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AGENDA ITEM 8:

Progress in the implementation of the WCA 2020 in Africa and the world



AFRICAN
COMMISSION ON
**AGRICULTURAL
STATISTICS**

2019/2020 AGRICULTURAL CENSUS LESOTHO

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HISTORY OF CENSUSES IN LESOTHO

- Lesotho has undertaken Agricultural Census since 1949/1950 under the Ministry of Agriculture
- After the establishment of the Bureau of Statistics (BOS) in 1965, decennial Agriculture Censuses have been conducted
- The 1969/1970, 1979/1980, 1989/1990 and the 1999/2000 Agricultural Censuses were all conducted by the Bureau of Statistics under the Statistics Act of 1965 mandate
- The last two Agricultural Censuses were conducted in 2009/2010 as part of the Food and Agriculture Organization of the United Nations (FAO) 2010 World Census of Agriculture, and the 2019/2020 census conducted as part of FAO WCA 2020
- In between the censuses, BOS has been conducting annual Agriculture Production Survey (APS) to provide updates on the key agricultural variables that change frequently
- The 2019/2020 census covered only rural areas
- The Bureau of Statistics collaborated with Ministry of Agriculture and Food Security (MAFS) for the 2019/2020 Agricultural Census
- The MAFS assisted with concepts and definitions and Commercial farmer frame. An officer was also assigned to work with BOS census team throughout the census



ASSISTANCE AND SUPPORT FOR CENSUS

- Technical assistance was received from FAO, 2 consultants were assigned to work with census team from planning stage up to after dissemination
- An Agriculture Census expert was available for stakeholders workshops, questionnaire design, pilot, listing, main data collection, Post Enumeration Survey (PES) and report writing etc.
- IT Consultant assisted with CAPI and data processing
- Lesotho Government paid for the entire survey (Data Collection DSA, communication, transport, publicity etc)



CENSUS DESIGN PROCESS

- FAO WCA2020 guidelines have been very useful for Lesotho as this was the first census to follow the Classical Approach (once off census). Previous censuses were basically Annual Production Surveys with larger samples, even though most of indicators were covered
- All FAO WCA2020 guidelines were followed from methodology up to tabulation with the exception of Themes like **Aquaculture, Forestry, Fisheries** which were left out as these are small at household level. **Household Food Security** was also not covered as the census covered only rural areas. However, FIES is usually collected in the Labour Force Survey
- Part of the guidelines mostly exploited was **Concepts and Definitions** of which most fit Lesotho context. The slight exception was on the definition for Holding, which is the same as Household as all household members use same labour and equipment
- 22 out of 23 Essential Items were collected. **Presence of Aquaculture on Holding** was not collected because it does not yet exist at household level. Ministry of Agriculture is introducing aquaculture at community level
- The FAO WCA2020 guidelines provided a strong foundation for conducting the 2019/2020 Agriculture Census. The next round of census, WCA 2030 need not change much as everything is already covered. However, it is important to have a Agriculture Census expert to assist with meeting the target of producing relevant indicators



METHODOLOGY

- The 2016 Population and Housing Census served as frame for the 2019/2020 Agricultural Census
- A stratified multi-stage sampling scheme was adopted for the selection of the sample. Two or more EAs were combined to constitute Primary Sampling Units (PSUs), and agricultural holdings (farming households) constitute Secondary Sampling Units (SSUs). Lesotho has 10 administrative districts. The PSUs were first stratified according to the ten districts and then within each District, the PSUs were grouped into the four agro-ecological zones namely; Lowlands, Foothills, Mountains and the Senqu River Vally. The PSUs were selected with Probability Proportional to Size (PPS) and number of households were taken as measure of size
- 500 rural PSUs were selected. After a listing exercise, 16 households were then selected in each PSU through systematic sampling. This resulted in a total of 8,000 agricultural households
- A **classical approach** on sample basis was adopted
- A community level data survey was conducted along with the census in each PSU, with villages under one area chief defined as community



