UGANDA - Census of Agriculture 2008-2009 and National Census of Livestock 2008 – Explanatory notes

1. Historical Outline

The third Uganda Census of Agriculture 2008-09 (UCA) was conducted in 2008/09. Uganda also conducted an independent National Livestock Census 2008 (NLC) with a separate frame and sample design. The primary advantage was not, however, just having the single purpose independent sample for livestock. Rather, it provided the flexibility to have a significantly smaller questionnaire, but with a substantially larger sample, than was planned for the 2008-09 Census of Agriculture initiative. In many respects Uganda's National Livestock Census could be considered a "Module" of the Census of Agriculture.

This was the first time that Uganda has separated the Census of Agriculture from the National Livestock Census. Uganda believes that using a multi-purpose crop and livestock sample design compromised the quality of the livestock estimates.

The first Uganda Census of Agriculture and Livestock was undertaken in 1963/65 with the assistance of the Food and Agriculture Organization of the United Nations (FAO) and the then Department of Technical Cooperation of Britain. The second Census of Agriculture (National Census of Agriculture and Livestock) was conducted during 1990/91 although preparatory arrangements had started earlier. That census was funded by the United Nations Development Programme (UNDP) and executed by FAO.

2. Legal Basis and Organization

Census of Agriculture 2008-2009

The Uganda Census of Agriculture 2008-09 (UCA 2008/09) was conducted as a joint effort between the Government of Uganda as the funding agency and the Uganda Bureau of Statistics (UBOS), in close collaboration with the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) were the implementing agencies. UBOS and MAAIF are extremely grateful to: FAO, the United Kingdom (UK) Department for International Development (DFID) and the Norwegian Agency for development (NORAD) for providing technical assistance.

National Livestock Census 2008

The National Livestock Census, 2008 was conducted under the authority of the Uganda Bureau of Statistics Act (Number 12 1998).The National Livestock Census was a collaborative effort between the Ministry of Agriculture, Animal Industry, and Fisheries – the implementing agency, and the Uganda Bureau of Statistics which provided the technical support.

3. Reference Period or Date

Census of Agriculture 2008-2009

The 2008-2009 Census of Agriculture reference period is not specifically stated in the available documentation, "Uganda Census of Agriculture 2008/2009, Volume II, Methodology Report. However the reference period appears to be the period July 2008 through June 2009. The crops information collected was for the crops grown on the selected holdings, during the Second Season of 2008 and the First Season of 2009.

National Livestock Census 2008

The 2008 National Livestock Census reference period is not specifically stated in the available documentation, "Uganda Livestock Census 2008, Volume II, Methodology Report. However, the reference date appears to be the day of the interview, which would be the period between the 18th and 25th of February 2008 as the questionnaire asks the respondent to report any livestock reared or kept by the household on the day of the interview.

4. Enumeration Period

Census of Agriculture 2008-2009

The Census enumeration period appears to be July 2008 to September 2009.

National Livestock Census 2008

Data collection operations were undertaken between February 18th and 25th 2008.

5. Definition of the Statistical Unit

Census of Agriculture 2008-2009

Definitions conform to FAO recommendations. *Household* is a group of persons who normally eat and live together. *Agricultural holding* is an economic unit of agricultural production under single management comprising all livestock kept and all land used wholly or partly for agricultural 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. The terms Agricultural Household and Holding are used to mean the same thing.

A *holding* may consist of one or more parcels located in one or more separate areas, provided the parcels share the same production means utilised by the holding, such as labour, farm buildings, farm implements and machinery or drought animals. The requirements of sharing the same production means should be fulfilled to a degree to justify the consideration of various parcels as components of one economic unit.

National Livestock Census 2008

For inclusion in the Livestock Census, an agricultural holding must have some livestock. The other concepts and definitions followed all FAO recommendations.

