



UGANDA BUREAU OF STATISTICS



THE REPUBLIC OF UGANDA

UGANDA NATIONAL PANEL SURVEY 2019/20

Interviewer's Manual Of Instructions

Agriculture Module

UGANDA BUREAU OF STATISTICS

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KAMPALA UGANDA

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CHAPTER ONE: AGRICULTURE MODULE

OBJECTIVES OF THE AGRICULTURAL MODULE IN THE UNPS

UBOS has received support under the LSMS-ISA project in the design and implementation of the UNPS with a focus on expanding the agricultural content of the UNPS and ensuring comparability with other surveys being carried out under the LSMS-ISA project in other countries in Sub-Saharan Africa. The emphasis is to ensure that information on agriculture and livestock are mainstreamed into the UNPS and that the quality and relevance of these data is further improved, and sustained over time.

The main objective of this support to the UNPS is to facilitate the production of household-level agricultural statistics as an integral part of the UNPS and foster its dissemination and use. A number of features have been incorporated into the UNPS design to ensure that agricultural and livestock data are collected in an efficient and cost-effective manner.

1. The Agricultural module is a core-module as the socioeconomic and community surveys in the Uganda National Panel Survey. This survey will cover the household crop farming enterprise particulars with emphasis on land, crop area, inputs, outputs and other allied characteristics.

2. The purpose of the agricultural module on the household survey is to give a better descriptive picture of Uganda's farm economy, and deeper insight into factors affecting farm incomes. These would include a better understanding of the influence of farmers' resources and marketing opportunities on farm-household income, and some sense of how farmers' situation has changed in the past few years. The latter can be addressed by the use of recall questions.

3. Data collected by the survey will allow analysis of the factors most highly associated with greater farm profitability. These can broadly be classified into two categories: commodity/factor markets, and technology. A second level of analysis would allow independent assessment of factors associated with higher profitability, such as commodity mix, level of input use, degree of commercialization, land market participation, etc. To the extent possible, the analysis should develop a causal model.

Timing

The agriculture module is administered in two visits to the selected households. The first series of visits will start in March 2019. The second set of visits will be conducted immediately after the first visit to all households is completed. During the first visit, agricultural production data will be collected on the second cropping season of 2018 (July – December 2018). The second visit will collect agricultural production data on the first cropping season of 2019 (January – June 2019). The sections that are going to be administered during the second visit are clearly marked. Detailed instructions are given in the respective sections.

GENERAL CONCEPTS AND DEFINITIONS

This section introduces the general concepts and definitions to be used throughout the fieldwork on the Agricultural Module. It is very important that you clearly understand the contents.

Agricultural Holding

1. This is **an economic unit of agricultural production under single management** comprising all livestock kept and all land used wholly or partly for agricultural production purposes, without regard to title, legal form or size. Single management may be exercised by an individual or by a household, jointly by two or more individuals or households, by a clan or tribe or a cooperative or government parastatals.
2. A holding may consist of one or more parcels located in one or more separate areas, provided the parcels share the same production means utilized by the holding, such as labor, farm buildings, farm implements and machinery or drought animals. The requirements of sharing the same production means should be fulfilled to a great degree to justify the consideration of various parcels as components of one economic unit.
3. In the case of a family which lives together and shares meals, all parcels cultivated by the household members will constitute one holding. On the other hand, if part of land is cultivated by relatives who live separately, even though they share work on the land, each of them will normally know which parcels/plots belong to them. In this case, the total area is not a holding, but several holdings, depending on the number of persons having claim to the parcels in question.
4. Some of the area of the holding may be cultivated, fallow, under forest trees, belonging to the holder or may be wholly and partly used for grazing livestock.
5. The following points will assist in getting the concept of holding clearer:
 - (i) There are holdings that do not have a significant area, e.g., poultry or piggery units or hatcheries for which much land is not absolutely necessary.
 - (ii) There are holdings that may be operated by holders who have another occupation in addition to being holders.
 - (iii) There may be holdings that may be operated jointly by two or more individuals.
 - (iv) Land which is open to communal grazing is not considered a holding.

Holder

The holder is a person who exercises management control over the holding and takes major decisions regarding resource use. The holding may be run by the holder himself/herself, by the spouse, by relatives or by an employed manager. The holder has technical and economic responsibility for the holding, but may delegate responsibilities related to the day to day work management.

Agricultural Season

1. The main or the first agricultural season normally refers to the growing cycle of temporary crops that are planted and harvested in the first half of the year, occasionally extending up to the end of June. It thus covers the period between January and June.
2. The second agricultural season is generally the period between July and December. It should be noted that seasons are directly related to rains and only indirectly related to the growing cycle of crops. The first rains are generally longer than the second rains.
3. Some areas in Uganda have only one significant agricultural season.

Temporary/Annual Crop

These are crops with a growing cycle of less than one year, sometimes only a few months, which needs to be newly sown or planted for further production after the harvest. Crops remaining in the plot for more than one year should also be considered temporary crops if harvesting destroys the plant (e.g., cassava and yams). Crops grown in rotation, and therefore destroyed when the land is ploughed (e.g., grasses), should be considered temporary crops. The specialized cultivation of vegetables, flowers, bulbs and market gardens should also be included in this category.

Permanent/Perennial Crops

These are crops which occupy the areas for a year or longer and which do not have to be planted after harvest. Land under tree crops is included in this broad category, except land under forest trees which should be classified under “wood or forest land”. Permanent pastures are excluded.

Pure Stand

This is a single crop cultivated alone in a plot. A pure stand crop can be either temporary or permanent.

Intercropped Stand

1. These are different crops cultivated simultaneously on the same plot. They can cause difficulties in ascertaining the proportion of the total plot area occupied by the component crops.
2. It can take the form of mixed or associated crops. Mixed crops are two or more different temporary crops or permanent crops grown simultaneously in the same plot. Associated crops are temporary and permanent crops cultivated simultaneously in the same field. The number, kind and proportions in the mixture will generally be according to prevailing practices or to other factors such as soil, rainfall and other weather conditions.

Parcel

1. A parcel is a contiguous piece of land with identical (uniform) tenure and physical characteristics. It is entirely surrounded by land with other tenure and/or physical characteristics or infrastructure e.g. water, a road, forest, etc, not forming part of the holding. This implies that a parcel is part of a holding that is physically separate from other parts of the holding. A holding is made up of one or more parcels.

Plot

1. A plot is defined as a contiguous piece of land within the parcel on which a specific crop or a crop mixture is grown. A parcel may be made up of one or more plots.

Total Holding Area

1. Total holding area is the area of all parcels that is operated by the holder. Forestland and other land owned and/or used by the holder should be included. Land rented from others and operated by the holder should be included in the holding. **But land owned by the holder but rented to others should not be included in calculating the holding area.** It should be, however, noted that information on parcels owned by the household, but rented to others (operated by others) will be collected in this survey even if it will be excluded in computing total holding area (cultivated area) at the analysis stage.
2. The holding area includes land under crops and pastures as well as land occupied by farm buildings. Land area of the holder's house is also included in the total holding area if the house is not located outside the holding (e.g., a house for residential purposes in a village or town) and is not used solely for residential purposes. It should be noted that data on non-agricultural land in general and residential land in particular irrespective of the location is collected in the socio-economic questionnaire under Section 14: Non-Agricultural Land by All Households and Agricultural Land by Non-Agriculturalists.
3. The total area of a holding practicing shifting cultivation should include area under crops during the reference period and areas prepared for cultivation but not sown or planted at the time of enumeration. It should exclude land abandoned prior to the reference period. Holders having access to communal grazing land should not include their estimated share of such land in their total land area.

Land Utilization

1. The recommended broad categories of land utilization in international nomenclatures are:
 - (a) Arable land
 - (b) Land under permanent crops
 - (c) Land under permanent pastures

- (d) Wood or forestland
- (e) All other land

(a) **Arable land** refers to all land generally under rotation whether it is under temporary crops, left temporary fallow or used as temporary pastures. Total arable land may be divided into four classes:

- (i) Land under temporary crops
- (ii) Land under temporary pastures
- (iii) Land temporarily fallow
- (iv) All other arable land

(i) **Land under temporary crops** includes all land used for crops with a growing cycle of under one year, sometimes only a few months, which needs to be newly sown or planted for further production after the harvest. Crops remaining in the plot for more than one year should also be considered temporary crops if harvesting destroys the plant (e.g., cassava and yams). Crops grown in rotation and therefore destroyed when the land is ploughed (e.g., grasses) should be considered temporary crops. The specialized cultivation of vegetables, flowers, bulbs and market gardens should also be included in this category.

(ii) **Land under temporary pastures** is the land temporarily cultivated with pastures. Because some practical difficulties may arise differentiating temporary from permanent pastures, such pastures cultivated for a period of less than five years should be considered temporary.

(iii) **Land temporarily fallow** is land at rest for a period of time before it is cultivated again. If the land remains fallow too long, it might acquire certain characteristics which would determine its inclusion in other major land uses groups. A maximum period of idleness is therefore defined, being less than five years. On the other hand, a piece of land should not be considered temporarily fallow unless it has been or is intended to be kept at rest for at least one agricultural year. If the time of enumeration falls at a time when sowing/planting has not been completed, the area lying fallow at that time, but which will be put under crops soon afterwards should be classified by the crops to be sown/planted and not as fallow land. Fallow land that is temporarily used for grazing should be classified fallow if the land is normally used for the cultivation of temporary crops.

(iv) **All other arable land** includes all rotation land not put to any of the uses mentioned above during the reference period, such as arable land temporarily damaged by floods, land prepared for cultivation, but not sown because of unforeseen circumstances and abandoned land.

(b) **Land under permanent crops:** This is land which is cultivated with crops which occupy it for a year or longer and which do not have to be planted after harvest. Land under tree crops is included in this broad category, except land under forest trees which should be classified under “wood or forest land”. Permanent pastures are excluded.

(c) **Land under permanent pastures** means land used permanently (i.e. for five years or more), seeded and cared for or grown naturally (grazing land). Permanent pastures on which trees and shrubs are grown should be classified under this category only if the growing of grass (naturally growing grass) is the most important use of the area.

(d) **Wood or Forest land** includes wood lots or tracts of timber, natural or planted, which have or will have value as wood, timber or other forest products. Nurseries of forest trees should also be classified under this category. Wood or forest land used only for recreational purposes should be classified as “All other land”

(e) **All other land** includes all other land not elsewhere classified, whether potentially productive or not. Generally it refers to unused lands and areas under buildings, roads, parks, swamps, rocky areas etc.

Agricultural land

This is defined as the sum of arable land, land under permanent crops and land under permanent pastures.

PARCEL AREA MEASUREMENT AND CALCULATION

Introduction

1. One of the most important factors for production used in growing crops, raising livestock or any other farming activity, is land. The pattern of Land-Use usually varies by seasons or by different regions of the country. Thus, accurate data on area used for agricultural purposes is an important aspect of agricultural planning.

2. Total land operated by the holder (i.e. the agricultural holding) is a crucial variable for the analysis of agricultural data. The area of a holding may vary from time to time. A holder may sell or leave part of his/her holding or he/she may buy or rent from others.

3. At any time the holder has the option to fully or partially utilize the holding. Thus the proportion of the holding under crop also varies from season to season or from year to year. Since production can be estimated as a product of Yield and Area, there is definite relationship between area planted and amount of crop harvested. The product can easily be computed in the case of crops grown in pure stand. The problem is however quite complex if crops are intercropped.

Area to be measured

1. The main work will involve collecting data on number of parcels and plots under the various crops. The areas to be measured will be, however, limited to parcels, and crop plots (for the second) cropping season of 2017 – Section 3A of the questionnaire) located within the selected EAs. For parcels located outside the EA, we depend only on farmers own estimation.