WHY LESOTHO USES SAMPLE INSTEAD OF FULL ENUMERATION

- Sampled census was elected due to human and financial constraints
- Annual Production Survey usually covers 100 PSUs while the 2019/2020 Agricultural Census sample was increased to 500 PSUs
- To cater for quality assurance, a minimum sample size was estimated resulting in 7,600 households which was adjusted to 8,000 households at the same time ensuring a low design effect
- The SPSS Software Complex Samples (CSPlan) module was used for estimating the sampling errors, for key indicators



SCOPE

- Agricultural holdings were restricted to those that grow crops regardless of size of field and rearing at least three sheep or three mixed herd of sheep/goats or two pigs or five poultry
- The census covered the Household sector, Commercial sector and Community level
- Both Household and commercial sectors covered permanent crops, temporary crops and livestock production
- Temporary crops comprised cereals & legumes, vegetables and tubers
- Permanent crops included fruits



FRAMES USED FOR THE CENSUS

- For the household sector, the 2016 Population and Housing Census was used as frame for the 2019/2020 Agricultural Census
- Two or more enumeration areas were combined to constitute Primary Sampling Units (PSUs) in order to increase chance of farming households
- The PSUs were first stratified according to the ten districts and then within each District, the PSUs were grouped into the four agro-ecological zones
- For the commercial sector, Ministry of Agriculture and Food Security register for crop and livestock farmers was used



TIME-TABLE OF THE IMPLEMENTATION OF MAIN CENSUS STAGES

	ACTIVITY	Starting Date	Finishing Date
1	Design of draft questionnaires	March 2018	August 2019
2	Preparation of Proclamation and Order	Statistics Act of 2001	
3	Stakeholders Workshop	30th August 2019	30th August 2019
4	Final Questionnaires	2019	7th March 2021
5	Final Manual of Instructions	2019	7th March 2021
6	Selection of Primary Sampling Units	2019	2019
7	AC Pilot Training of enumerators	31th August 2020	11th September 2020
8	AC Pilot Study	14th September 2020	14th October 2020
9	Listing of PSUs	31st October 2020	29th November 2020
10	Training of Trainers	30th November 2020	6th December 2020
11	Training of Supervisors	7th December 2020	18th December 2020
12	Training of Enumerators	17 February 2021	7 March 2021
13	Main Enumeration	7th March 2021	13th April 2021
14	Post Enumeration Survey	12th May 2021	19th June 2021
15	Data Processing and Report Writing	28th June 2021	30th November 2022



USE OF CAPI FOR DATA COLLECTION

- CAPI in CPro (Census and Surveys Processing System) was used for data collection
- About nineteen (19) IT personnel assisted in ensuring daily functionality of the CAPI devices. They were also responsible for data synchronization from enumerators to the office data management server
- 1 IT supervisor was responsible for 2-3 Teams
- The data collection Application was thoroughly tested and good
- There was no data loss throughout the census
- However, Tablets used for data collection were outdated resulting in constant freezing causing delays
- There was need for power banks as battery constantly dying



MAIN FINDINGS OF THE POST ENUMERATION SURVEY (PES)

- This was the first PES for Lesotho
- The overall goal of the PES was to assess the quality of the census data collected by measuring the magnitude of non-sampling errors in terms of i) coverage errors and ii) content errors
- A one-stage stratified probability sample design was used comprising 30 PSUs from 500 PSUs amounting to 480 households by 30 enumerators and 6 supervisors
- FAO guidelines and UN (2010) Post Enumeration Surveys Operational guidelines were adhered to
- For Coverage Error Evaluation, the Dual System Estimation was applied in estimating the coverage error estimates
- For Content Error Evaluation, age, sex, marital status, relationship and education level of individual persons were evaluated for content errors



MAIN FINDINGS OF THE POST ENUMERATION SURVEY (PES)