6. Geographic Coverage

Census of Agriculture 2008-2009

The Census of Agriculture 2008/09 covered all the 80 Districts in the country as of July 2007 and census data was to be disaggregated and available down to the District level. Limited data on livestock variables was planned to be collected because comprehensive livestock data was to be collected in a Livestock Census of 2008.

National Livestock Census 2008

The National Livestock Census 2008 covered all 80 Districts of Uganda.

7. Exclusions and Cut-Off Thresholds

Census of Agriculture 2008-2009

None.

National Livestock Census 2008

None, as all households reporting livestock were included.

8. Methodology

FAO Modular Approach

Census of Agriculture 2008-2009

The Census of Agriculture followed a modular approach. As already mentioned, Uganda's Census of Population and Housing 2002, had included an "agriculture module". Its main objective was to provide core data that would form a basis for constructing sampling frames for future censuses of agriculture and annual agricultural sample surveys.

- UCA Form 2, Agricultural Household and Holding Characteristics Module: This form was used to collect data on the demographic characteristics of Household members as well as structural type of data on the Agricultural Holding;
- UCA Form 4, Crop Area Module: This form requested data on holding parcel and crop plot areas using a GPS device;
- UCA Form 5, Crop Production Module: This form collected data on crop production;
- UCA Form 6, Private Large Scale and Institutional Farms: This form requested data from the Private Large-Scale and Institutional Farms on a complete enumeration basis.

National Livestock Census 2008

With the decision to undertake a separate and independent National Livestock Census there was, therefore, no Livestock Module in the Uganda Census of Agriculture 2008-09. There was an "Agriculture Module" with very similar core livestock questions on the 2002 Population and Housing Census.

Frame

Census of Agriculture 2008-2009

All small and medium scale agricultural holdings in the country constitute the sampling frame from which a sample was drawn. All agricultural holdings regardless of size and location were included. District supervisors compiled lists of institutional farms and large scale farms. These were interviewed on a complete enumeration basis. No attempt was made to stratify the holdings by rural/urban strata.

The 2002 Uganda Population and Housing Census included an Agricultural Module whose main purpose was to collect data to identify agricultural households, information that would form a basis for constructing sampling frames for agriculture and livestock surveys. The advantage of the data from the Agricultural Module of the Population and Housing Census was that the data were the result of complete enumeration of all households.

National Livestock Census 2008

All small and medium scale agricultural holdings in the country with livestock constitute the sampling frame from which a sample was drawn. District supervisors compiled lists of institutional farms and large scale farms. These were interviewed on a complete enumeration basis.

Complete or sample enumeration methods

Census of Agriculture 2008-2009

The Private Large-Scale and Institutional Farms were surveyed on a complete enumeration basis as their proportion and contribution to total crop production is substantial. The small and medium sized holdings were sampled. A stratified two-stage sample design of all Census of Population and Housing EA's with agricultural activity, was used for the small and medium-scale household-based agricultural holdings.

National Livestock Census 2008

The Private Large-Scale and Institutional Farms were surveyed on a complete enumeration basis as their proportion and contribution to total livestock production is substantial. The small and medium-scale household-based agricultural holdings were heavily sampled and surveyed, amounting to 15 percent of the total number of households in Uganda as of 2008.

Sample Design

Census of Agriculture 2008-2009

A stratified two-stage sample design was used for the small and medium-scale household-based agricultural holdings. At the first stage Enumeration Areas were selected with Probability Proportional to Size (PPS), and at the second stage, households, which were the ultimate sampling units, were selected using systematic sampling.

For each of the sampled Enumeration Areas, all households in the selected EAs were listed to identify the households with agricultural activity. Agricultural households were then stratified into a small/medium holdings stratum or the Private Large-Scale holdings stratum. All Private Large-Scale and Institutional Farms were placed in a take-all stratum and all were enumerated.

