THE FEDERAL REPUBLIC
OF NIGERIA

NATIONAL BUREAU OF STATISTICS

Basic Information Document

Nigeria
General Household Survey–Panel
2012/13

February 10, 2015

ACRONYMS

BMGF	Bill and Melinda Gates Foundation
EA	Enumeration Area
FCT, Abuja	Federal Capital Territory, Abuja
FMA&RD	Federal Ministry of Agriculture and Rural Development
GHS	General Household Survey
GHS-Panel	General Household Survey-Panel (panel subcomponent of GHS)
HNLSS	Harmonized National Living Standards Survey
LGA	Local Government Area
LSMS-ISA	Living Standards Measurement Study – Integrated Surveys on Agriculture
NASS	National Agricultural Sample Survey
NBS	National Bureau of Statistics
NFRA	National Food Reserve Agency
TOT	Training of Trainers
WB	World Bank

Table of Contents

1.0 Introduction

The purpose of the present document is to provide detailed information on the panel survey component of the General Household Survey (GHS) fielded by the National Bureau of Statistics (NBS) in 2012-2013. This survey is the second wave of a panel survey of households. The GHS-Panel is the result of a partnership that the NBS has established with the Federal Ministry of Agriculture and Rural Development (FMA&RD), the National Food Reserve Agency (NFRA), the Bill and Melinda Gates Foundation (BMGF), and the World Bank (WB). The ability to follow the same households over time makes the GHS-Panel a new and powerful tool for studying and understanding income generating activities and socio-economic outcomes in Nigeria. The GHS-Panel is the first panel survey to be carried out by NBS.

The GHS survey is a cross-sectional survey of 22,000 households carried out periodically throughout the country. Under the work of the partnership, a full revision of the questionnaire was undertaken and, at the same time, a sub-sample of the GHS was randomly selected to form the sample of the GHS-Panel. The GHS-Panel consists of 5,000 households of the GHS collecting additional data on agricultural activities, other household income activities, and household expenditure and consumption. As the focus of this panel component is to improve data from the agricultural sector and link this to other facets of household behaviour and characteristics, the GHS-Panel questionnaire drew heavily on the Harmonized National Living Standards Survey (HNLSS – a multi-topic household survey) and the National Agricultural Sample Survey (NASS – the key agricultural survey). The second wave of the GHS-Panel was carried out in two visits (post-planting visit in September – November 2012 and post-harvest visit in February-April 2013).

This GHS-Panel is part of a larger, regional project in Sub-Saharan Africa to improve agricultural statistics. Nigeria is one of the seven countries being supported by the WB, through funding from the BMGF, to strengthen the production of household-level data on agriculture. This regional project, the Living Standards Measurement Study-Integrated Surveys on Agriculture (LSMS-ISA) has the over-arching objective of improving our understanding of agriculture in Sub-Saharan Africa – specifically, its role in household welfare and poverty reduction.

The present document is designed to provide an overview of the Wave 2 GHS-Panel. Wave 2 consisted of two visits to the household: the post-planting visit occurred directly after the planting season to collect information on preparation of plots, inputs used, labour used for planting, and other issues related to the planting season for the agriculture questionnaire as well as administer a household and agriculture questionnaire. The post-harvest visit occurred after the harvest season and collected information on crops harvested, labour used for cultivating and harvesting activities, and other issues related to the harvest cycle for the agriculture questionnaire and also administered a household and a community questionnaire.

The Basic Information Document for the GHS-Panel 2010/2011 (Wave 1) contains additional background information and should be used in conjunction with this document.

2.0 The Survey Instruments

The GHS-Panel Wave 2 consists of three questionnaires for each of the two visits. The ***Household Questionnaire*** was administered to all households in the sample. The ***Agriculture Questionnaire*** was administered to all households engaged in agricultural activities such as crop farming, livestock rearing and other agricultural and related activities. The ***Community Questionnaire*** was administered to the community to collect information on the socio-economic indicators of the enumeration areas where the sample households reside.[1]

GHS-Panel Household Questionnaire*:* The Household Questionnaire provides information on demographics; education; health (including anthropometric measurement for children and child immunization); labor and labor data collection options; food and non-food expenditure; household nonfarm income-generating activities; food security and shocks; safety nets; housing conditions; assets; information and communication technology; and other sources of household income. Household location is geo-referenced in order to be able to later link the GHS-Panel data to other available geographic data sets (See Section 7.24 and Appendix 4). The labor module of the Household Questionnaire introduced four different variants to test the sensitivity of labor statistics to how labor modules are designed.

GHS-Panel Agriculture Questionnaire*:* The Agriculture Questionnaire solicits information on land ownership and use; farm labor; inputs use; GPS land area measurement and coordinates of household plots; agricultural capital; irrigation; crop harvest and utilization; animal holdings and costs; and household fishing activities. Some information is collected at the crop level to allow for detailed analysis for individual crops.

GHS-Panel Community Questionnaire*:* The Community Questionnaire solicits information on access to infrastructure; community organizations; resource management; changes in the community; key events; community needs, actions and achievements; and local retail price information.

The Household Questionnaire is slightly different for the two visits. Some information was collected only in the post-planting visit, some only in the post-harvest visit, and some in both visits. See Section 7.21 for more details.

The Agriculture Questionnaire collects different information during each visit, but for the same plots and crops. See Section 7.22 for more details.

The Community Questionnaire collected prices during both visits, and different community level information during the two visits. See Section 7.23 for more details.

The contents of each questionnaire for the GHS-Panel post-planting and GHS-Panel post-harvest are outlined below.

[1] The Community Questionnaire does not collect information from communities in the sociological sense. The data cannot be used to represent communities in Nigeria. The data collected at the community level represent information that is common to the households selected for inclusion in the selected sample enumeration areas (EAs).

Table 2.1: GHS-Panel Household Wave 2 Questionnaire – Post Planting Visit

Section	Topic	Respondent	Description
Cover	Cover	Field staff	Household identifier variables, enumerator, supervisor, and data entry clerk identifiers, date and time of interview and data entry, and observation notes by enumerator regarding the interview
1	Roster	Household head or spouse.	Roster of individuals living in the household, relationship to the household, gender, year of birth, age, marital status, spouse identification, parental status, and place of birth.
2	Education	Individuals 5 years and above	Educational attainment, school characteristics, and expenditures for the 20011-12 academic year
3A	Labour	Individuals 5 years and above	Labor market participation during the last seven days, wage work, and domestic activities within the home
3B	Labour Option 1	Individuals 5 years and above in approximately 25% of randomly selected households	Labor market participation during the last six month, wage work, and domestic activities within the home
	Labour Option 2	Individuals 5 years and above in approximately 25% of randomly selected households	Labor market participation during the last twelve months, wage work, and domestic activities within the home
	Labour Option 3	Individuals 5 years and above in approximately 25% of randomly selected households	Labor activity during the last six months (March 2012 to August 2012)
	Labour Option 4	Individuals 5 years and above in approximately 25% of randomly selected households	Labor market participation and summary labor activity during the last twelve months. Includes wage work, and domestic activities within the home
4	Credit and Savings	Individuals 15 years and above	Savings made, loans or credit received, insurance, and remittances by the household during the last six months, and conditions of the transaction
4B	Financial	Individuals 15 years and	Household budgeting and members'

Section	Topic	Respondent	Description
	Capability	above	contribution to household expenses as well as household financial planning and preparation for unexpected expenses
5	Household assets	Household head	Ownership of assets and value
6	Non-farm Enterprises And Income Generating Activities	Owner or manager of enterprise	Enterprise ownership, status, labor, value of stock, sales, business costs and constraints to opening and operating a non-farm enterprise.
7A	Meals Away From Home	Most knowledgeable person	Naira value of food consumed outside the home during the last seven days.
7B	Household Food Expenditure	Person responsible for food purchases	Quantity and value of food consumed within the household during the last seven days.
8	Household Non-food Expenditures	Person responsible for household purchases	Non-food expenditure during the last week/last month/last six months/last 12 months
9	Food Security	Household head or eligible adult	Food security status of households in during the past 7 days/12 months
10	Other Income	Household head or eligible adult	Others sources of household income since the new year

Table 2.2: GHS-Panel Agriculture Wave 2 Questionnaire – Post Planting Visit

Section	Topic	Respondent	Description
Cover	Cover	To be completed by field Staff. Household ID must be copied from Household to Agriculture Questionnaire.	This section contains household location and identification data as well as administrative data as regards administering and managing the questionnaire
11A	Plot Roster	Owner or manager of plot	Information on all plots owned and/or managed by the Household. This section includes data on estimated area, GPS measured area and the GPS measured location of the plot
11B1	Land Inventory	Owner or manager of plot	Data on plot acquisition, tenure and use
11B2	Land Tenure	Owner or manager of plot	Information on land ownership, demarcation and disputes
11C1	Planting Labor	Owner or manager of plot	Information on household members and hired labor that worked in planting activities on the plot. Includes information on amount of time spent by

Section	Topic	Respondent	Description
			each person and payments made to hired labor
11C2	Input costs	Owner or manager of plot	Use and cost of pesticide, herbicide, animal labor and use of machinery
11D	Fertilizer acquisition	Owner or manager of plot	Access to, use and cost of fertilizer
11E	Seed acquisition	Owner or manager of plot	Data on source, quantity and cost of seeds used on the plot
11F	Planted field crops	Owner or manager of plot	Data on crops planted on the plot, amount of crops planted and expected harvest. Also includes questions on cowpeas, variety, features and year of adoption
11G	Planted tree crops	Owner or manager of plot	This section collects details on tree crops
11H	Marketing	Owner or manager of plot	Marketing of agricultural surplus. Quantities sold, value and information on purchaser
11I	Animal holdings	Farmer or caretaker of animals	Data on farm animals owned by the household and commercial activity with these animals
11J	Animal costs	Farmer or caretaker of animals	Livestock farmer caretaker activities and costs
11K	Agriculture by-product	Farmer or caretaker of animals	Trading activity in agricultural by-products
11L1	Extension Services I	Owner or manager of plot	Main source (government and non-governmental) of farming advice on select agricultural activities
11L2	Extension Services II	Owner or manager of plot	Details of information provided by main source of information on agricultural activities. Includes frequency of visits and usefulness of the information provided
12	Network Roster	Farmer, owner or manager of plot	Roster of places or businesses where the household sells and purchases agricultural produce and/or supplies

Table 2.3: GHS-Panel Community Wave 2 Questionnaire – Post Planting Visit

Section	Topic	Respondent	Description
Cover	Cover	To be completed by the field staff	Cover
C1	Respondents Characteristics	Community Focus Group	Respondent characteristics
C2	Food Prices	Market Food Sellers	Food prices
C3	Labor	Community Focus Group	Labor

Section	Topic	Respondent	Description
C4	Land Prices and Credit	Community Focus Group	Land prices and credit

Table 2.4: GHS-Panel Household Wave 2 Questionnaire – Post Harvest Visit

Section	Topic	Respondent	Description
Cover	Cover	To be completed by the field staff	Household identifier variables, enumerator, supervisor, and data entry clerk identifiers, date and time of interview and data entry, and observation notes by enumerator regarding the interview
1	Roster	To be fill by the Head of Household or spouse.	Roster of individuals living in the household, relationship to the household, gender, year of birth, age, marital status, polygamous marriages, spouse identification, parental status, place of birth, date joined household if new, migration.
2 (A and B)	Education	Individuals 5 years and above	Educational attainment, school characteristics, and expenditures. Section 2a collects information for new members of the household while Sect 2b collects follow-up and current information on original household members for the 2010-11 academic year
3 (A and B)	Labour	Individuals 5 years and older	Section 3a collects data on labour market activity of all household members 5 years and older. This includes employment and earnings information. Section 3b collects information on employment in one or more industries in the past 6 months
4 (A and B)	Health	All individuals	Section 4a: general health status and utilization and cost of health services for those that need medical care. Data on effect of disabilities on activity and functioning; and anthropometrics. Section 4b: Child immunization.
5	Information and communication technology	All individuals 10 years and above	Access to and use of communication technology, including computers and internet
6	Remittances	All individuals 10 years and above	Remittances received from abroad by household members 10 years and older
7	Household	Most knowledgeable	Household assets sale and acquisition in

Section	Topic	Respondent	Description
	Assets sale and acquisition	person	the past 6 months
8	Housing	Head of household or any knowledgeable adult	Housing, facilities and cost. Access to utilities and costs
9	Non-farm Enterprises and income generating activities	Owner or manager of enterprise	Data on non-farm businesses owned and/or operated by the household. Follow-up data on the businesses from the previous visit and new businesses that were started since the previous visit
10 (A, B and C)	Meals Away From Home, Food Expenditures and Aggregate Food Consumption	Female in the household responsible for food preparation and/or food purchases	Section 10A: Meals away from home Section 10B: Food expenditures Section 10C: Aggregate food consumption
11	Non-food Expenditures	Most knowledgeable person or person who is responsible for household purchases	Consumption and expenditure on non-food items
12	Food Security	Household head or knowledgeable adult household member	Collects information on quantity of food, preferred foods and variety of foods available to household members based on economic reasons. Also collects data on intra-household food security dynamics.
13	Other household Income	Household head or knowledgeable adult household member	Miscellaneous income received by household
14	Safety Nets	Household head or knowledgeable adult household member	Household access to and utilization of safety nets
15 (A and B)	Economic Shocks and death	Household head or knowledgeable adult household member	Section 15a: Data on economic shocks affecting the household Section 15b: Deaths of household members in the past 12 months, including age of deceased and cause of death.

