Kingdom of Lesotho

Bureau of Statistics

2019/2020 LESOTHO AGRICULTURAL CENSUS

VOLUME V: TECHNICAL REPORT

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Food and Agriculture Organization of the United Nations

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PREFACE

The Ministry of Finance and Development Planning through the Department of the Bureau of Statistics (BOS), in collaboration with the Ministry of Agriculture and Food Security (MAFS) conducted the 2019/2020 Agricultural Census. The Census was conducted with technical assistance of the Food and Agriculture Organization of the United Nations (FAO). This was the eighth Census undertaken by the Government of Lesotho since 1949/1950.

The main objective of the 2019/2020 Agricultural Census was to provide baseline data on agricultural statistics, which will be used for agricultural planning, policy formulation and implementation of agricultural programmes and projects for improvement of the agricultural sector. The information will also be used to monitor and evaluate implementation of the national, regional and international frameworks such as National Strategic Development Plan II (NSDP II), Agenda 2063 and Sustainable Development Goals (SDGs).

This report constitutes Volume V of the census reports and highlights the technical approach: instruments used, sampling design, sample size, data collection, data processing and cleaning as well as the sampling errors for key indicators.

BOS would like to acknowledge, with many thanks, the technical assistance, financial contribution and support from the Government given to the Bureau. We acknowledge the support of FAO Representative in Lesotho, Mr. Nthimo; Mr. David Mwesigwa - FAO Emergency and Resilience Coordinator (FAOL) for their unflinching support through the census period.

Our special appreciation goes to Team Leader, Agricultural Census Team (ESS) – Mr. Jairo Castaño; Ms. Adriana Neciu Statistician (ESS); Mr. Kofi Agyeman-Duah, International Agricultural Census Expert for FAO; Mr. Lamin Janneh International Expert of Data Processing for FAO for providing the technical backstopping on the project. All participants of the Census, comprising Coordinators, Supervisors, Enumerators as well as support staff are given special acknowledgement. Finally, appreciation goes to numerous farmers who provided information as well as district and local leaders who provided guidance to the enumerators in ten districts of the country where the Census was successfully undertaken.

M.C. Molato

Director, Bureau of Statistics
MINISTRY OF FINANCE AND DEVELOPMENT PLANNING

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ACRONYMS

AC	Agriculture Census
AFSSD	Agriculture and Food Security Statistics Division
APS	Agriculture Production Survey
ASS	Agricultural Sector Strategy
BOS	Bureau of Statistics
CAPI	Computer-assisted Personal Interviewing
CsPRO	Census and Surveys Processing Software
CV	Coefficient of variation
EA	Enumeration Area
FA	Field Assistant
FAO	Food and Agriculture Organization of the United Nations
GIS	Geographic Information System
GPS	Global Positioning System
ICT	Information Communication and Technology
IT	Information Technology
MAFS	Ministry of Agriculture and Food Security
NAPFS	National Action Plan for Food Security
NGO	Non-Governmental Organizations
NSDP	The National Strategic Development Plan
PDA	Personal Digital Assistant
PES	Post-enumeration Survey
PSU	Primary Sampling Unit
SDGs	Sustainable Development Goals
SPSS	Statistical Program for Social Scientists
SMCD	Survey Methods and Cartography Division
TCP	Technical Cooperation Programme
UN	United Nations
WCA	World Programme for the Census of Agriculture

CHAPTER 1: INTRODUCTION

1. Background

Agricultural Census (AC) is a complex, large-scale operation usually undertaken only once in every decade. According to World Programme for the Census of Agriculture 2020 (WCA 2020), census of agriculture is a "statistical operation for collecting, processing and disseminating data on the structure of agriculture, covering the whole or a significant part of a country. Typical structural data collected in a census of agriculture are size of holding, land tenure, land use, crop area, irrigation, livestock numbers, labour and other agricultural inputs. In an agricultural census, data are collected at the holding level, but some community-level data was also collected"[1].

1.1. History of Agricultural Censuses and Surveys in Lesotho

Lesotho has undertaken Agricultural Census since 1949/50 under the Ministry of Agriculture. The 1959/60 Agricultural Census was the second to be conducted in Lesotho by the Ministry of Agriculture. After the establishment of the Bureau of Statistics (BOS) in 1965, decennial Agriculture Censuses have been conducted. The 1969/70, 1979/80, 1989/90 and the 1999/2000 Agricultural Censuses were all conducted by the Bureau of Statistics under the Statistics Act of 1965 mandate.

However, the 2009/2010 and the 2019/2020 Agriculture Censuses were conducted under the Statistics Act of 2001, which repealed and replaced the Statistics Act of 1965.

In between the censuses, BOS has been conducting annual Agriculture Production Survey (APS) to provide updates on the key agricultural variables that change frequently. Whereas the last Agricultural Census was conducted in 2009/10 as part of the Food and Agriculture Organization of the United Nations (FAO) 2010 World Census of Agriculture, the 2019/20 census was conducted as part of FAO WCA 2020.

Again, while the 2009/10 census included both rural and urban areas, the 2019/20 census covered only rural areas as the programme highlights the synergies with the "Global Strategy to Improve Agricultural and Rural Statistics" (2010).

1.2. The 2019/2020 AC Challenges and Lessons Learnt

Several problems were encountered in most stages of the census. During household listing exercise, listing was done in teams since PSU terrain was not friendly and not deemed safe for one to travel alone. The household listing application was designed - in a way that it allowed all five PSUs the team worked on to be entered without restricting the listing pattern. This resulted in some enumerators entering wrong PSU codes leading to a long time taken to clean listing data. This also delayed the process of selecting eligible agricultural households.

[1] FAO. 2015. *World Programme for the Census of Agriculture 2020 Volume 1: Programme, concepts and definitions.* Rome

Another issue was that, the assigned PSUs were very large, resulting in more listing time than anticipated.

The AC was not conducted immediately after the listing exercise because of the COVID-19 pandemic. 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

Another issue was that gadgets (tablets) used for data collection were outdated resulting in constant freezing causing delays.

The 2019/20 Census Justification

The Government of Lesotho has formulated a number of development policies and population programmes which require recent and accurate data for their monitoring, evaluation as well as implementation. These policies include among others the National Vision 2020, National Action Plan for Food Security (NAPFS), Agricultural Sector Strategy (ASS), Global Strategy to Improve Agricultural and Rural Statistics and The National Strategic Development Plan (NSDP). Most recently, the Government of Lesotho adopted a National Monitoring and Evaluation framework which attempts to monitor and evaluate the Government development agenda, therefore data generated from the AC will be utilized in the process.

The AC provides data to monitor Sustainable Development Goals (SDGs) indicators that seek to end hunger and all forms of malnutrition and to achieve sustainable food production by 2030. It is premised on the notion that everyone should have access to sufficient nutritious food, which will require widespread promotion of sustainable agriculture, doubling of agricultural productivity, increased investments and properly functioning food markets.

1.3. Scope and Content of the Census

The census scope and content were based on national, regional and international data requirements, in particular, the UN World Programme for the Census of Agriculture. However, emerging country issues emanating from a series of User-Producer workshops organized by LESBOS informed the coverage and content of the final census questionnaire. Hence, the Census covered both household and non-household sectors (commercial farmers) engaged mainly in the:

- Growing of non-perennial crops (temporary crops);
- Growing of perennial crops (permanent crops);
- Animal production; and
- Mixed farming.

The Agricultural Census covered agricultural activities (Crops – temporary and permanent; Livestock and Aquaculture in line with the NSDPII) on both households and commercial

farms under different systems of land tenure in the administrative districts as well as the four (4) ecological zones in the rural settlement of the country. All fields were also covered, regardless of field size. However, households with no fields, no cattle and less than: - three sheep or three mixed herd of sheep/goats; two pigs; or five (5) poultry were excluded in the farming households sampling frame.

1.4. Objectives

The overall objective of the AC is to provide data on the structure of agricultural holdings, with attention given to small administrative units; Agricultural census provides benchmarks to improve current agricultural statistics; and Agricultural census provides sample frames for agricultural sample surveys.

Specifically, the 2019/20 Census is designed to:

- Provide data on size of holding, land tenure, land use, and crop area;
- Provide data on irrigation;
- Provide data on livestock numbers;
- Provide data on labour and use of machinery;
- Provide data on gender-disaggregated agricultural statistics on key agricultural activities;
- Provide data on indicators for monitoring the sustainable development goals (SDGs), Malabo Declaration etc;
- Provide a frame for subsequent agriculture-based surveys like the Annual Production Survey (APS); and
- Above all, provide data on indicators for MAFS to lead and monitor trends in food security in line with the NSDPII strategic objectives.

CHAPTER TWO: CENSUS ORGANISATION AND INSTITUTIONL ARRANGEMENT

2.1. Census Implementation Strategies

The Census objectives and outputs were designed to be realised through a number of interrelated strategies and activities that were undertaken at each phase of census implementation: preparatory, enumeration and post enumeration.

The major strategies included: legal and administrative framework, cartography and GIS, data collection, advocacy and publicity, data processing, data analysis, report writing and dissemination as well as monitoring and evaluation.

2.2. Legal and Administrative Framework

Major activities at this level included: preparing census proclamation and executive order, establishing organizational and administrative frameworks, creating census committees, determining the scope and coverage of the census programme. All this was done in line with the Lesotho 2001 Statistics Act.