Measuring Unit

1. Land area will be measured with a Global Positioning System (GPS) tool and recorded as acres with **two decimal places** in Section 2, Part A and B of the agricultural questionnaire i.e. the smallest area possible to record is 0.01 of an acre.

Parcel and Plot Area Measurement

Introduction

1. During the UNPS, the Enumerator will carry out area measurements on parcels, and crop plots for the current cropping season using a GPS device. The area measurement should be done after the interview is completed.

2. The parcel and plot area measurements will be carried out in the following sequence:

- (i) It will be necessary to walk around the parcel with the holder/respondent to decide on the parcel boundaries and the number of plots to be found.
- (ii) The Enumerator will do the area measurement using the GPS equipment and record it in Section 2, Part A and B of the agricultural questionnaire.

3. The Supervisor and/or the team from UBOS will crosscheck some selected parcels and plots by re-measuring, using GPS equipment.

YIELD AND PRODUCTION ESTIMATES

Introduction

1. Reliable estimation of annual production of food crops and other agricultural commodities are extremely important as Uganda makes serious efforts to tackle the problem of ensuring food security, diversifying her export crops, increasing income of her people, and, thus raising their living standards.

2. A number of methods for estimation of crop production exist. These include estimating production directly or through a product of Crop Area and the Yield Rate. Area Estimation has been briefly described above.

3. In the UNPS, the holder will give an estimate of what was actually harvested (post-harvest estimates) of the crops planted during the last completed season i.e. planted during the period of July - December, 2018, for the first visit and planted during the period of January – July 2019 for the second visit.

Measuring Unit

1. Many holders in Uganda are expected to have a fairly good idea on quantities of the crop they produce, even if they normally do not keep farm records. However, when it comes to compiling information for statistical purposes, the holder's estimate may be difficult to use due to the absence of standard measurement units. If guided on the use and conversion of various measurement units, experience shows that holders can give fairly accurate estimates. A number of countries in Africa have, thus, applied this method for collection of crop production statistics with a fair amount of success.

2. The holder should estimate his/her harvest in measurement units he/she is familiar with. These measuring units will vary with kind of crops, districts, traditions, etc. The Enumerator is requested to take note on the measurement units used locally.

DETAILED INSTRUCTIONS ON HOW TO FILL IN THE FORMS

1. The agricultural questionnaire for the UNPS is organized into sections, parts and questions. Sections are organized by subject matter covered. Each section has a serial number. Each part is denoted by a letter and covers a particular aspect within the subject. The contents of the sections are listed below:

Section 1A: Household Identification Particulars

Section 1B: Staff Details and Survey Time

Section 2A: Current Land Holdings - Owned

Section 2B: Land that the household has access through use rights

Section 3A & 3B: Agricultural and Labour Inputs (First & second Season)

Section 4A & 4B: Crop grown and type of seeds used (First & second Season)

Section 5A & 5B: Quantification of Production (First & second Season)

Section 6A, 6B & 6C: Livestock Ownership (Cattle, Pack Animals; Small Animals and poultry and others)

Section 7: Livestock Inputs

Section 8A, 8B & 8C: Livestock Products

Section 9: Extension Services

Section 10: Farm Implements and Machinery

Section 12: Land market and related activities

SECTIONS 1A: HOUSEHOLD IDENTIFICATION PARTICULARS AND 1B: STAFF DETAILS AND SURVEY TIME

For the instructions, see [the socio-economic manual of instruction](#).

SECTION 2A: CURRENT LAND HOLDINGS

Purpose: The purpose of this section is to have a complete list of all the parcels owned and/or operated by the household during the second season of 2018 and the first season of 2019. It allows us to refer back to these parcels in the next sections of the questionnaire, together with the rights under which they are

held and their current use. It is divided into two different parts. The first, Part A, collects information on parcels of land owned by the household. The second, Part B, collects information on parcels of land that the household has use rights/usufruct only while the ownership right belongs to someone else.

This section is administered to households who have been involved in crop farming during the last completed and the current cropping seasons. Information is collected on agricultural land that these households have access during the reference period. Note that information on non-agricultural land owned by all the sampled households.

The different scenarios of getting access to land through ownership and use rights are discussed as follows.

Ownership rights

Land owned is the land area possessed by the household for which the household has a title or certificate of ownership. Land owned also includes land which the household can reasonably expect to eventually possess title or certificate of ownership and land which has been operated for many years by the same household without any other claims being made on the land.

In Uganda, the systems of owning land which are recognized by the law are freehold, leasehold, mailo and customary tenures.

Freehold tenure is ownership of land for an unlimited period. It means that one can pass on this land to another person after one's death. The owner of a freehold title has full powers to use and do anything with the land as long as it is not against the law.

Leasehold tenure is a way of owning an interest in land based on an agreement with the owner of the land allowing another person to take possession and use the land to the exclusion of anyone else for a specified or limited period of time, usually five years, forty nine years or ninety nine years.

Mailo tenure was created by the 1900 agreement. It is ownership of land formerly given to the Baganda chiefs mainly in Buganda. It is similar to freehold tenure except that tenants on mailo land have security of tenure.

Customary tenure is a traditional method of owning land. Each community has traditionally developed a system of owning land. It may be owned either by the community, clan, families or individuals.

Individuals can have ownership rights to land under either of the above mentioned tenure systems. A person who owns land under these systems, except customary tenure, is entitled to possess certificate of title. But a certificate of customary ownership is given to a person or group of persons who own land under a customary system. A detailed discussion and definition of the different forms of certificates is provided in the section that deals with land rights, certificates and disputes. Land owned under these arrangements should be recorded in Part A.

Use rights

This refers to the case where a person has the right to use and benefit from land belonging to another as long as the land is not damaged in any way. Use rights mainly involve arrangements between a tenant occupying or using the land and the owner of the land. The most common types of tenants in Uganda are

Lawful and Bona fide occupants on freehold, leasehold or mailo land. The former refers to a person staying on land with the permission of the owner and making some payments to the owner in return. The latter refers to a person who has stayed on and used the land or improved the land for a minimum of twelve years without being challenged or asked to leave by the owner before the date of 8th October 1995. These tenants are entitled to apply for certificate of occupancy.

Individuals can also be given a license to occupy or use land on a short term basis, say, for one season by the owner of the land. For the purpose of this survey **squatters** are assumed to have only use rights on the land they are occupying without the consent of the owner.

Therefore, information on land occupied under any of these arrangements should be collected in Part B.

The following table provides the link between different tenure regimes, ownership and use rights and formal certificates.

	Registrable Interest	Type of Certificate	Type of Right
1	Freehold Mailo Leasehold	Certificate of title	Ownership right
2	Customary	Certificate of customary ownership	Ownership right
3	Lawful/Bona fide occupant	Certificate of occupancy	Use/occupancy right
4	Short term rental/license, squatters	None	Use/occupancy right

Respondent: The respondent is the head of the household or the person best informed about the agricultural activities of the household. In some of the cases, the individual holder or the person who manages the parcel must be invited to give the answers.

Reference period: You need to be careful with the reference period. The reference periods cover the second cropping season of 2017 (July – December 2018) and the first cropping season of 2019 (January – June 2019).

Part A: Land Owned by the Household

The land referred in this part covers all the parcels owned by the household for agricultural purposes including woodlots and forest land. This includes land rented out or lent out to other persons.

Note that land under cultivation by the household but owned by other households or institutions should be excluded.

Instructions

The information is organized by parcel. Refer to the definition of the parcel given in one of the previous sections. For the purpose of this survey the definition is slightly modified as follows. If a portion of a parcel has been rented to others, the two contiguous pieces (the portion of land operated and the other portion rented out) should be considered as two separate parcels on the basis of agricultural operation.

You should identify each parcel clearly by number and name. The recording of parcel(s) should start with the parcel where the interview is taking place, preferably by the parcel where the household's dwelling house is located. This should be parcel number one. For all the parcels within the EA, GPS coordinates at the geographical center of the parcel should be given at the bottom of the page. Use extra sheets if necessary.

Question 1: This is a filter question. It establishes whether the household owns any agricultural land including woodlots and that of forest land. If the answer is 'no', then skip to Part B. If the answer is 'yes', ask the respondent to list all the parcels the household owns and their details.

Column (2): Parcel ID

Column (2) is labeled PARCEL ID (identification code). Each row in the grid is assigned a number. The identification code assigned for each parcel is determined by the row in which the parcel's name is entered. The Parcel ID is extremely important, as it allows the information gathered in the various sections of the agricultural module that pertains to the same parcel to be matched together. Parcels within the EA should be the first to be recorded/listed in the questionnaire. If the holder operates any parcels outside the EA, these parcels should be registered after all parcels within the EA are listed.

Column (5.1): Respondent ID for Parcel

Record the Person ID of the respondent for each parcel. Copy the Person ID from Section 2 of the Household Questionnaire.

Column (3): Parcel name

This question obtains a name or brief description of the parcels, for reference during the interview and for re-interviewing the same household in future survey. For instance, each parcel could be named after the village where it is located, or locations such as near swamps, rivers, hills etc. or even the main crop grown. Make a complete list of all the parcels owned by the household including parcels that are in fallow.

Column (3.1): Change in Parcel size

Establish whether the parcel size has changed in the last 12 months.

Column (4): GPS Measurement with two decimal places

It should be noted that area measurement is done after the interview is completed. This column is thus filled in after the completion of the interview. The use of the GPS has been extensively explained above and in Annex 2. However, the actual measurement should be conducted only on those parcels located within the EA. **Once again exclude the portion of the parcel devoted for residential purposes i.e. land area for housing building and its secondary parts such as kitchen, toilet and other related structures.**

Column (5): Farmer's estimate

Record farmer's/holder's area (size) estimate of the parcels listed in acres. It is important that the holder's estimate is not influenced at all - just register his/her estimate. **Exclude the portion of the parcel devoted for residential purposes i.e. land area for housing building and its secondary parts such as kitchen, toilet and other related structures.**

It is expected that many holders will give areas as acres and as fractions of acres, probably not more detailed than 3/4, 1/2 and 1/4 of an acre. The Enumerator should transfer the fractions to decimals as follows 3/4=0.75, 1/2= 0.50 and 1/4=0.25 and fill in the areas with two decimals. Make sure that the decimals are correctly registered in order to avoid data entry errors at a later stage. Also remember the following conversions:

1 acre \cong 4000 m² \cong 0.4 hectares

1 hectare =10,000 m² \cong 2.5 acres

If any local area measurement unit is used, it should be converted into acres and recorded in this column.

The following guidelines can be used:

- an acre is a measure on the ground of approximately 70 yd x 70 yd or half a standard football field;
- by casually walking round a square of 50 steps by 50 steps, one covers an area of approximately 1/4 or 0.25 acres;
- an area measuring 22 yd x 22 yd covers 0.1 acres; and
- an area measuring 16 yd x 16 yd covers 0.05 acres.

Column (5.2_2): GPS Coordinates

For each parcel, record the GPS coordinates from the centre of the parcel.

Column (5.2_1): Reasons for not capturing GPS Coordinates

For every parcel that does not have corresponding GPS coordinates, record the reason for not capturing the GPS coordinates.

Question (5.3): Have you listed all parcels owned by the household

This question is a Yes/No response type question and is required to be filled in so as to identify if all parcels owned by the household during the first and second seasons have been captured entirely.

Column (6): Travel time to parcel

Record the time taken to travel from the parcel from the homestead to each parcel using the codes provided.

Column (7): Land Tenure System

Here, ask about the rights under which the owner operates the land i.e. the tenure status of the land.

Column (8): How the parcel was acquired

Ask how the household acquired the parcel for the first time. If unmarried household head inherited land from his/her family, then use code '2' (inherited or gift from own family). CLEARED, code '7' is common mainly in areas with customary land ownership where one clears land and uses it.

Column (9): Year in which parcel was acquired

Record the year in which the parcel was acquired for the first in four digits. For example, if the parcel was acquired in 1989, write 1989 in the appropriate box. If the parcel was acquired in bits and pieces, give the year in which the major part was acquired.