Table 2.5: GHS-Panel Agriculture Wave 2 Questionnaire – Post Harvest Visit

Section	Topic	Respondent	Description
Cover	Cover	To be completed by field Staff. Household ID must be copied from Household to Agriculture Questionnaire.	This section contains household location and identification data as well as administrative data as regards administering and managing the questionnaire
A1	Land and Dry Season Planting	Farmer, owner or manager of plot	Follow-up on use of land for in post-planting visit and data on any subsequent planting or other use of the plot. Also information collected on new plots (i.e. added since post-planting visit)
A2	Harvest Labor	Farmer, owner or manager of plot	Information on household members and hired labor that worked in crop harvesting activities on the plot. Includes information on amount of time spent by each person and payments made to hired labor
A3	Agricultural production Harvest of Field and Tree Crops	Farmer, owner or manager of plot	Quantity and value of field crops produced
A4	Agricultural Capital	Farmer, owner or manager of plot	Ownership and value of agricultural machinery and tools owned by the household
A5 (A and B)	Extension Services	Farmer, owner or manager of plot	Access to and utilization of technical support from various sources (government and non-government)
A6	Animal Holdings	Owner or caretaker of animals	Data on farm animals owned by the household and commercial activity with these animals
A7	Animal Costs	Owner or caretaker of animals	Expenditure on livestock
A8	Other Agricultural Income	Farmer or caretaker of animals	Income from sale of agricultural products not capture previous section under crops and livestock
A9 (A and B)	Fishing, Capital and Revenue	Owner of fishing operations	SectionA9a: Data on fishing activities, includes capture, harvesting and processing Sectiona9b: Data on boat usage and the use of hired labour
A10	Network Roster	Farmer, owner or manager of plot	Roster of places or businesses where the household sells and purchases agricultural produce and/or supplies

Table 2.6 GHS-Panel Community Wave 2 Questionnaire – Post-Harvest Visit

Section	Topic	Respondent	Description
Cover	Cover	To be completed by the field staff	Cover
C1	Respondents Characteristics	Community Focus Group	Respondents Characteristics
C2	Community Infrastructure and Transportation	Community Focus Group	Community Infrastructure and Transportation
C3	Community Organizations	Community Focus Group	Community Organizations
C4	Community Resource Management	Community Focus Group	Community Resource Management
C5	Community Changes	Community Focus Group	Community Changes
C6	Community Key Events	Community Focus Group	Community Key Events
C7	Community Needs, Actions, and Achievements	Community Focus Group	Community Needs, Actions, and Achievements
C8	Food Prices	Market Food Sellers	Food Prices

There were some changes made in the questionnaires between Waves 1 and 2 to improve the questionnaire while still maintaining comparability between the two waves. Tables 2.7 and 2.8 outline these changes for the post-planting and post-harvest visits, consecutively.

Table 2.7: Wave 1 to Wave 2 Comparison, Post-Planting

Questionnaire	Section	Notes
Household Questionnaire	Cover sheets	Questions dropped from Wave 2: S1, S2, and S3
	Section 1: Household Roster	Questions re-ordered in Wave 2: starting with Q4
		Questions added in Wave 2: Q5, Q6, Q10, Q14-17, and Q29 onwards
		Question dropped in Wave 2: Q7
	Section 2: Education	Question added in Wave 2: Q1
		Change in Wave 2: Q18 has new response option
	Section 3A: Labor	Wave 1: was Section 3
		Questions added in Wave 2: Q22 and Q35
	Section 3B: Labor 6 Months, 12 Months, Activity Table, and Activity Summary	New section in Wave 2
		Change in Wave 2: Q2 response options changed

Questionnaire	Section	Notes
	Section 4: Credit and Savings	Questions added in Wave 2: Q3 - Q6, Q14, and Q15
		Change in Wave 2: Q9 has new response option
	Section 4B: Financial Capability	New section in Wave 2
	Section 5: Household Assets	Added in Wave 2: new item codes
	Section 6: Nonfarm Enterprises and Income Generating Activities	Wave 1 Q1 asks "During the past 12 months has any member of the household worked for himself, other than on a farm or raising animals?" with a yes/no response. Meanwhile Wave 2 Q1 asks to check Wave 1 Post Harvest Questionnaires for any household enterprises and copy information, to answer Q2 and then to list new enterprises/activities as part of Wave 2 Q1
		Wave 2 Q1 asks about the original enterprise ID in reference to Wave 1 enterprises
		Questions added in Wave 2: Q2 - Q4, Q6, Q8, Q9, Q25, Q26, Q32, and Q33
		Question dropped in Wave 2: Q8
		Change in Wave 2: time frame differs for Q11, Q17, Q19, Q20, Q21, Q22, and Q23
		Wave 2 Q7 includes "if not a member of the household, leave blank" while this is not in Wave 1 Q4
		Change in Wave 2: Q31 has new response options
	Section 7B: Food Expenditure	Change in Wave 2: Changes to food codes
		Change in Wave 2: Q2, Q3, Q6, and Q7 have new unit response options
		Question added in Wave 2: Q5
	Section 9: Food Security	Change in Wave 2: the directions say to "Ask senior female or person most knowledgeable about food consumption"
		Change in Wave 2: Q7 has new response option
	Section 10: Other household income	Questions added in Wave 2: Q3, Q7, and Q11
		Change in Wave 2: time frame differs for Q1, Q2, Q4, Q6, Q8, and Q10
Agriculture Questionnaire	Section 11b1: Land Inventory	Wave 1: was Section 11b
		Questions added in Wave 2: Q7- Q10, Q15 - Q18, Q23 – Q25, Q35 – Q38, and Q44 – Q46
		Change in Wave 2: Q28 has new response option
		Change in Wave 2: Q30 response option for "other specify" dropped
	Section 11b2: Land Tenure	New section in Wave 2
	Section 11c1: Planting Labor	New section in Wave 2

Questionnaire	Section	Notes
	Section 11c2: Input Cost	Wave 1: was called Section 11c
		Change in Wave 2: Q2, Q7, Q11, and Q16 have more unit response options
		Change in Wave 2: Response options for kilograms and litres in Q2, Q7, Q11, and Q16 are reversed
		Change in Wave 2: Q28 and Q30 have new response options
	Section 11d: Fertilizer Application	Wave 2 Q1, Q12, and Q24 has value 2 "no" go to Next Plot, while in Wave 1 Q1, Q12, and Q23 value 2 "no" goes to Next Section
		Questions added in Wave 2: Q13 and Q25
		Wave 2 Q29, Q30, and Q31 are in a different order than Wave 1 Q27, Q28, and Q29
	Section 11e: Seed Acquisition	Change in Wave 2: Q6, Q10, Q18, and Q30 have more unit response options
		Questions added in Wave 2: Q15 and Q27
	Section 11f: Planted Field Crops	Change in Wave 2: Q1 response option "other specify" dropped
		Change in Wave 2: Q4 has more unit response options
		Questions added in Wave 2: Q5 – Q12
	Section 11g: Planted Tree Crops	Change in Wave 2: Q1 response option "other specify" dropped
		Change in Wave 2: Q8 has more unit response options
	Section 11h: Marketing	Change in Wave 2: Q2, Q5, Q12, Q17 – Q20, and Q24 have more unit response options
		Change in Wave 2: Q9 and Q16 have new response option
	Section 11k: Agriculture By-Product	Change in Wave 2: Q3 and Q5 have more unit response options
		Question added in Wave 2: Q7
	Section 11l1: Extension Services I	Wave 1: was called Section 11: Extension
	Section 11l2: Extension Services II	Wave 1: was called Section 11l2: Extension
	Section 12: Network Roster	Change in Wave 2: Q3 value 8 combined values 7 and 8
Community Questionnaire	Section 1: Respondent Characteristics	Change in Wave 2: Numbering comes after ID code
	Section 2: Food Prices	Change in Wave 2: Item codes differ
		In Wave 2 the unit response is a separate variable
		Change in Wave 2: Numbering comes after item code
	Section 3: Labor	A "no" for Wave 2 Q1 instructs to go to the next section while a "no" for Wave 1 Q1 does not instruct this

Questionnaire	Section	Notes
	Section 4: Land Prices and Credit	Q4 and Q5 are switched between Waves
		Question added in Wave 2: Q13
		Added in Wave 2: two more ways listed on how land is used or acquired

Note: New numbering of questions occurs as a result of additional or dropped questions in Wave 2

Table 2.8: Wave 1 to Wave 2 Comparison, Post-Harvest

Questionnaire	Section	Notes
Household Questionnaire	Section 1: Household Roster	Change in Wave 2: Q5 adds "or a child six years and younger"
		Questions dropped in Wave 2: Q13 – Q18
		Change in W2: Q28 specifies that individual reported dead should have interview ended
		Different months in Wave 1 Q34 and Wave 2 Q29
	Section 2A: Education – New Members	Wave 2 questions starts with Q1, which asks if person is new. This is not present in Wave 1 until Q4.
		Change in Wave 2: Q17 has new response option
	Section 3A: Labor	Change in Wave 2: Q6 has new response options
		Questions added in Wave 2: Q12b, Q18b, Q24b, Q30b, Q39b, and Q40b
	Section 3B: Labor – 12 Months	New section in Wave 2
	Section 3B: Labor Activity	Dropped from Wave 1
	Section 4A: Health	Change in Wave 2: Q10 instructs "If at patient's home put 0"
		Change in Wave 2: Q11 instructs "If at patients home leave blank"
	Section 4B: Child Immunization	Change in Wave 2: Q4 and Q5 have new response option
	Section 5: Information and Communication Technology	Question added in Wave 2: Q1
		Change in Wave 2: Q2 has new response option
		Change in Wave 2: Q5 value 11 "does not use it to watch TV"
	Section 6: Remittances	Change in Wave 2: Q4 and Q8 have both amount and currency code
	Section 7: Household Assets Sale and Acquisition	Change in Wave 2: Q1 instructs to write "The number of [item] owned by household at the time of the post planting interview. If none, put 0"
		Change in Wave 2: Item codes differ
	Section 8: Housing	Change in Wave 2: Q6 has new response options
		Change in Wave 2: Q10 has new response option
		Change in Wave 2: Q11 change in response options

Questionnaire	Section	Notes
		Change in Wave 2: Q18 for "Lighting" has new response options
		Change in Wave 2: Q33 has new response options
		Change in Wave 2: Q38 response values changed
	Section 9: Nonfarm Enterprises and Income Generating Activities	Change in Wave 2: Q4 has new response option
		Questions added in Wave 2: Q5b, Q23a, Q23b, Q29, and Q30
		Change in Wave 2: Q28 has new response options
	Section 10B: Food Expenditure	Change in Wave 2: Q2, Q3, Q6, and Q7 have more unit response options
		Questions added in Wave 2: Q5
		Change in Wave 2: Food codes differ
	Section 13: Other Household Income	Questions added in Wave 2: Q2b, Q5b, and Q8b
	Section 14: Safety Nets	Change in Wave 2: Q2 unit response options 3 and 4 dropped
Agriculture Questionnaire	Section A1: Land and Dry Season Planting	Change in Wave 2: Q9, Q28, and Q34 response options for "other specify" dropped
		Wave 2 Q11 and Q14 has space for more than one ID code
		Change in Wave 2: Q15 – Q22 appear in a different order
		Change in Wave 2: Q25 splits up value 5
		Change in Wave 2: Q30 and Q36 have response option for April dropped
		Change in Wave 2: Q31 and Q37 have more unit response options
	Section A2: Harvest Labor	Question added in Wave 2: Q10b
		Change in Wave 2: Q2, Q5, and Q8 instruct skip questions if response is "none"
	Section A3: Agricultural Production – Harvest of Field and Tree Crops	Change in Wave 2: Q6, Q8, Q11, and Q16 have more unit response options
		Questions added in Wave 2: Q6b, Q12b, Q12c, and Q17b
		Questions dropped from Wave 2: Q19 – Q23
	Section A4: Agricultural Capital	Change in Wave 2: item codes differ
	Section A6: Animal Holdings	Question added in Wave 2: Q19b
		Questions dropped from Wave 2: Q25 – Q28
	Section A8: Other Agricultural Income	Change in Wave 2: Q3 and Q5 have more unit response options
		Question added in Wave 2: Q7 and Q8
	Section A9a: Fishing	Change in Wave 2: Q5, Q7, Q10, Q12, Q13, Q15, and Q18 have fewer unit response options
		Change in Wave 2: boat engine codes differ

Questionnaire	Section	Notes
	Section A9b: Fishing Capital and Revenues	Question added in Wave 2: Q5
		Change in Wave 2: Time frame differs for Q7 – Q9
		Wave 1 Q11b and Wave 2 Q13 are variations of the same question
		Change in Wave 2: Wave 1 Q15 has fewer unit response options
	Section A10: Network Roster	Change in Wave 2: Q3 value 7 combines values 7 and 8
Community Questionnaire	Cover sheets	Survey staff details are numbered differently across Waves
		Change in Wave 2: asks for information about Data Validation Clerk
	Section C8: Food Prices	Change in Wave 2: Item codes differ
		Unit of measure in Wave 1 is given in Wave 2 Q1b

Note: New numbering of questions occurs as a result of additional or dropped questions in Wave 2

For the tracking of households that moved out of the original community, two sets of questionnaires were fielded. New Household and Agriculture questionnaires were designed for households that had moved prior to the post-planting visit of Wave 2 (between Waves 1 and 2). For households that moved after the post-planting visit Wave 2 but before the post-harvest visit Wave 2, they are simply given the Visit 2 questionnaires.

In the case of households that moved prior to the post-planting visit of Wave 2, it was necessary to administer both the post-planting and post-harvest sets of questionnaires. However some of the sections in the post-planting and post-harvest questionnaires are very similar so in order to reduce the burden on the respondent, household questionnaires for both visits were combined. The same was done for the agriculture questionnaires. Tables 2.7 and 2.8 describe these consolidated questionnaires.