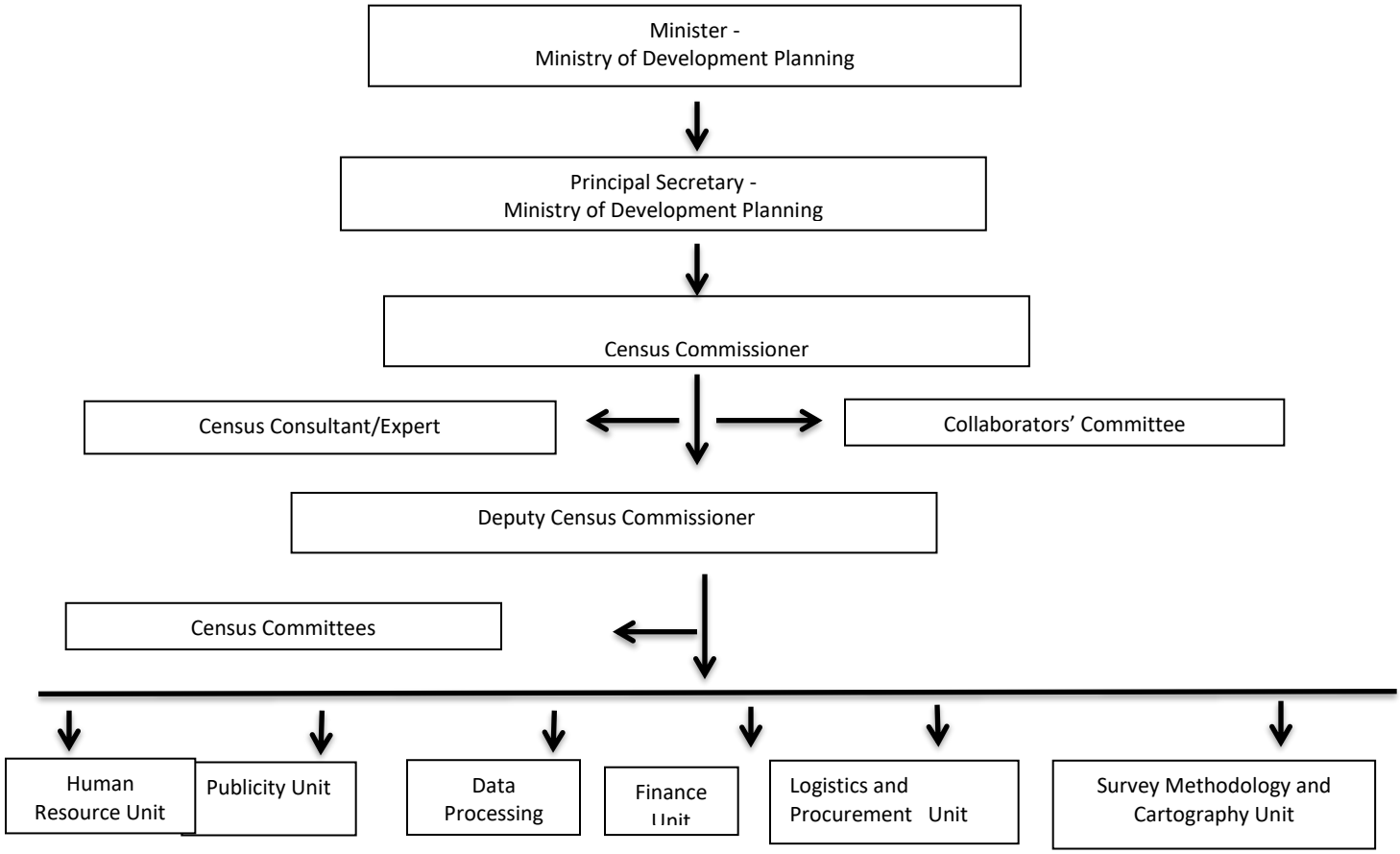
2.3. Census administrative and Organizational Framework

The Ministry of Development Planning was the executing agency for the Census and Bureau of Statistics the implementing agency.

The Minister of Development Planning appointed a Census Commissioner (Director, BOS) who had the overall responsibility to implement the census programme. The Census Commissioner appointed a Deputy Census Commissioner, who was responsible for the day-to-day running of the census.

The Minister also established the Collaborators' Committee with responsibilities to provide policy guidelines, mobilize the necessary resources for the Census and, act as the link between the Government and the implementing organs on the advice of the Census Commissioner.

Figure 1: The 2019/20 Census of Agriculture Organization Chart



2.4. Census Committees

A number of committees were established to offer policy direction and technical advice and material assistance to the Census Commissioner in the conduct of the 2019/20 AC: Senior Management Team, Collaborator's Committee, Census Technical Committee, Survey Methodology and Cartography Committee, Census Procurement and Logistics Committee, Publicity Committee and Post Enumeration Survey Team.

2.5. Senior Management Team

The team comprised of all the Heads of BOS divisions and headed by the Director as the Census Commissioner. The Deputy Commissioner is the Head of Agriculture and Food Security Statistics Division of the Bureau of Statistics who was responsible for census

mapping, census regional offices, finance, recruitment, data processing and logistics (Table 1).

Table 1: Senior Management Team

Title	Designation
Census Commissioner	Chairperson
Head, Agriculture and Food Security Statistics Division	Deputy Commissioner
Head, Survey Methodology and Cartography Division	Member
Head, Population Statistics Division	Member
Head, Socio-Economic Statistics Division	Member
Head, National Accounts Statistics Division	Member
Head, Foreign Trade and Price Statistics Division	Member
Head, Environment and Energy Statistics Division	Member
Head, Field Organization Division	Member
Information and Communication Technology Manager	Member
Senior Statistician, Production and Dissemination Unit	Member
Human Resource Manager	Member
Assistant Administration Officer	Member
Finance Officer	Member
Assistant Procurement Officer	Member
Legal Officer	Member

Roles and Responsibilities

- To closely monitor and assess implementation of census activities,
- To make recommendations and necessary adaptation/adjustments to the census programme,
- To generally oversee the smooth execution of the project,
- To guide, direct and organize overall census programme,
- To facilitate scouting of advocacy champion for 2019/20 Agricultural Census.

2.6. Census Technical Committee

This committee comprises of BOS technical staff and MAFS and was in charge of all the technical aspects of the 2019/20 Census of Agriculture. It was the responsibility of this committee to review all census instruments including questionnaires, manuals, control forms etc.

Table 1: Census Technical Committee

Name	Designation
Deputy Commissioner	Chairperson
Senior Statistician, AFSSD	Secretary
BOS Technical Staff	Member
Ministry of Agriculture and Food Security	Member

Roles and responsibilities

- Develop 2019/20 Census of Agriculture project document
- Review and finalize census instruments
- Train field staff
- To ensure implementation of best practices for preparatory activities, data collection, data processing, data analysis, dissemination and publication
- To ensure smooth conducting of the pilot and main census enumeration as per schedule
- To form Census data analysis team
- To prepare tabulation plans, ensure data processing, data analysis, dissemination, monitoring and evaluation are well carried out and follow international standards and best practices
- To organize user/producer workshops to review census instruments with relevant stakeholders.

2.7. Publicity Committee

This committee chaired by the Head of Production and Dissemination Unit developed and implemented the publicity and advocacy strategy for the entire census project. The Publicity committee is composed of the BOS and MAFS.

Table 2: Publicity Committee

Name	Designation
Senior Statistician, Production and Dissemination Unit	Chairperson
Senior Statistician, AFSSD	Secretary
BOS staff	Member
Public Relations Officer	Member
Ministry of Agriculture and Food Security	Member

Roles and responsibilities

- To advocate for 2019/2020 AC
- Produce publicity material
- To be responsible for publicizing the census activities, playing a leading role of bringing together different Ministries, so as to ease communication between enumerators and the public as well as to sensitize the public about the activities of the census.

2.8. Post Enumeration Survey Team

The Post Enumeration Survey Team consisted of the following:

Table 3: Post Enumeration Survey Team

Name	Designation
Senior Statistician, Survey Methodology and Cartography Section	Chairperson
Senior Statistician, AFSSD	Secretary
Statistician Survey Methodology and Cartography Section	Member
Senior Statistician, Field Organization Division	Member
Senior Analyst Programmer, ICT	Member

Roles and responsibilities

- To monitor data quality checks so as to measure sampling and non-sampling errors
- To develop PES sampling design, estimation procedures, methodology, data collection tools, procedures for matching and reconciliation exercise
- To perform the matching exercise and reconciliation
- To coordinate the data collection, data processing, analysis and report writing

2.9. Mapping and GIS

2.9.1. Delineation of EA Maps

Specific tasks of the survey methodology and cartography included:

- re-delineation of enumeration areas (EAs) into manageable size in terms of population to be enumerated during the census period;
- ensuring that EA maps could easily guide enumerators during enumeration period
- provision of the basis for estimating resources required at each administrative level e.g. personnel, materials and transport;
- monitoring of the enumeration process; and,
- contribution to the analysis and dissemination of census results.

2.10. Data Collection

2.10.1. Data Collection Strategy

The technical Committee developed an effective data collection strategy with specific activities. Main activities undertaken include: preparing effective data collection instruments, timely distribution of all field work materials and resources, recruiting qualified personnel, organizing effective training to all data collection staff at all levels, ensuring that

all enumeration areas are visited during census data collection, ensuring proper deployment of enumerators, ensuring smooth data collection process, providing adequate transport for each administrative unit and monitoring continuously all activities.

2.10.2. Use of Computer Assisted Personal Interview (CAPI) for Data Collection

Instead of use of traditional questionnaires (paper) for collection, the technical Committee decided to use CAPI. The methodology expedited the process of data collection. The methodology also ensured that as data collection was being undertaken, it was simultaneously uploaded onto the main server at LESBOS. Thus, data entry and coding processes were completely avoided.

2.10.3. Coordination of Field Work

Field work was coordinated by District coordinators. Appropriate guidelines and training manuals were developed and provided to all field staff.

2.11. Census Advocacy and Publicity Strategy

The Publicity Committee developed and distributed publicity materials. The role of Publicity Committee is to develop a nationwide strategy aimed at: creating awareness and sensitizing the general public on the importance of the Census, getting buy-in from various government agencies and mobilizing community involvement in the project. The strategy was fostered through a series of information and sensitization workshops at the national level.

2.11.1. Awareness Creation Channels

Several channels of awareness creation were deployed including print and electronic media; conducting educational programs and conducting workshops.

The workshops were conducted at national level for government officials, local public officials, development partners, non-Governmental organizations (NGO) as well as media practitioners.

Furthermore, Publicity Committee designed and produced different forms of awareness creation materials including: t-shirts, caps, visibility reflector vests, billboards, banners, gazebos, calendars, pamphlets, posters and flyers. Other activities included branding government vehicles and putting stickers on public transport

Other activities and channels for awareness creation and sensitizing stakeholders included:

- Designing census logo and slogan
- Developing publicity and advocacy manual
- Holding gatherings at villages and community council offices
- Using African Statistics Day commemoration to sensitize the public
- Radio and TV programmes

2.11.2. Advocacy and Publicity Workshops

The following Census publicity and advocacy workshops were organized:

- Training workshop for Publicity Committee
- Sensitization press conference for media houses by Minister of Development Planning.

2.12. Data Processing

2.12.1. Data processing Strategy

The Data Processing Unit prepared a comprehensive census data processing strategy. The strategy encompassed various interrelated activities including: acquisition of necessary computer software and hardware, staff training and undertaking data processing (content editing, structural editing, and preparation of edit programs and production of statistical tables based on tabulation plans).

To ensure an effective data processing programme, subject matter specialists and data-processing experts worked together from the inception of census implementation.

2.12.2. Use of PDAs for Data Collection and Data Capturing

Personal Digital Assistant (PDA) was used for field data collection (as opposed to use of traditional questionnaire) and for data capturing. A number of advantages derived from use of PDAs are as follows:

- Reducing time required for production of census tabulation programme tables
- Monitoring enumeration with the web-based application
- Simultaneous transfer of data from the field to the Headquarters
- Interactivity and real-time display of collected data
- Consistency checks of data collected in real time
- Monitoring data collection exercise (coverage)
- Fast data centralization
- Ensuring better quality of census data and automatic processing of results.
- Ability to export data in different formats (ASCII delimited or fixed).

2.13. Data Analysis, Report Writing and Dissemination Strategy

The technical team prepared a comprehensive strategy on data analysis, report writing, dissemination and archiving.

2.13.1. Census Data Analysis Strategy

A comprehensive analysis of the Census data analysis strategy was put in place by assemblying a team of subject-matter specialists from BOS and Ministry of Agriculture and Food Security. As part of preparations for the analysis, the analysts undertakook literature review and held consultations with relevant data users. Other related activities included peer reviewing of the reports.

2.13.2. Writing the Census Reports

Aside from the initial five volumes namely: Household and Crops Statistics; Livestock Statistics; Commercial Crops and Livestock Statistics; Community Profile and Technical Reports to be released within the first year of the completion of the data collection, analytical reports, thematic reports (selected themes) and census atlas would also be produced by middle of 2023.