Column (10): Estimated value of the parcel if sold

Get the respondents estimate of the value of the parcel at the prevailing market price if it was to be sold, **including the investment on it e.g. farm buildings, permanent crops, etc.** Exclude residential buildings since residential land is not considered as part of the parcel. Note also that annual crops should not be considered as an investment. Respondents may have a difficult time answering this question. You should try to obtain estimates, however rough, of the value of land with the investment. Sometimes you

may have to ask about the value of a similar parcel with similar type of investment in the same locality – this can be a good indicator of value.

Column (10): Access to the Parcel

Ask the respondent whether he/she currently has access to the parcel. Access here refer to use rights to the parcel

Columns (11a) and (11b): Primary use of the parcel

Ask about the **primary** use of the parcel during the second cropping season of 2018 (July – December 2018) and the first cropping season of 2019 (January – July 2019) in columns (11a) and (11b), respectively. (See subsection 2. Land Utilization of this manual for the detailed description of some of the response codes).

Rented out means that the parcel was given to another household to operate in return for either a fixed sum (cash or in-kind) or a share of the crops harvested. Note that code '4' should be used if the land was **cultivated by a mailo tenant** during the reference period.

Column (12) and (13a and 13b): Land Under fallow

In these questions, ask about the parcels that have been under fallow (Code '5' in 11a or 11b). If the respondent indicates that the parcel is under fallow; ask for the most recent year/agricultural season in which the land was left fallow. Be sure to record the year as a four digit figure.

In column (13a) ask for the number of years that the parcel was consecutively under fallow and in column (13b) ask for the type of fallow and in column (13b), record the type of fallow.

Column (14): Rent received for renting out parcel

This question should be asked for the parcels that the household did not cultivate. If the parcel was rented out or cultivated by a mailo tenant, ask what rent was received from the tenant during the two seasons and record what was received in cash in column (14). Record the net rent, i.e. the rent net of the value of any inputs the household provided to the tenant. Be careful to follow the instructions

Column (15a & 15b): Proportion of parcel cultivated

For each of the parcels that the household is using, establish the proportion that is cultivated or under plant. Record the proportions as a percentage out of 100 for both seasons in 15a and 15b respectively.

Column (28 & 29): Buildings

These questions seek to establish whether there were any permanent or semi-permanent buildings on the parcel and if so, the use of the buildings/structures.

Column (16 & 17): Soil type/land quality

Ask the respondent about the soil type/land quality of the parcel. We use a simple ranking between Good, Fair and Poor to classify the general condition of the parcel with respect to soil/land quality.

Column (18): Main water source for crop production

Irrigation refers to purposively providing land with water other than rain for improving crop production. Uncontrolled land flooding by the overflowing of rivers and stream is not considered as irrigation. When

rainwater or uncontrolled overflow from rivers or streams is collected and later used on the land, it is then considered irrigation. If the parcel has any type of irrigation as defined above, fill in code 1. Otherwise fill in appropriate source of water for agricultural production.

Column (30a & 30b): Kind of irrigation related structures/improvements

For those parcels on which irrigation is practiced, establish the kinds of irrigation related structures or improvements that exist on the parcel. Record up to two kinds using the codes provided.

Column (19): Topography

This question refers to a simple categorization of slope of the parcel. Ask information about the slope that best describes the major part of the parcel.

Column (20) to (22a and 22b): Soil erosion problems

The purpose of these questions is to establish whether the household has encountered problems of soil erosion and what was done to control. **Soil erosion** refers to the Movement of soil components, especially topsoil, from one place to another, usually by wind, flowing water, or both. This natural process can be greatly accelerated by human activities that remove vegetation from soil.

In column (20) ask whether the household experienced soil erosion on each of the parcels in the last completed season. If the response in column (20) is code '1', establish the possible cause of the erosion problems in column (21). The question in column (22) seeks to establish whether any erosion controls or water harvesting facility is available on the parcel. Note that the question in column (22) is multiple responses and more than one response can be recorded as provided for by columns (22a & 22b).

Column (23): Land certificate

Ask whether the parcel has a formal certificate of title, or customary certificate of ownership or certificate of occupancy. The definitions are given below. If the household has ownership rights on the parcel ask about either certificate of title or customary certificate of ownership depending on the tenure status of the parcel. But if the household has only use rights then ask about certificate of occupancy.

Definition

Certificate: Refers to a written or printed and signed document that specifies the registered interests or claims against that right to own, use or occupy the land or parcel. The document should be issued by and registered with government authorities e.g. the commissioner for registration, the land board, or the recorder (the office registering land and giving certificates).

Certificate of Title: Refers to a written or printed and signed document that is an official record of an agreement concerning the ownership of land or parcel. It registers the right to own the land. Interests that can be entered in the register of titles are a freehold, lease, and mailo ownership. Customary ownership and occupancy of land belonging to someone else are not recognized in the registration of titles. The title gives the owner the right of using and developing the land for any purpose, entering into any dealings (selling, renting, and giving it out as a security), allowing other people to use it and giving away the land by will.

Certificate of customary ownership: Is given to a person or group of persons who own land under a customary system to recognize and guarantee his/her interest in the land or parcel. The document must be issued by the land board. It states that the customary rights on the land it refers to belong to the person or persons named on it. Certificate of customary ownership gives the owner to;

- rent the land or part of it for a limited period of time (leasing),
- allow a person to use the land or part of it for a limited period,
- give the land or part of it as security or guarantee for a debt or money borrowed,
- divide the land or part of it
- sell the land or a portion of it if the certificate of customary ownership allows,
- give away the land by will

Certificate of occupancy: Is a document issued to a tenant on a land on which he/she are not the owners or lessees. It clearly states the interests or claims of the tenant (occupant). A tenant with certificate of occupancy

- can give away, sublet, give as security or create rights to another person to use the land and do anything allowed on the land,
- can pass it on to other people such as spouse, children, relative or friends after his/her death, but
- before dealing with the land in any way, the tenant by occupancy will apply to the owner in a standard form asking for permission to be allowed to deal with the land

Column (31): Year of acquisition of Land Title/Certificate

Record the year in which the household acquired the formal title/certificate for the parcel.

Column (26a) & (26b): Ownership

Ask which household member's names appear on the title/certificate. Record up to two Person IDs.

Column (32a) & (32b): Semi formal/informal ownership documents

Ask the respondent whether the household has other documents – semi-formal or informal that would provide proof of ownership to this parcel. If the response is "No" (code 2), observe the skip pattern.

Column (33a) & (33b): Type of semi-formal/informal ownership documents possessed

For those parcels for which the household has informal documents, establish the type of document(s) they possess. Provision has been made to record up to three types of informal documents.

Column (24a) & (24b): Ownership rights

Ask who has the ownership rights to the parcel among members of the household. Record the Person IDs of up to two household members.

Column (27a) & (27b): Decision maker regarding sale or use of parcel as collateral

Record the Person IDs of up to two members of the household who can decide whether to sell or use a parcel as collateral.

Column (34): Rights to Inheritance

This question seeks to collect information on norms regarding inheritance rights of the female child. For each parcel, establish the female child's right to inheritance and record the responses using the codes provided.

Columns (25) – (38): Land disputes

Land dispute: Is a disagreement over land rights, boundaries or uses. A land dispute occurs where specific individuals or collective interests relating to land are in conflict. These questions aim at establishing a measure of perceived land tenure security at the parcel level by combining the incidence and nature of current land-related disputes and perceived risk of future disagreements with private parties. The information that will be collected using these variables can help to broadly assess the land's investment climate of the country and, in particular, to examine households' incentives to make long-term investments to enhance productive capacity of land or to transfer land from less to more productive users.

Column (25): This question gathers information on whether the household has ever had concerns that somebody might dispute their ownership/use rights on that parcel.

Columns (34) – (35): This set of questions collects information regarding the incidence and nature of current land disputes during the past 12 months.

Columns (36) – (37): This set of questions focuses on perceptions of households as to whether and to what extent they are concerned about future disagreements on ownership and use rights of their parcels of land with private parties in the coming 5 years.

Column (38): This question gathers information on the perceived sales value of land. Land being a sensitive issue, care should be taken while asking this question.

SECTION 2B: LAND THAT THE HOUSEHOLD HAS ACCESS TO THROUGH USE RIGHTS

This part refers to parcels the household cultivated but does not own during the second season of 2018 and the first season of 2019. It gathers information about each parcels belonging to someone else that was cultivated by the household irrespective of the type of contractual arrangements with the owner of the land. It can be rented or lent to the household or even it can be without any arrangement with the owner of the land. It should be clear that the household has only use rights to the land i.e. the right to utilize and enjoy the profits and advantages of the land that belongs to another person so long as it is not damaged in any way. In other words, the household has only third party rights that can be enjoyed on land of which a member of the household is not the owner or lessees.

Instructions

Question 1: If the answer to question 1 is 'yes', list all the parcels that the household has access (use rights), but that belongs to someone else during the second cropping season of 2018 and the first cropping season of 2019. If the answer is 'No', skip to Section 3.

Columns (2) – (8)

These questions are identical to columns (2) – (8) in Part A, so the same instructions above apply here. The tenure system (column (7)) refers to the type of ownership of the parcel from the owner's perspective – **it should not be linked with the contractual arrangements between the owner of the land and the one who is currently using it.**

The response codes for column (8) are slightly different from that of the Part A in order to address the issues related to the agreement between the household and the owner of the parcel.

Column (9): Rent during the two seasons

Ask for the amount of rent that the household paid to the owner of the parcel during the two seasons if it was acquired through an agreement with the land/use right owner (code '1' for column (8)). Write only cash payments here.

Column (10): Period of possession of parcel

Ask the respondent for the length of time that the household has been in continued possession of the parcel i.e. farming the parcel. Record in completed years. **If less than one year, write '0'.**

Column (11): Renewal of user rights

Find out whether the household has to renew use rights to the parcel at least once a year.

Columns (12a & 12b): Primary use of parcel

These questions are similar to column (11a & 11b) of Part A, respectively. The list of response codes for column (12a & 12b) is customized to fit the circumstances of access to land on the basis of use rights.

Columns (12a.1 & 12b.1): Parcel under fallow

Ask about the type of fallow

Column (13): Rent received for renting out parcel

This question should be asked for the parcels that the household did not cultivate. If the parcel was rented out or cultivated by a mailo tenant, ask what rent was received from the tenant during the two seasons and record what was received in cash in column (13). Record the net rent, i.e. the rent net of the value of any inputs the household provided to the tenant. Be careful to follow the instructions

Column (14 - 15): Soil type/land quality

Ask the respondent about the soil type/land quality of the parcel. We use a simple ranking between Good, Fair and Poor to classify the general condition of the parcel with respect to soil/land quality.

Column (16): Main water source for crop production

Irrigation refers to purposively providing land with water other than rain for improving crop production. Uncontrolled land flooding by the overflowing of rivers and stream is not considered as irrigation. When rainwater or uncontrolled overflow from rivers or streams is collected and later used on the land, it is then considered irrigation. If the parcel has any type of irrigation as defined above, fill in code 1. Otherwise fill in appropriate source of water for agricultural production.

Column (22a & 22b): Kind of irrigation related structures/improvements

For those parcels on which irrigation is practiced, establish the kinds of irrigation related structures or improvements that exist on the parcel. Record up to two kinds using the codes provided.

Column (17): Topography

This question refers to a simple categorization of slope of the parcel. Ask information about the slope that best describes the major part of the parcel.

Column (18) to (20a & 20b): Soil erosion problems

The purpose of these questions is to establish whether the household has encountered problems of soil erosion and what was done to control. **Soil erosion** refers to the Movement of soil components, especially topsoil, from one place to another, usually by wind, flowing water, or both. This natural process can be greatly accelerated by human activities that remove vegetation from soil.