Table 2.9: GHS-Panel Wave 2 Questionnaire - Combined Household Tracking Questionnaire

Section	Topic	Respondent	Description
Cover	Cover	To be completed by the field staff	Household identifier variables, enumerator, supervisor, and data entry clerk identifiers, date and time of interview and data entry, and observation notes by enumerator regarding the interview
1	Roster	To be fill by the Head of Household or spouse.	Roster of individuals living in the household, relationship to the household, gender, year of birth, age, marital status, polygamous marriages, spouse identification, parental status, place of birth, date joined household if new, migration.
2	Education	Individuals 5 years and above	Educational attainment, school characteristics for the 20011-12 academic year; and educational expenditures for the past 12 month.
3 (A and B)	Labour	Individuals 5 years and older	Section 3a collects data on labour market activity of all household members 5 years and older. This includes employment and earnings information. Section 3b collects information on employment in one or more industries in the past 12 months
4 (A and B)	Health	All individuals	Section 4a: general health status and utilization and cost of health services for those that need medical care. Data on effect of disabilities on activity and functioning; and anthropometrics. Section 4b: Child immunization.
5 (A and B)	Credit and Savings and Financial Capability	Individuals 15 years and above	5a: Credit and Savings. Savings made, loans or credit received, insurance, and remittances by the household during the last six months, and conditions of the Transaction 5b: Financial Capability. Household budgeting and members' contribution to household expenses as well as household financial planning and preparation for unexpected expenses
6	Information and Communication Technology	All individuals 10 years and above	Access to and use of communication technology, including computers and internet

Section	Topic	Respondent	Description
7	Remittances	All individuals 10 years and above	Remittances received from abroad by household members 10 years and older
8	Household Assets	Most knowledgeable person	Ownership of assets and value
9	Housing	Head of household or any knowledgeable adult	Housing, facilities and cost. Access to utilities and costs
10	Non-farm Enterprises and Income Generating Activities	Owner or manager of enterprise	Data on non-farm businesses owned and/or operated by the household. Follow- up data on the businesses from the previous visit and new businesses that were started since the previous visit
11 (A, B and C)	Meals Away From Home, Food Expenditures and Aggregate Food Consumption	Female in the household responsible for food preparation and/or food purchases	Section 10A: Meals away from home Section 10B: Food expenditures Section 10C: Aggregate food consumption
12	Non-food Expenditures	Most knowledgeable person or person who is responsible for household purchases	Consumption and expenditure on non- food items
13	Food Security	Household head or knowledgeable adult household member	Collects information on quantity of food, preferred foods and variety of foods available to household members based on economic reasons. Also collects data on intra-household food security dynamics.
14	Other household Income	Household head or knowledgeable adult household member	Miscellaneous income received by household
15	Safety Nets	Household head or knowledgeable adult household member	Household access to and utilization of safety nets
16 (A and B)	Economic Shocks and Death	Household head or knowledgeable adult household member	Section 15a: Data on economic shocks affecting the household Section 15b: Deaths of household members in the past 12 months, including age of deceased and cause of death.

Table 2.10: GHS-Panel Wave 2 Questionnaire – Combined Agriculture Tracking Questionnaire

Section	Topic	Respondent	Description
Cover	Cover	To be completed by field Staff. Household ID must be copy from Household to Agriculture Questionnaire.	This section contains household location and identification data as well as administrative data as regards administering and managing the questionnaire
TA1	Plot Roster	Owner or manager of plot	Information on all plots owned and/or managed by the Household. This section includes data on estimated area, GPS measured area and the GPS measured location of the plot
T1B	Land Inventory	Owner or manager of plot	Data on plot acquisition, tenure and use
T1C	Land Tenure	Owner or manager of plot	Information on land ownership, demarcation and disputes
TID	Planting Labor	Owner or manager of plot	Information on household members and hired labor that worked in planting activities on the plot. Includes information on amount of time spent by each person and payments made to hired labor
T1E	Harvest Labor	Farmer, owner or manager of plot	Information on household members and hired labor that worked in crop harvesting activities on the plot. Includes information on amount of time spent by each person and payments made to hired labor
TIF	Input costs	Owner or manager of plot	Use and cost of pesticide, herbicide, animal labor and use of machinery
T1G	Fertilizer acquisition	Owner or manager of plot	Access to, use and cost of fertilizer
T2A	Seed acquisition	Owner or manager of plot	Data on source, quantity and cost of seeds used on the plot
T2B	Planted field crops	Owner or manager of plot	Data on crops planted on the plot, amount of crops planted and expected harvest. Also includes questions on cowpeas, variety, features and year of adoption
T2C	Planted tree crops	Owner or manager of plot	This section collects details on tree crops
T2D	Agricultural Production of Field and Tree Crops	Farmer, owner or manager of plot	Quantity and value of field crops produced
T3	Agricultural Capital	Farmer, owner or manager of plot	Ownership and value of agricultural machinery and tools owned by the household

Section	Topic	Respondent	Description
T4	Animal holdings	Farmer or caretaker of animals	Data on farm animals owned by the household and commercial activity with these animals
T5	Animal costs	Farmer or caretaker of animals	Livestock farmer caretaker activities and costs
T6	Agriculture by-product	Farmer or caretaker of animals	Trading activity in agricultural by-products
T7A	Extension Services I	Owner or manager of plot	Main source (government and non-governmental) of farming advice on select agricultural activities
T7B	Extension Services II	Owner or manager of plot	Details of information provided by main source of information on agricultural activities. Includes frequency of visits and usefulness of the information provided
T8	Fishing	Owner of fishing operations	Data on fishing activities, includes capture, harvesting and processing
T9	Fishing Capital and Revenues	Owner of fishing operations	Data on boat usage and the use of hired labour
T10	Network Roster	Farmer, owner or manager of plot	Roster of places or businesses where the household sells and purchases agricultural produce and/or supplies

3.0 Wave 2 Sample and Weights

The GHS-Panel sample is designed to be representative at the national level as well as at the zonal (urban and rural) level. The sample size of the GHS-Panel is not adequate for state-level estimates. The complete sampling information for the GHS-Panel Wave is described in the Basic Information Document for GHS-Panel 2010/2011.

The objective of the GHS-Panel Wave 2 was to re-interview all of the Wave 1 households. There are two important aspects to this. First, the team attempted to track households that moved to a new dwelling, including households that relocated to new communities after Wave 1. Second, the team did not track individual members who moved out (sometimes referred to as split-off households).

Table 3.1 show the details of the Wave 2 sample. No household that was re-located refused to participate though there were a few that were not at home or had moved away (N=5), so almost all attrition was due to the inability to relocate the household.

Table 3.1: Details of Wave 2 Sample

	Wave 1 Final Sample			Wave 2			Attrition				Wave 2 HHs interviewed in main survey phase			Wave 2 HHs interviewed in the tracking phase		
	All	Urban	Rural	All	Urban	Rural	All	Urban	Rural		All	Urban	Rural	All	Urban	Rural
North Central	794	217	577	784	214	570	10	3	7		777	214	563	7	0	7
North East	797	138	659	741	117	624	56	21	35		731	112	619	10	5	5
North West	898	170	728	878	156	722	20	14	6		866	155	711	12	1	11
South East	794	204	590	763	197	566	31	7	24		745	190	555	18	7	11
South South	769	229	540	761	219	542	8	10	-2		712	203	509	49	16	33
South West	864	611	253	789	562	227	75	49	26		669	465	204	120	97	23
Total	4916	1569	3347	4716	1465	3251	200	104	96		4500	1339	3161	216	126	90

4916 is the number of households that are in Wave 1 post-planting **and** Wave 1 post-harvest
4716 is the number of households that are in Wave 2 post-planting **and** Wave 2 post-harvest
4671 is the number of households interviewed in *both visits of Wave 1* **and** *both visits of Wave 2*

Table 3.2 shows the distribution of households without complete panel information in Waves 1 and 2.

Table 3.2: Distribution of households without complete panel information

	NUMBER HHs
Only in one visit of Wave 2[2]	87
Refusing to answer	24
Not found	28
Dead	19
Moved away	48
Not interviewed for unknown reason	39
Total	245

When a sample of households is selected for a survey, these households represent the entire population of the country. To accurately use the datasets, the data must be weighted to reflect the distribution of the full population in the country. Two population weights were calculated for panel households in wave 2. The first (***wt_wave2***) is to be applied when wave 2 data *only* is used. The second (***wt_combined***) is to be applied when using the wave 2 data *in conjunction* with wave 1. When applied, these weights will raise the sample households and individuals to national values adjusting for population concentrations in various. Both weights are included in the Section A data files (***secta_plantingw2*** for post-planting and ***secta_harvestw2*** for post-harvest).

[2] There are several reasons as to why a household did not interview in one visit. For example, a household may not have been found in Wave 2 visit 1 but was found and then interviewed in Wave 2 visit 2. By design, any household that did not interview in Wave 2 visit 1 as a result of being in a crisis area is included in this category.

4.0 Training of Field Staff and Data Entry Operators for the Survey

4.1 Training Design

Two levels of training were mounted for both the post-planting survey and the post-harvest survey. The first level was organized at NBS Headquarters in Abuja and was called the Training of Trainers (TOT). The participants in the TOT became the resource persons for the next level of training. The top management team of the survey participated in the TOT, which lasted for four days. The core training materials for the 2nd level training were harmonized and finalized during the TOT. The persons trained in the TOT were then sent to carry out the second level training.

The second level training was conducted over a nine day period. Seven days were dedicated to theory including data entry training and two days to field practice and review. Participants in the training were Zonal Controllers, State Officers, Field Supervisors, Field Interviewers, and Data Entry Operators. Training instructions were given to the field staff by the resource persons from the management team (NBS, FMS&RD, and NFRA) with support from World Bank technical missions. Three (3) resource persons were sent to each training center to perform the training. Each trainer was given responsibility for one of three areas of training: Household Questionnaire, Agriculture Questionnaire and IT including data entry.

Specifically, the training consisted of (i) classroom instructions on the questionnaire, concepts and definitions, (ii) interview techniques, (iii) methods and field practices in performing actual interviews to ensure that field interviewers fully understood the questionnaire and (iv) data entry and data management. In addition, participants did actual interviews in the field with households that were not scheduled to be part of the actual survey sample. Most of the training instructions are detailed in the interviewer's and supervisor's manuals which are also available.

4.2 Post-Planting Training Locations

Due to security concerns in the North-East and North-West zones, the training for those two zones was moved to North-Central zone. As a result, all three northern zones: North-East, North-West and North-Central, were trained in two training locations near the town of Masaca in Nasarawa State. The training for the other zones: South-East, South-West and South-South, was conducted within their zones in Enugu (Enugu State), Ibadan (Oyo State) and Calabar (Cross River State), respectively.

4.3 Post-Harvest Training Locations

The continuing security concerns in the North-East and North-West zones required that those zones were returned to the post-planting training locations in Nasarawa State in the North-Central zone for training. The North-Central zone trainees, however, were moved from the location in Nasarawa used for their post-planting training and relocated to join with the South-East zone for training in Ibadan (Oyo State). The training locations for the other two zones, South-East and South-South, remained as they were for the post-planting training.

4.4 Evaluation of Field and Data Entry Staff

At the end of the training session, trainees were assessed according to both a test that was administered on the material covered in the training process, and an evaluation by the resource persons. Based on the results of the tests some interviewers and data entry operators were removed from the survey. In some instances the removed workers were replaced and in other cases there was no replacement but those remaining in the team were given extra time to complete the fieldwork and data entry. The tests also revealed that some workers (particularly data entry operators) needed extra training so special training sessions were put in place to strengthen these workers.

5.0 Field Work

5.1 Organization of Fieldwork

Data were collected by teams consisting of a supervisor, between 2 and 4 interviewers, and a data entry operator. The number of teams varied from state to state depending on the sample size or number of EAs selected. The teams moved in a roving manner and data collection lasted for between 20 – 30 days for each of the post-planting and post-harvest visits. Additional details on the structure of the visits are available in Section 7.

The GHS-Panel Wave 2 was administered in two visits: post-planting (September - November 2012) and post-harvest (February - April 2013). A tracking phase was conducted in June-July 2013 to interview households that had moved out of the Wave 1 community or had moved between Visit 1 and Visit 2 in Wave 2.

5.2 Gift to Households

As a show of appreciation for the panel households continued participation, all panel households that were located, were given a gift (even if they refused to participate in Wave 2). These gifts were given during the post-harvest survey and consisted of a large umbrella and a plastic bucket. Households were very appreciative of the gifts and many households that refused to participate in the post-planting survey or reluctant to continue at all in the panel survey, had a change of heart and participated.

5.3 Pre-printed Wave 2 Household Roster

To facilitate identification of the same people over time, the field team implemented Wave 2 with a pre-printed household roster. The roster asks for information on all Wave 1 members (whether they still reside in the household, have moved or are deceased). New members are added to the roster. So the ID number in the roster can be merged with Wave 1 to identify the same respondent.

5.4 Fieldwork Monitoring and Evaluation

As an additional aid to ensuring good quality data, extensive monitoring was done of the field work. There were three levels of monitoring and evaluation. The first level of monitoring followed immediately after the zonal training. One (1) monitor was assigned to 1 – 2 states and all states were covered, including Federal Capital Authority, Abuja (FCT, Abuja). This monitoring was carried out by the technical team from the zonal training (i.e. the trainers) which included individuals from the Head Office of NBS, the FMA&RD, and the NFRA headquarter staff. The first monitoring team also included World Bank officials and consultants. The second monitoring was carried out by NBS state officers and zonal controllers and took place over an extended period during the fieldwork. The third and final monitoring took place no later than a week before the end of fieldwork. The team involved in the third monitoring was selected from the team that carried out the first monitoring.

During first and second monitoring, the monitors made sure that proper compliance with the procedures as contained in the manual were followed, effected necessary corrections and tackled problems that arose. The third monitoring focused on data issues and included checking the entered data against data in the questionnaires. Where problems were found, these were corrected either directly or through a revisit to the household for verification of information or for further information.

6.0 Household Tracking Exercise

The tracking exercise conducted in wave two was for the tracking of households that moved between wave one and wave two and households that moved during wave two, that is between the post planting visit and the post-harvest visit. Interviewers were instructed to complete a tracking form for all complete households for which there was a confirmed relocation. In the case of households that moved to nearby locations, i.e. within the enumeration area, the interviewers were instructed to locate these households and administer the questionnaires.

6.1 Tracking States and Staff Assignments

The tracking exercise was conducted by staff of the panel management team with support from interviewers in each of the states. In states with two or less households to be tracked, the tracking was conducted by state staff only. Table 6.1 below shows the state where the tracking exercise took place, the number of households to be tracked and the number of field staff that were engaged in the activity. No tracking was done in Adamawa State, Borno State and Yobe State as there was a state of emergency in those states at the time. The table also shows that 27 tracking forms did not have any information on the state to which the households relocated, hence the category "UNKNOWN". A further 15 households had no information at all concerning the relocation of the households.