2.13.3. Dissemination of Census results

The Census results shall be disseminated to stakeholders.
Dissemination channels shall include:

- Workshops
- Electronic media and radio
- Dissemination of reports and census results through CDs, website, etc.

2.13.4. Archiving

The census results shall be archived and documented (NADA etc.)

2.14. Quality Control, Monitoring and Evaluation Strategy

2.14.1. Quality Control

To ensure quality of all census data the technical committee put in place adequate procedures aimed at minimizing error rates. Monitoring was instituted at all stages of census implementation i.e. during pre-enumeration, enumeration and post enumeration.

Specific mechanisms put in place include: use of good EA maps, using well designed questionnaires, adopting simple enumeration procedures for enumeration, conducting effective training for all enumeration staff, removing inconsistencies in data and eliminating errors through computer editing.

2.14.2. Monitoring

At each phase of census implementation, the technical committee put in place specific monitoring activities. One specific mechanism was to institute continuous supervision at all levels of census implementation, more especially during mapping, data collection and data processing.

2.14.3. Evaluation

The quality of the census was evaluated through Post Enumeration Survey (PES). Ideally, the PES should be undertaken immediately after the census, but it was carried out a month after census enumeration due to the Covid-19 and other logistical challenges. The main objectives of the PES were to measure the levels of accuracy of the census results (coverage and content errors) as well as determination of main sources of error.

The PES findings would assist users in determining data limitations as well as providing guidance for planning future census programmes.

2.15. Capacity Building Strategy

FAO engaged two international consultants to assist from tabulation plan, questionnaire and application design up to report writing. This contributed a lot to the development of BOS capacity for undertaking large-scale statistical enquiries, especially with the usage of advanced technology for data collection.

2.16. Calendar of Activities

	ACTIVITY	Starting Date	Finishing Date
	Pre-census		
1	1st Advisory's meeting		
2	Design of draft questionnaires	March 2018	August 2019
3	2ndAdvisory meeting–questionnaires		
4	Preparation of Proclamation and Order	Statistics Act of 2001	
5	User/Producer meeting	30th August 2019	30th August 2019
6	Final Questionnaires	2019	7th March 2021
7	Final Manual of Instructions	2019	7th March 2021
7	Selection of Primary Sampling Units	2019	2019
8			
9	Training of Trainers	30th November 2020	6th December 2020
10	Training of Supervisors	7th December 2020	18th December 2020
11	Training of Enumerators	17 May	7 March 2021
12	listing of PSUs	31st October 2020	29th November 2020
13	Selection of households		
14	AC Pilot Training of enumerators	31th August 2020	11th September 2020
15	Pilot	14th September 2020	14th October 2020
16	Main Enumeration	7th March 2021	13th April 2021
17	PES	12th May 2021	19th June 2021
18	Data Processing and Report Writing	28th June 2021	31st August 2021

CHAPTER THREE: TECHNICAL APPROACH AND METHODOLOGY

3.0. INTRODUCTION

The methodology took into account the objectives of the census and the suitability of the chosen methodologies to the realisation of the stated objectives.

3.1. Instruments

The instruments used were designed strictly in compliance to the WCA2020 Guidelines whereby the designers ensured that "the 23 Essential Items' were included in the instruments (Appendix VII). Again, the concepts of households were clearly defined as NOT being the same as holding.

To this end, a Tabulation Plan in line with the "Items for consideration by theme" (Appendix VII) was first developed before the commencement of the four instruments.

The Four instruments used which differed completely in content and design from the ones used for the 1999/2000 and 2009/2010 censuses are:

I. Household Listing Form;
II. Household Questionnaire;
III. Commercial Questionnaire; and
IV. Community Profile Questionnaire.

I. Household Listing Form

The Listing Form was used to collect data on all structures as well as their GPS Coordinates in the selected PSUs. Then in each structure the following were collected: Name of Household Head, Total Number of Persons in the household (male and female) and their agricultural activities. From this, only those households who operated fields in the last agricultural season or kept/reared livestock were considered for selection in the second stage of the sampling design.

II. Household Questionnaire

The household questionnaire was divided into 10 Sections based on the "Items for consideration by theme" while ensuring that the 23 essential items recommended by FAO WCA 2020 were all covered.

a. Section A: Identification
b. Section B: Demographic and Social Characteristics (Theme 1 And Theme 8)
c. Section C: Land Use and Crops (Theme 2 And Theme 4)
d. Section D: Agricultural Practices (Theme 6)
e. Section E: Irrigation System (Theme 3)
f. Section F: Services for Agriculture (Theme 7)
    i. Extension Services
    ii. Access to Agricultural Credit/Loan
g. Section G: Farm Implement and Assets (Household Level)
h. Section H. Non- Residential Buildings (Holding Level)

i. Section J: Labour Input (Work on the Holding) (Theme 9)
    i. Labour Input of Household Members
    ii. Input of Employees
j. Section K: Livestock (Theme 5) (Holding) excluding: dogs, cats, Livestock in-take, livestock off-take, livestock losses and Agro-processing and marketing.

However, Theme 11 – Household food security, Theme 12 – Aquaculture, Theme 13 – Forestry and Theme 14 – Fisheries were excluded.

III. Commercial Questionnaire

The Commercial Questionnaire was administered to all Commercial Farmers. It covered all the sections in the Household Questionnaire except the following: Demographic and Social Characteristics and Labour Input of Household Members. However, it included Livestock in-take, livestock off-take, livestock losses and Agro-processing and marketing in the Livestock Section (Appendix VIII, C).

IV. Community Profile Questionnaire

The community questionnaire was used to collect data on: Proximity of Village to Basic Services and Service Institutions such as: Education Facilities, Health Facilities, Service Facilities and Agricultural Facilities. In addition, data on Public Transport, Road Network, Community Water Supply, Electricity, Groups or Cooperative societies and Credit Institutions, Source of Employment, Land Tenure, Village Programmes and Services as well as Other Agricultural Services were collected (Appendix VIII, D).

3.2. Sample Design

The sampling design methodology considered the objectives of the TCP/LES/3703/C2 and also differed from the 2009/2010. Only rural agricultural households were considered in the design.

The census was a probability sample design in which each sampling unit in the target population has a known, non-zero probability of being included. For each sampling unit to have a known, non-zero probability of being included in the sample there has to be a suitable list, or sampling frame for each stage of selection.

Consequently, a two-stage stratified cluster sample design is used:

- The first stage units are the Primary Sampling Units (PSUs). Each PSU is made up of two or more enumeration areas (EAs) from the National Sample Frame (EA frame) provided by BOS; and

- The second stage units were the agricultural households selected from the current listing exercise of agricultural households within the sampled PSU.

3.2.1. Agricultural Household

The agricultural households in this sector are mainly engaged in subsistence agriculture. The crop cultivation and animal rearing are mainly for their own consumption. However, some households may occasionally sell some of their products when required to get some income but the intention of carrying out these activities is mainly for own consumption.

3.2.2. Unit of Analysis and Unit of Selection

The unit of analysis is the agricultural households and the agricultural holders who are operating the agricultural activities within these households.

3.2.3. Target Population

The target population or the universe for the census of Agriculture 2019/20 is defined as all the rural agricultural households engaged in crop cultivation, aquaculture and/or livestock farming in the districts.

3.2.4. Census Population

The Census Population consisted of all rural areas and agro-ecological areas of the selected PSUs in Lesotho.

3.3. Sampling Frame

3.3.1. Primary sampling frame of PSUs

The Survey Methodology and Cartography Division (SMCD) of BOS maintains a current list of small geographic areas with population households as the size measure called enumeration areas (EAs). Two or more such EAs were grouped to constitute one primary sampling unit (PSU) and used as the basis for the first stage and called the primary sampling frame or the PSU frame. All necessary information for selected PSUs including the maps was uploaded onto the GPSs and the CAPI application.

3.3.2. Secondary Sampling Frame of Agricultural Households

Field teams carried out a listing exercise in the selected PSUs to obtain the current list of agricultural households within each PSU. This served as the secondary frame for the selection of sample agricultural households.

3.4. Stratification

The PSUs were first stratified according to the ten administrative districts namely: Botha-Bothe, Leribe, Berea, Maseru, Mafeteng, Mohale's Hoek, Quthing, Qacha's Nek, Mokhotlong, and Thaba-Tseka. Then within each District, the PSUs were grouped into the four agro-ecological zones:

1). Lowlands;
2). Foothills;
3). Mountains; and
4). Senqu River Valley (SRV)

3.5. Sample Size and Allocation

A total of 8,000 agricultural households in 500 sample PSUs from rural areas and all the four ecological zones were covered in the 2019/20 Census unlike the 2009/10 Census, where 2,292 households from 120 PSUs were selected from rural areas and 600 households from 40 PSUs were selected from urban areas.

In arriving at the 8,000 agricultural households, a number of factors including resources, time and logistical considerations influenced the choice of the sample size. These include:

1. The lowest domain of estimation is the district;
2. Production levels of maize, wheat and sorghum;
3. Livestock numbers of cattle, sheep and goats;
4. The expected level of precision for the important variables like maize, wheat, sorghum (crops), cattle, sheep and goats (livestock) at the district level is fixed around ***7.5% CV*** (Coefficient of Variation);
5. The minimum sample size at the district level is fixed as ***400*** agricultural households;
6. Available human and financial resources.

To ensure that the design effect was kept low, the following were also considered:

- Many clusters as feasible as possible than few clusters;
- The smallest cluster size in terms of number of households that is feasible was used;
- A constant cluster size rather than a variable one was used; and
- A systematic sampling method was used to select PSUs and households rather than a segment of geographically contiguous households.

For instance, for an anticipated agricultural household size of 8,000, a sample of 500 PSUs of 16 households rather than 250 PSUs of 32 households was considered a better option.

Hence, the estimation formula for the minimum sample size, n_h, is:

$$n_h = (z^2)(r)(1-r)(f)(k)/[(p)(\tilde{n})(e^2)], where$$

n_h is the parameter to be calculated and is the sample size in terms of number of agricultural households to be selected;
z is the statistic that defines the level of confidence desired (95%) i.e. 1.96;
r is an estimate of a key indicator to be measured by the survey (e.g. Maize production, number of livestock);
f is the sample design effect, *deff*, assumed to be 2.0 (default value);
k is a multiplier to account for the anticipated rate of non-response;
p is the proportion of the total population accounted for by the target population ***(agricultural households)*** and upon which the parameter, r, is based;
$\tilde{n}$ is the average household size (number of persons per household);
e is the margin of error (CV) to be attained[2]

On the basis of this, a minimum sample size of 7,600 agricultural households (475 PSUs) would have been required. However, this was adjusted to 8,000 agricultural households (500 PSUs) so that the 500 PSUs could be used as a frame for subsequent agriculture production surveys (APS) whereby 100 PSUs could be drawn each year until the next agriculture census.

[2] United Nations (2008): Designing Household Survey Samples: Practical Guidelines, New York (P.41).

3.5.1. Sample Allocation

Using pure proportional allocation, Qacha's Nek did not meet the minimum criteria of 400 agricultural households per domain (Table 1). This is because the larger districts would have had larger samples while the smaller districts would get small samples. The implication is that estimates from the smaller districts will have very high variances and may therefore not be reliable.