A total of 3,787,487 out of the 5,186,558 households identified by the 2002 Population and Housing Census reported that one or more of their members were engaged in an “agricultural activity” as of September 2002. Agricultural activity was defined as food crops, horticulture, and tree crop production, including crops produced for fiber, livestock and animal products, aquaculture and apiary. These households were referred to as “households with agricultural activity” or “agricultural households”.

The Census of Agriculture estimates were planned to be fit-for-use at the National, Regional and District levels. To achieve this, a sampling scheme of 3,606 EA’s and 10 agricultural households in each selected EA, lead to a 36,060 household sample.

National Livestock Census 2008

It is a two-stage stratified cluster-sampling design in which Districts formed strata at the first stage. At the second stage, EAs (villages) were systematically selected from each selected Sub-County. For each selected EA all households were listed and all households with livestock were enumerated.

The sample of the NLC was selected using the 2002 Population and Housing Census sampling frame. The number of households with cattle was used as a basis for the allocation of EAs among Districts. Using the number of households with cattle, gave a more representative distribution of EAs per District than the numbers of cattle or poultry.

Countrywide, a total of 8,870 EAs were selected. The sampling design resulted in a large sample of 964,047 households representing 15.1% of the total number of households in Uganda.

Compared to previous livestock censuses in both Uganda and other developing countries, sample sizes are normally in a range of one to five percent of the total number of households. The Uganda National Livestock Census stands out as one of the most comprehensive sample-based livestock censuses in the world.

Collection Method

Census of Agriculture 2008-2009 and the National Livestock Census 2008

Interviewers conducted personal interviews with respondents.

Questionnaire(s)

Census of Agriculture 2008-2009

There were five separate forms or questionnaires: Agricultural Module Census of Population and Housing 2002, UCA Form 2 Agricultural Household and Holding Characteristics Module, UCA Form 4 Crop Area Module, UCA Form 5 Crop Production Module, UCA Form 6, Private Large Scale and Institutional Farms. There was no questionnaire or information for livestock as livestock was collected using a separate Census of Livestock in 2008.
Data was collected on: (1) Crop area and production; (2) core livestock numbers (cattle, goats, sheep, and chickens); (3) Aquaculture and Apiary; (4) Land access/ownership/tenure and use; (5) Demographic characteristics of the holder and his/her household; (6) Use of agricultural labour; (7) Access and use of implements, farm machinery, etc.; (8) Irrigation; (9) Agricultural credit/loans; (10) Agricultural buildings/storage facilities; (11) Mode of transportation; (12) Sources of agricultural information; and (13) Access to facilities e.g. electricity, roads, markets, inputs etc.

National Livestock Census 2008

There were two concise three-page questionnaires, one for the small and medium-size agricultural holdings and another for the Private Large-Scale and Institutional Farms. There was also a "Form" for listing the households in the sampled EAs to identify those with livestock.

The key variables for which the National Livestock Census obtained data include information on: cattle population by production system (breed, sex and age, milk production and sales); goat population by production system (breed, sex and age); sheep population by production system (breed, sex and age of rams, ewes and lambs; pig population by production system(breed, sex and age of boars, sows and piglets; poultry population by production system(breed, sex and age of adults and chicks); rabbit population by production system(breed and sex); horses, donkeys, and camels by production system and by sex; cats and dogs population by sex; bee hives (number and honey production); and farm infrastructure, equipment and implements.

Controls to Minimize Non-Sampling Errors

Census of Agriculture 2008-2009 and the National Livestock Census 2008

The questionnaires, the field collection procedures, and the data processing systems were all thoroughly tested before the start of the Census enumeration.

A great deal of emphasis was placed on data quality throughout the whole exercise - from planning, questionnaire design, training, supervision, data entry, validation through to cleaning, editing and the final imputation. As a result, it is believed that the Census is highly accurate and representative of what was experienced at field level during the Census year. With very few exceptions, the variables in the questionnaire are within the norms for Uganda and they follow expected time series trends when compared to historical data, standard errors and coefficients of variation for the main variables.