Table 6.1: Number of Households to be Tracked and Allocation of Field Staff

STATE WHERE HOUSEHOLD RELOCATED	NUMBER OF HOUSEHOLDS	STATE VISITED BY HQ STAFF	NUMBER OF HQ STAFF TO VISIT STATE	Number State Persons
Abia	2	YES	1	1
Adamawa	2	NO		
Akwa Ibom	5	YES	1	1
Anambra	6	YES	1	1
Bauchi	7	YES	1	1
Bayelsa	10	YES	1	1
Benue	5	YES	1	1
Borno	2	No		
Cross River	3	NO	-	2
Delta	10	YES	1	1
Edo	9	YES	1	1
Ekiti	16	YES	2	2
Enugu	4	YES		2
Imo	4	YES	1	1
Jigawa	1	NO		
Kaduna	4	YES	1	1
Kano	2	NO	-	2
Kogi	2	NO	-	2
Kwara	4	NO	-	2

STATE WHERE HOUSEHOLD RELOCATED	NUMBER OF HOUSEHOLDS	STATE VISITED BY HQ STAFF	NUMBER OF HQ STAFF TO VISIT STATE	Number State Persons
Lagos	26	YES	2	2
Nasarawa	5	YES	1	1
Niger	2	NO	-	2
Ogun	16	YES	2	2
Ondo	20	YES	2	2
Osun	9	YES	1	1
Oyo	22	YES	2	2
Rivers	8	YES	1	1
Sokoto	1	NO	-	2
Taraba	2	NO	-	2
Yobe	1	NO		
Zamfara	1	NO	-	2
FCT Abuja	2	YES	1	1
UNKNOWN	***27***			
Sub Total	**240**			
HH /w Missing Info.	15			
TOTAL	255			

6.2 Training of Tracking Staff

Training for the tracking exercise was conducted at the NBS head office for panel staff that would be involved in the activity. This training took place on June 20 and 21, 2013. The persons trained were to train their partner staff as well as state officers in their assigned state. A number of trainers also had responsibility to train staff from states where no head office staff were slated to visit. The tracking fieldwork commenced round about June 25, 2013 and was completed by the end of July, 2013.

6.3 Tracking Methodology

The tracking of households included the following steps:

- Discussion of the set of tracking households with the state to obtain all information necessary. Use this information to finalise the list of households that will be tracked
- In order to properly prepare for the tracking field activities, the tracking exercise was initiated by the panel management team while at NBS head office. Contact was made with most of the households to be tracked by using the phone numbers given on the tracking forms. Information was also used from the contact information on the questionnaires. That is, where households could not be contacted using the information on the tracking form, the contact information for family, friends and neighbours which was collected in the household questionnaire were also used. These preliminary tracking activities proved to be a very useful exercise in confirming the location of the relocated household and laying out the plan for the tracking fieldwork. Also,

the opportunity was taken during the preliminary exercise, to obtain directions to households' new address and to set appointments for the interview.

- In cases where there was no useful phone information (either in the tracking form of household contact information) and the new address of the household was not known, the original location of the household was visited and effort made to obtain phone numbers for the household or the address. When information on the address was obtained, the household was visited by the team in charge of the state to which the household had moved.
- Completion of the required questionnaires

6.31 Categories of Households Tracked

There are three categories of households that were tracked:

Category 1: Households that were not there for the post-planting and post-harvest survey were required to complete the combined questionnaires. All of these households were required to complete the household questionnaires and those with a farm were also be required to complete the agriculture questionnaire. These questionnaires were prefilled.

Category 2: Households that were not located in post-planting visit but were located in the post-harvest visit. Enumerators did not go to the field in the post-harvest visit with post-planting questionnaires. Therefore, these households were administered the post-harvest questionnaires and then revisited in the tracking phase and administered the post-planting questionnaires.

Category 3: Households that provided data for post-planting and were not available for the post-harvest survey were required to complete the post-harvest questionnaires only. These questionnaires are exactly the same as what was completed in the post-harvest survey in February/March 2013. Pre-filling was done with these questionnaires

The *tracked_obs* variable at the end of each data file indicates which of these three categories the household belongs to. Categories 1, 2, and 3 are labelled "Combined", "PP only", and "PH only" respectively.

6.32 Tracking Households with Unknown Locations

Households with an unknown new address have been included as a part of the state in which they were originally located. It was the responsibility of the head office staff going to the original state of these "unknown" households to make an effort to gather further information on the place to which the household had relocated. This effort was made early in the head office staff member's visit to the state. In cases where the household had moved to a new state, the new household location was passed to the staff member visiting the state to which the household had relocated. This household will then became a part of that staff member's tracking assignment. If the household had moved to another location within the original state then it was included as a tracking assignment of the head office staff member in that state.

6.4 Gift to Tracked Households

As a show of appreciation for the tracked households continued participation in the panel survey, the tracked households were presented with their choice of either a large umbrella or a raincoat.

7.0 Data Management and Description of Datasets

7.1 Data Management

7.11 Data Entry

This survey used concurrent data entry approach. In this method, the fieldwork and data entry were handled by each team assigned to the state. Each team consisted of a field supervisor, 2-4 interviewers and a data entry operator. Immediately after the data were collected in the field by the interviewers and supervisors (the supervisors administered the community questionnaires and collected data on prices), the questionnaires were handed over to the supervisor to be checked and documented. At the end of each day of fieldwork, the questionnaires were then passed to the data entry operator for entry. After the questionnaires were entered, the data entry operator generated an error report which reported issues including out of range values and inconsistencies in the data. The supervisor then checked the report, determined what should be corrected, and decided if the field team needed to revisit the household to obtain additional information. The benefits of this method are that it allows one to:

- Capture errors that might have been overlooked by a visual inspection only,
- Identify errors early during the field work so that if any correction required a revisit to the household, it could be done while the team was still in the EA

The CSPro software was used to design the specialized data entry program that was used for the data entry of the questionnaires.

7.12 Data Communication System

In Wave 2, a new data communication system was implemented resulting in data transmission between the states and the head office with minimal user intervention. Previously, in Wave 1, data was sent to the head office by email using a dedicated email account for the purpose. This method of communication posed a challenge to many of the data entry persons because a number of them were not familiar with using email and in some other cases, there were problems accessing the internet.

The problem with this is that they were significant delays between when the data was entered was sent and received at the head office. As a result the data cleaning activities were delayed because sometimes the data would take up to three weeks to be received at the head office and even then they were errors in sending and it was not useful.

The new system that was implemented was essentially automated. Each data entry person was given a mobile modem and once they connected to the internet the system would automatically send data to the head office in Abuja. The data entry persons were instructed to do this every two to three days so there was a steady flow of current data from the field to the head office.

7.13 Data Cleaning

The data cleaning process was done in a number of stages. The first step was to ensure proper quality control during the fieldwork. This was achieved in part by using the concurrent data entry system which was, as explained above, designed to highlight many of the errors that occurred during the fieldwork. Errors that are caught at the fieldwork stage are corrected based on re-visits to the household on the instruction of the supervisor. The data that had gone through this first stage of cleaning was then sent from the state to the head office of NBS where a second stage of data cleaning was undertaken.

During the second stage the data were examined for out of range values and outliers. The data were also examined for missing information for required variables, sections, questionnaires and EAs. This stage of the data checking was facilitated by the new data transmission system. The team was established at the head office specific responsibility for the checking of the data as it was received from the states. Any problems found were then reported back to the state where the correction was then made. This was an on-going process until all data were delivered to the head office.

After all the data were received by the head office, there was an overall review of the data to identify outliers and other errors on the complete set of data. Identified problems were reported to the state. There the questionnaires were checked and where necessary the relevant households were revisited and a report sent back to the head office with the corrections.

The third stage of the cleaning process was to ensure that the household- and individual-level data sets were correctly merged across all sections of the Household Questionnaire. Special care was taken to see that the households included in the data matched with the selected sample and where there were differences these were properly assessed and documented. The agriculture data were also checked to ensure that the plots identified in the main sections merged with the plot information identified in the other sections. This was also done for crop-by-plot information as well.

The last stage of cleaning involved a final comprehensive review of the data primarily conducted by World Bank staff in Washington, DC in consultation with the headquarters and state offices of NBS in Nigeria. Every variable was examined individually for (1) consistency with other sections and variables, (2) out of range responses, and (3) outliers. Obvious errors were corrected where possible and questionnaires were checked when deemed necessary. However, special care was taken to avoid making strong assumptions when resolving potential errors. Some minor errors remain in the data where the diagnosis and/or solution were unclear to the data cleaning team.

7.14 Data Cleaning Challenges

The cleaning process at the head office was impeded by the fact that the questionnaires were not immediately available for inspection when problems were identified in the data. The questionnaires were retained by the state in case there was the need for household revisits. So whenever problems were identified at the head office, the state office had to be contacted in order to determine if the suspect data were the same as the information on the questionnaire, and to ensure that changes were captured in both places. This was a very cumbersome and time consuming process since communication was difficult and in many instances the response was not timely. However, this is a necessary process to ensure that the households can be re-visited to

provide the correct information to avoid having to make imputations. Also, this process allows the state officers to understand the key issues that arose during fieldwork and will serve to enhance further rounds of data collection. It will be important, nonetheless, to find a mechanism to facilitate this process in the next round of data collection and cleaning.

A second challenge in data management and cleaning was the difficulty faced by state offices in sending the data from the state to the head office. There were difficulties in accessing internet facilities in many of the EAs and surrounding areas where the field teams were active. The consequence of this was that the data were not sent to the head office until the teams returned to state capitals where, due to the distance, it was difficult to return to the EAs for household revisits when requested by the head office. This issue will need to be addressed for future rounds of the survey.

7.2 Description of Datasets

The GHS-Panel Wave 2 was administered in two visits: post-planting (September - November 2012) and post-harvest (February - April 2013). During each visit two questionnaires were administered to the household respondents (Household Questionnaire and Agricultural Questionnaire) and a third questionnaire was administered at the level of the enumeration area (Community Questionnaire). The tracking phase (for moved households) was completed in June-July 2013. The tracking data is integrated into the post-planting and post-harvest structure, even though the data were actually collected in the tracking phase.

7.21 Household Data

In the Household Questionnaire, some of the modules were administered in both the post planting and post-harvest visit and others were only administered during one of the two visits. This should be taken into account when using the datasets.

Group 1: These modules are administered in both visits but the module in the post-harvest version is a follow up to the post-planting module. For example, for the Roster and Education modules, additional information is gathered during the post-harvest only for individuals who had joined the household since the first, or post-planting, visit. (These people are referred to as 'new household members'.) For assets and enterprises, the module attempts to update the information from the first visit.

- Roster
- Education
- Household Assets
- Nonfarm Enterprises

Group 2: These modules are administered in both visits as standalone modules. For these topics we have complete information at two points in time during the year of the survey.

- Labor
- Meals Away From Home
- Food Consumption and Expenditure

- Nonfood Expenditure
- Food Security
- Other Household Income

Group 3: These modules only appear in either the post-planting or the post-harvest visit

- Post-planting only
  - Credit and Savings
- Post-harvest only
  - Health and Child Immunization
  - Information and Communication Technology
  - Remittances
  - Housing
  - Aggregate Food Consumption
  - Safety Nets
  - Economic Shocks and Deaths

Tables 7.1a and 7.1b show the sections of the Household Questionnaire and the datasets that correspond to these.

Table 7.1a: Post-planting household datasets

Section	Section Name	Dataset Filename
Cover	Cover	secta_plantingw2
1	Roster	sect1_plantingw2
2	Education	sect2_plantingw2
3	Labour	sect3a_plantingw2
		sect3b_plantingw2
		sect3c_plantingw2
		sect3d_plantingw2
		sect3e_plantingw2
4	Credit and Savings	sect4a_plantingw2
		sect4b_plantingw2
5	Household Assets	sect5a_plantingw2
		sect5b_plantingw2
6	Non-farm Enterprises	sect6_plantingw2
7A	Meals Away From Home	sect7a_plantingw2
7B	Household Food Expenditure	sect7b_plantingw2
8	Household Non-Food Expenditures	sect8a_plantingw2
		sect8b_plantingw2
		sect8c_plantingw2
		sect8d_plantingw2
		sect8e_plantingw2
9	Food Security	sect9_plantingw2
10	Other Income	sect10_plantingw2

Table 7.1b: Post-harvest household datasets

Section	Section Name	Dataset Filename
Cover	Cover	secta_harvestw2
1	Roster	sect1_harvestw2
2A	Education - New Member	sect2a_harvestw2
2B	Education – Original Household Members	sect2b_harvestw2
3A	Labour	sect3a_harvestw2
3B	Labour Activity	sect3b_harvestw2
4A	Health	sect4a_harvestw2
4B	Child Immunization	sect4b_harvestw2
5	Information and Communication Technology	sect5_harvestw2
6	Remittances	sect6_harvestw2
7	Household Assets Sales and Acquisition	sect7_harvestw2
8	Housing	sect8_harvestw2
9	Non-farm Enterprises and Income Generating Activity	sect9_harvestw2
10A	Meals Away From Home	sect10a_harvestw2
10B	Food Consumption and Expenditures	sect10b_harvestw2
10C	Aggregate Food Consumption	sect10c_harvestw2
		sect10ca_harvestw2
		sect10cb_harvestw2
11	Non-food Expenditures	sect11a_harvestw2
		sect11b_harvestw2
		sect11c_harvestw2
		sect11d_harvestw2
		sect11e_harvestw2
12	Food Security	sect12_harvestw2
13	Other Household Income	sect13_harvestw2
14	Social Safety Nets	sect14_harvestw2
15A	Economic Shocks	sect15a_harvestw2
15B	Deaths	sect15b_harvestw2
		sect15b1_harvestw2
		sect15b2_harvestw2

7.22 Agriculture Data

It should be noted that in the Agriculture Questionnaire, the plot roster and land inventory information collected during the post-planting visit is updated during the post-harvest visit in the Land and Dry Season Planting section to include additional plots households may have acquired

or old plots they have disposed of since the first, post-planting visit.[3] Information on inputs to agricultural production was collected in the post-planting visit only. The crop codes used in the Agriculture Questionnaire are presented in Appendix 3. As with the Household Questionnaire, some modules were administered in both visits. For these modules, during the post-harvest visit, information was gathered on the activities since the post-planting interview.