Table 4: Distribution of PSUs by Household Size by District

District	Number of Households	Sample Households (Proportional allocation)
Botha-Bothe	21,542	538
Leribe	54,926	1,371
Berea	43,073	1,075
Maseru	60,592	1,512
Mafeteng	33,120	826
Mohale's Hoek	28,118	702
Quthing	17,880	446
Qacha's Nek	12,371	309
Mokhotlong	20,319	507
Thaba-Tseka	28,656	715
Total	**320,597**	**8,000**

Thus, the 8,000 sample agricultural households were distributed using Power Allocation method (Table 6). The power allocation redistributed the sample from the larger districts to the smaller districts while keeping the overall sample fixed.

Table 5: Final Allocation using Power Distribution by District

District	Number of Households	Sample Households $\lambda = 0.6$ (Power Allocation)
Botha-Bothe	21,542	656
Leribe	54,926	1,136
Berea	43,073	976
Maseru	60,592	1,200
Mafeteng	33,120	832
Mohale's Hoek	28,118	752
Quthing	17,880	576
Qacha's Nek	12,371	480
Mokhotlong	20,319	624
Thaba-Tseka	28,656	768
Total	**320,597**	**8,000**

The final distribution of the 500 PSUs and 8,000 agricultural households by district and Zone is shown in Tables 7 and 8 respectively.

Table 6: District Distribution of PSUs Covered for 2019/2020

District	PSUs	Households	Percentage of PSUs
Botha-Bothe	41	656	8.2
Leribe	71	1,136	14.2
Berea	61	976	12.2
Maseru	75	1,200	15.0
Mafeteng	52	832	10.4
Mohale's Hoek	47	752	9.4
Quthing	36	576	7.2
Qacha's Nek	30	480	6.0
Mokhotlong	39	624	7.8
Thaba-Tseka	48	768	9.6
Lesotho	**500**	**8,000**	**100.0**

Table 7: Distribution of Sample PSUs and Agricultural Households by District and Zone

S/N	District	Zone				PSUs	Agric. Household
		Lowlands	Foothills	Mountains	SRV		
1	Botha-Bothe	19	18	4		41	656
2	Leribe	53	9	9		71	1,136
3	Berea	49	11	1		61	976
4	Maseru	40	24	11		75	1,200
5	Mafeteng	39	13			52	832
6	Mohale's Hoek	12	7	8	20	47	752
7	Quthing			16	20	36	576
8	Qacha's Nek			14	16	30	480
9	Mokhotlong			39		39	624
10	Thaba-Tseka			41	7	48	768
11	**Lesotho**	**212**	**82**	**143**	**63**	**500**	**8,000**

3.6. Sample Selection

At the first stage, 500 PSUs were selected systematically while at the second stage, after a complete household listing by the field team, 16 agricultural households were selected systematically from each PSU visited.

3.6.1 Comparative samples between the 2009/2010 and 2019/2020 Agric. Censuses

Table 9 shows the 2019/2020 samples compared with the 2009/2010 samples.

Table 8: Comparative samples between the 2009/2010 and 2019/2020 Agric. Censuses

Description	***2009/2010****	***2019/2020***
Survey period	1st August 2009 To 31st July 2010	7th March 2021to 13th April 2021
Number of PSUs selected	**160**	**500**
Urban	40	
Rural	120	500
Number of households selected	**3,240**	**8,000**
Urban		
Rural		8,000
PSUs interviewed	**160**	**499**
Urban	40	
Rural	120	499
Households interviewed	**2,892**	**7,854**
Urban	600	
Rural	2,292	7,854

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CHAPTER FOUR: RECRUITMENT, TRAINING AND FIELDWORK

4.1. Recruitment

Mostly BOS field staff were recruited. Additional enumerators with university degree were recruited to augment the field team. However, only those field staff who are computer literate would be considered. In all about 331 field staff were recruited in the main field data collection. For the listing exercise, 260 were recruited.

4.2. Training

Three levels of training were used considered:

- Training of Trainers (TOT):- 5 days (at a central location);
- Training of supervisors (TS):- 5 days (at a central location); and
- Training of enumerators (TE):- three weeks (three different locations).

Training for the listing took place in June, 2020 and lasted for 5 days. The TOT lasted from 10th to 14th August 2020. The TS began from 17th August and ended on 21st August, 2020. The TE commenced from 31st August 20th September, 2020.

The methodology adopted included the use of power point presentations, discussion of the questionnaires, mock interviews and field practice. Subject specific experts were invited to give presentations to the participants on their subject areas as they relate to the census so as to guide them on best practice.

There were a number of assessments during the training which involved written assessments, field practice (one day was used for field practice) and observations.

4.3. Team Composition

There were fifty census teams. The composition of each team was as follows:

Supervisor	…	1
Enumerators	…	5
Total	**…**	**6**

4.4. Enumerator Workload

The enumerator workload was based on the assumption of same work same remuneration, a maximum of 30 days for field work was considered. Each enumerator administered a minimum of two (2) household questionnaires per PSU per day. In all, 200 enumerators and 40 supervisors were engaged (Table 10).

Table 9: Team Workload

District	No. of Teams per District	Number of Enumerators per District	No. of PSUs per Enumerator	Number of PSUs per District	Total PSUs Allocated per District	Difference*	Distribution of the Workload Difference amongst Teams
Botha-Bothe	3	15	2	30	32	2	2 Teams from Leribe
Leribe	6	30	2	60	57	(3)	
Berea	5	25	2	50	49	(1)	
Maseru	6	30	2	60	61	1	1 Team from Leribe
Mafeteng	4	20	2	40	42	2	1 Team from Berea and 1 Team from Mohale's Hoek
Mohale's Hoek	4	20	2	40	38	(2)	
Quthing	3	15	2	30	29	(1)	
Qacha's Nek	2	10	2	20	23	3	1 Team from Mohale's Hoek, 1 Team from Quthing and 1 Team from Thaba-Tseka
Mokhotlong	3	15	2	30	31	1	1 Team from Thaba-Tseka
Thaba-Tseka	4	20	2	40	38	(2)	
Total	**40**	**200**	**20**	**400**	**400**	-	

***Blue colour had assistance from other teams, while brown colour gave assistance to other teams.**

4.5. Census Period

The field work started from 7th March 2021 to 13th April 2021.

4.6. Data Quality and Supervision

Precautions which were taken to ensure that good quality data were collected and processed without delay include the following:

- The questionnaire was almost entirely pre-coded. This obviously eliminated the very slow and tedious coding process, which is often liable to various types of errors.
- A data entry application system was designed to check the data automatically to detect inconsistencies so that any errors could be corrected by the interviewer in consultation with the supervisor.
- Close supervision was enforced with one supervisor to a team of five interviewers in the presence of an IT Coordinator.

Regular spot-check and monitoring visits were undertaken by Head Office officials and survey team members to assess progress of fieldwork, challenges faced and feedback on issues that were identified at the data processing stage.

4.6.1. Pretest/Pilot

Pretesting/piloting survey instrument is an integral part of data quality assurance in any statistical enquires. It helps in assessing the extent to which the questions address the objectives of the survey. The average time it takes to administer a questionnaire, as well as the burden on respondents and interviewers could be known from the exercise. Consequently, the number of field staff which should be recruited for the main field work can be estimated.

Additionally, the pretest would serve as practical training for the survey secretariat staff and minimize field challenges.

Therefore, the questionnaires were first pretested on a small scale in the course of its development and later piloted from 14th September, 2020 to 14th September, 2020 before the main fieldwork. After the pretest/pilot, a general review session was held to discuss the findings from the field and any defects addressed in the questionnaires. This provided inputs to finalize the survey instruments.

4.6.2. Data collection and Supervision

Field data collection involved enumerators and various levels of supervision.

In all about 331 field staff were engaged in the main field data collection. Enumerators were 250 each deployed in two PSUs.

To ensure data quality, three levels of supervision were involved, including: field supervisors (FS), Census Coordinators and IT Coordinators.

- Fifty field supervisors were deployed and each was responsible in supervising the work of five census enumerators.
- A total of 12 Census Coordinators was deployed with responsibilities to:
    - deliver and collect census materials
    - train the first level field staff

- 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.

Coordinators ensured that regular field visits were in place. They reviewed the work of the enumerators and ascertained that the field staff were performing to the required standard. The monitors:

- Met teams in the field to check on the quality/quantity of work undertaken by the teams and advised on any apparent lapses;
- Brought to the attention of field teams error messages generated by data processing for rectification;
- Ensured that the teams had adequate logistics to undertake their work uninterrupted; and gave progress report to the Project Secretariat.

CHAPTER FIVE: DATA PROCESSING, ANALYSIS AND REPORT WRITING

5.1. Data Processing, Cleaning and Generation of Tables

The data was collected using CAPI in CSPro (Census and Surveys Processing Software). Captured data was validated for consistency, with all inconsistencies corrected. Thereafter, the captured data was exported into Statistical Program for Social Scientists (SPSS) for further cleaning (missing data, duplicates, invalid data values and consistency checking). Tables were generated using SPSS and ultimately exported into Excel for data analysis.

During interviews data was simultaneously validated for consistency for each interviewer tablet. This later paid dividend as data from almost all of the sections of the census were found to be consistent, except for small cases of inconsistency found between age, relationship, marital status and educational level. These inconsistencies were later resolved at the data cleaning stage.

All captured data was first consolidated into one data file. SPSS was preferred for further cleaning (checking for missing data, duplicates, invalid data values and consistency checking) and production of Tables, the data from CSPro was exported into SPSS and the tables were generated using SPSS. The SPSS output tables were exported into Excel for formatting and further analysis.

5.2. Data Cleaning

5.2.1. Editing and Re-Coding

Some limited batch editing imputations for some multiple response categories which could not properly output in SPSS after export were accomplished in CSPro. The improper output of these multiple response question categories was mostly caused as a result of some bugs in the CSPro logics for those multiple response questions.

Some coding might be required of the 'Other Specify' categories of the data in SPSS. However, after running the tables with the Other Specify Categories, the responses from all such affected tables were not significant enough to warrant their coding.

5.3. Report Writing

5.3.1. Validation

Data validations were already built into the CAPI application. These helped to minimize the number of validations that was done during the cleaning. That notwithstanding, further range checkings were carried out during the cleaning. Most of the range checks were found to be consistent.

5.3.2. Missing Data

Missing value checks were carried out for some key variables, namely, Relationship, Sex and Age from the household roster or demographics section. Ideally these variables cannot have

missing values in them. Initial investigations revealed two (2) and 40 missing values for Sex and Age. However, further investigations showed that only two (2) genuinely missing cases were finally found for the two variables. These missing values might have been introduced during secondary checking by Supervisors as CAPI application will not allow interview to progress without filling out adequate responses to the mandatory fields. The rest of the cases just did not have any data. The two cases were latter resolved after calling the respondents.

5.3.3. Duplicates

Initial checking of the duplicates revealed no duplicated households for all sections of the census.

5.4. Consistency Checks

Consistency checks were carried out between Age and Relationship; age and Marital status; Age and Educational Level by simple cross tabulations of the identified variables with Age. The checked did reveal some inconsistencies. These cases arose as a result of consistency check initially built into CSPRo logics for these variables did not take care of all possible scenarios. Some of the cases were resolved through recording into appropriate responses categories whilst for some others, they were resolved after calling the affected households.

