1. Floating fish feed/imported 2. Sinking fish feed/local 3. Both 4. Others(specify) 1.imported fish feed 2.local fish feed 3.Both	9
Bi16	<b>What type of farm activities do you practice in your farm?</b>	1. Hatchery 2. Grow-out/On-growing 3. Feed Mill 4. Processing Others specify (1) Others specify (2) Others specify (3)	
Bi17	<b>What farming practices/technologies did you use to improve your aquaculture production last farming season? (multiple selection)</b> <b>Read out options</b>	1. Pond liming 2. Pond fertilization 3. Water quality checks (for iron concentration, nitrites, acidity, etc.) 4. Pond desilting 5. Tidal monitoring 6. Timely operations (plant/harvest), 7. Fingerlings establishment/management 8. Pest and Diseases management 9. Soil and water conservation 10. Water harvesting 11. Farm planning and record keeping. 12. Post-harvest handling 13. Construction of bunds	6, 9

		14. Others (specify)	
Bi18	What type of fish do you use for stocking?		<b>Number</b>
		<b>Fingerlings</b>	
		<b>Juveniles</b>	
		<b>Table fish</b>	
Unit cost			
Total cost			
One production cycle is defined as beginning with an empty pond, stocking new fish, feeding and growing the fish and then harvesting all of the fish.			
<b>PART B: FARM OPERATIONS COST</b>			
p100		Was cost of labor lump sum payment	1. Yes 2. No
p101j.		Aggregate cost	
<b>PI</b>	<b>Paid Labor</b>	<b>Total</b>	
	<b>Type of operation</b>	<b>Cost of labor</b>	
	Land Clearing		
	Pond Construction		
	Pond Preparation/Repair		
	Pond Filling/Impoundment		
	Transport of inputs		
	Stocking		
	Feeding		
	Harvesting of fish		
	Handling/Sorting		
	ul00. Did you use an unpaid Labor last cycle or season?	1. Yes 2. No	
	An Unpaid Labor is an activity you would have paid for, but someone like your family did the activity and you did not have to pay.		
	<b>Unpaid Labor</b>	<b>Total</b>	
	<b>Type of operation</b>	<b>Cost of labor</b>	
	Land Clearing		
	Pond Construction		
	Pond Preparation/Repair		
	Pond Filling/Impoundment		
	Transport of inputs		
	Stocking		
	Feeding		
	Harvesting of fish		
	Handling/Sorting		
	Other indirect costs (e.g. pond security etc.)		

.3 Production Costs-Raw fish					
Item	Source	Unit Price	Total Quantity Purchased (Kg)	Total Amount Paid	
Water (Bought)					
Fuel for pumping water					
Brood stock (Parent stock for breeding)					
Fingerlings					
Juveniles					
Feeds - floating					
Feeds - sinking					
Fertilizer					
Chemicals					
Drugs					
Farm Equipment			Not applicable		
Transport of inputs (fish feed, juveniles, etc.)		Not applicable	Not applicable		
Transport of finished product to market		Not applicable	Not applicable		
Taxes		Not applicable	Not applicable		
Dues		Not applicable	Not applicable		
Utilities		Not applicable	Not applicable		