In column (18) ask whether the household experienced soil erosion on each of the parcels in the last completed season. If the response in column (18) is code '1', establish the possible cause of the erosion problems in column (19). The question in column (20) seeks to establish whether any erosion controls or water harvesting facility is available on the parcel. Note that the question in column (20) is multiple response and more than one response can be recorded as provided for by columns (20a & 20b).

Column (21a & 21b): Ownership or user rights

Ask who has the ownership or use rights to the parcel among members of the household. Use the appropriate code given in the column.

SECTION 3A: AGRICULTURAL AND LABOUR INPUTS

Purpose: This section collects information on crop plot areas and inputs. The focus is mainly on land improvements such as bunds, terracing and mulching, and investments/inputs which are of paramount importance in Ugandan agriculture.

Respondent: The same respondent as in Section 2.

Agricultural inputs:

Fertilizers are divided into inorganic and organic fertilizers.

i) Inorganic or chemical fertilizers are divided into four types: nitrogenous, phosphate, potash and mixed complex fertilizers.

ii) Organic fertilizers include farmyard manure, compost, green manure and seaweed. Farmyard manure refers to farm faeces and urine mixed with litter, mainly straw, to absorb the urine. Compost is manure derived from decomposed plant remains, usually fermented waste plant materials such as straw, grass, mowing, etc, heaped in alternative layers with lime, nitrogen and water added. Green manure is a crop, such as sun hemp, mustard etc, grown specifically to be ploughed back into the soil to provide humus. Green manure crops are often planted before the crops.

Pesticides these include; insecticides, fungicide, fumigants, herbicides, rodenticides and various other materials, mostly synthetic chemicals produced in concentrated form, but diluted for application with various substances such as water, tale, clays, kerosene etc. They are used for mitigating, controlling or eliminating pests troublesome to crops or livestock.

Instructions

This section collects information on all the parcels listed in Section 2, Parts A and B i.e. parcels that the household has access through ownership and use rights.

Column (1-3): Parcel ID

In this column, record the identification number of each parcel listed in Section 2 (Parts A and B). Make sure that the identification codes are exactly the same as in Section 2, Parts A and B. Transcribe the name of the parcel in column (2) then assign a running serial number to each of the plots within the parcel in column(3). In column 3a) ask whether the land was burnt as a land preparation technique.

Column (3.1 – 3.4a & 3.4b): Plot management

These questions refer to the management of the plots with in parcels owned and rented in by households. Record the respondent for each plot in column (3.1). In column (3.2) ask if the decisions regarding a particular plot are made by single or multiple members of the household. Column (3.3) asks who the primary decision maker on the plot is and in column (3.4a & 3.4b) record the decision makers.

Column (3a): The practice of burning

This question captures information on the practice of burning as a method of field preparation.

Columns (4) – (12): Organic fertilizers/Manure

These questions refer to the use of any Organic fertilizer/manure on each and every specific plot during the reference period. Column (4) is a filter question. If the answer to this question is 'no', skip go to column (13). In column (5), record the total quantity of Organic fertilizer/manure that the household used on the plot during the reference period. **Use kg as the unit of measure; convert other measures such as bags, tins, etc. into kg.** In column (6), ask about whether the organic fertilizer was purchased by the household. The question in column (7) specifically asks about the quantity of organic fertilizer/ manure which was purchased or bartered for use during the reference period (**use kg**). If none was purchased, write 0. Column (8) is a follow up question regarding the total amount of money spent (both in cash and in-kind) on purchased or bartered organic fertilizer/manure. Record the amount in Uganda Shillings. The purpose of the question in column (9) is to establish the source of the organic fertilizer bought. Record appropriately. Ask the respondent about whether or not the household received the organic fertilizer on credit to be paid later in col (10); if response to column (10) is 'no' the skip to column (13). In column (11), ask the respondent about the source from whom the credit used to purchase the organic fertilizer was received observe the skip pattern. In column (12) ask the respondent the main source of the organic fertilizer used on the plot since it was not purchased.

Columns (13) to (19): Inorganic/Chemical fertilizer

If the answer in column (13) is 'no', then skip to column (22). Note the questions in column (13) – (19) are similar to those asked about organic fertilizers in columns (4) – (12) respectively. The only difference here is that we are asking the questions with reference to inorganic/chemical fertilizers. Be careful to ask the questions about chemical fertilizers used for crop cultivation (plot-by-plot) during the reference period.

Columns (22) and (28): Pesticides/herbicides

Similar to the previous columns, record the information for all pesticides, herbicides or fungicides in column (22) to (28). Follow the same instruction as in column (4) to (12). Note that information should be collected plot-by-plot.

Columns (33a) – (36): Labour inputs during the first cropping season

Purpose: This sub-section collects plot-by-plot information on the labour time hired by the household on different tasks other than that provided by household members in **the second Season of 2018**. This section collects information on expenditure made by the household on the purchases of agricultural inputs like hired labour.

Respondent: The head of the household or the person who is best informed about the agricultural activity of the household. Ask the plot manager as much as possible.

Definition

Person days: A measurement that is used to reflect the total amount of time a team spends in any activity. It reflects both the size of the team and the number of days spent. For example, a team consisting of three people spends three days (full time) in hoeing a field. The person days would then be nine person days i.e.

$$\text{Person days worked by all persons} = \text{Number of days worked} * \text{Number of workers}$$

Note that for our survey full time hours worked depends on the usual number of hours worked per day in that community.

Information on hired labour should be collected using person days as a unit of measurement.

Hired labour is labour input supplied by persons other than holding household members and who are paid for their work either in cash or kind or both. The persons are hired for purposes of doing agricultural work on the holding. They can be permanent or temporary labourers.

Instructions

This section will be filled in during the first visit and the information should be collected plot-by-plot.

Column (33a) – (33e_1): Family labour for all tasks

These questions determine which household members worked on its plots during the second season of 2018 and how many days each person worked. In column (33a) – (33e), ask which household members worked during the second cropping season of 2018 on the specific plot under consideration. In column (33a_1) – (33e_1), ask how many days each household member worked during the second cropping season of 2018 on the specific plot under consideration.

Column (34) – (36): Hired labour for all tasks

These questions determine whether the household spent to hire workers to work on its plots during the first season. Since there are many kinds of workers, performing different tasks for different periods of time and paid in many different ways, these questions will require some probing on your part.

In column (34), ask if the household had hired any agricultural workers during the second cropping season of 2018 on the specific plot under consideration. You should probe any type of agricultural workers hired for any of the agricultural tasks during the reference period. If the respondent did not hire any agricultural worker (code '2'), skip go to next section.

Column (35a-35c): You should calculate the total number of person days worked by the hired agricultural workers during the recall period plot-by-plot. You must multiply the number of people hired by the average number of days they worked. Refer to the definition of person days above.

Column (36): Record the total cash and any in-kind payments made to workers for the total number of person days (plot-by-plot). Include the total cost of meals or any payments in the form of crops, etc. This is thus the total payment by the household for all type of agricultural worker hired during the reference period.

SECTION 4A: CROPS GROWN AND TYPE OF SEED USED

Purpose: This section collects information on crop cover of parcels farmed by the household. It refers to crops planted by the household during the second cropping season of 2018 (July-December 2018) on parcels belonging to the household and on parcels that the household has access through use rights.

Note that crops grown on parcels belonging to this household that has been rented/lent to someone else should not be included, since the crops are not being maintained by the household being interviewed.

Recall Period: This section should be completed during the first visit. The recall period refers to **the second cropping season of 2018 (July-December 2018)**. Thus, data should be collected for this cropping season only.

Respondent: The same respondent as the previous sections. Try to obtain information from each crop manager as much as possible.

Question 1:

This is an introductory question to the section that seeks to find out whether the household grew any crops in the second cropping season of 2018.

Column (2) & (3): Parcel ID & Name

This question identifies the parcels that have been cultivated by the household (including those which were left fallow) during the second cropping season of the previous year. Since the objective of this section to identify the use of each and every parcel during the specified season. The parcel identification codes should be copied from Section 2 Parts A and B. **Note to exclude those parcels that were cultivated by someone else.**

Column (4): Plot identification

This question identifies the number of plots in each parcel (refer to the definition of a plot given in the section of this manual that covers the topics related to concepts and definitions). Only plots with crops, plots with land under fallow and plots under farm buildings, etc. will be included. Both plots with temporary and permanent crops should be recorded and given the relevant codes (permanent and temporary crops are defined above). Note that plot identification number starts from 1 (one) in each parcel.

Most of the crop plots have irregular shapes, and very often with undefined boundaries. Some may be far from the house. By the time of your visit, the temporary crops plots, e.g. beans, maize, groundnuts, the crop will have been harvested already. It is necessary that such plots should be identified and recorded accordingly.

More than one row should be used if a parcel has more than one plot. See the example below.

Columns (5) and (6): Crop name and code

Here we want to know all the crops the household has planted in each plot during the first season. This would include all crops in which household members were engaged in planting in the second season of 2018. **Ask what crops were planted in each plot, not what crops were harvested.** You should probe the respondent about this; otherwise the respondent may omit crops that completely failed. Note that one crop code should be "FALLOW" indicating that no crop was grown on a plot during the specified season.

If more than one or more crops were grown (intercropped) on the same plot in the same season, use one row for each crop i.e. use the subsequent rows to fill in the details on each crop. No limit has been set on the number of crops to be recorded for an intercropped plot. In this case, the main and the constituent crops have to be decided and **recorded in order of decreasing coverage percent. The first crop should be the one with the largest cover.**

A few examples may help to illustrate. If one of the crops is almost planted as pure stand when the others are simply scattered around the plot, then this crop should be taken as the main crop. However, if a farmer has planted beans and groundnuts at the normal density in a plot of young coffee or banana, then coffee or banana is the main crop. The holder's intention is to have a plot of coffee or banana, though they are still young.

List the name of the crops in each plot in column (5), and then write down the crop code number in column (6). The list of crop codes is given in Annex 9. Record the ID of the respondent of each crop in column (6.1).

Column (7): Farmer's/Holder's area estimate

The Enumerator should record the holder's estimates of the size of the plots one by one in acres. Often it will be necessary to convert from other units. Note that the total area for all plots on a parcel should ideally add up to the area of the parcel measured in Section 2 of the questionnaire. Note that the answer recorded here should not vary across crops on the same plot.

Column (8): Cropping system

Definitions of pure and intercropped stands are given in Section 2 of this manual. Obviously, if the crop is in pure stand, there will be only one crop on the plot.

Column (9): Percentage of crop coverage on the plot

This question attempts to determine how much of the plot is assigned to each crop – the percentage of the plot devoted to each crop. The area of intercropped plots can be estimated using whatever convenient method is appropriate. In some cases, the intercropped land can be divided according to estimates of the area under each crop. In other cases, this is not possible and an estimate based on seeding rates made. In all cases, the total of the crop areas for the intercropped plot is the same as the area of the plot itself. Hence, the percentages should normally add up to **100 percent**.

EXAMPLE

Suppose the household has one parcel with ownership rights in Section 2, Part A. The size of the parcel is 2 acres. Assume that the parcel has three plots, namely; a maize plot, a plot intercropped with banana food type, cassava and beans, and a fallow plot. Further the sizes of the plots are 0.5, 1, and 0.5 acres, respectively. And, the percentages of the intercropped plot devoted to each crop are 50, 25 and 25 percent respectively. The information should, therefore, appear in the questionnaire as follows:

P A R C E L I D	Parcel Name	P L O T I D	Crop Type		What is the total area of [plot] planted? ANSWER SHOULD NOT VARY ACROSS CROPS ON THE SAME PLOT (in acres)	What type of crop stand was on the [PLOT] 1=Pure stand (>> Col 10) 2=Mixed stand	Approximately what percentage of the [plot] area was under this [crop]? (%)
			Crop name	Code See code sheet			
2	3	4	5	6	7	8	9
01	Home	01	MAIZE	170	0.5	1	100
01	Home	02	BANANA FOOD TYPE	741	1	2	50
01	Home	02	CASSAVA	630	1	2	25
01	Home	02	BEANS	210	1	2	25
01	Home	03	FALLOW	930	0.5	1	100

Columns (9.1) – (9.2): When crop was planted

Record the month and year the crop was planted.