Enumerators were trained to probe the respondents until they were satisfied with the response given before it was recorded in the questionnaire. Enumerators in the field did the first check of the questionnaires during the enumeration process. District supervisors, followed by National Supervisors, did the second check. Supervisory visits at all levels of supervision focused on consistency checking of the questionnaires. Inconsistencies encountered were corrected, and where necessary, a return visit to the respondent was made by the enumerator to obtain the correct information. Further quality control checks were made through a major post-enumeration checking exercise where all questionnaires were checked for consistencies by editors/coders from the UCA Data Centre at UBOS Entebbe offices.

Innovative Methodologies

Census of Agriculture 2008-2009

Uganda conducted an evaluation of the precision of crop yield estimates based on the practice of "crop cutting" compared to information obtained by "interviewing the holder method". Having tested

and evaluated the various methods for estimating crop production, Uganda has adopted the "Interviewing the holder method" as experience has proven that is just as reliable and accurate as the most popular alternatives of: (1) Crop cutting/weighing on sampled sub-plots, (2) Weighing of produce from the entire plot (can be one time for crops like rice or several times for continuously harvested crops like sweet potatoes), or (3) Recording using a crop card.

Experience in earlier Crop Surveys under the Uganda National Household Surveys Programme - the Pre-Test 2008, and the Pilot Census of Agriculture 2003 - established that as long as the frequency of visits to the holder is increased, high quality and precision data could be collected on quantities produced. This is true because problems attributed to memory lapse are substantially reduced.

National Livestock Census 2008

Uganda developed a separate and independent sampling frame (households with livestock) for the National Livestock Census. Uganda strongly recommends a single purpose sample design for livestock independent of the design for crops and land, as they have found that livestock have been particularly difficult to estimate at the District and Sub-County level, something that the Uganda Bureau of Statistics believes can be resolved with a larger sample.

9. Data Entry, Edits, Imputation and Tabulation

Census of Agriculture 2008-2009 and the National Livestock Census 2008

As soon as they were completed, the questionnaires were sent directly to the data processing center, which was at the Uganda Bureau of Statistics offices in Entebbe. The concurrent collection and processing of data was an advantage in that the data processing was a means of monitoring data quality and providing immediate feedback to the field operations team and the District Supervisors.

Questionnaires entering the processing operation were subject to the following procedures: (1) Coding, (2) Data capture, (3) Editing and Imputation (4) Secondary Editing, (5) Quality Control and Verification, and (6) Tabulation.

Census processing used CSPro software, which was also used for data capture, data editing and management of the information within a batch. MS Access and Visual Basic were used for the general data management, STATA was used for data editing and analysis and Microsoft Excel was used for presentation of results from the analysis. A Tabulation Plan was prepared in conformity with recommendations of FAO.

10. Data Dissemination and Use

The Uganda Census of Agriculture 2008-2009 and the National Livestock Census 2008 are available from printed reports, CD's, the websites of CountrySTAT-Uganda, the Uganda Bureau of Statistics and the Ministry of Agriculture, Animal Industry and Fisheries, and upon request.

11. Census Data Quality

Census of Agriculture 2008-2009 and the National Livestock Census 2008

A great deal of emphasis was placed on data quality throughout the whole exercise from planning, questionnaire design, training, supervision, data entry, validation and cleaning/editing. As a result of this, it is believed that the census is highly accurate and representative of what was experienced at field level during the Census year. With very few exceptions, the variables in the questionnaire are within the norms for Uganda and they follow expected time series trends when compared to historical data. Standard Errors and Coefficients of Variation for the main variables are presented in UCA Volumes 111 and 1V.

12. Data Sources

FAO ESS World Census of Agriculture 2010, Country Documents, www.fao.org/economic/ess/ess-wca/wca-2010/countryinfo/en/
Uganda Census of Agriculture 2008/09, Volume II, Methodology Report, www.ubos.org

Ministry of Agriculture, Animal Industry and Fisheries http://www.agriculture.go.ug/

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