B.4 FISH PRODUCTION POND											
	TYPE OF FISH PRODUCED			Number		Total Weight (Kg)					
	Brood stock (Parent stock for breeding)										
	Fingerlings										
	Juveniles										
	Adult (Table Fish)										
	Total			Sum of number		Sum of weight					
C1. SALES - For RAW FISH											
	Fish Type	Total Harvested(A)			Total Fish Sold(B)						
		Number	Total Weight (Kg)	Average weight	Number	Total Weight (Kg)	Average weight	Price per kg	Average price per fish (not weighed)	Total sales by weight (kg)	Total sales by appearance
	Fingerlings										
	Juveniles										
	Adult (Table Fish)										
	Brood stock										
	Total										
C1b. FISH GIVEN AS PAYMENT											
Did you give any fish as payment in the last cycle?								1: Yes 2: No		If no skip module	
	Total value of Fish given for payment in kind (C)					Total value of fish given as gift (D)					
	Fish Type	Numbers	Weight (Kg)	Price per kg	Total value of fish given		Number	Weight(kg)	Price per kg	Total value of fish given	
	Fingerlings										
	Juveniles										
	Adult (Table Fish)										
	Brood stock										
	Total										
Did you CONSUME FOR HOME USE in the last cycle?											
1: Yes 2: No											
	Total value of fish consumed at home(E)										
	Fish Type	Number	Weight(kg)	Price per kg	Total value of fish given	Number	Total value of fish given				
	Fingerlings										
	Juveniles										
	Adult (Table Fish)										
	Brood stock										
	Total										
Did you loss any fish during this cycle											
1: Yes 2: No											
	Total Value of Fish losses due to mortality	Total Number	Total Weight (Kg)	Unit price per kg	Gross Losses						
	Fingerlings										
	Juveniles										
	Adult (Table Fish)										
	Brood stock										
	Total										
What is the major point of sale for your fish?											
1. On the farm 2. Within 5 Km 3. Within 15km 4. Within 16-49km 5. More than 50 km											
PART D: PROCESSED FISH SALES											
D1a	Do you process your fish?			1: Yes 2: No		If no, skip module					

D1b	If yes? How do you majorly process them?	1. Sun dried 2. Salting 3. Smoking 4. Prickled 5.. Frozen 6 Canning 1.Batch one 2.Batch two 3.Batch three 4.Batch four 5.Batch five 6.Batch six	Continuing with this module if smoking is yes
D02	Which of this batch did you sell smoked fish in the last cycle?		

## D2. SALES- For SMOKED FISH

	Weight and value of raw fish			SMOKED FISH SALES		SMOKED FISH Given as Payment in Kind			
	Weight of raw fish before smoking (KG)	Price per kg of raw fish (Naira)	Total Value of Raw Fish	Weight of Smoked Fish (KG)	Price per kg of smoked fish (Naira)	Total Smoked Fish Sales	Weight of Smoked Fish	Price per kg of smoked fish (Naira)	Total value of smoked fish given as payment in kind
Batch One									
Batch two									
Batch three									
Batch four									
Batch five									
Batch six									
Total									

## D3. SMOKED FISH GIVEN AS GIFT OR CONSUMED AT HOME OR UNSOLD

	SMOKED FISH GIVEN AS GIFT			SMOKED FISH CONSUMED AT HOME		SMOKED FISH UNSOLD			
	Weight of raw fish before smoking (KG)	Price per kg of raw fish (Naira)	Total Value of Raw Fish	Weight of Smoked Fish (KG)	Price per kg of smoked fish (Naira)	Total Smoked Fish Sales	Weight of Smoked Fish	Price per kg of smoked fish (Naira)	Total Value of Smoked Fish Given as Payment in Kind
Batch One									
Batch two									
Batch three									
Batch four									
Batch five									
Batch six									
Total									
D3b	What is the major point of sale for your smoked fish?			1 On the farm 2 Within 5 Km 3. Within 15km 4. Within 16-49km 5 More than 50 km					
D3c	What is the major point of sale for your smoked and packaged fish?			1 On the farm 2 Within 5 Km 3. Within 15km 4. Within 16-49km 5 More than 50 km					

## D4. POND UTILISED AND HARVESTED

D04. Which of the pond did you utilize and harvest in the last cycle?										1.Regular 2.Circular	
POND UTILIZED					PONDS HARVESTED						
Type	Units		No of ponds	Area	Type	UNITS		No of ponds	Area		
						Length	Breath				
Rectangular					Rectangular						
Type	Units		No of ponds	Area	Type	UNITS		No of ponds	Area		
Circular					Circular						

## D4. CLOSING FOR ALL AQUACULTURE

What are the Major constraints you encounter in this investment (Aquaculture?)		a. Lack of finance b. Poor road network to transport input and output c. lack of discounted/subsidized prices for agricultural input d. herders' disturbance e. insecurity f. lack of water for irrigation/ usage in ponds g. Trucks for transportation of farm produce
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	h.	Others (specify)
	i.	None

THANK YOU VERY MUCH FOR YOUR TIME