At the end of all this, the weights were applied to the cleaned data and the estimated agricultural population was compared with the 2009/2010 agriculture census results (Table 11).

Table 10: Comparison with Census and Population Projection Data

District	2010 Population Projections*	2009/2010 Agric. Census Pop	2010Agric. Proportion	2021 Population Projections **	Estimated 2019/2020 Agric. Census Pop	2021 Agric. Proportion
Botha-Bothe	106,764	59,340	0.56	126,688	62,926	0.50
Leribe	294,214	146,519	0.50	361,630	155,457	0.43
Berea	253,769	115,040	0.45	281,374	124,823	0.44
Maseru	453,571	139,519	0.31	556,271	153,725	0.28
Mafeteng	185,964	105,292	0.57	190,952	112,534	0.59
Mohale's Hoek	173,325	94,424	0.54	177,418	100,459	0.57
Quthing	121,207	78,290	0.65	123,717	82,605	0.67
Qacha's Nek	69,254	44,580	0.64	79,892	46,561	0.58
Mokhotlong	100,872	83,713	0.83	107,616	88,569	0.82
Thaba-Tseka	132,890	76,224	0.57	145,015	81,594	0.56
Lesotho	**1,891,830**	**942,943**	**0.50**	**2,150,573**	**1,009,253**	**0.47**

Source:

*LBOS (2019): Survey Methodology Division

**LBOS (2019): 2016 LESOTHO POPULATION AND HOUSING CENSUS, Volume VI: Population Projections, Page 30

5.5. Table Generation

Two weeks were used to generate the basic tables after three weeks of data cleaning.

5.6. Non Response and Raising Factors

The target was to cover 8,000 agricultural households in 500 PSUs but at the end of the field work, 7,984 households in 499 PSUs were successfully enumerated. One PSU out of the 39 PSUs selected in Mokhotlong was found to have no agricultural household and out of the 7,984 households found, 7,854 were interviewed.

Thus, the overall non-response rate is 1.63%. The districts with the highest non-response rates are Qacha's Nek (3.75%), Berea (2.56%) and Mokhotlong (2.14%). The districts with the lowest non-response rates are Thaba-Tseka (0.78%), Maseru (0.83%) and Botha-Bothe (0.91%) (Table 12).

Table 11: Non-Response Rates by Districts

District	PSUs found	Household found	Household interviewed	Response Rate	Non-Response Rate
Botha-Bothe	41	656	650	99.09	0.91
Leribe	71	1136	1121	98.68	1.32
Berea	61	976	951	97.44	2.56
Maseru	75	1,200	1190	99.17	0.83
Mafeteng	52	832	818	98.32	1.68
Mohale's Hoek	47	752	740	98.40	1.60
Quthing	36	576	565	98.09	1.91
Qacha's Nek	30	480	462	96.25	3.75
Mokhotlong	38	608	595	97.86	2.14
Thaba-Tseka	48	768	762	99.22	0.78
Lesotho	**499**	**7,984**	**7,854**	**98.37**	**1.63**

The overall raising factor (the inverse of the probability of selection of an agricultural household) for the survey is 25. This means that, on average, the interviews were conducted with 1 in 25 of the agriculture population of all ages per cluster. However, interviewing rates ranged from as low as 1 in 17 in Qacha's Nek District to as high as 1 in 29 in the Mafeteng District (Table 13).

Table 12: Distribution of Achieved Sample, and Corresponding Population Estimates

District	Sample		Estimates		
	Households Interviewed	Household Members	Households	Population (persons in Households)	Raising Factors
Botha-Bothe	650	3299	12,545	62,926	19
Leribe	1121	5567	31,276	155,457	28
Berea	951	4812	24,888	124,823	26
Maseru	1189	5915	30,94	153,725	26
Mafeteng	818	3970	23,468	112,534	29
Mohale's Hoek	740	3647	20,557	100,459	28
Quthing	565	3246	14,492	82,605	26
Qacha's Nek	463	2684	7,923	46,512	17
Mokhotlong	595	3181	11,93	88,569	20
Thaba-Tseka	762	3914	16,345	81,594	21
Total	**7,854**	**40,235**	**199,177**	**1,009,253**	**25**

5.7. Publications

Planned Publications

Four volumes in addition to the Technical Report are planned between August, 2021 and September, 2022 for the 2019/2020 Agriculture Census. These are:

- Volume I: HOUSEHOLDS AND CROPS STATISTICS
- Volume II: LIVESTOCK STATISTICS
- Volume III: COMMERCIAL CROPS AND LIVESTOCK STATISTICS
- Volume IV: COMMUNITY PROFILE
- Volume V: TECHNICAL REPORT

Volume I. Household and Crops Statistics: The report presents mainly household characteristics with some key demographic and socio-economic variables including sex, education, age, occupation, sources of livelihood and residential status being used at different levels such as household heads and to some extent members of the household. Results relating to fields and land utilization for crops and fruit trees are also provided. Included also are the types of field operations and utilization of inputs. Ownership of farm equipment, building and labour are incorporated in this report.

Volume II. Livestock Statistics: This report contains results on the rural livestock sector comprising of cattle, sheep, goats, horses, donkeys, mules, pigs, rabbits and chickens.

Volume III. Commercial Crops and Livestock Statistics: This report deals with farmers who are into large scale crops and livestock production.

In these publications (Volumes I, II and III) tables derived from all parts of the different questionnaires are presented. Time series from past censuses and surveys are also shown

where applicable. Most of the tables are presented by zone and district. Graphic presentation showing the present and the past trends are included in this report.

Volume IV: Community Profile: This report gives information and profile of each community councils for the entire country. This includes; agricultural facilities, health facilities and educational facilities etc. It also shows infrastructure and developments made in each community councils.

Volume V. **Technical Report:** This report gives the historical background of the past censuses. It explains the objectives of the census, its implementation, planning, concepts and definitions used during the census. The sampling and estimation procedures and techniques, staffing and technical procedures used in data collection are described. The main objective of this report is to document the technical aspects of the census, to make principal users aware of the possibilities and challenges with the census data.

Other Reports

Analytical reports, thematic reports (selected themes) and census atlas would also be produced by August of 2022.

APPENDIX

I. Computation of Weights

The 2019/2020 Agriculture Census is not a self-weighting sample design because disproportionately larger samples from regions with smaller populations were drawn. Therefore, each sample household did not have the same chance of selection into the sample. Hence, weights were computed to account for the different probabilities of selection in order to obtain the true contribution of each selected PSU in the sample based on the first and second stage probabilities of selection. For instance, an observation with a sampling weight of 25 represents twenty-five individuals from the target population while another observation with a sampling weight of say 17 represents only seventeen individuals.

Let M_{hi} = Number of 2016 Lesotho Population households in the i^{th} selected PSU in the h^{th} stratum or District

ΣM_{hi} = Population in the i^{th} stratum (i.e. population size in either in rural areas or ecological zones in a District)

M_{hi}^* = Number of agricultural households listed in the i^{th} selected PSU in the h^{th} stratum

a_h =Number of clusters selected in the h^{th} stratum

b = 16 (number of selected agriculture households per PSU in each stratum)

Then the first and second stage probabilities of selection are:

$$P_{1hi} = \frac{a_h M_{hi}}{\sum M_{hi}} \quad \text{and} \quad P_{2hi} = \frac{b}{M_{hi}^*}$$

Where,

P_{1hi} is the probability of selecting the i^{th} PSU in the h^{th} stratum, and P_{2hi} is the probability of selecting a household in the i^{th} PSU of the h^{th} stratum. The overall probability of selection of a household in the i^{th} selected PSU of the h^{th} stratum is given by:

$$F_{hi} = P_{1hi} * P_{2hi}$$
$$= \frac{a_h b}{\sum M_{hi}} * \frac{M_{hi}}{M_{hi}^*}$$

II. Design Weight (Base Weight)

Since the PPS selection is not self-weighting, the sample data was weighted. These weights which are generally called sample weights or design weights/base weights are the inverse of the inclusion probability.

Therefore the weighting factor (or expansion factor), W_{hi}, for a household in the i^{th} selected PSU in the h^{th} stratum is the reciprocal (inverse) of the overall probability of selecting that household.

That is, $$W_{hi} = \frac{1}{F_{hi}}$$

$$= \frac{\sum M_{hi}}{a_h b} * \frac{M_{hi}^{*}}{M_{hi}}$$

III. Non-response Adjustment

To cater for non-response the number of households successfully interviewed in each PSU were used in the computation. Therefore,

The final weight for the sample households in the j-th cluster within the i-th sample PSU in stratum h is given as:

$$W_{hi}^{'} = W_{hi} * \frac{b^{'}}{b^{''}},$$

Where:

b'= The number of interviews plus the number of no interviews in the sample cluster

b''= Total number of interviewed sample households selected in the j-th sample PSU within the i-th sample stratum h.

IV. Post Stratified Adjustment

Finally, the estimated totals and sub groups of the population were compared with current statistics. It was observed that there were some differences, consequently, using this information another adjustment factor was applied to the non-response adjusted weights so that the sub group totals from the census data were reconciled with the system of current statistics.

V. Estimates of Sampling Errors

The SPSS Software Complex Samples (CSPlan) module was used for estimating the sampling errors, the coefficient of variation (CV), the confidence limits, the design effect and the square root of the design effect for key indicators (Table A2). A CV exceeding 20% is considered very low and signifies that the sample size is too small (Table A1).

Table A1: Interpretation of the Reliability Coefficients

No.	CV %	Indicator
1	1% - < 5%	Highly precise
2	5% - < 10%	Good precision
3	10% - < 15%	Acceptable if close to 10%
4	15% - < 20%	Less precise
5	20% or more	Very low precision (sample size is too small)

Table A2: Sampling Errors for Key Indicators

No.	Indicator	Estimate	Base Population
1	Total Agric. Population	Number	All Agric. household members
2	Total Agric. Households	Number	All Agric. Households
3	Agric. Household size	Mean	All Agric. Households
4	Total Agric. Holders	Number	All Agric. Holders
5	Area Harvested of Maize	Hectares	All Agric. Holders
6	Total Maize Produced	MT	All Agric. Holders
7	Area Harvested of Sorghum	Hectares	All Agric. Holders
8	Total Sorghum Produced	MT	All Agric. Holders
9	Area Harvested of Wheat	Hectares	All Agric. Holders
10	Total Wheat Produced	MT	All Agric. Holders
11	Number of Cattle	Number	All Agric. Holders
12	Number of Sheep	Number	All Agric. Holders
13	Number of Goats	Number	All Agric. Holders

VI. Sampling Errors for Selected Indicators

The design effect is the ratio of the variance of an indicator used in the sample design to the variance calculated under a simple random sampling. The square root of the design effect of 1.0 indicates that the sample design is as efficient as a simple random sample, whereas a value greater than 1.0 indicates the increase in the sampling error due to the use of a more complex and less statistically efficient design. Again, a CV not exceeding 15% is deemed precise enough for the indicator and indicates that the sample size for the domain is appropriate. The results are shown in Tables A3-A18.