Columns (16) – (15): Type of Seeds used

In column (16), find out whether the household used any seeds/seedlings on the plot. If the household did not use, skip to next crop. In column (11A) and (11B), record the unit of quantity code and the quantity of seed used for the crop. Record how much seed the farmer would have used if he had planted it as pure stand on the plot in column (12A) and unit in column (12B). In column (13), ask the respondent to specify the type of seeds that were purchased used for each crop and their type if they were improved in column (14). In column (10), record whether or not seeds/seedlings for the specified crop were purchased. How much was paid for the purchase both in kind and cash during the second cropping season of 2018 should be recorded in column (15).

The box below gives further explanations.

Local seeds are seeds obtained locally and normally of local varieties. They can be own seeds or obtained e.g., from neighbors. They are the most commonly sown/planted.

Hybrid/improved seeds are mostly sold in shops, e.g., Kawanda composite for maize.

SECTION 5A: QUANTIFICATION OF PRODUCTION

Purpose: This section attempts to estimate the total crop production for **the second cropping season of 2018** and how the household used the produce or amount harvested, covering all the parcels and plots operated by the household (whole holding). This is done by crop-by-crop.

Respondent: The same as the previous sections.

Instructions

This section will be filled out during the first visit. You should follow the following practical steps:

- (i) In the case of permanent crops the harvest period is strictly limited between July to December 2018; and
- (ii) In the case of temporary crops you should record the total quantity harvested even if the actual harvest took place in the first cropping season of 2019 as long as the crop was planted during the second cropping season of 2018 and recorded in Section 3A.

Columns (4) - (5.2): Crop details

Ask the respondent to list all the crops he/she grew on parcels farmed by the household during the second cropping season of 2018 (on both owned parcels and parcels with use rights). By now, you have already asked what crops he grew on each plot of parcel in section 4A, so check to make sure all the crops are listed here. If he/she remembers now some crops he/she did not mention earlier, add the crop there as well, on the row for the plots where it was grown. Use the list of crop codes provided in Annex 9 for filling in column (5) of this section. Once the list is completed, ask if the crop is immature in column (5.2) and if the answer is No (code 2), then proceed to ask the other questions.

Columns (6): Amount Harvested

Fill in the columns as follows.

Column (6b, 6a & 6c): Record the unit of quantity code, quantity and condition/state of the crop harvested in these columns respectively. The codes are given in Annex 10 of this manual. **Note that if a crop was harvested in more than one conditions and state, then record each condition and state as separate crop using the condition and state code as an identifier. Use one unit of measure for each row.**

Column (6d): Here record the conversion factor of the unit of measure reported in column (6d) into kg. You should remind the respondent about the condition and state of the crop. Probe carefully.

Column (6e & 6f.1): Record the months and years in which the harvest began (column 6e & 6e.1) and when the harvest ended (column 6f & 6f.1)

Column 6a1-6a4: Decision making

These questions seek to collect information on decision making regarding crop output. The interest is to find out if household members make decisions singly or jointly and who the primary decision makers are.

Column (7a -7c): Crop sales

In column (7a) Record the total quantity of crop sold in terms of the unit of measure as specified in column (6a). Again, estimates will often have to be worked in a notebook and filled in the questionnaire. **It should be noted that the condition/ state at the time of harvest may be different from at the time of sale.** Hence, record the condition/state at the time of sale in column (7b) and the unit code in (7c) using the appropriate codes provided in the codebook. **If the crop was not sold, write '0' in quantity of sales and go to column (8).**

Column (8): Value of sales

Record the value of total sales of each crop in Ugandan shillings.

Column (9): Buyer of the largest part

This question establishes to whom the sale(s) was made. If more than one buyer is reported, then record the code of the buyer of the largest part.

Columns (10): Transport expenses

Ask the respondent for the total amount spent on transport of the harvested crop from each plot of each parcel. Be sure to probe for both cash and in-kind payments made. If no expenditure was made on transport, record '0' and ask the next question.

Column (11e – 11h): Decision making regarding earnings from crop sales

These questions seek to collect information on decision making regarding use of earning from crop sales. The interest is to find out if household members make decisions singly or jointly and who the primary decision makers are.

Column (12): Amount of crop given out

Record the total amount of crop given out as gifts, reimbursements for land, labour or oxen among others. In the case of the crop that has just been harvested, include also the amount the household expects to give out even if this amount has not actually been given. Note that the unit of quantity used here is the same as the one in columns 6a and 7c

Column (13): Quantity consumed

Record the amount of the crop that has already been consumed by members of the household.

Column (14a & 14b): Quantity processed

Record the total amount crop used to produce processed food products for sale and for animal feed in columns 14a and 14b respectively. This includes only crops that were processed then sold to others. This is considered a household business. ***Crops that were processed then consumed by household members should not be included here.***

Column (15): Quantity saved for seed

Record the amount of crop that harvested during the second season of 2018 that was saved for seed.

Column (16): Quantity lost/wasted

Here, record the percentage of the crop that has been lost or wasted after the harvest. This may be hard to recall, try to get an estimate in percentages.

Column (17) - (22): Food Security

Food security exists when all people, at all times, have physical and economic access to enough safe and nutritious food to meet their dietary needs and food preferences for an active and healthy lifestyle (World Food Summit 1996). It refers to the availability of food and one's access to it. A household is considered food secure when its occupants do not live in hunger or fear of starvation.

The purpose of these questions is to collect information that can be used to assess some aspects of food security in Uganda. In column (17), ask the respondent the main reason for the post-harvest loss. Inquire about the main method of storage that the household uses for the listed crops in column (18) and whether or not anything is done to protect the stored crop in column (19). For the respondents who report that something is done to the stored crop, ask them to state what is done to the crop in column (20). The quantity of the specified crop that was harvested in the second cropping season and is still being stored by the time of the survey should be recorded in column (21). In column (22), ask the respondent to indicate the main reason for pre-harvest loss.

Column (23a) – (23b)

Ask the respondent whether or not they harvested any crop residues and if so, what the main use of the residues was. Note that the use of the crop residues is a multi-response question.

SECTION 3B: CROP PLOT AREA AND INPUTS: FIRST CROPPING SEASON OF 2019 – SECOND VISIT
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The content of this section is the same as Section 3A, except that this section refers to **the first cropping season of 2019 (January – July 2019)**. The instructions in Section 3A apply here as well. This section is administered in the second visit.

Note that the number of plots within each parcel should not necessarily be the same as that of Section 3A because household may often change their production decisions over time.

SECTION 4B – 5B: FIRST CROPPING SEASON OF 2019 (JANUARY – JUNE 2019)

These sections are exactly the same as that of section 4B – 5B. The same instructions apply in these sections as well. The only difference is the reference period. **These sections refer to the first cropping season of 2019 i.e. January – June 2019.**

It should be noted that the harvest period for permanent crops is limited between January and June 2019. On the other hand, harvest of annual crops might be extended beyond June 2019 though planted during the first cropping season of 2019. You should thus follow the same logic as in Sections 4A – 5A and hence record the total quantity harvested including those harvested after June 2018.

LIVESTOCK MODULE

Purpose: the purpose of the livestock module of the household survey is to give a better descriptive picture of Uganda's livestock economy, and deeper insight into factors affecting incomes of livestock farmers. These would include a better understanding of current situation and some sense of how farmers' situation has changed in the past few years. The latter will be addressed by the use of recall questions.

The livestock module collects information on large ruminants, small ruminants, poultry, pigs and other related animals owned and/or kept by the household, on the dynamics of such animals over the reference period, and on livestock-related inputs and outputs, both in quantity and value terms. Information on ownership is collected separately and at the animal level for cattle and pack animals (Section 6A), for small animals (Section 6B) and for poultry, other birds and beekeeping (Section 6C). Information on inputs and outputs is collected for major groups of animals, i.e. large ruminants, small ruminants, pigs and poultry birds.

Reference period: In this module you need to be careful with the reference period. The reference period varies across the different parts. For cattle and pack animal ownership, the reference period will be the past 12 months. For small animal ownership, the reference period will be the past 12 months. For poultry ownership and other related animals, the reference period will be the past 3 months. The reference period for information on inputs and outputs will be the past 12 months, but for egg production for which the reference period will be 3 months.

For the data on current inventory of livestock in all the three parts, the date of enumeration is the reference period.

Respondent: The respondent for this section is the person in the household who is most knowledgeable about the livestock activities of the household.

Definitions

Cattle Breeds:

1. Exotic refers to livestock introduced in the country from abroad, e.g., Holstein Friesian, Jersey and Guernsey.
2. Improved/cross refers to livestock, which are crosses of exotic and indigenous breed.

3. Indigenous refers to livestock of the local types, e.g., the Ankole long-horned cattle or Zebu or Nganda type of cattle.

The types of cattle to be recorded are:

1. **Calf** which is a male or female cattle from birth to the time of weaning.
2. **Bull** refers to normally an uncastrated male of cattle capable of serving and is used for multiplication purposes. For the purpose of study, steer – castrated bull before sexual maturity which is normally used for commercial beef production – is included here.
3. **Ox** is a male of cattle which has been castrated and are normally used for ploughing purposes.
4. **Heifer** refers to a female of cattle between weaning stage and first calving stage.
5. **Cow** refers to a mature female of cattle with at least on calf either in milk or not in milk on the date of enumeration.

Poultry:

1. Backyard refers to a system of poultry keeping where birds look after themselves (free range).

In rural areas those birds may not even be provided with buildings, but the owner shares his/her house with them. This contrasts with exotic birds that are normally kept in their own structures.

2. Parent stock for broilers both male and female birds kept purely for laying hatching eggs.
3. Parent stock for layers both male and female birds kept purely for laying hatching eggs.
4. Layers are female laying birds, normally kept to produce table eggs.
5. Pullet chicks are young female birds which are reared purposively for laying.
6. Growers are of two categories:
 - a) Broilers which are meat birds from 4 weeks to point of sale. They are usually white in colour.
 - b) Layers from 8 weeks to the point of laying
7. Broilers are meat birds especially to produce chicken meat.
8. Turkeys are domestic birds much bigger than all the above types. They can attain 10 kg of bodyweight.
9. Ducks are water birds normally domesticated for meat or egg consumption.
10. Geese and other birds. Goose is a water bird slightly bigger than a duck.

SECTION 6A: CATTLE AND PACK ANIMALS

This part collects information with respect to cattle and pack animals. The reference period for this part is the past 12 months.

Definitions:

Calf refers to male or female cattle from birth to the time of weaning. **Bull** normally refers to an uncastrated male of cattle capable of serving and is used for multiplication purposes. A steer - a castrated bull before sexual maturity normally used for commercial beef production is included under bulls. An **ox** is a male of cattle which has been castrated and are normally used for ploughing purposes. A **heifer** refers to a female of cattle between weaning stage and first calving stage. A **cow** refers to a mature female of cattle with at least on calf either in milk or not in milk on the date of enumeration.

Instructions:

Question (1): Ask whether the household (any member of the household) owned cattle and pack animals at any point in time during the past 12 months. This question is significant for helping the interviewer to distinguish whether information should be collected in the next questions. If the household did not own any cattle and/or pack animals over the past 12 months, skip to Next Section.

Columns (2) – (16) ask about cattle and pack animals owned and their dynamics over the past 12 months. However, columns (4a), (4b) and (4c) ask about animals kept but not owned by the household, i.e. entrusted to the household by some other household.