Table 7.2a: Post-planting Agriculture datasets

Section	Section Name	Dataset Filename
11a	Plot Roster	sect11a_plantingw2
		sect11a1_plantingw2
11b	Land Inventory	sect11b1_plantingw2
		sect11b2_plantingw2
11c	Input Costs	sect11c1_plantingw2
		sect11c2_plantingw2
11d	Fertilizer Acquisition	sect11d_plantingw2
11e	Seed Acquisition	sect11e_plantingw2
11f	Planted Field Crops	sect11f_plantingw2
11g	Planted Tree Crops	sect11g_plantingw2
11h	Marketing of Agricultural Surplus	sect11h_plantingw2
11i	Animal Holdings	sect11i_plantingw2
11j	Animal Costs	sect11j_plantingw2
11k	Agriculture By-product	sect11k_plantingw2
11l	Extension	sect11l1_plantingw2
		sect11l2_plantingw2
12	Network Roster	sect12_plantingw2

Table 7.2b: Post-harvest Agriculture datasets

Section	**Section Name**	**Dataset Filename**
A1	Land and Dry Season Planting	sectaa_harvestw2
		secta1_harvestw2
A2	Harvest Labour	secta2_harvestw2
A3	Agricultural Production – Harvest of Field and Tree Crops	secta3_harvestw2
A4	Agricultural Capital 1	secta41_harvestw2
	Agricultural Capital 2	secta42_harvestw2
A5	Extension Services 1	secta5a_harvestw2
	Extension Services 2	secta5b_harvestw2
A6	Animal Holdings	secta6_harvestw2
A7	Animal Costs	secta7_harvestw2
A8	Other Agricultural Income	secta8_harvestw2
A9a	Fishing	secta9a1_harvestw2

[3] In theory, plots in wave 2 can be matched to wave 1using the characteristics of the plots. However, the plot description and codes were not prefilled from the wave 1 roster. Thus plots cannot be matched across plots using plot IDs.

Section	Section Name	Dataset Filename
		secta9a2_harvestw2
A9b	Fishing Capital and Revenue	secta9b1_harvestw2
		secta9b2_harvestw2
		Secta9b3_harvestw2
A10	Network Roster	secta10_harvestw2

7.23 Community Data

Tables 7.3a and 7.3b show the sections of the community questionnaire and their corresponding data sets.

Table 7.3a: Post-planting Community datasets

Section	Section Name	Dataset Filename
Cover	Cover	sectc_plantingw2
C1	Respondent Characteristics	sectc1_plantingw2
C2	Food Prices	sectc2_plantingw2
C3	Labor	sectc3a_plantingw2 sectc3b_plantingw2 sectc3c_plantingw2
C4	Land Prices and Credit	sectc4a_plantingw2 sectc4b_plantingw2

Table 7.3b: Post-harvest Community datasets

Section	Section Name	Dataset Filename
Cover	Community identification	sectc_harvestw2
C1	Respondent Characteristics	sectc1_harvestw2
C2	Community Infrastructure and Transportation	sectc2_harvestw2
C3	Community Organizations	sectc3_harvestw2
C4	Community Resource Managements	sectc4_harvestw2
C5	Community Changes	sectc5_harvestw2
C6	Community Key Events	sectc6_harvestw2
C7	Community Needs, Actions and Achievements	sectc7_harvestw2
C8	Food Prices	sectc8_harvestw2

Note that, for purposes of maintaining the confidentiality of the data, all names and addresses have been removed from the datasets. Additionally, the GPS coordinates have also been removed as these could be used to locate households and plots with accuracy. See Appendix 4 and the next section on the geo-variables which are made available in lieu of actual locations of household dwellings and plots.

7.24 Geospatial variables

To increase the use of the GHS-Panel data, a set of geospatial variables has been provided by using the georeferenced plot and household locations in conjunction with various geospatial databases that were available to the survey team. More information is available in Appendix 4 on how these variables are constructed and linked to the GHS-Panel data. The table in Appendix 4 provides the name, type, source, reference period, resolution, description, and source of each geospatial variable included.

7.25 Consumption aggregate

The consumption aggregate is constructed using Stata executable programs (do-files), which are available on request.

As noted above, the survey was implemented in two visits – the first visit occurred in the post planting season and the second in the post-harvest season. Consumption and/or expenditure information was collected in both visits. The steps used to calculate the consumption aggregate are applied uniformly across both the 2012-13 and 2010-11 surveys. The consumption aggregate includes (a) food expenditures (including meals eaten outside the home); (b) non-monetary food consumption resulting from consumption of home production, gifts and in-kind payments; (c) education expenditures; (d) health expenditures; and (e) housing expenditures, including imputed rent.

A consumption aggregate file was created from the data for each visit. These files have been combined to create an overall annual consumption file which is being distributed with the data. The individual visit files are available upon request.

Food

The food component of the consumption aggregate includes food consumption from all possible sources: food eaten away from home (such as from kiosks or on the street), food purchases, food from own-production, and food received as gifts or in-kind income. The recall period for all of the food sources was last the 7 days.

In the case where food consumption was reported in non-standard units, such as cigarette cup or olodo, units are converted using files that contain conversion units for most units reported by respondents.

For those non-standard units which are not included in the conversion file, total consumption of the food item (in kg) was imputed from the Local Government Area (LGA) median value if more than 20 observations are found in the LGA. If LGA values could not be used, the median value as calculated at the state level was used – again if more than 20 observations are found in the state. Finally, the national median was used if the lower level units could not be used.

Median prices per kilo for each item within each of the areas (LGA, state, zone) are calculated as long as at least 50 observations are seen at the area level. Using these median regional prices, the total expenditure for each item was obtained. From this value, group-wise expenditure for items is obtained. Outliers are replaced with the national median expenditure per item.[4]

Total household food expenditure (fdtexp) is obtained from the total expenditure on purchased foods (fdtotby) and the total value of own production consumed by household members (fdtotpr).

Households reporting 0 food expenditure are dropped from the sample.

Non-food

There are different recall periods used in the collection of the non-food data depending on how often the purchases are likely to be made: 1, week, 1 month, 6 months and 12 months.[5]

Weekly expenditures are recorded for non-food items which are purchased frequently. Median expenditures per item are calculated for the month of the interview and the zone. Outliers, observations that are 3 standard deviations away from the mean, are replaced with the median.

A similar method was used to calculate monthly, bi-annual and annual expenditures as was used for weekly expenditures. Median expenditures per item are calculated and outliers are dealt with on a per capita basis and replaced by the median.

Total household non-food expenditure (nfdtexp) is obtained from the sum of expenditures on non-food items (hltexp nfdftexp nfditexp nfdtexp hhtexp).

Education

Education expenditures are self-reported values given in the education module. Reported expenditures on different scholastic items are included: tuition, book purchases, extra-curricular activities, food and boarding, transport, fees, insurance, and other expenditures related to education. If the respondent was unable to provide information for the individual expenditure items, total household expenditure on education was recorded. This value is used in all cases where it is not missing. If the reported total expenditure on education is missing, the sum of the individual components is used.

Health

Health expenditures are collected primarily in the post-harvest visit. There was no health module in the post-planting visit, although some health expenditures are collected in the non-food expenditure module. The expenditures include consultation fees, medication, hospitalization, transport to hospital, health insurance, therapeutic equipment, and expenditures on health not mentioned elsewhere.

[4] Outliers are defined as values 3 standard deviations away from the median.
[5] See the questionnaires for details.

Housing

Housing expenditures include payments for electricity, landline telephones, cell phones, drinking water, garbage disposal, and estimated rent. Values for phone and electricity expenditures are reported for different time spans (monthly, weekly, annually) and are adjusted accordingly. Outliers are dealt with on a zone basis. Values are imputed with the zone median if the value is 3 standard deviations away from the zone mean.

Households that actually pay rent are used to estimate an hedonic model. Because most rural households have no rent values, estimated rent was based on mostly urban households. Even using urban households, less than 20 percent of households reported actual rents. The model used the natural log of rent paid in Naira as the dependent variable and various characteristics of the housing such as composition of the walls and floors; amenities such as connection to water, type of cooking fuel used, type of lighting used; and location (rural-urban, regions, or ecological zones) to obtain coefficients. Subsequently predicted rent values are obtained for households that did not report rent but had reported dwelling characteristics.

In the final analyses, households whose actual rent are outliers are replaced by the estimates from the model.

Totals

Non-food expenditure

Non-food expenditure totals are obtained from the sum of the total expenditure on education (edtexp), expenditure on frequent non-food items (nfdftexp), and expenditure on infrequently consumed items (nfditexp).

Food expenditures

Total food expenditure is obtained by adding the total food expenditure originating from purchases and value of consumption of own goods.

Household expenditure

Total household expenditure is calculated by adding total food and non-food expenditures. Per capita expenditure is obtained by dividing total expenditure by the number of members in the household.

Regional Deflators

All households in the 40th percentile are used to create a food basket. Using this population, the share of expenditure on each food item is estimated. Consumption data are then deflated spatially using zone level price deflators. Deflators are built using zone level baskets and monthly priced using item level prices at the state levels.

Aggregated Expenditures

The aggregated file for the GHS-Panel2010 is called cons_agg_w1 (w1 indicating "wave 1" for the first wave of the panel survey), and the aggregated file for the GHS-Panel2012 is called cons_agg_w2 (w2 indicating "wave 2" for the second wave of the panel survey).

Since households are interviewed twice for each survey, post planting (between August and October) and post-harvest (between February and April), consumption information is averaged over the two visits to proxy for the household's annual expenditure pattern. Thus the aggregated variables are only relevant for households present in both visits during each wave and only those households are included in the aggregate files.

In order to construct the aggregated expenditure per each wave, the regionally deflated expenditures are adjusted to 2010 PPP prices. Using these adjusted values the expenditure for each of the two waves is estimated as the mean expenditure between the post-planting and post-harvest visits.

The decision on which figures to use are left to the end user, and thus values for each visit as well as the wave aggregate values are present in each dataset. Within each file the relevant variables are labeled accordingly, the variables ending in PP come from post-planting figures, PH comes from post-harvest, and w1 or w2 indicates the mean value between the two visits made in that wave.

7.26 Tracking status of household and individuals

Two additional data sets are released with Wave 2 which summarize the status of households and individuals across both waves: ***htrack.dta*** and ***ptrack.dta.***

7.27 Agricultural Output Non-Standard Units Conversion Factors

In the field interviewees were asked to report the amount of crop items that they were engaged with. Kilograms, grams, liters, and centreliters were the standard units collected from interviewees, but oftentimes interviewees would give non-standard units such as "olodo" and "milk cup". In order to convert from non-standard units to the more widely understood standard units, the dataset ***w2agnconversion.dta*** was created with conversion factors between the two sets of units for crops. Units are either converted to kilograms or liters depending on the container. Some crops were not able to be measured and so do not have conversion factors.

In order to use the conversion factors, one has to multiply a crop item with a conversion factor. For example, the dataset ***secta3_harvestw2.dta*** features question 8, which asks how much of the harvest was given to the landowner. One household is said to have given 10 mudu of shelled maize. In order to convert mudu to kg, the dataset ***w2agnconversion.dta*** has to be merged in, and then 10 is multiplied with the conversion factor under the variable name "conversion." One mudu of shelled maize is 1.5 kg, and so 10 mudu of shelled maize is 10.5 kg.

8.0 Using the Data

8.1 File Structure

The data should always be used in conjunction with the questionnaire and the interviewer's instruction manual. Where there are no issues of confidentiality all the variables from the questionnaire have been included in the data sets. In some cases there is an additional variable which contains the "other specify" information that was written in the questionnaire. So, for example, if there is a variable with two parts question 5a and question 5b, a third variable, question 5c, might be added which would contain the other "specify information".

8.2 Merging Datasets

8.21 Household and Agriculture Datasets

All household and agriculture datasets in both the post-planting and post-harvest files contain a variable (***hhid***), which is a unique identifier for the household. This variable is used as the unique key variable in the merging of all household type datasets. In some of the other types of datasets, additional key variables may be required in the merging process. In the case of individual type files, the variable that uniquely identifies the individual in the household is ***indiv***. So in order to merge any two individual type files, both the variables ***hhid*** and ***indiv*** would be used. In the agriculture datasets, plot files are merged using ***hhid*** and ***plotid*** while crop files are merged using ***hhid, plotid*** and ***cropid.***

8.22 Post-Planting and Post-Harvest Datasets

Post-planting and post-harvest files can be merged using the methodology explained above. That is, the ***hhid*** is the same for a specific household in the post-planting and post-harvest visit. It should be noted that there was some attrition of households between the post-planting and post-harvest visits so some households in the post-planting files will not have a match in the post-harvest data sets. Note also that people may have left the households or joined them in the time between the two visits. Thus the number of people will vary between visits.

8.23 Community Datasets

The community questionnaire is administered at the EA level so the location variables ***lga*** for local government area (LGA) and ***ea*** are unique for each community questionnaire. Merging of community files within the round or with community files from the other round or with any of the household or agriculture files from either round should be done using the ***lga*** and ***ea variables***, in that order.

Location variables: ***zone***, ***state***, ***lga***, ***sector***, ***ea*** and ***ric*** have not been included in all the datasets. Instead, these variables have been included in the questionnaire cover datasets, i.e. secta_harvestw2, secta_plantingw2, sectc_harvestw2 etc., and from there they can be merged into any of the other datasets using the key variables as explained above.

8.3 Network Roster

A network roster is included in both the post-planting and post-harvest agriculture questionnaires. The network roster keeps a record of the list of places (businesses, markets, persons etc.) with which the household engages in agricultural trading activities. Each place is assigned the network code of the line in which it is in that section. Each place is recorded only once so we have for example, network codes N1, N2 etc. which is just a serialization of the places. This is similar to the household roster where an individual acquires the individual code of the line in which the person's name is written.

After the information has been entered in the network roster, the network code can be used in any section of the Agriculture Questionnaire where a place of trading is requested. The network roster contains information on the type of place and its location.

8.4 Food Consumption Unit Measures

Changes were made to the questionnaires to improve the collection of food consumption and expenditure data. There were two main changes. The first change was to add a question i.e. question five shown in the questionnaire extract below. This question was aimed at determining the quantity of the food item that was consumed out of purchases, whether the item was purchased in the past 7 days or before. The previous method, as used in Wave 1, of relying on the actual quantity of purchase indicated in question 3 was unreliable since a household often purchased more than they consumed in the last 7 days. The inclusion of question 5 solved this problem and it was now possible to fully account for the acquisition of all food item consumed. That is, through purchases, own production and gifts.

The second change was an increase in the number the units used in the quantity measures (see questions, 2, 3, 5, 6 and 7 in the figure below). The units were now expanded to include, not only the standard units, but the more commonly used non-standard units. This reduced the need for the interviewers to do the conversion from nonstandard units to standard units and hence eliminated some of the errors identified in wave one.