Table A3: Total Agriculture Population

District	Estimate	Standard Error	95% Confidence Interval		Coeffici ent of Variatio n	Design Effect	Square Root Design Effect	Unweighted Count
			Lower	Upper				
Botha-Bothe	62,926	4293.710	54489.383	71362.177	6.8	12.974	3.602	3,299
Leribe	155,457	10103.076	135606.543	175308.137	6.5	32.227	5.677	5,567
Berea	124,823	7655.582	109781.446	139865.234	6.1	22.247	4.717	4,812
Maseru	153,723	16038.871	122209.092	185236.308	10.4	81.969	9.054	5,915
Mafeteng	112,534	7457.213	97881.415	127185.685	6.6	23.093	4.806	3,970
Mohale's Hoek	100,459	7181.274	86348.729	114568.651	7.1	23.671	4.865	3,647
Quthing	82,605	7095.414	68663.969	96546.491	8.6	27.562	5.250	3,246
Qacha's Nek	46,539	3702.916	39263.271	53814.449	8.0	12.825	3.581	2,684
Mokhotlong	88,569	2570.966	83517.537	93620.543	2.9	3.397	1.843	3,181
Thaba-Tseka	81,594	4391.744	72964.773	90222.807	5.4	10.678	3.268	3,914
Zone								
Lowlands	385,055	21623.509	342568.504	427541.416	5.6	81.524	9.029	16,294
Foothills	200,388	21700.473	157750.132	243025.488	10.8	121.749	11.034	6,535
Mountains	322,071	20761.266	281278.592	362863.188	6.4	81.613	9.034	11,956
Senqu River Valley	101,715	11339.164	79435.163	123994.157	11.1	58.370	7.640	5,450
Lesotho	**1,009,228**	**25,169.344**	**959,774.912**	**1,058,681.728**	**2.5**			**40,235**

Table A4: Total Number of Households

District	Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect	Square Root Design Effect	Unweighted Count
			Lower	Upper				
Botha-Bothe	12,536	845.342	10874.799	14196.701	6.7	2.499	1.581	650
Leribe	31,147	1921.984	27370.534	34923.266	6.2	5.775	2.403	1,121
Berea	24,847	1482.713	21933.506	27760.054	6.0	4.152	2.038	951
Maseru	31,138	3101.628	25044.147	37232.473	10.0	15.042	3.878	1,189
Mafeteng	23,384	1451.226	20532.411	26235.229	6.2	4.191	2.047	818
Mohale'sHoek	20,562	1510.887	17593.368	23530.632	7.3	5.085	2.255	740
Quthing	14,480	1190.382	12140.954	16818.746	8.2	4.335	2.082	565
Qacha's Nek	7,944	546.106	6871.027	9017.033	6.9	1.606	1.267	463
Mokhotlong	16,663	426.875	15824.445	17501.915	2.6	.490	.700	595
Thaba-Tseka	16,358	876.421	14636.064	18080.096	5.4	2.101	1.450	762
Zone								
Lowlands	385,055	21623.509	342568.504	427541.416	5.6	81.524	9.029	16,294
Foothills	200,388	21700.473	157750.132	243025.488	10.8	121.749	11.034	6,535
Mountains	322,071	20761.266	281278.592	362863.188	6.4	81.613	9.034	11,956
Senqu river valley	101,715	11339.164	79435.163	123994.157	11.1	58.370	7.640	5,450
Lesotho	**199,059**	**4825.099**	**189578.215**	**208539.185**	**2.4**			**7,854**

Table A5: Mean Household Size

District	Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect	Square Root Design Effect	Unweighted Count
			Lower	Upper				
Botha-Bothe	5.0	.134	4.76	5.28	2.7	1.438	1.199	650
Leribe	5.0	.087	4.82	5.16	1.7	1.514	1.230	1,121
Berea	5.0	.077	4.87	5.18	1.5	.994	.997	951
Maseru	4.9	.100	4.74	5.13	2.0	1.905	1.380	1,189
Mafeteng	4.8	.109	4.60	5.03	2.3	1.824	1.351	818
Mohale'sHoek	4.9	.111	4.67	5.10	2.3	1.721	1.312	740
Quthing	5.7	.149	5.41	6.00	2.6	1.297	1.139	565
Qacha's Nek	5.9	.180	5.50	6.21	3.1	1.134	1.065	463
Mokhotlong	5.3	.114	5.09	5.54	2.1	1.541	1.241	595
Thaba-Tseka	5.0	.091	4.81	5.17	1.8	.975	.987	762
Zone								
Lowlands	4.8	.050	4.71	4.91	1.0	1.395	1.181	3,334
Foothills	5.0	.081	4.88	5.20	1.6	1.577	1.256	1,301
Mountains	5.3	.061	5.21	5.45	1.1	1.373	1.172	2,233
Senqu river valley	5.4	.125	5.18	5.67	2.3	1.351	1.162	986
Lesotho	**5.1**	**.035**	**5.00**	**5.14**	**0.7**	**1.502**	**1.226**	**7,854**

Table A6: Number of Holders

District	Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect	Square Root Design Effect	Unweighted Count
			Lower	Upper				
Botha-Bothe	13,638	975.98339	11720.68	15555.96	7.2	3.031	1.741	744
Leribe	37,902	2461.92191	33064.56	42739.06	6.5	7.748	2.784	1,456
Berea	28,112	1762.14471	24649.91	31574.53	6.3	5.112	2.261	1,168
Maseru	34,231	3527.34595	27300.51	41161.75	10.3	17.306	4.160	1,363
Mafeteng	26,028	1697.35807	22692.56	29362.60	6.5	5.074	2.253	986
Mohale'sHoek	22,240	1644.95999	19008.06	25472.18	7.4	5.483	2.342	851
Quthing	16,355	1388.52067	13626.96	19083.36	8.5	5.177	2.275	750
Qacha,s Nek	8,542	587.75509	7386.91	9696.59	6.9	1.718	1.311	565
Mokhotlong	20,900	750.66663	19425.10	22374.96	3.6	1.208	1.099	807
Thaba-Tseka	19,951	1174.89430	17642.50	22259.42	5.9	3.087	1.757	1,022
Zone								
Lowlands	89,752	5098.16647	79735.40	99769.44	5.7	18.671	4.321	3,973
Foothills	44,153	4715.16536	34888.22	53417.18	10.7	25.151	5.015	1,517
Mountains	73,575	4701.58539	64336.94	82812.54	6.4	17.559	4.190	2,976
Senqu river valley	20,419	2275.30487	15948.64	24889.80	11.1	11.334	3.367	1,246
Lesotho	**227,899**	**5689.03919**	**216721.10**	**239,077.06**	**2.5**	**76.981**	**8.774**	**9,712**

Table A7: Number of Holdings

District	Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect	Square Root Design Effect	Unweighted Count
			Lower	Upper				
Botha-Bothe	13,638	975.460	11,722	15,555	7.2	3.033	1.742	700
Leribe	37,902	2,455.968	33,076	42,727	6.5	7.802	2.793	1335
Berea	28,145	1,761.840	24,683	31,607	6.3	5.143	2.268	1094
Maseru	34,,234	3,577.975	27,203	41,264	10.5	17.986	4.241	1311
Mafeteng	26,028	1,671.646	22,743	29,312	6.4	4.954	2.226	903
Mohale's Hoek	22,252	1,643.255	19,024	25,481	7.4	5.497	2.344	803
Quthing	16,395	1,421.120	13,602	19,187	8.7	5.425	2.329	636
Qacha's Nek	8,542	591.425	7,380	9,704	6.9	1.739	1.319	500
Mokhotlong	20,900	743.804	19,439	22,361	3.6	1.191	1.091	745
Thaba-Tseka	19,951	1,169.070	17,654	22,248	5.9	3.069	1.752	927
Zone								
Lowlands	89,787	5,102.294	79,762	99,813	5.7	19.552	4.422	3725
Foothills	44,165	4,724.085	34,883	53,447	10.7	25.617	5.061	1440
Mountains	73,614	4,730.759	64,319	82,909	6.4	18.353	4.284	2701
Senqu river valley	20,419	2,290.431	15,919	24,920	11.2	11.535	3.396	1088
Lesotho	**227,986**	**5,716.057**	**216,755**	**239,217**	**2.5**			**8,954**

Table A8: Area Planted Maize (Ha)

District	Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect	Square Root Design Effect	Unweighted Count
			Lower	Upper				
Botha-Bothe	8,640	843,28	6982,99	10296,79	0,10	3,54	1,88	670
Leribe	22,729	2119,73	18564,06	26893,91	0,09	7,20	2,68	941
Berea	19,640	1783,30	16135,73	23143,52	0,09	5,92	2,43	833
Maseru	27,332	4050,92	19372,93	35291,73	0,15	20,39	4,52	1008
Mafeteng	17,995	1669,52	14714,74	21275,42	0,09	5,14	2,27	593
Mohale's Hoek	12,943	1378,51	10234,03	15651,13	0,11	4,69	2,17	507
Quthing	8,236	1136,14	6003,67	10468,34	0,14	5,36	2,32	320
Qacha's Nek	6,019	770,96	4503,78	7533,40	0,13	3,51	1,88	429
Mokhotlong	9,735	822,40	8118,98	11350,75	0,08	2,68	1,64	525
Thaba-Tseka	13,866	1205,17	11497,54	16233,47	0,09	3,30	1,82	718
Zone								
Foothills	37,187	4785,96	27783,75	46591,03	0,13	23,66	4,86	1351
Lowlands	54,776	3945,95	47023,06	62529,34	0,07	12,50	3,54	2531
Mountains	43,477	3883,17	35847,58	51107,18	0,09	13,52	3,68	1926
Senqu River Valley	11,692	1621,58	8506,35	14878,63	0,14	7,99	2,83	736
Lesotho	**147,133**	**5787,58**	**135761.81**	**158505,11**	**0,04**	**23,62**	**4,86**	**6,544**

Table A9: Area Harvested Maize (Ha)

District	Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect	Square Root Design Effect	Unweighted Count
			Lower	Upper				
Botha-Bothe	7,462	768,80	5951,06	8972,22	0,10	3,37	1,84	670
Leribe	18,667	1986,55	14763,55	22570,06	0,11	7,47	2,73	941
Berea	18,090	1714,42	14721,30	21458,40	0,10	5,98	2,45	833
Maseru	21,008	3163,62	14791,53	27223,54	0,15	16,35	4,04	1,008
Mafeteng	13,439	1258,83	10965,75	15912,52	0,09	3,89	1,97	593
Mohale's Hoek	8,646	975,20	6729,59	10561,81	0,11	3,70	1,92	507
Quthing	6,042	915,58	4242,72	7840,66	0,15	4,83	2,20	320
Qacha's Nek	4,602	577,49	3467,79	5737,12	0,13	2,81	1,68	429
Mokhotlong	4,967	603,49	3781,21	6152,72	0,12	3,19	1,79	525
Thaba-Tseka	8,946	933,60	7111,63	10780,38	0,10	3,10	1,76	718
Zone								
Lowlands	45,234.9	3289,00	38772,53	51697,22	0,07	10,46	3,23	2,531
Foothills	30,268.5	4103,91	22204,93	38331,97	0,14	20,58	4,54	1,351
Mountains	27,549.0	2683,11	22277,14	32820,90	0,10	9,70	3,11	1,926
Senqu River Valley	8,815.4	1241,55	6375,99	11254,88	0,14	6,44	2,54	736
Lesotho	**111,868**	**4735,87**	**102562,58**	**121172,99**	**0,04**	**14,44**	**3,80**	**6,544**