Column (2): Cattle and pack animals owned and/or raised

Ask whether the household raised or owned any of the cattle and pack animals listed during the past 12 months. If the household owns/owned (code '1') the animals concerned during the past 12 months, ask the rest of the questions. If the answer is 'No' (code '2'), skip to the next animal on the list.

Column (3a): Number owned now (present at farm or away)

For each kind of cattle and pack animals, record the number currently (on the day of enumeration) owned at farm and/or away. **Note that the reference period is the date of enumeration. Note also the skip pattern.**

Columns (3b), (3c), (3d) and (3e): Intra-household ownership

Here ask about the members of the households who own the animals and about the members of the household who keep the animals. Owner and keeper may or may not be the same person. Provision has been made to record a maximum of two person IDs.

Columns (4a) and (4b): Livestock kept but not owned.

Here ask about the animals entrusted to the household by some other household, and about who is responsible for keeping those animals. Provision has been made to record a maximum of two person IDs.

Columns (5a), (5b) and (5c): Non-family labour

Here, ask whether non-family labour-force is hired by the households to herd/keep the animals owned and kept on behalf of some other household. In column (5b), record the main type of labour employed while keeping the livestock. In column (5c), report annual wages in US\$, including value of in-kind payments.

Column (6): Number owned exactly 12 months ago

For each kind of animal determine how many the household owned at farm and/or away exactly 12 months ago.

Column (7): Number born/graduated

Record the number of cattle or pack animals newly born or graduated to, say, from calves to either heifer or bull in the last 12 months.

Columns (8) and (9): Number received and given as gift / for services provided and received

Record the number of cattle or pack animals received by and given to others as gift, or received by and given to others as payment for some service provided or received in the last 12 months.

Columns (10) and (11): Number lost to theft, injury or natural calamities

Record the number of cattle or pack animals lost due to theft or to injury/natural calamities in the last 12 months.

Column (12): Number lost to disease

Record the number of cattle or pack animals lost to disease in the last 12 months.

Columns (13a) and (13b): Number and value of purchased

Record how many animals of each type were bought during the last 12 months in column (13a) and then record the average purchase value of the animals bought in column (13b). **Livestock bought refer to those animals bought for raising and not those intended for the preparation of meals.**

Columns (14a) and (14b): Number and value of cattle and pack animals sold

Record how many animals were sold alive during the last 12 months in column (14a) and the average sales value of each animals sold in column (14b).

Columns (15): Number slaughtered

Record the number of animals slaughtered from own stock during the last 12 months. Exclude those animals bought from the market and then slaughtered for preparation of meals or for the purpose of sales of meat.

Columns (15b – 15c): Reasons for possessing/raising livestock

For each type of livestock that the household possessed/raised, establish the two principal reasons why the household possessed or raised the livestock. Use the codes provided.

Column (16): Purpose of the livestock products

In column 16, identifies the main purpose of slaughtering

SECTION 6B: SMALL ANIMALS OWNERSHIP (GOATS, SHEEP AND PIGS)

This part collects information regarding small animals such as goats, sheep and pigs owned by the household. The animals are subdivided into the different breeds and between females and males. The reference period for this part is the past 12 months.

Instructions:

The instructions in Section 6A apply in this section as well.

SECTION 6C: POULTRY, OTHER BIRD OWNERSHIP

Poultry refer to domesticated birds, e.g., hens, ducks, geese or turkeys. It also includes the rearing of birds for meat and/or egg purposes. Information regarding beekeeping will also be collected in this part. If one or more of these domestic birds, rabbits or beehives are owned by the household; then ask for the details in this part. The reference period for this section is the past 3 months.

Definitions

Indigenous dual purpose chicken refers to birds which are used to both produce eggs and meat. These usually scavenge and are not provided with shelters, but the owner shares his/her house with them. This contrasts with exotic birds that are normally kept in their own structures. **Layers** are female laying hens, normally kept to produce table eggs. **Broilers** are meat chicken from 4 weeks to point of sale.

Instructions:

The instructions in Section 6A apply here as well. The only differences are that there are no questions on animals entrusted to the household by other households and that, as stated above, the reference period is the past 3 months.

SECTION 7: LIVESTOCK INPUTS

Purpose: The purpose of this section is to get information on major inputs use to raise animals as well as some information on basic husbandry practices.

Definitions

Large ruminants include calves, bulls, oxen, heifer and cows. **Small ruminants** include male and female sheep and male and female goats. **Poultry** include chicken and other birds used to produce meat and eggs.

Columns (1a) - (1c): Breeding Practices

For each type of livestock, establish whether the household practiced any controlled mating or other breeding strategy in the past 12 months. If the response in column (1a) is a 'Yes' (code 1), then establish the breeding strategy that the household used during the reference period. Use the breeding codes provided in the manual and record up to two strategies.

BREEDING CODES			
1	None	9	Artificial insemination - same breed
2	Controlled mating – best male(s) from herd	10	Purchase of high quality breeding female(s)
3	Controlled mating – to avoid mating of close relatives	11	Castrate non-productive males
4	Controlled mating – other (e.g. corrective)	12	Culled/sold non-productive males
5	Use of high quality breeding male from neighbour, other supplier	13	Culled/sold non-productive females
6	Exchange of high quality breeding male	14	Cross-breeding - own herd
7	Purchase of high quality breeding male	15	Cross-breeding - male from neighbour, other supplier
8	Artificial insemination - cross breeding	96	Other (specify)

Columns (2a), (2b), (2c), (2d) and (2e): Feeding Practices

In column (2a) and (2b), record what has been the household's major feeding practice for the livestock in the last 12 months. In column (2c), establish whether the household has ever paid to feed its livestock in the last 12 months. If it has, circle the months during which it paid to feed the livestock in column (2d) and how much the household paid over the last 12 months to feed the livestock in Uganda Shillings.

Columns (3a), (3b), (3c) and (3f): Watering Practices

In column (3a), ask about the average frequency of watering the livestock during the past 12 months and record the response appropriately using the codes provided. In column (3b) and (3c), record the two main sources of water for livestock during the reference period. In column 3f, record the amount the household paid in the past 12 months to access the main water sources. If nothing was paid write '0'.

Column (4): Housing:

Here ask about housing systems for animals. Record the response appropriately using the codes provided.

Columns (5a) to (8c): Vaccination, deworming, treatment against ticks and treatment of diseases

In column 5a-5d ask the respondent whether the animals were vaccinated in the last 12 months, who provided the services, which diseases they were vaccinated against, and the total cost of the vaccination including vaccines and professional fees. Columns (6a) – (6c) ask about deworming, columns (8a) – (8c) ask about treatment against ticks while columns (9a) – (9c) ask about curative services. Take note of the skips in this section. The codes for the diseases for which vaccination is available, as well as some brief description of the diseases and definition of some key terms are provided in the table below.

DISEASE CODE / NAME		DEFINITION	HOSTS AFFECTS	CLINICAL SIGNS / SYMPTOMS
1	FMD Foot and Mouth Disease	A highly contagious viral disease	Cattle, sheep, goats, pigs and water buffalos	Fever, ulcerations in the mouth, nose, muzzle, feet, teats. Drooling of saliva can also be observed
2	CBPP (Contagious Bovine Pleuro-pneumonia)	A highly infectious acute/sub-acute/chronic disease affecting lungs and occasionally joints	Cattle	Fever, cough, increased respiratory rate (in sequence).
3	CCPP (Contagious Caprine Pleuro-pneumonia)	An acute highly contagious disease	Goats	Fatal weeping pneumonia, laboured breathing, death within 7-10 days after onset of clinical signs.
4	LSD Lumpy Skin Disease	It is a viral disease transmitted by insects.	Cattle	Persistent fever, generalized skin nodules, oedema of corresponding lymph nodes, hair loss.
5	Anthrax	It is an infectious but non-contagious	All domestic animals and buffalo	Sudden death, fever, severe diarrhoea with blood, bloody nasal discharge.
6	Blackleg	Blackleg is a highly fatal disease of young cattle	Young cattle	Lameness, loss of appetite, rapid breathing and the animal is usually depressed and has a high fever. Characteristic swellings develop in the hip, shoulder, chest, back, neck or elsewhere
7	PPR (Peste des petits ruminants)	An acute viral Rinderpest like disease of sheep and goats	Goats and sheep	Similar to those of rinderpest in cattle: Respiratory difficulty with cough, high fever, weakness, dull coat, nasal discharge, Severe bloody diarrhoea.
8	Sheep and goat pox	Contagious viral disease of small ruminants, There is a high mortality rate in susceptible populations	Small ruminants (sheep and goats)	Onset of fever followed by erythematous macules that develop into papules. Lesions may also develop on the mucous membrane and on internal organs, causing systemic signs (respiratory signs, diarrhoea, depression, emaciation, abortion and sometimes death).
9	Newcastle disease	A highly contagious zoonotic poultry disease	Chicken and other domestics fowls and wild avian species.	High mortality above 30%, characterized by respiratory and nervous symptoms,
10	Fowl pox	Fowl pox is a relatively low-spreading viral disease of poultry	Chicken and other domestics fowls and wild avian species.	skin lesions and/or plaques in the pharynx
11	Avian flu	Avian influenza is a highly-contagious flu infection in birds. It is a zoonotic disease	Chicken and other domestics fowls and wild avian species.	Decrease in bird's activities, decline in egg production, swelling of the face with blue coloured combs and wattles, breathing problems, diarrhoea, muscle paralysis and sudden death.
12	IBD (Infectious Bursal Disease) / Gumbaro	A highly contagious disease of young chicks	Chicken	Mortality at 3-6 weeks and can rise up to 75%. Birds are depressed, watery diarrhoea.

96	Other (specify)			
98	Do not know			
KEY TERMS				
Contagious		Spread by means of contact.		
Infectious		Spread by means of virus, bacteria or a parasite.		
Fatal		Leads to death.		
Zoonotic disease		An infectious disease that can be transmitted to humans and vice versa.		
Curative		Care provided to improve a situation (especially medical procedures or applications that are intended to relieve illness or injury)		

SECTION 8A: LIVESTOCK PRODUCTION - MEAT

Purpose: The purpose of this section is to estimate the quantity of meat produced from owned/kept animals and cash earnings from sale of meat.

Column (1): number of animals slaughtered

For each type of livestock, record the number of animals slaughtered for meat in the past 12 months. Check that the total number of large ruminants, small ruminants, pigs and poultry slaughtered is consistent with information collected in Section 6A, Q15; Section 6B, Q15; and Section 6C, Q14.

Column (2): Average weight of animals slaughtered

For each type of livestock, record the average live weight in Kgs of the animals that the household slaughtered in the past 12 months.

Column (3) – (4): Quantity of meat sold and where/to whom it was mostly sold

For each type of livestock, record the quantity of meat sold in column (3) and where/to whom it was mostly sold in column (4).

Column (5): Revenue earned

For each type of livestock, record the amount earned over the last 12 months from sale of the meat in Uganda Shillings.

Column (6a) and (6b): Control of Revenue

Record up to two Peron IDs of household members who control the revenue from that product.

SECTION 8B: LIVESTOCK PRODUCTION - MILK

Purpose: The purpose of this section is to estimate the quantity of milk produced from owned/kept animals, self-consumption of milk and earnings from sale of milk. Recall period is 12 months, but the reference period for some questions is one day

Columns (1), (2), (3) and (4): Milk production

These three questions aim at quantifying milk production per year, i.e. Q1 x Q2 x Q3 should give an estimate of total milk production per year. Note the milk taken by suckling calves is not measured, but column (4) asks whether suckling was allowed during milking.

Columns (5) - (8): Disposition of milk produced

These questions aim at understanding the disposition of the milk produced by the households. Column (8) refers to both liquid milk and dairy products. In theory, (column (5) + column (5.1) + column (6) + column (7)) should be equal to (column (1) x column (2) x column (3)).