SECTION 7B: FOOD EXPENDITURE

ITEM CODE	1	2.		3.		4.	5.		6.		7.	
	Within the past 7 days, did the members of this household eat/drink any of this [ITEM] within the household? PLEASE ONLY LIST ITEMS CONSUMED WITHIN THE HOUSEHOLD AND EXCLUDE FOOD CONSUMED OUTSIDE THE HOUSEHOLD. ASK THIS QUESTION FOR ALL ITEMS, BEFORE MOVING ON TO THE NEXT QUESTIONS FOR ITEMS WITH YES YES..1 NO...2 (▶ NEXT ITEM)	How much in total did your household consume of this [ITEM] in the past 7 days? UNIT CODE KILOGRAMS (kg)...01 GRAMS (g).....02 LITRE (l).....03 CENTILITRE (cl)..04 MUDU.....05 OLODO.....06 CONGO.....07 PAINT RUBBER.....08 LARGE DERICA.....09 MEDIUM DERICA....10 SMALL DERICA.....11 MILK CUP.....12 CIGARETTE CUP....13 TIYA.....14 KOBIOWU.....15		How much did the household purchase of this [ITEM] during the past 7 days? IF NONE WRITE 0 FOR QUANTITY AND LEAVE UNIT BLANK (▶Q5) UNIT CODE KILOGRAMS (kg)...01 GRAMS (g).....02 LITRE (l).....03 CENTILITRE (cl)..04 MUDU.....05 OLODO.....06 CONGO.....07 PAINT RUBBER.....08 LARGE DERICA.....09 MEDIUM DERICA....10 SMALL DERICA.....11 MILK CUP.....12 CIGARETTE CUP....13 TIYA.....14 KOBIOWU.....15		How much did your household spend on this [ITEM] during the past 7 days? THIS QUESTION REFERS TO THE QUANTITY IN QUESTION 3	How much of consumption of this [ITEM] came from purchases made during the past 7 days or before? IF NONE WRITE 0 FOR QUANTITY AND LEAVE UNIT BLANK UNIT CODE KILOGRAMS (kg)...01 GRAMS (g).....02 LITRE (l).....03 CENTILITRE (cl)..04 MUDU.....05 OLODO.....06 CONGO.....07 PAINT RUBBER.....08 LARGE DERICA.....09 MEDIUM DERICA....10 SMALL DERICA.....11 MILK CUP.....12 CIGARETTE CUP....13 TIYA.....14 KOBIOWU.....15		How much of consumption of this [ITEM] came from own-production during the past 7 days? IF NONE WRITE 0 FOR QUANTITY AND LEAVE UNIT BLANK UNIT CODE KILOGRAMS (kg)...01 GRAMS (g).....02 LITRE (l).....03 CENTILITRE (cl)..04 MUDU.....05 OLODO.....06 CONGO.....07 PAINT RUBBER.....08 LARGE DERICA.....09 MEDIUM DERICA....10 SMALL DERICA.....11 MILK CUP.....12 CIGARETTE CUP....13 TIYA.....14 KOBIOWU.....15		How much of consumption of this [ITEM] came from gifts and other sources during the past 7 days? EXCLUDE FOOD TAKEN OUTSIDE THE HOUSEHOLD IF NONE ,WRITE 0 FOR QUANTITY AND LEAVE UNIT BLANK UNIT CODE KILOGRAMS (kg)...01 GRAMS (g).....02 LITRE (l).....03 CENTILITRE (cl)..04 MUDU.....05 OLODO.....06 CONGO.....07 PAINT RUBBER.....08 LARGE DERICA.....09 MEDIUM DERICA....10 SMALL DERICA.....11 MILK CUP.....12 CIGARETTE CUP....13 TIYA.....14 KOBIOWU.....15	
		QUANTITY	UNIT	QUANTITY	UNIT	NAIRA	QUANTITY	UNIT	QUANTITY	UNIT	QUANTITY	UNIT

8.41 Unit Conversion Factors

The inclusion of nonstandard unit options for food quantities made it necessary for a conversion table to be prepared that would include these nonstandard units and their conversion factors to standard units. In order to prepare this conversion table, items that were commonly purchased using the nonstandard units, were purchased and measured using the nonstandard unit and then measured using the standard units.

For some items such as grains the conversion factor did not vary significantly for items within the group so the same conversion factor was used for these similar items.

This set of nonstandard unit options have also been used to replace the standard unit options in other sections and questions where food quantity is required. It is also used in agriculture questionnaire for quantities including seeds used for planting as well as crop harvest. The food non-standard units conversion factors files are named "food_conv_w2pp" and "food_conv_w2ph" for the post planting and post-harvest modules respectively.

8.42 Use of Pictures

Pictures of food items with their weights were introduced in the post-harvest visit of Wave 1. During the survey the respondents indicating that they purchased a food item and were unable to state the quantity in standard units were shown the picture of the item (usually a set of the item with different weights) and asked which one best matched the quantity that they purchased. The standard weight attached to the item they indicated was then recorded in the quantity response for the question.

In Wave 2, additional pictures of food items with their weights were introduced, thus increasing the original set from Wave 1. See appendix 5 for the set of pictures of food items introduced in Wave 2.

9.0 Overall Problems and Challenges Faced During Wave 2

Designing and implementing a complex survey such as the GHS-Panel presents various challenges. In this section we outline some key issues that arose, lessons learned and make recommendations for the next Wave of the survey.

9.1 Tracking

It was discovered that a number of households that were identified as relocated during the post-planting visit were actually households that no longer wanted to participate in the panel survey. Interestingly, the gifts that were given during the post-harvest survey prompted most of these households to reverse their decision to withdraw from the panel. Those households were removed from the post-planting tracking list.

A major area of concern was the way in which the interviewers completed the tracking forms. In many instances the tracking form was not properly completed and this resulted in significant difficulty, and even failure, in tracking the relocated households. Where problems were identified with the post-planting tracking forms, interviewers were instructed to update the forms during the post-harvest survey. Even with this instruction many of the forms were not properly completed and had to be updated during the tracking exercise. If, after properly updating

For future tracking exercises, the tracking form should be entered at the same time as the questionnaires and the data submitted to NBS head office for inspection. Where there are problems in the data, the field staff be informed so that corrections can be made.

9.2 Pre-filling of Questionnaires

Special care has to be taken to ensure that house hold members were pre-field in the same lines that they were placed in the wave one visits, even in cases where those household members had left the household. This was done so as to ensure that household member would have the same household number and individual number in all waves and visits thus enabling the matching of individuals across all the panel surveys. The need to ensure consistent line positions is also true of the plots and crops in the agriculture questionnaire. In this case consistency must be maintained for this data between the post-planting visit and the subsequent post-harvest visit.

At the end of the wave one set of surveys, all questionnaires were moved from state offices to the NBS head office in Abuja. The pre-filling of wave two post-planting questionnaires, therefore had to take place at the NBS head office where the wave one questionnaires were available. This proved to be a challenging exercise for staff at the NBS head office, in terms of managing the process and ensuring good quality work. As a result errors were made during the prefilling exercise. These errors proved to be a problem during the post-planting visit because the field staff no longer had access to previous the questionnaires to check and make corrections where necessary.

During the wave two visit, post-planting questionnaires were not moved from the state offices so they were available to the field staff for the prefilling of the post-harvest questionnaires. The

prefilling of post-harvest questionnaires was conducted at the zonal training centers where the field staff prefilled all the questionnaires for their own state. The prefilling was done under the supervision of the trainers at the zone the location to ensure that the errors in the pre-filling exercise were minimized. This approach proved to yield better results than when the questionnaires were prefilled at NBS head office.

9.3 Omitted Questions

A few questions between Waves 1 and 2 were dropped from the questionnaires due to printer error. This includes questions that, given the structure of the surveys in Wave 1, were to come after question 18 in Wave 2 Agriculture Questionnaire post-harvest Section A3 (questions 19-23 from Wave 1), as well as questions that come after question 24 in Wave 2 Agriculture post-harvest Section A6 (Questions 25-28).These questions therefore were not asked of respondents in Wave 2 and so no data is collected concerning these questions.

9.4 Availability of Electricity

Electricity was required by the data entry operator to operate the laptop computer and printer when in the field. This problem was anticipated so inverters were purchased and made available to each data entry operator. The intention was that these inverters would be connected to the cigarette lighter socket or battery of the vehicle that was providing transportation for the team. By doing so electrical power would be generated to run the laptop and printer. Unfortunately, in most cases, no vehicle was available since the team was simply transported and left at the location. In addition some of the locations could only be accessed by motorcycles, which did not have the facility to operate the inverters.

In order to alleviate this problem, special provision had to be made for the purchase or renting of portable generators. This proved to be a satisfactory solution to the problem.

9.5 Security Problems

During wave 2 of the panel survey, the security situation has significantly deteriorated in number of states in the North-East and North-West zones. These problems have made it hazardous for field staff to go into certain areas to collect data. In Yobe and Kaduna State, for example, there are panel enumeration areas where no attempt is made to collect data. While in a number of other EAs throughout those zones, the security situation can change from day to day.

There have also been problems with the security of questionnaires. In Yobe state a number of questionnaires were lost as violence flared up and NBS state workers had to hurriedly pack and leave the state office for their own safety. Unfortunately the entered data was not properly saved for those questionnaires so the data is permanently lost.

Special care is now taken to ensure that completed questionnaires are entered as soon as possible after the interview. It is also important that the entered data is secured through transmission to the head office using the online data communication system and through keeping multiple copies on separate media, such as a flash drives. The challenge with entering certain areas remains but when

the opportunity arises for data to be collected in those areas, all steps are taken to ensure that the data is securely stored.

9.6 GPS Units

New GPS units were acquired for use in wave 2. These units are more user friendly and efficient than the units used in wave one. A number of units used in wave one had stopped functioning and many others were functioning but faulty. The wave one units performed poorly in overcast weather and where there was tree cover. The interviewers also had problems using those units.

While the wave one units were sufficient to provide only one unit to each field team, the number of new GPS units purchased made it possible for nearly all teams to receive two units. This served to improve the pace at which the fieldwork was completed as one team, by breaking into groups, were able to measure two farms at the same time. This was particularly beneficial in states with a large number widely dispersed farms

9.7 Data Entry

Data entry has been a significant source of errors in both waves of the panel survey. Efforts were made in wave two to reduce the errors by evaluating the performance of the data entry operators and by replacing the worst performers and retraining those that seemed to have perceived potential to improve.

After administering performance tests to the data entry operators following the post-planting training, four were replaced and ten were retrained. After observation of the performance of the data entry operators in the post-planting survey, a further six operators were replaced making a total of ten replacements.

Replacement of data entry operators was made primarily from data entry staff at the head office. These staff were included as participants in the post-harvest zonal training and sent to the states to perform data entry activities during the course of the survey.

In addition to ensuring good performance among the data entry operators, the data entry systems should be upgraded to include a double data entry system. This should serve to further reduce the errors in the data capture process.

9.8 Delay in States Responding to Data Queries

In the panel surveys, the states retain custody for all questionnaires administered by their field staff within the state. During wave 1, this posed a significant problem when data sent to head office was flagged as having possible errors because the head office staff were not able to directly examine the questionnaires. When the data concerns were sent the states, there were long delays in receiving responses and this led to significant delays in finalizing the data. In order to address this problem two measures were taken:

1. a near online data communication system was implemented that automatically transmitted the data very shortly after it was entered. This allowed for early identification of potential data errors or inconsistencies in the data
2. data quality checks were introduced as an activity in field monitoring activities. That is, the panel team from NBS head office were provided with the data and potential errors were identified for the states that they were selected to visit. During the visit the monitor would examine the questionnaires with the local team and identify genuine problems and make corrections or instruct remedial action, such as revisiting the household for clarification, where necessary.

These steps have served to significantly improve the data quality and the time taken to finalize data management and processing activities.

Appendix 1: How to Obtain Copies of the Data

The data are available through the NBS web site:

http://www.nigerianstat.gov.ng/

or through the LSMS-ISA website:

http://www.worldbank.org/lsms-isa

Users do not need to obtain the permission of the NBS to receive a copy of the data, but will be asked to fill in a data access agreement. In this agreement, users agree to: (a) cite the National Bureau of Statistics as the collector of the data in all reports, publications and presentations; (b) provide copies of all reports publications and presentation to the National Bureau of Statistics (see address below) and the Poverty and Inequality Division of the World Bank (see address below); and (c) not pass the data to any third parties for any reasons.

Leo Sanni
Statistical Information Officer
Plot 762, Independence Avenue,
Central Business District,
FCT, Abuja
Nigeria
www.nigerianstat.gov.ng
Phone: +2348033865388
Email: leosanni@nigerianstat.gov.ng

LSMS Database Manager
Poverty and Inequality Division
The World Bank
1818 H Street, NW
MSN MC3-306
Washington, DC 20433
www.worldbank.org/lsms-isa
Email: lsms@worldbank.org

Appendix 2: Updates to the Data

In June 2014 and February 2015, updates were made to the 2012-2013 GHS-Panel data. As of February 2015, all data downloaded from the web site included the following updates. If the data that you are using does not include these updates, you should download a newer version of the data by going to the LSMS web site (see Appendix 1).