- **Net Difference Rate (NDR)** was low for both males and females implying that the inconsistency of reporting sex was very low for both sexes. **Index Of Inconsistency** was low at 10.9 percent for both sexes meaning respondents provided reliable information. A **Rate of Agreement (RA)** of 94.6 percent showed that census and PES responses for sex were highly in agreement
- 78.5 percent of Age responses for both census and PES were in agreement. The **NDR** was low for all the age categories, however, age groups “0-4” and “10-19” were under reported in the census (-0.3 and -1.2 respectively). The Aggregate index of inconsistency is medium for age (25.2 percent). The highest **Index of Inconsistency** occurred among the “5-9” age group (32.7%) meaning a large number of cases varied between Census and PES
- In addition, agriculture population of 1,009,228 obtained in the main AC is also within the estimated confidence limits. Main Census coverage rate is 98.37 percent
- There was no need to adjust the census results since both surveys in line
- With a coverage rate of 94.8 percent, omission rate of 5.2 percent, net coverage error of 5.1 percent, a coefficient of variation of 5.6 percent and the census agriculture population of 1,009,228 falling within the estimated confidence limits, it was concluded that the census results were highly precise and could be used for planning and policy



MAIN FINDINGS OF THE POST ENUMERATION SURVEY (PES)

Content Error Indices for Age

Sex	Number of cases in Census	Number of cases in PES	Net Difference Rate (NDR)	Index of Inconsistency
Male	1,062	1,074	-0.6	10.9
Female	925	913	0.6	10.9
Lesotho	1,987	1,987		
Aggregate Index of Inconsistency				10.7
Gross Difference Rate				0.1
Rate of Agreement				94.6

Content Error Indices for Age

Age Group	Number of Cases in Census	Number of Cases in PES	Net Difference Rate (NDR)	Index of Inconsistency
0-4	155	160	-0.3	21
5-9	203	194	0.5	32.7
10-19	476	500	-1.2	27.2
20-29	329	324	0.3	31
30-39	224	219	0.3	31.8
40-49	200	195	0.3	26.7
50-59	137	137	0	14.1
60+	263	258	0.3	11.3
Lesotho	1,987	1,987		
Aggregate Index of Inconsistency				25.2
Gross Difference Rate				0.2
Rate of Agreement				78.5



DISSEMINATION OF RESULTS

- Products of 2019/2020 Agricultural Census are:
 1. - Volume I: HOUSEHOLDS AND CROPS STATISTICS REPORT
 2. - Volume II: LIVESTOCK STATISTICS REPORT
 3. - Volume III: COMMERCIAL CROPS AND LIVESTOCK STATISTICS REPORT
 4. - Volume IV: COMMUNITY LEVEL DATA REPORT
 5. - Volume V: TECHNICAL REPORT
 6. - Volume VI: POST ENUMERATION SURVEY REPORT
- There was no dissemination workshop due to financial constraints . Financial prioritized COVID 19 related activities
- Reports were emailed to stakeholders
- All reports can be accessed online at <https://www.bos.gov.ls/>



CHALLENGES AND LESSONS LEARNED

- Several problems were encountered. During household listing exercise, listing was done in teams for safety of enumerators. The household listing application was designed in a way that it allowed all five PSUs the team were allocated to be captured without restricting the listing pattern. This resulted in some enumerators capturing wrong PSU codes leading to a long time taken to clean listing data, delaying selection of eligible agricultural households
- The assigned PSUs were very large, resulting in more listing time than anticipated
- The Agricultural Census was not conducted immediately after the listing exercise because of the COVID-19 pandemic. Listing done 31st Oct to 29th Nov 2020 while the main data collection was from 7th March to 13th April 2021(a 3 month gap). This resulted in a lot of changes in the listing frame content and coverage, resulting in non-response. The following were inevitable;
 - Some holders had moved to different PSUs/districts or to different countries
 - Some household members had died
 - Some/all livestock had died or stock theft
- Tablets used for data collection were outdated resulting in constant freezing causing delays

Thank you for your attention!

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