Column (9): Revenue earned

For each type of livestock, record the amount earned over the last 12 months from sale of the milk and dairy products in Uganda Shillings.

Column (10a) and (10b): Control of Revenue

Record up to two Peron IDs of household members who control the revenue from that product.

SECTION 8C: EGG PRODUCTION AND INCOME

Purpose: The purpose of this section is to estimate the quantity of eggs produced from owned/kept birds, self-consumption of eggs and cash earnings from sale of eggs. Recall period is 3 months, but the reference period for some questions is one day. The questions and instructions are similar to Sections 8A and 8B.

SECTION 11: ANIMAL POWER

Purpose: The purpose of this section is to appreciate if and how household make uses of animal power from owned / kept animals. Recall period is 12 months.

Columns (1a), (1b) and (1c): Use of dung

Establish whether the household has made any use of the dung produced by the different types of animals in the last 12 months and if so the main uses of the dung. Record up to two main uses of the animal dung in columns (1a) and (1b) respectively. Code 6 refers to 'no use of dung'. Code 1 'manure' refers to manure used in land parcels cropped by the household. In column (1c), record the total revenue from sale of dung from each type of livestock in Uganda Shillings. Include in-kind payments.

Columns (2), (3) and (4): Draught power

Ask here whether the household has used the animals it owns or keeps for its own transport (persons, goods, crops, etc.). In column (3), establish whether the household has used any of its livestock for ploughing its own fields in the past 12 months. In column (4), establish whether this household has used any of its livestock to provide transport or ploughing services to other households.

Column (5):

In column (5) record the total amount earned from provision of draught power for ploughing or transport in the past 12 months. Include any in-kind payments received.

SECTION 9: EXTENSION SERVICES

Purpose: This section collects information on agricultural technology and extension services. It covers access to extension services and access to and demand for agricultural technology.

Respondent: The respondent to this section is the head of the household.

Definition

Extension workers: are individuals employed by the government or non-governmental organizations who work as an agricultural development agents for contacting and demonstrating improved farming methods to farmers. They are responsible for organizing, disseminating, guiding and introducing technical methods in agricultural production directly to farmers, and for facilitating farmers coming into contact with cultivation methods to promote agricultural production.

Instructions

Column (3): Ask whether anyone in the household has received advice/information from/about agricultural/livestock activities from the sources listed in column 2 during the past 12 months. It should be only work related visit – visit associated with the responsibilities of extension workers described above. If the answer to this question is 'No', skip to the next source.

Column (4a) – (4d): Record the person IDs of up to four household members who received /benefited from the information received.

Column (5a) – (5g): In these columns, information is collected about the subject/topic of the advice. Read out the listed subjects/topics and record a Yes or No for each.

Question (6a) – (6b): Ask whether the household's plots have been visited by an extension worker during the past 12 months. It should be only work related visits – visits associated with the responsibilities of extension workers described above. Record the number of solicited visits in column (6a) and unsolicited visits in column (6b).

Column (7) – (10): Record the number of visits anyone in the household made to the listed source for technical advice during the past 12 months in column (7). If the household visited a particular source more than once in the last 12 months, add the total number of visits made. The question in column 8 seeks to establish whether the household member(s) paid anything in order to receive any type of advice from the listed source. Record the amount of money paid to the different sources and how the respondent rates the advice received from the sources in columns (9) and (10) respectively.

Columns (11) - (16): Ask whether household members are informed of training programs organized by National Agricultural Advisory Services (NAADS) in column (11) and whether any household member has participated in a training program organized by NAADS in column (12). Furthermore, ask the respondent about whether they are informed of farmers' groups established under the farmer Institutional Development scheme of NAADS in column (13). If the response in column (13) is 'No', skip to column (15). Establish whether any household member is a member of such a farmers' group in column (14). In column (15), ask the respondent to indicate whether they are informed of NAADS initiatives to prioritize enterprises to demand for advisory services. Establish whether any household member has participated in such initiatives in the past 12 months in column 16.

SECTION 10: FARM IMPLEMENTS AND MACHINERY.

Purpose: This section collects information on farm implements and machinery. It covers the ownership and estimated value of the machinery and implements.

Column (1): Ask about the number of each farm implements owned by the household currently and if none is owned a zero is recorded and follow the skip pattern.

Column (2): capture the estimated total value of all the [ITEM] in its/their current state.

Column (3) – (5): Ask how many of each item the household owned exactly 12 months ago and if item was owned, ask if it was used within the last 12 months in column (4). If the item was not used, ask the reason as to why the item was never used column (5).

Column (6)-(8): Ask if the items were rented or borrowed in column (6). In column (7), ask how many of the items were borrowed/rented during the last 12 months and how much the household paid to rent or borrow [ITEM] in column (8). Include in-kind values as well.

SECTION 12: LAND MARKET AND RELATED ACTIVITIES

The questions in this section will attempt to obtain information on basic characteristics of the land market (both sales and lease) within the community and possible interactions with outsiders as well as availability and access to land administration institutions to document and formalize land transactions. The questions are self-explanatory.

ANNEX 1: GPS

Area Measurement using GPS Equipment

After the parcel identification, all parcels owned and/or operated by the selected households located within the EA, and crop plot area for the current (first) cropping season of 2005 within these parcels should be measured using a GPS device. In the UNHS, GARMIN 12 hand-held Global Positioning System (GPS) equipment will be used. The GPS equipment is in principle a high precision digital watch combined with a signal receiver. The Supervisor will be responsible for ensuring availability of fully charged batteries. The GPS equipment should be handled with great care and stored in a safe place when not in use.

The area to be measured is found by walking clockwise the perimeter (outline) of each parcel with the GPS equipment active. **By marking the starting point, the perimeter should be walked at a reasonable slow speed, making 10 seconds stop-over's at every point where the plot outline changes direction, in order to delineate accurately the whole area of the plot. The 10 seconds lapse can be monitored by the change of one unit on the GPS digital counter, where each track point count is equivalent to 10 seconds. Back at the starting point, a time of 10 seconds should be spent before quickly using the pad keys to move to calculate (CALC?) area.** The area of each parcel is then calculated directly in acres by the GPS equipment the way it is set up for the UNHS. Obviously, very small plots (i.e., < 0.01 acres) should be ignored since they will not be properly catered for by two decimal places. **Exclude residential land i.e. land area for housing building and its secondary parts such as kitchen, toilet and other related structures.**

The GPS equipment makes it possible to find the geographical position on the earth surface by longitude and latitude. The position is found by continuously measuring the time that a signal uses to reach from satellites in the sky to the signal received by the GPS device on the earth surface. Clear signals from at least four satellites are necessary to calculate the geographical position with reasonable accuracy. The better the sight to the sky the GPS device has, the clearer and more signals are received. Shadows of trees, buildings etc should be avoided while using the GPS equipment in the field.

Step by step instruction for use of GPS equipment for measuring area:

This is a detailed instruction on how to set up the GPS GARMIN 12 (or 12XL) device.

Background for set-up

The GPS tool measurement accuracy is sensitive to the setup of the instrument and possibly to battery status. The batteries to be used should be either Duracell or Energizer AA batteries. Batteries should be changed when they reach 75% used – see the black bar indicator on the GPS display.

During the survey, the GPS is used for two purposes:

1. For registration geographical coordinates (position) of dwellings, parcel, etc.
2. For calculation of parcel areas

It is important to be aware that the geographical position should be recorded as decimal degree in the forms. It will look as follows on the GPS display:

N 00.00000°
E 000.00000°

The GPS geo-referencing system must be set up correctly to decimal degrees and datum WGS84

The area calculation should be recorded as acres with 2 decimals. The GPS should be set up so that areas are calculated in acres.

The GPS measuring unit must be correctly set up to acres in order to get area correct.

When using the GPS, the tool records and stores the geographical position at a specific interval of times based on signals from satellites that are received continuously as long as the device is switched on and has free sight to the sky.

The time interval that the GPS should use between each observation of position is recorded in the GPS memory should be correctly set up to 00.00.10 seconds

Set-up instruction – step by step

1. Turn on the GPS by pushing the “red bulb” button on the GPS tool
2. Press the “page” button repeatedly until the screen with the “MAIN MENUE” is visible
3. Press the “down arrow” repeatedly until the black cursor marks the “SETUP MENUE” line.
4. Press enter on the “SETUP MENUE” line and the screen with the “SETUP MENUE” appears
5. Press “down arrow” repeatedly until the black cursor marks the “SYSTEM” line.
6. Press enter on the system line and you get the “SYSTEM SETUP” page. If the GPS is correctly set up you should find the following text:

Mode: Power save

Date: (actual day, month and year)

Time: (actual time)

Offset: +03:00

Hours: 12

Contrast: (a black horizontal bar filling approximately 1/3-1/2 of the screen width.

Light: 15 sec

Tone: NONE (to save battery as much as possible)

If one or more items are not set up like above, use the “down arrow” repeatedly until it marks the un-correct line. Then press “enter”. Then use the “right-left-up-down” arrow to select the correct value. When the correct value is visible, press “enter” and use the “down arrow” to go to next un-correct setup value.

7. When all values on the “SYSTEM SETUP” screen are correct, press “quit” and return to the “SETUP MENUE” page.
8. Press the “down arrow” repeatedly until the black cursor marks the “NAVIGATION”. Then press “enter” and get the “NAV SETUP” page. If the GPS is correctly set up you should find the following text:

POSITION FRMT: hddd.ddddd°

MAP DATUM: WGS 84

CDI: +-0.25

UNITS: METRIC

HEADINGS: GRID E000°

DEGEES

If one or more items are not set up like above, use the “down arrow” repeatedly until it marks the un-correct line. Then press “enter”. Then use the “right-left-up-down” arrow to select the correct value. When the correct value is visible, press “enter” and use the “down arrow” to go to next un-correct setup value and repeat the correction exercise.

9. When all values on the “NAV SETUP” screen are correct, press “quit” and return to the “SETUP MENUE” page.

10. From the "SETUP MENUE" pres "quit" and return to "MAIN MENUE".
11. On the "MAIN MENUE" press "page" repeatedly until you reach the blank page with the heading "km – PAN – OPT".
12. On the "blank page" press the "left-right arrow" until the black marker is on the "km" field. If the reading in this field is not "0.3 km" then press "enter" and press the "up-down arrow" repeatedly until the reading is "0.3 KM" then press "enter".
13. Press "right-left arrow" until the black marker covers the "OPT" field and then press "enter".
14. Press "up-down arrow" until the black marker covers the "MAP SETUP" line. On the "MAP SETUP" line press "enter" and get the "MAP SETUP" menu.
15. The "MAP SETUP" menu should have the following line settings:

MAP: Track up
RINGS: No
ROUTE: Yes
NEAREST: Yes
Names: Yes
TRACK LOG: Yes

If any of the lines is not setup as described above, press the "up-down arrow" until the false setup line is covered by the black cursor and press "enter". There after press the "up-down arrow" to get the right value/text and finally press "enter"

16. Press "quit" and return to the "blank" page (where maps will be drawn later).
17. Again press "enter" on the "OPT" field and thereafter press the "up-down arrow" until the black cursor covers the "TRACK SETUP" line and then press "enter". That gives you the "TRACK SETUP" menu.
18. The "TRACK SETUP" menu should have the following settings:

RECORD: Wrap (or Fill)
METHOD:
TIME INTERVAL: 00:00:10
MEM USED < accept whatever is written on this line>
CALC AREA?
CLEAR LOG?