Table A10: Total Maize Produced (MT)

District	Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect	Square Root Design Effect	Unweighted Count
			Lower	Upper				
Botha-Bothe	3571.01	367.83072	2848.28	4293.74	10.3	.949	.974	458
Leribe	12651.72	2481.26268	7776.45	17527.00	19.6	1.544	1.242	671
Berea	9186.23	915.40154	7387.61	10984.84	10.0	1.930	1.389	588
Maseru	9893.25	1756.73623	6441.55	13344.95	17.8	1.712	1.308	681
Mafeteng	5444.37	691.29982	4086.07	6802.66	12.7	2.827	1.681	425
Mohale's Hoek	3469.73	599.44598	2291.92	4647.55	17.3	2.359	1.536	365
Quthing	2080.35	288.18636	1514.11	2646.59	13.9	1.748	1.322	237
Qacha's Nek	1253.20	190.93488	878.04	1628.35	15.2	1.535	1.239	296
Mokhotlong	1743.55	199.05574	1352.44	2134.66	11.4	1.549	1.244	346
Thaba-Tseka	1722.88	200.22296	1329.48	2116.29	11.6	1.841	1.357	507
Ecological Zone								
Lowlands	27734.91	3023.09202	21795.03	33674.80	10.9	1.657	1.287	1,834
Foothills	12963.74	2028.64192	8977.79	16949.69	15.6	4.190	2.047	890
Mountains	7270.74	726.77172	5842.75	8698.73	10.0	4.522	2.126	1,316
SRV	3046.90	411.83223	2237.72	3856.09	13.5	2.390	1.546	534
Lesotho	**51016.29**	**3354.47417**	**44425.29**	**57607.28**	**6.6**	**1.773**	**1.332**	**4,574**

Table A11: Area Planted Sorghum (Ha)

District	Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect	Square Root Design Effect	Unweighted Count
			Lower	Upper				
Botha-Bothe	2,248	239,44	1777,30	2719,16	0,11	1,26	1,12	208
Leribe	4,665	634,81	3416,62	5913,70	0,14	3,68	1,92	194
Berea	4,710	583,95	3561,06	5858,08	0,12	2,92	1,71	179
Maseru	4,206	836,62	2561,00	5851,93	0,20	6,92	2,63	200
Mafeteng	4,434	595,89	3262,02	5606,00	0,13	2,93	1,71	134
Mohale?sHoek	1,855	386,77	1094,36	2615,78	0,21	2,59	1,61	83
Quthing	1,298	328,55	651,83	1944,23	0,25	3,04	1,75	53
Qacha's Nek	840	162,16	520,95	1158,81	0,19	1,18	1,09	71
Mokhotlong	809	138,32	537,06	1081,15	0,17	0,90	0,95	44
Thaba-Tseka	1,782	331,13	1130,69	2433,22	0,19	2,05	1,43	115
Zone								
Foothills	9,248	1355,17	6582,35	11913,07	0,15	9,39	3,06	365
Lowlands	11,656	1047,22	9596,18	13715,55	0,09	4,79	2,19	561
Mountains	3,297	456,66	2398,73	4195,03	0,14	2,44	1,56	169
Senqu River Valley	2,647	454,87	1752,38	3541,66	0,17	3,10	1,76	186
Lesotho	**26,847**	**1506,30**	**23884,89**	**29810,07**	**0,06**	**10,53**	**3,25**	**1,281**

Table A12: Area Harvested Sorghum (Ha)

District	Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect	Square Root Design Effect	Unweighted Count
			Lower	Upper				
Botha-Bothe	1,828	216,57	1402,34	2254,25	0,12	1,25	1,12	208
Leribe	3,688	553,97	2598,19	4777,28	0,15	3,49	1,87	194
Berea	4,175	542,41	3108,52	5242,16	0,13	2,88	1,70	179
Maseru	3,125	680,82	1786,38	4464,48	0,22	5,89	2,43	200
Mafeteng	3,554	539,12	2493,16	4613,85	0,15	3,02	1,74	134
Mohale?sHoek	1,489	369,62	762,40	2216,35	0,25	2,84	1,69	83
Quthing	1,042	282,20	486,50	1596,55	0,27	2,77	1,66	53
Qacha's Nek	601	112,28	380,38	822,06	0,19	0,76	0,87	71
Mokhotlong	429	120,26	192,85	665,92	0,28	1,50	1,23	44
Thaba-Tseka	1,064	203,78	662,81	1464,39	0,19	1,46	1,21	115
Zone								
Foothills	7,391	1131,48	5165,91	9616,69	0,15	7,53	2,75	365
Lowlands	9,726	941,36	7874,04	11576,98	0,10	4,52	2,13	561
Mountains	1,891	299,85	1300,87	2480,37	0,16	1,96	1,40	169
Senqu River Valley	1,988	364,72	1270,64	2705,32	0,18	2,62	1,62	186
Lesotho	**20,995**	**1298,85**	**18440,82**	**23549,99**	**0,06**	**6,76**	**2,60**	**1,281**

Table A13: Total Sorghum Produced (MT)

District	Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect	Square Root Design Effect	Unweighted Count
			Lower	Upper				
Botha-Bothe	621.61	109.71564	405.82	837.40	17.7	.945	.972	174
Leribe	1,490.45	222.26725	1,053.30	1,927.61	14.9	.817	.904	170
Berea	1,520.86	198.74936	1,129.96	1,911.76	13.1	1.170	1.082	149
Maseru	894.63	219.75295	462.42	1,326.84	24.6	1.688	1.299	178
Mafeteng	975.95	250.82017	482.64	1,469.26	25.7	2.081	1.443	121
Mohale's Hoek	400.61	88.79789	225.96	575.26	22.2	1.533	1.238	78
Quthing	299.19	86.31429	129.43	468.95	28.8	1.544	1.243	48
Qacha's Nek	154.01	36.64238	81.94	226.08	23.8	1.006	1.003	61
Mokhotlong	60.98	14.05367	33.34	88.62	23.0	.646	.804	34
Thaba-Tseka	141.77	30.38787	82.00	201.53	21.4	1.072	1.035	100
Ecological Zone								
Lowlands	4,006.57	438.63160	3,143.87	4,869.27	10.9	1.479	1.216	494
Foothills	1,726.62	277.72652	1,180.38	2,272.85	16.1	2.701	1.643	308
Mountains	315.85	61.70962	194.47	437.22	19.5	1.175	1.084	148
SRV	511.03	107.18413	300.22	721.84	21.0	2.013	1.419	163
Lesotho	**6,560.06**	**479.52319**	**5,616.93**	**7,503.19**	**7.3**	**1.563**	**1.250**	**1,113**

Table A14: Area Planted Wheat (Ha)

District	Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect	Square Root Design Effect	Unweighted Count
			Lower	Upper				
Botha-Bothe	184	42,61	100,17	268,30	0,23	0,35	0,59	13
Leribe	1,303	462,96	389,63	2216,21	0,36	5,55	2,36	49
Berea	969	274,25	428,42	1510,45	0,28	2,39	1,54	38
Maseru	1,222	427,03	379,56	2064,38	0,35	4,81	2,19	57
Mafeteng	368	70,23	229,72	506,80	0,19	0,61	0,78	21
Mohale?sHoek	1,050	226,44	603,41	1496,82	0,22	1,42	1,19	31
Quthing	1,386	358,90	677,72	2093,75	0,26	2,97	1,72	42
Qacha's Nek	1,056	424,63	217,88	1893,26	0,40	4,53	2,13	52
Mokhotlong	1,824	332,27	1168,51	2479,48	0,18	3,09	1,76	112
Thaba-Tseka	2,286	362,61	1570,80	3001,46	0,16	1,70	1,30	93
Zone								
Foothills	240	82,69	76,59	402,82	0,35	1,37	1,17	13
Lowlands	1,878	317,98	1251,03	2505,61	0,17	1,71	1,31	94
Mountains	8,449	1030,25	6416,83	10481,63	0,12	7,57	2,75	366
Senqu River Valley	1,081	359,39	372,13	1790,10	0,33	3,52	1,88	35
Lesotho	**11,648**	**1039,68**	**9597,37**	**13699,37**	**0,09**	**8,45**	**2,91**	**508**

Table A15: Area Harvested Wheat (Ha)

District	Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect	Square Root Design Effect	Unweighted Count
			Lower	Upper				
Botha-Bothe	73	19,252	35,012	110,968	0,264	0,348	0,590	13
Leribe	843	306,840	237,815	1448,442	0,364	4,931	2,221	49
Berea	822	267,879	293,152	1350,057	0,326	2,879	1,697	38
Maseru	781	314,303	161,226	1401,295	0,402	4,607	2,146	57
Mafeteng	207	45,263	117,477	296,059	0,219	0,601	0,775	21
Mohale?sHoek	602	185,079	236,993	967,217	0,307	2,034	1,426	31
Quthing	1,053	301,220	458,531	1646,982	0,286	2,532	1,591	42
Qacha's Nek	829	318,033	202,089	1456,876	0,383	3,369	1,835	52
Mokhotlong	1,265	261,587	749,259	1781,342	0,207	2,504	1,582	112
Thaba-Tseka	1,765	306,970	1159,378	2370,517	0,174	1,561	1,249	93
Zone								
Foothills	108	48,36	12,73	203,54	0,45	0,91	0,96	13
Lowlands	1,113	210,32	697,74	1527,56	0,19	1,48	1,22	94
Mountains	6,091	770,04	4571,48	7609,66	0,13	5,05	2,25	366
Senqu River Valley	929	329,85	278,28	1579,69	0,36	3,30	1,82	35
Lesotho	**8,240**	**809,88**	**6642,67**	**9838,02**	**0,10**	**5,12**	**2,26**	**508**

Table A16: Total Wheat Produced (MT)

District	Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect	Square Root Design Effect	Unweighted Count
			Lower	Upper				
Botha-Bothe	14.97	6.59431	1.97	27.98	44.0	.547	.739	10
Leribe	425.83	154.95745	120.15	731.51	36.4	3.929	1.982	41
Berea	406.82	179.39488	52.93	760.71	44.1	1.673	1.294	38
Maseru	405.85	149.13910	111.65	700.05	36.7	2.154	1.468	53
Mafeteng	75.99	23.49397	29.65	122.34	30.9	.848	.921	21
Mohale's Hoek	1,157.47	967.65053	-751.37	3066.32	83.6	1.203	1.097	29
Quthing	203.51	41.32299	122.00	285.03	20.3	1.310	1.145	38
Qacha's Nek	147.16	50.45835	47.62	246.70	34.3	2.181	1.477	45
Mokhotlong	549.76	84.58085	382.92	716.61	15.4	1.081	1.040	95
Thaba-Tseka	319.49	75.02188	171.50	467.48	23.5	1.507	1.228	88
Ecological Zone								
Lowlands	621.57	207.46902	212.30	1030.84	33.4	1.651	1.285	84
Foothills	36.56	21.80896	-6.46	79.58	59.7	1.873	1.369	11
Mountains	2,932.39	1001.98419	955.82	4908.97	34.2	1.277	1.130	332
SRV	116.34	39.56328	38.29	194.38	34.0	2.420	1.555	31
Lesotho	**3,706.86**	**1016.07856**	**1702.48**	**5711.24**	**27.4**	**1.285**	**1.134**	**458**