June 2014 Updates

Post Planting - Household:

Section 1: HOUSEHOLD ROSTER

- Description: Missing information on where members had moved within Nigeria corrected. There were several cases where the LGA name (s1q32a) was given but a corresponding LGA code (s1q32b) was missing or did not match the name. There were similar cases for State name (s1q32c) and code (s1q32d). LGA and State codes were added or corrected according to the name specified. Consistency between LGA and State was also checked, but was not always able to be corrected.
- Relevant file:
  - sect1_plantingw2
- Variables affected:
  - s1q32a
  - s1q32b
  - s1q32c
  - s1q32d

Section 7b: FOOD EXPENDITURE

- Description: Several observations were identified which had incorrectly specified units. In most instances, grams/centilitres were recorded when the values are actually in terms of kilograms/litres.
- Relevant file:
  - sect7b_plantingw2
- Variables affected:
  - s7bq2b
  - s7bq3b
  - s7bq5b

Post Planting - Agriculture:

Section 11c2: INPUT COST

- Description: A data entry error was identified whereby pesticide and herbicide amounts were entered without a decimal point. This resulted in most use amounts being inflated by a factor of 100. The relevant observations were identified and corrected.
- Relevant file:
  - sect11c2_plantingw2

- Variables affected:
    - s11c2q2a
    - s11c2q7a
    - s11c2q11a
    - s11c2q16a

Section 11d: FERTILIZER ACQUISITION

- Description: A data entry error was identified whereby fertilizer amounts were entered without a decimal point. This resulted in all use amounts being inflated by a factor of 100. The relevant observations were identified and corrected.
- Relevant file:
    - sect11d_plantingw2
- Variables affected:
    - s11dq4
    - s11dq16
    - s11dq28

Post Planting - Community:

Section 2: FOOD PRICES

- Description: Another instance where improper units were specified/entered. In most cases, grams or centilitres were recorded when in fact the prices are for kilograms of litres. The appropriate observations were identified and corrected.
- Relevant file:
    - sectc2_plantingw2
- Variables affected:
    - c2q2

Post Harvest - Household:

Section 1: HOUSEHOLD ROSTER

- Description: Missing information on where members had moved within Nigeria corrected. There were several cases where the LGA name (s1q31a) was given but a corresponding LGA code (s1q31b) was missing or did not match the name. There were similar cases for State name (s1q31c) and code (s1q31d). LGA and State codes were added or corrected according to the name specified. Consistency between LGA and State was also checked, but was not always able to be corrected.
- Relevant file:
    - sect1_harvestw2
- Variables affected:
    - s1q31a
    - s1q31b
    - s1q31c
    - s1q31d

Section 10b: FOOD EXPENDITURE

- Description: Several observations were identified which had incorrectly specified units. In most instances, grams/centilitres were recorded when the values are actually in terms of kilograms/litres. There were also some specific observations with obvious errors regarding the amount of food consumed, purchased, etc.
- Relevant file:
  - sect10b_harvestw2
- Variables affected:
  - s10bq2a
  - s10bq2b
  - s10bq3a
  - s10bq3b
  - s10bq5a
  - s10bq5b
  - s10bq6a
  - s10bq6b
  - s10bq7b

Miscellaneous:

Food Nonstandard Unit Conversion files:

- Description: There was an error in the nonstandard unit conversion rate for small derica for all food items.
- Relevant files:
  - food_conv_w2pp
  - food_conv_w2ph
- Variables affected:
  - conv

February 2015 Updates

Post-Planting - Agriculture:

Section 11h: MARKETING

- Description: A data entry error was identified whereby all quantities were entered without a decimal point. This resulted in most amounts being inflated by a factor of 100. The relevant observations were identified and corrected.
- Relevant file:
  - sect11h_plantingw2
- Variables affected:
  - s11hq2a
  - s11hq5a
  - s11hq12a
  - s11hq17a

- s11hq18a
- s11hq19a
- s11hq20a
- s11hq24a

Post-Planting - Household:

Section 1: HOUSEHOLD ROSTER

- Description: Information on whether the individual was still a member of the household, a new member of the household, and why they were no longer a member was missing for several households interviewed in the tracking phase. This information has now been included.
- Relevant file:
  - sect1_plantingw2
- Variables affected:
  - s1q4
  - s1q5
  - s1q29
  - s1q29b

Post-Harvest - Household:

Section 1: HOUSEHOLD ROSTER

- Description: In previous versions, there were a relatively large number of persons who had no response indicating whether they were still a member of the household (question 14). The cases where this question was missing were investigated and corrected. It was discovered that the majority of these cases were persons who had left the household prior to the post-planting visit. There were also some persons who did not leave prior to post-planting but whose status could be determined from other information in the post-harvest data. Where possible, missing values were filled when the individual's status could be determined. For a few members, the reason for visit was given in the text of the person's name. For these cases, the reason for leaving (question 28) was also filled.
- Relevant file:
  - sect1_harvestw2
- Variables affected:
  - s1q14
  - s1q28

Section 2a, 2b, 3a, 3b, 4a, 4b, 5, and 6: INDIVIDUAL LEVEL SECTIONS

- Description: Following the changes to s1q14 in section 1 described above, observations in these sections for individuals that (1) were determined to no longer be members of the household AND (2) had no information in the sections were dropped. Observations with any information were kept even if they reported to no longer be members of the

household. We allow the user to decide whether these observations should be dropped or not.

- Relevant files:
  - sect2a_harvestw2
  - sect2b_harvestw2
  - sect3a_harvestw2
  - sect3b_harvestw2
  - sect4a_harvestw2
  - sect4b_harvestw2
  - sect5_harvestw2
  - sect6_harvestw2

Miscellaneous:

Household and individual status files:

- Description: Two variables were added to both files that indicate whether the household had moved between wave 1 and the relevant visit (post-planting or post-harvest). This variable is only relevant for households that were located and interviewed. Those households that moved but were not located or interviewed are excluded.
- Relevant files:
  - HHTrack
  - PTrack
- Variables affected:
  - moved_w2v1 (new)
  - moved_w2v2 (new)

Household status file:

- Description: The household status variable was altered to better identify households that were tracked. Previously, tracked households were reported as interviewed, but a new category was added for households that were tracked and interviewed (value 5).
- Relevant files:
  - HHTrack
- Variables affected:
  - hhstatus_w2v1
  - hhstatus_w2v2

Person status file:

- Description: The person status file was updated to reflect the changes to post-planting and post-harvest section 1 described above.
- Relevant files:
  - PTrack
- Variables affected:
  - pstatus_w2v1
  - pstatus_w2v2

Basic Information Document:

- Description: Table 3.1 in the BID had incorrect information on the number of tracked households in wave 2. The correct information was added. An additional category was added to the table for households interviewed in the main phase of the survey (not the tracking phase). An additional description of the *tracked_obs* variable in the data was added to section 6.

Appendix 3: Agriculture Land Conversion Factors

The table below shows the conversion factors used to convert self-reported land areas (for agricultural land area of crops planted and harvested) into hectares.

General Conversion Factors to Hectares

Zone	Unit	Conversion Factor
All	Plots	0.0667
All	Acres	0.4
All	Hectares	1
All	Sq Meters	0.0001

Zone Specific Conversion Factors to Hectares

Zone	Conversion Factor		
	Heaps	Ridges	Stands
1	0.00012	0.0027	0.00006
2	0.00016	0.004	0.00016
3	0.00011	0.00494	0.00004
4	0.00019	0.0023	0.00004
5	0.00021	0.0023	0.00013
6	0.00012	0.00001	0.00041

Note: All conversion is to Hectares

Appendix 4: Crop Codes

CROP	CODE	CROP	CODE	CROP	CODE
BEANS/COWPEA	1010	GINGER	2100	COCOA	3040
CASSAVA OLD	1020	GINGER PEELED	2101	COCOA POD	3041
COCOYAM	1040	GINGER SPLIT	2102	COCOA BEANS	3042
COTTON	1050	OTHER SPICES/VANILA	2103	COCONUT	3050
SEED COTTON	1051	GUM ARABIC	2110	COFFE	3060
COTTON LINT	1052	OKRO	2120	COFFE ARABICA	3061
COTTON SEED	1053	ONION	2130	COFFEE ROBUSTER	3062
GROUND NUT/PEANUTS	1060	PEPPER	2140	DATE PALM	3070
UNSHELLED GROUND NUTS	1061	SWEET PEPPER	2141	GRAPE FRUIT	3080
SHELLED GROUND NUTS	1062	SMALL PEPPER	2142	GUAVA	3090
GUINEA COURN/SORGHUM	1070	ATARE	2143	JUTE	3100
MAIZE	1080	PIGEON PEA	2150	KOLANUT	3110
UNSHELLED MAIZE(COB)	1081	PINEAPPLE	2160	KOLANUT UNSHELLED	3111
SHELLED MAIZE(GRAIN)	1082	PLANTAIN	2170	KOLANUT SHELLED	3112
POP CORN MAIZE	1083	POTATO	2180	BITTER KOLA	3113
MELON	1090	SWEET POTATO	2181	LEMON	3120
UNSHELLED MELON	1091	PUMPKIN	2190	LIME	3130
SHELLED MELON	1092	PUMPKIN LEAVE	2191	LOCUST BEAN	3140
WATER MELON	1093	PUMPKIN FRUIT	2192	MANDARIN/TANGERINE	3150
MILLET/MAIWA	1100	PUMPKIN SEED	2193	MANGO	3160
RICE	1110	GREEN VEGETABLE	2194	ORANGE	3170
UNSHELLED RICE(PADDY)	1111	DRY LEAVES(KUKA)	2195	OIL PALM TREE	3180
SHELLED RICE(MILLED)	1112	RIZGA	2200	FRESH FRUIT BUNCH	3181
YAM	1120	SHEA NUTS	2210	FRESH NUT	3182
WHITE YAM	1121	SOYA BEANS	2220	PALM OIL	3183
YELLOW YAM	1122	SUGAR CANE	2230	PALM KERNEL	3184
WATER YAM	1123	TEA	2240	AGBONO(ORO SEED)	3190
THREE LEAVE YAM	1124	TOBACCO	2250	OIL BEAN	3200
ACHA	2010	TOMATO	2260	PAWPAW	3210
BAMBARA NUT	2020	WALNUT	2270	PEAR	3220
BANANA	2030	WHEAT	2280	AVOCADO PEAR	3221
BEENI-SEED/SESAME	2040	ZOBO	2290	RUBBER	3230
CARROT	2050	ZOBO SEED	2291	RUBBER LUMP	3231
CUCUMBER	2060	APPLE	3010	RUBBER SHEET	3232
CABBAGE	2070	CASHEW	3020	CHERRY(AGBALUMO)	3240
LETUS	2071	CASHEW FRUIT	3021	ERU	3250
GARDEN EGG	2080	CASHEW NUT	3022	IYERE	3260
GARLIC	2090	CHILLI	3030		

Appendix 5: Confidential Information, Geospatial Variables

The GHS-Panel collects confidential information on respondents. The confidential variables pertain to (i) names of the respondents to the household and community questionnaires, (ii) village and constituency names, (iii) descriptions of household dwelling and agricultural plot locations, (iv) phone numbers of household members and their reference contacts, (v) GPS-based household and agricultural plot locations, (vi) names of the children of the head/spouse living elsewhere, (vii) names of the deceased household members, (viii) names of individuals listed in the network roster, and (ix) names of field staff. To maintain the confidentiality of our respondents, certain parts of the GHS-Panel database have not been made publicly available.

To enhance the GHS-Panel data, a set of geospatial variables has been generated using the georeferenced plot and household locations in conjunction with various geospatial databases that were available to the survey team. These include simple measures of distance, climatology, soil and terrain and other environmental factors. The variables are intended to provide some understanding of how geophysical characteristics vary across households and between communities.

All geospatial variables have been produced using the unmodified GPS data. Most of the underlying datasets are static (with exception of time-series), so the values should be largely unchanged relative to year 1, for non-mover households. Note that there may be some variation due to GPS data entry error, differences in data collection procedure, and technical limitations of the device. Geospatial variables are provided in 2 separate files: NGA_PlotGeovariables_Y2 and NGA_HouseholdGeovariables_Y2.

NGA_PlotGeovariables_Y2

The household plot-level file, *NGA_PlotGeovariables_Y2*, contains four variables measuring plot distance to household, slope of plot, elevation of plot and plot potential wetness index. The observations are uniquely identified by the combination of **hhid plotid**. The observations included in this file are plots that are owned and/or cultivated by the household and that have been visited for GPS-based land area measurement.

Coordinates of the plots are not included.

NGA_HouseholdGeovariables_Y2

The household-level file, *NGA_HouseholdGeovariables_Y2*, contains a range of variables measuring (on the basis of the household dwelling) distance to other features, climatology, landscape typology, soil and terrain, and growing season parameters. The observations are uniquely identified by **hhid**.

This file also contains modified GPS coordinates, which enables users to generate their own spatial variables while preserving the confidentiality of sample household and communities. Following the method developed for the Measure DHS program, the coordinate modification strategy relies on random offset of cluster center-point coordinates (or average of household GPS

locations by EA in GHS-Panel) within a specified range determined by an urban/rural classification. For urban areas a range of 0-2 km is used. In rural areas, where communities are more dispersed and risk of disclosure may be higher, a range of 0-5 km offset is used. An additional 0-10 km offset for 1% of rural clusters effectively increases the known range for all rural points to 10 km while introducing only a small amount of noise. Offset points are constrained at the state level, so that they still fall within the correct state for spatial joins, although boundary precision may be an issue for clusters located very close to the border.

In the second wave of panel data collection some households are tracked to a new location. These include both local and long-distance moves, although a majority of tracked households are within 5 km of the original location. The public coordinates for new locations that are within 5 km of the original household location remain unchanged (modified coordinates of original sample EA). The public coordinates of tracked households that are more than 5 km from original location are assigned a new offset location, according to the method described above. Additionally, the distance from original location is provided for tracked households with new locations.

The result is a set of coordinates, representative at the cluster level, that fall within known limits of accuracy. Users should take into account the offset range when considering different types of spatial analysis. Analysis of the spatial relationships between locations in close proximity would not be reliable. However, spatial queries using medium or low resolution datasets should be minimally affected by the offsets. Zonal statistics (average or range of values within an area corresponding to the known range) could help minimize the effect of offsets when combining with large scale data or high resolution grids with a high degree of local variation.

The tables below provide the name, type, source, reference period, resolution, and description of each variable. With the exception of 3 distance variables (dist_road2, dist_popcenter2, dist_borderpost2), the source data are unchanged. The three distance variables have been updated using more reliable spatial datasets.