If "Record", "Method" or "Time interval" is not set up as described above, press the "up-down arrow" until the black cursor covers the false line, press "enter", press the "up-down-right-left arrow" to see the correct value/text and finally press "enter"

19. On the "TRACK SETUP" menu press the "up-down arrow" until the "CALC AREA?" line is covered by the black cursor. Then press "enter"
20. In the "AREA ENCLOSED BY TRACK LOG" menu press the "up-down arrow" until the black cursor covers the "UNITS: ..." line. Then press "enter"
21. Press the "up-down arrow" until the unit "ACRES" is visible, then press "enter" (be very sure that it is only area measured as ACRES i.e. acres that you accept).
22. When the "TRACK SETUP" menu is correctly setup, press "quit" twice and finally press the "red bulb" button and hold it pressed until the GPS shuts down.
23. Now the GPS should be correctly setup and practical use can start.

Under practice/use of the GPS keep an eye on the different displays and see to that you do not accidentally change the setup.

Instructions for practical use of the GPS for taking the coordinates of the parcel representation point

1. Go to the geographical center of the parcel (it serves as a representation point of the holding).

2. Ensure that there is enough free sight to the sky for the GPS
3. Turn on the GPS by pressing the “red bulb” button
4. Press “page” until the screen where the black columns with indication on how many satellites that are received is visible and wait until at least 5 black columns are visible.
5. Press “page” repeatedly until the screen with “POSITION” is visible

Take note on the (N) North and (E) East coordinates. If the GPS is correctly setup, the co-ordinates should appear on the screen as decimal degrees with the following format:

N 00.00000°

E 000.00000°

Coordinate systems

WGS SYSTEM

	N=1	S=2	D	M					
LAT									
LONG									

Please Find attached what I have designed for the data collection for coordinates

In the first instance i.e. WGS data is captured in decimal degrees.

Note:

LAT (LATITUDE): N=1, S=2 Defines the point location in terms North/South of Equator

- Uganda lies between 1 Degrees South and 4 degree North so one box is enough for the record. The shaded box not to be filled
- There are at least five digits after the degree separated by the gap between the boxes

LONG (LONGITUDE)

- Uganda lies between longitudes i.e. 29degrees and 35 degrees East hence two digits (first two Boxes)

UTM SYSTEM

UTM N									
UTM E									

If you are not able to solve the problems with the GPS, do not hesitate to contact your District Supervisor or the UBOS Project Staff.

ANNEX 7: CODES FOR UNIT OF QUANTITY

Unit Code	Unit Label	Unit Code	Unit Label	Unit Code	Unit Label
001	Kilogram (kg)	045	Buns (50 g)	095	Cluster-Small
002	Gram	046	Bathing soap (Tablet)	096	Bundle-Big
003	Litre	047	Washing soap (Bar)	097	Bundle-Medium
005	Metre	048	Washing soap (Tablet)	098	Bundle-Small
006	Square metre	049	Packet (2 kg)	099	Others specify
007	Yard	050	Packet (1 kg)	100	Fish Whole-Large
008	Millilitre	051	Packet (500 g)	101	Fish Whole-Medium
009	Sack (120 kgs)	052	Packet (250 g)	102	Fish Whole-Small
010	Sack (100 kgs)	053	Packet (100 g)	103	Plastic basin (5ltrs)
011	Sack (80 kgs)	054	Packet(unspecified)	104	Glass (0.5ltrs)
012	Sack (50 kgs)	058	Fish Cut piece (up to 1kg)	105	Glass (0.125ltrs)
013	Sack (unspecified)	059	Fish Cut piece (1 - 2 kg)	106	Jug (2.5ltrs)
014	Jerrican (20 lts)	060	Fish Cut piece (Above 2 kg)	107	Nice cup (100g)- Large
015	Jerrican (10 lts)	061	Tray of 30 eggs	108	Nice cup (60g)-Medium
016	Jerrican (5 lts)	062	Ream	109	Nice cup (50g)-Small
017	Jerrican (3 lts)	063	Crate	110	Metallic tumbler (100g)- Big
018	Jerrican (2 lts)	065	Dozen	111	Metallic tumbler (50g)- Small
019	Jerrican (1 lt)	070	Bunch (Big)	112	Plastic tumbler (50g)- Big
020	Tin (Debe) - 20 lts	071	Bunch (Medium)	113	Plastic tumbler (30g)-Small
021	Tin (5 lts)	072	Bunch (Small)	114	Plastic plate (60g)-Large
022	Plastic Basin (15 lts)	074	Gourd (1-5ltrs)	115	Plastic plate (30g)-Small
023	Bottle (750ml)	075	Gourd (5-10ltrs)	116	Metallic plate (100g)-Large
024	Bottle (500ml)	076	Gourd (Above 10 lts)	117	Metallic plate (80g)- Small
025	Bottle (350ml)	077	Jug (2 lts)	118	Plastic bowl (40g)
026	Bottle (300ml)	078	Jug (1.5 lts)	119	Nomi Tin (1kg)
027	Bottle (250ml)	079	Jug (1 lt)	120	Nomi Tin (500g)
028	Bottle (150ml)	080	Tot (50 ml)	121	Nomi Tin (250g)
029	Kimbo/Cowboy/Blueband Tin (2kg)	081	Tot (sachet)	122	Nido Tin (400g)
030	Kimbo/Cowboy/Blueband Tin (1kg)	082	Tot (Unspecified)	123	Akendo-Big
031	Kimbo/Cowboy/Blueband Tin (0.5)	083	Tobacco leaf (Number)	124	Akendo-Medium

032	Cup/Mug (0.5lt)	084	Pair	125	Akendo-Small
033	Glass (0.25lt)	085	Number of Units (General)	126	Jerrican (0.5ltrs)
034	Ladle (100g)	086	Acre	133	Sadolin Tin- 3ltrs
035	Table spoon	087	Piece-Big	134	Loaf (1Kg)
036	Tea spoon	088	Piece-Medium	135	Loaf (0.5Kg)
037	Basket (20 kg)	089	Piece-Small	136	Bottle (1ltr)
038	Basket (10 kg)	090	Heap-Large	137	Bottle (1.5ltr)
039	Basket (5 kg)	091	Heap-Medium	138	Bottle (2ltr)
040	Basket (2 kg)	092	Heap-Small		
043	Buns (200 g)	093	Cluster-Large		
044	Buns (100 g)	094	Cluster-Medium		

ANNEX 9: CROP CODES

Ser. no.	Crop name	Crop code	Ser. no.	Crop name	Crop code
1	Wheat	111	31	Oranges	700
2	Barely	112	32	Paw paw	710
3	Rice	120	33	Pineapples	720
4	Maize	130	34	Banana food	741
5	Finger millet	141	35	Banana beer	742
6	Sorghum	150	36	Banana sweet	744
7	Beans	210	37	Mango	750
8	Field peas	221	38	Jackfruit	760
9	Cow peas	222	39	Avocado	770
10	Pigeon peas	223	40	Passion fruit	780
11	Chick peas	224	41	Coffee all	810
12	Groundnuts	310	42	Cocoa	820
13	Soya beans	320	43	Tea	830
14	Sunflower	330	44	Ginger	840
15	Simsim	340	45	Curry	850
16	Cabbage	410	46	Oil palm	860
17	Tomatoes	420	47	Vanilla	870
18	Carrots	430	48	Black wattle	880

19	Onions	440		49	Other	890
20	Pumpkins	450		50	Natural pastures	910
21	Dodo	460		51	Improved pastures	920
22	Eggplants	470		52	Fallow	930
23	Sugarcane	510		53	Bush	940
24	Cotton	520		54	Natural forest trees	950
25	Tobacco	530		55	Plantation trees	960
26	Irish potatoes	610		56	Bamboo	970
27	Sweet potatoes	620		57	Other forest trees	990
28	Cassava	630				
29	Yam	640				
30	Coco yam	650				

ANNEX 10: CROP CONDITION AND STATE

When yield estimation is made, the **Condition** of the crop has to be given, i.e., whether **wet** or **dry**. Obviously, there is a complication as there are bound to be various stages of wetness or dryness. The **State** of the crop is also required. This indicates whether the crop is **in shell, without shell, with stalk, without stalk, or in the cob/head**. Thus, there are a number of combinations and in all these situations; conversion factors to some standard condition and state are needed for each crop. Thus, identification is needed of the most common conditions and states of each crop. These seem to vary by district.

A total of five (5) **Condition** classes and seven (7) **State** classes can be combined, including 0=Not applicable and 9= Other. To better guide the Enumerator on this classification, the relevant codes for the most common and probably most difficult crops to classify are listed by crop type in Table 2. Special attention should be paid to classification of Maize in table 2. What is considered the most common **Condition** and **State** codes for each crop in Table 2 is marked with an asterix.

Table 1: Summary of the logic structure of the system for coding of crop condition and state

Crop Condition		Crop State	
Co de	Description	Co de	Description
0	Not applicable	0	Not applicable
1	Green harvested (before full maturity/ripe)	1	With shell/cob and with stalk/in the head
2	Fresh/raw harvested (full maturity/ripe)	2	With shell/cob and without stalk/in the head
3	Dry at harvest (Before additional drying)	3	Without shell/without stalk/in the head/on the cob
4	Dry after additional drying (Ready for long term storage)	4	In pods or shell/husks
9	Other n.e.s	5	Without shell or pods/grains/seeds
		9	Other n.e.s

Table 2. Classification of crop condition/state for selected commonly grown crops

Crop type		Condition and state	
Code	Name	Description	Code
111	Wheat	Dry – grain	45
120	Rice	Dry at harvest - with shell	32
		Dry after additional drying – with shell	42
		Dry after additional drying – grain	45
130	Maize	Green harvested – with shell/cob and with stalk	11
		Green harvested – with shell/cob without stalk	12
		Green harvested – in the cob	13
		Fresh/raw harvested – with shell/cob and with stalk	21
		Fresh/raw harvested – with shell/cob without stalk	22
		Fresh/raw harvested – in the cob	23
		Dry at harvest – with shell/cob and with stalk	31
		Dry at harvest – with shell/cob without stalk	32
		Dry at harvest – in the cob	33
		Dry after additional drying – in the cob	43
		Dry after additional drying - grain	45
141/150	F. Millet/Sorghum	Fresh/raw harvested – with shell/cob and with stalk	21
		Fresh/raw harvested – with shell/cob without stalk	22
		Dry at harvest – with shell/cob and with stalk	31
		Dry at harvest – with shell/cob without stalk	32
		Dry after additional drying – with shell and with stalk	41
		Dry after additional drying – with shell and without stalk	42
		Dry after additional drying - grain	45
210/320	Beans/Soya beans	Green harvested – in the pods	14
		Fresh/raw harvested – in pods	24
		Dry at harvest – grain	35
		Dry after additional drying - grain	45

Table 2 CONT'D. Classification of crop condition/state for selected commonly grown crops

221/222/223/ 224	Field peas/Cowpeas/ Pigeon peas/Chick peas	Green harvested – in the pods	14
		Fresh/raw harvested – in pods	24
		Dry after additional drying - grain	45
310	Groundnuts	Fresh/raw harvested – with shell/cob without stalk	22
		Dry at harvest – with shell/cob without stalk	32
		Dry after additional drying – with shell and without stalk	42
		Dry after additional drying - grain	45
330/340	Sunflower/Sim-sim	Dry at harvest – grain	35
		Dry after additional drying – grain	45
410/420/430/ /440/450/460/47 0/610/620 640/740/741/74 2/All fruits	Cabbages/Tomatoes/ Carrots/Onions/Pumpkin s/Dodo/Eggplants Irish potatoes/ Sweet potatoes/Yams/Bananas /All Fruits	Fresh/raw harvested – state not applicable	20
630	Cassava	Fresh/raw harvested – state not applicable	20
		Dry after additional drying – state not applicable	40
520/530	Cotton/Tobacco	Dry after additional drying – state not applicable	40
810	Coffee	Fresh/raw harvested – in pods	24
		Dry after additional drying – In pods or shell/husks	44
		Dry after additional drying – grain	45
820	Cocoa	Fresh/raw harvested – in pods or shell/husks	24
		Dry after additional drying – grain	45
830	Tea	Fresh/raw harvested – state not applicable	20