Table A4.1 NGA_PlotGeovariables_Y2

Theme	Source	Dataset Title	Variable Name	Variable Type	Reference Period	Resolution	Description	Web
Distance	LSMS-ISA	Plot Distance to Household	dist_household	Continuous	N/A	N/A	Plot distance to household	
Soil & Terrain	NASA	SRTM 90m	srtm_nga	Continuous	N/A	0.000833 dd	Elevation (m)	ftp://xftp.jrc.it/pub/srtmV4/arcasci/
	USGS	Slope (percent)	srtmslp_nga	Continuous	N/A	0.000833 dd	Derived from unprojected 90m SRTM using DEM Surface Tools	http://pubs.usgs.gov/of/2007/1188/, data provided USGS upon request
	AfSIS	Topographic Wetness Index	twi_nga	Continuous	N/A	0.000833 dd	Downloaded from AfSIS website. Derived from modified 90m SRTM. Local upslope contributing area and slope are combined to determine the potential wetness index: WI = ln (A s / tan(b)) where A s is flow accumulation or effective drainage area and b is slope gradient.	http://www.ciesin.columbia.edu/afsis/bafsis_fullmap.htm#

Table A4.2 NGA_HouseholdGeovariables_Y2

Theme	Source	Dataset Title	Variable Name	Variable Type	Reference Period	Resolution	Description	Web
Distance	FERMA	Household Distance to Main Road	dist_road2	Continuous	2013	N/A	Household distance to nearest federal road included in FERMA survey, 2013	
	WorldCities	Household Distance to Towns	dist_popcenter2	Continuous	2012	N/A	Population for cities of > 20,000 listed in worldcities database, c. 2012	http://www.worldcities.us/nigeria_cities/
	USAID FEWSNET	Household Distance to Key Market Centers	dist_market	Continuous	N/A	N/A	Household distance to nearest major market (FEWSNET key market centers)	
	GoogleEarth and other map sources	Household Distance to Border Posts	dist_borderpost 2	Continuous	N/A	N/A	Household distance to nearest border post on main road, primary crossings only	
	Wikipedia and other map sources	Household Distance to State Capital	dist_admctr	Continuous	N/A	N/A	Household distance to to the capital of the State of residence	
Climatology	UC Berkeley	WorldClim Bioclimatic Variables	af_bio_1	Continuous	1960-1990	0.008333 dd	Average annual temperature calculated from monthly climatology, multiplied by 10 (°C)	http://www.worldclim.org/bioclim
	UC Berkeley	WorldClim Bioclimatic Variables	af_bio_8	Continuous	1960-1990	0.008333 dd	Average temperature of the wettest quarter, from monthly climatology, multiplied by 10. (°C)	http://www.worldclim.org/bioclim
	UC Berkeley	WorldClim Bioclimatic Variables	af_bio_12	Continuous	1960-1990	0.008333 dd	Total annual precipitation, from monthly climatology (mm)	http://www.worldclim.org/bioclim
	UC Berkeley	WorldClim Bioclimatic Variables	af_bio_13	Continuous	1960-1990	0.008333 dd	Precipitation of wettest month, from monthly climatology (mm)	http://www.worldclim.org/bioclim
	UC Berkeley	WorldClim Bioclimatic Variables	af_bio_16	Continuous	1960-1990	0.008333 dd	Precipitation of wettest quarter, from monthly climatology (mm)	http://www.worldclim.org/bioclim
Landscape Typology	ESA and UC Louvain	GlobCover v 2.3	fsrad3_lcmaj	Categorical	2009	0.002778 dd	Majority landcover class within approximately 1km buffer	http://ionia1.esrin.esa.int/

Theme	Source	Dataset Title	Variable Name	Variable Type	Reference Period	Resolution	Description	Web
	ESA and UC Louvain	GlobCover v 2.3	fsrad3_agpct	Continuous	2009	0.002778 dd	Percent under agriculture within approx 1 km buffer	http://ionia1.esrin.esa.int/
	IFPRI	IFPRI standardized AEZ based on elevation, climatology	ssa_aez09	Categorical		0.008333 dd	Agro-ecological zones created using WorldClim climate data and 0.0833dd resolution LGP data from IIASA.	http://harvestchoice.org/production/biophysical/agroecology
Soil & Terrain	NASA	SRTM 90m	srtm_nga	Continuous		0.000833 dd	Elevation (m)	ftp://xftp.jrc.it/pub/srtmV4/arcasci/
	USGS	Slope (percent)	slopepct_nga	Continuous		0.008333 dd	Derived from 90m SRTM, aggregated to 1km block	http://pubs.usgs.gov/of/2007/1188/, data provided USGS upon request
	AfSIS	Topographic Wetness Index	twi_nga	Continuous		0.000833 dd	Downloaded from AfSIS website. Derived from modified 90m SRTM. Local upslope contributing area and slope are combined to determine the potential wetness index: WI = ln (A s / tan(b)) where A s is flow accumulation or effective drainage area and b is slope gradient.	http://www.ciesin.columbia.edu/afsis/bafsis_fullmap.htm#
	LSMS-ISA	Terrain Roughness	srtm_nga_5_15	Categorical		0.000833 dd	Derived from 90m SRTM using 15 Meybeck relief classes and 5x5 pixel neighborhood	
	FAO	Harmonized World Soil Database	SQ1	Categorical		0.083333 dd	Nutrient availability	http://www.iiasa.ac.at/Research/LUC/External-World-soil-database/HTML/
	FAO	Harmonized World Soil Database	SQ2	Categorical		0.083333 dd	Nutrient retention capacity	http://www.iiasa.ac.at/Research/LUC/External-World-soil-database/HTML/
	FAO	Harmonized World Soil Database	SQ3	Categorical		0.083333 dd	Rooting conditions	http://www.iiasa.ac.at/Research/LUC/External-World-soil-database/HTML/

Theme	Source	Dataset Title	Variable Name	Variable Type	Reference Period	Resolution	Description	Web
	FAO	Harmonized World Soil Database	SQ4	Categorical		0.083333 dd	Oxygen availability to roots	http://www.iiasa.ac.at/Research/LUC/External-World-soil-database/HTML/
	FAO	Harmonized World Soil Database	SQ5	Categorical		0.083333 dd	Excess salts	http://www.iiasa.ac.at/Research/LUC/External-World-soil-database/HTML/
	FAO	Harmonized World Soil Database	SQ6	Categorical		0.083333 dd	Toxicity	http://www.iiasa.ac.at/Research/LUC/External-World-soil-database/HTML/
	FAO	Harmonized World Soil Database	SQ7	Categorical		0.083333 dd	Workability (constraining field management)	http://www.iiasa.ac.at/Research/LUC/External-World-soil-database/HTML/
Crop Season Parameters	NOAA CPC	Rainfall Estimates (RFE)	anntot_avg	Continuous	2001-2012	0.1 dd	Average 12-month total rainfall (mm) for Jan-Dec	ftp://ftp.cpc.ncep.noaa.gov/fews/newalgo_est_dekad/
	NOAA CPC	Rainfall Estimates (RFE)	wetQ_avg	Continuous	2001-2012	0.1 dd	Average total rainfall in wettest quarter (mm) within 12-month periods from Jan-Dec	ftp://ftp.cpc.ncep.noaa.gov/fews/newalgo_est_dekad/
	NOAA CPC	Rainfall Estimates (RFE)	wetQ_avgstart	Continuous	2001-2012	0.1 dd	Average start of wettest quarter in dekads 1-36, where first dekad of Jan =1	ftp://ftp.cpc.ncep.noaa.gov/fews/newalgo_est_dekad/
	NOAA CPC	Rainfall Estimates (RFE)	h2012_tot	Continuous	2012	0.1 dd	12-month total rainfall (mm) in Jan-Dec, starting January 2012	ftp://ftp.cpc.ncep.noaa.gov/fews/newalgo_est_dekad/
	NOAA CPC	Rainfall Estimates (RFE)	h2012_wetQ	Continuous	2012	0.1 dd	Total rainfall in wettest quarter (mm) within 12-month periods starting January 2012	ftp://ftp.cpc.ncep.noaa.gov/fews/newalgo_est_dekad/

Theme	Source	Dataset Title	Variable Name	Variable Type	Reference Period	Resolution	Description	Web
	NOAA CPC	Rainfall Estimates (RFE)	h2012_wetQstart	Continuous	2012	0.1 dd	Start of wettest quarter in dekads 1-36, where first dekad of January 2012 =1	ftp://ftp.cpc.ncep.noaa.gov/fews/newalgo_est_dekad/
	BU	MOD12Q2 Land Cover Dynamics (PHENOLOGY)	eviarea_avg	Continuous	2001-2012	0.004176 dd	Average total change in greenness (integral of daily EVI values) within growing season, averaged by state	ftp://e4ftl01.cr.usgs.gov/MOTA/MCD12Q2.005
		MOD12Q2 Land Cover Dynamics (PHENOLOGY)	evimax_avg	Continuous	2001-2012	0.004176 dd	Average EVI value at peak of greenness, averaged by state	ftp://e4ftl01.cr.usgs.gov/MOTA/MCD12Q2.005
	BU	MOD12Q2 Land Cover Dynamics (PHENOLOGY)	grn_avg	Continuous	2001-2012	0.004176 dd	Average timing of onset of greenness increase in day of year 1-356, within early growing season, averaged by state	ftp://e4ftl01.cr.usgs.gov/MOTA/MCD12Q2.005
	BU	MOD12Q2 Land Cover Dynamics (PHENOLOGY)	sen_avg	Continuous	2001-2012	0.004176 dd	Average timing of onset of greenness decrease in day of year 1-356, within growing season, averaged by state	ftp://e4ftl01.cr.usgs.gov/MOTA/MCD12Q2.005
	BU	MOD12Q2 Land Cover Dynamics (PHENOLOGY)	h2012_eviarea	Continuous	2012	0.004176 dd	Total change in greenness (integral of daily EVI values) within growing season of 2012, averaged by state	ftp://e4ftl01.cr.usgs.gov/MOTA/MCD12Q2.005
		MOD12Q2 Land Cover Dynamics (PHENOLOGY)	h2012_evimax	Continuous	2012	0.004176 dd	EVI value at peak of greenness within growing season of 2012, averaged by state	ftp://e4ftl01.cr.usgs.gov/MOTA/MCD12Q2.005

Theme	Source	Dataset Title	Variable Name	Variable Type	Reference Period	Resolution	Description	Web
	BU	MOD12Q2 Land Cover Dynamics (PHENOLOGY)	h2012_grn	Continuous	2012	0.004176 dd	Onset of greenness increase in day of year 1-356, within growing season of 2012, averaged by state	ftp://e4ftl01.cr.usgs.gov/MOTA/MCD12Q2.005
	BU	MOD12Q2 Land Cover Dynamics (PHENOLOGY)	h2012_sen	Continuous	2012	0.004176 dd	Onset of greenness decrease in day of year 1-356, within growing season of 2012, averaged by state	ftp://e4ftl01.cr.usgs.gov/MOTA/MCD12Q2.005

Appendix 5: Description of Food Photo Files

Table A5.1: Description of Food Photo Files from Wave 1 Collection

File name	Item Code	Item Name	Item if other	Specification in the JPG: KGS/liters			Non standard unit
i10guineacorn1_5kg	10	Guinea Corn		1.5			One Mudu
i11millet1_7kg	11	Millet		1.7			One Mudu
i12maize1_48kg	12	Maize		1.48			One Mudu
i13i14rice1kg	13; 14	Rice - local ; Rice - Imported		1			One Mudu
i17yamflour1_43kg	17	Yam Flour		1.43			
i31yamroots	31	Yam Roots		2.3	3.2	5.2	
i32gariwhite1_25kg	32	Gari White		1.25			One Mudu
i34cocoyam1_4kg	34	Cocoyam		1.4			
i34cocoyam1_73kg	34	Cocoyam		1.73			
i34cocoyam_69kg	34	Cocoyam		0.69			
i36sweetpotatoes	36	Sweet Potatoes		1	2.2	3.6	Heap
i42whitebeans1_35kg	42	White beans		1.35			One Mudu
i43groundnuts1_5kg	43	Groundnut		1.5			One Mudu
i44othMelonseeds_2kg	44	Other nuts/seeds/pulses	Melon Seeds	0.20			Small Derica
i44othMelonseeds_9kg	44	Other nuts/seeds/pulses	Melon Seeds	0.9			Large Deeica
i44othMelonseeds_35kg	44	Other nuts/seeds/pulses	Melon Seeds	0.35			Medium Size
i44othRedbeans1_65	44	Other nuts/seeds/pulses	Red Beans	1.65			One Mudu
i60bananas1_3kg	60	Bananas		1.30			
i60bananas1_55kg	60	Bananas		1.55			
i60bananas3_6kg	60	Bananas		3.60			
i61oranges	61	Oranges		1.2	2.60	4.3	

File name	Item Code	Name	Item if other	Specification in the JPG: KGS/liters			Non standard unit
i64pineapples	64	Pineapples		1.90	2.2	2.50	
i66othPawpaw	66	Other fruits	Pawpaw	2.3	3.00	3.4	
i70tomatoes	70	Tomatoes		1.00	2.4	4.50	
i73gardeneggs	73	Garden Eggs		0.4	0.65	0.9	
i78othCarrot_1kg	78	Other vegetables (fresh or canned)	Carrot	0.10			
i78othCarrot_05kg	78	Other vegetables (fresh or canned)	Carrot	0.05			
i78othCarrot_17kg	78	Other vegetables (fresh or canned)	Carrot	0.17			
i78othGreenpepper1_5kg	78	Other vegetables (fresh or canned)	Green pepper	1.5			
i78othGreenpepper1kg	78	Other vegetables (fresh or canned)	Green pepper	1.00			
i78othGreenpepper_53kg	78	Other vegetables (fresh or canned)	Green pepper	0.53			
i78othRedpepper	78	Other vegetables (fresh or canned)	Red pepper	0.80	1.5	4.00	
i83agrieggs2kg	83	Agricultural Eggs		2			Crate
i83agrieggs_1kg	83	Agricultural Eggs		0.10			6 pieces
i83agrieggs_89kg	83	Agricultural Eggs		0.89			12 pieces
i103driedfish.jpg	103	Dry Fish		0.30	1.1	1.90	Small, medium, large

Table A5.1: Description of Food Photo Files from Wave 2 Collection

File name	Item Code	Name	Item if other	Specification in the JPG: KGS/liters			Non standard unit
i20maizeunshelledw2	20	Maize (unshelled)		0.25	0.3	0.35	
i25breadw2	25	Millet		0.2	0.3	0.8	
i31yamrootsv2w2	31	Yam - roots		2.2	2.8	3.3	
i34cocoyam1_4kgv2w2	34	Cocoyam		1.4			
i35plantains1_3kgw2	35	Plantains		1.3			
i36sweetpotatoesv2w2	36	Sweet potatoes		0.2	0.45	0.85	
i37potatoes1kgw2	37	Potatoes		1			
i43groundnutsv2w2	43	Groundnut		0.03	0.075	0.1	
i61orangesv2w2	61	Oranges		1.2	2.6	4.3	
i63avocadopearsw2	63	Avocado pears		0.16	0.25	0.3	
i64pineapplesv2w2	64	Pineapples		1.9	2.2	2.5	
i66othPawpawv2w2	66	Other fruits	Paw paw	2.3	3.0	3.4	
i70tomatoesv2w2	70	Tomatoes		0.04	0.05	0.075	
i72onionsw2	72	Onions		0.05	0.1	0.15/0.28	
i73gardeneggs	73	Garden eggs		0.4	0.65	0.9	
i76freshpepperw2	76	Fresh pepper		0.18	0.2		
i100freshfishw2	100	Fresh fish		0.5	1.45		