Table A17: Number of Cattle

District	Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect	Square Root Design Effect	Unweighted Count
			Lower	Upper				
Botha-Bothe	3,5219	3809.920	27,733	42,705	10.8	5.509	2.347	2632
Leribe	8,6780	7090.968	72,847	100,712	8.2	9.337	3.056	4788
Berea	8,0440	5814.826	69,015	91,865	7.2	6.470	2.544	4263
Maseru	10,0394	11292.106	78,207	122,581	11.2	16.067	4.008	5523
Mafeteng	7,4155	6099.899	62,170	86,141	8.2	7.354	2.712	3612
Mohale's Hoek	7,1149	7279.218	56,847	85,452	10.2	9.191	3.032	3102
Quthing	4,9185	4439.740	40,461	57,908	9.0	5.151	2.270	2422
Qacha's Nek	3,2541	3012.605	26,622	38,461	9.3	2.660	1.631	2030
Mokhotlong	4,9314	2742.286	43,926	54,702	5.6	2.271	1.507	2618
Thaba-Tseka	4,1817	3218.751	35,493	48,142	7.7	3.763	1.940	3115
Ecological Zone								
Lowlands	230974	14420.450	202,640	259,308	6.2	14.873	3.857	14210
Foothills	137386	15981.280	105,985	168,786	11.6	23.977	4.897	6076
Mountains	190092	13934.555	162,713	217,471	7.3	14.037	3.747	9765
SRV	62544	7430.173	47,945	77,143	11.9	11.251	3.354	4054
Lesotho	**620,995**	**19052.153**	**583,561**	**658,429**	**3.1**	**10.177**	**3.190**	**34,105**

Table A18: Number of Sheep

District	Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect	Square Root Design Effect	Unweighted Count
			Lower	Upper				
Botha-Bothe	97,651	16331.279	65,563	129739	16.7	5.844	2.417	1,012
Leribe	201,974	30488.490	142,069	261879	15.1	8.184	2.861	1,804
Berea	125,350	15325.716	95,237	155462	12.2	5.314	2.305	1,640
Maseru	265,904	60907.336	146,231	385577	22.9	11.575	3.402	1,840
Mafeteng	179,893	20650.205	139,319	220467	11.5	4.131	2.032	1,988
Mohale's Hoek	204,680	30959.343	143,850	265510	15.1	9.502	3.082	1,520
Quthing	235,120	33655.831	168,992	301248	14.3	7.014	2.648	1,208
Qacha's Nek	111,248	16523.807	78,781	143715	14.9	3.315	1.821	864
Mokhotlong	320,862	25576.150	270,609	371115	8.0	3.271	1.809	1,484
Thaba-Tseka	245,280	23504.641	199,097	291463	9.6	2.809	1.676	1,624
Ecological Zone								
Lowlands	395,163	31790.500	332,700	457626	8.0	7.100	2.665	5,896
Foothills	316,689	42058.071	234,052	399326	13.3	9.991	3.161	2,152
Mountains	1086,438	92190.120	905,299	1267576	8.5	9.676	3.111	5,184
SRV	189,672	28380.727	133,908	245435	15.0	7.692	2.774	1,752
Lesotho	**1,987,962**	**95593.465**	**1,800,136**	**2,175,788**	**4.8**	**7.991**	**2.827**	**14,984**

Table A19: Number of Goats

District	Estimate	Standard Error	95% Confidence Interval		Coefficient of Variation	Design Effect	Square Root Design Effect	Unweighted Count
			Lower	Upper				
Botha-Bothe	57,068	9888.866	37636	76499	17.3	4.559	2.135	684
Leribe	104,585	14411.854	76266	132905	13.8	5.964	2.442	1052
Berea	82,439	12288.370	58292	106586	14.9	5.964	2.442	992
Maseru	163,430	26129.365	112086	214775	16.0	9.889	3.145	1472
Mafeteng	64,320	12108.283	40527	88112	18.8	7.469	2.733	596
Mohale's Hoek	113,968	13748.432	86953	140984	12.1	4.421	2.103	1188
Quthing	108,050	12860.973	82778	133322	11.9	4.376	2.092	1160
Qacha's Nek	68,066	11305.524	45851	90282	16.6	2.889	1.700	792
Mokhotlong	99,581	8392.530	83089	116072	8.4	1.954	1.398	1012
Thaba-Tseka	94,415	9048.930	76634	112196	9.6	2.627	1.621	1288
Ecological Zone								
Lowlands	183,624	18937.059	146413	220836	10.3	5.774	2.403	2568
Foothills	224,801	28069.168	169645	279957	12.5	9.839	3.137	1884
Mountains	391,231	35342.488	321783	460679	9.0	8.642	2.940	3768
SRV	156,266	20043.739	116880	195652	12.8	6.654	2.580	2016
Lesotho	**955,923**	**43822.438**	**869812**	**1042034**	**4.6**	**6.717**	**2.592**	**10,236**

VII. Questionnaire

A. HOUSEHOLD QUESTIONNAIRE

SECTION A: IDENTIFICATION

A.	IDENTIFICATION INFORMATION	Codes	
A1. District			
A2. Constituency			
A3. Community Council			
A4. PSU Code			
A5. Serial Number of PSU			
A6. Agro-Zone			
A7. Village Name			
A8. Chief/Headman			
A9. Structure Number			
A11. Household Number			
A12. Name of Household Head			
A13. Name of Respondent		A14. Contact number of Respondent	

STAFF DETAILS			
Name of Enumerator			
Number of Visits	**1**	**2**	**3**
Start Date			
Start Time			
End Date			
End Time			
Name of Supervisor			
Date of Inspection			

SECTION B: DEMOGRAPHIC AND SOCIAL CHARACTERISTICS (THEME 1 and THEME 8)

Household member ID ***(CAPI generated)***	**B1**. Names of household members ***(start from the head)***	**B2.** What is (*name's*) relationship to head?	**B3**. Is *(name)* Male/female? **1=Male 2=Female**	**B4**. How old is (*name*) in completed years? ***(If age is less than 1year, write 00)***	**B5.** What is (*name's*) marital status? ***(12 years or older)***	**B6.** What is (*name's*) highest educational level? ***(For those aged 3 years and above)*** ***Check if B4<3 years, skip to Next member***	**B7.**What is (Name's) Main activity **(10 years and above)?** ***(Refer to codes)***	**B7_1.** What is (Name's) Status in employment of Main Job activity ***(Refer to codes)***	**B8.** What is (Name's) Secondary activity **(10 years and above)?** ***(Refer to codes)***	**B8_1.**What is (Name's) Status in employment of secondary Job activity ***(Refer to codes)***	**B9**. Does (Name) operate fields or keep livestock? 1=Yes 2=No 3=N/A **(if B7&B8=14) skip to next member**	**B10.** What kind of decision does (name) make on fields/livestock? 1=Complete decision 2= Partial (in consultation) 3= No decision Check if B7 & B8=1-5 and B10= 1or2 then is a holder ***Else if, Not a holder, end interview for member.***	**B11.** What is (Holder's) agricultural activity? 1= Mainly crop production (***Copy the ID of member to Section C and applicable Sections)*** 2=Mainly livestock production (***Copy the ID of member to Section K and applicable Sections)*** 3=Mixed ***Copy the ID of member to Section C and applicable Sections***	**B12**. Has (Holder) had any of the following agricultural training? ***(Refer to codes)***
1														
2														
3														

CODES FOR RELATIONSHIP TO HEAD(B2)	**CODES FOR MARITAL STATUS(B5)**	**CODES FOR EDUCATIONAL LEVEL ATTAINED(B6)**	**CODES FOR MAIN & SECONDARY ACTIVITIES (B7 and B8)**	**CODES FOR STATUS OF MAIN & SECONDARY ACTIVITY (B7_1 and B8_1)**	**CODES FOR AGRICULTURAL TRAINING/ EDUCATION OF HOLDER (B12)**	

01 Head of Household	00 Never Married	00= Pre-school	1=Crop production	1= Employee	00=None	
02 Spouse	01 Monogamously Married	(01-07) Std 1-7	2= Livestock	2= Employer	01= Informal learning in agriculture	
03 Partner (Cohabiting)	02 Polygamously Married	(11-15) Form 1-5	3= Fisheries	3 = Own-account worker	02=Non-formal education in agriculture	
04 Son/Daughter	03 Cohabiting	18=None	4= Forestry	4= Contributing family worker	03=Secondary education in agriculture	
05 Son/Daughter-in-law	04 Separated	19= Non Formal Education	5=Aquaculture	5= Member of producers' cooperative	04= Tertiary education in agriculture	
06 Step Child	05 Divorced	20= Diploma/Certificate after Primary	6=Trader	6=N/A (if B7&B8=14)		
07 Sibling	06 Widowed	21= Vocational and Technical after Primary	7= Artisan	11= Other (specify)		
08 Own Parent	07 Don't know	22= Diploma/Certificate after Secondary	8= Agricultural paid job outside holding			
09 Step Parent		23=.Vocational Technical after Secondary	9 = Non agriculture paid job			
10 Parent-in-law		24= Diploma/Certificate after High School	10= No activity-looking for work			
11 Grand Parent		25= Vocational and Technical after High School	11= No activity - not looking for work			
12 Great/Grandchild		26=Graduate	12 = Student			
13 Other Relative		27=Post Graduate Diploma /Honours	13 = Household work			
14 Not Related		28=Masters	14 = Too young/old			
		29=PHD				
		30= Other (Specify).....				
		99= Don't Know				

B14. What is the main purpose of production of the holding?	**B15.** Apart from agricultural production, what were the other economic activities of the household? (Multiple response)	**B16.** What is the MAIN source of income for the household?	**B17.**How much is the contribution of agriculture to the total household income?
1=Producing only for sale	A=Support activities to agriculture and post-harvest crop activities	01=Subsistence Farming	**0=NONE (**For a livestock farming household, if livestock is still too young (kids or calves only))
2=Producing mainly for sale with some own consumption	B=Hunting, trapping, and related service activities	02= Cash Crop	1=Less than a quarter
3=Producing mainly for own consumption with some sales	C=Forestry and logging	03= Livestock	2=A quarter to less than a half
4=Producing mainly for own consumption	D= Fishing and aquaculture	04 = Livestock Products	3=A half to less than three-quarters
	E= Manufacturing - Processing of agricultural products (agro-processing), Handicrafts	05= Remittance/Transfers	4=Three-quarters to less than all
	F= Wholesale and retail trade, repair of motor vehicles and motorcycles	06 = Wage/Salary	5=All income

	G=Hotels and restaurants (excluding agrotourism)	09= Social Grant	
	H=Agrotourism	13 = Other (Specify)……	
	Q=None		
	X= Other (specify…….)		

SECTION C: LAND USE AND CROPS (THEME 2 AND THEME 4)
Ci: Land Use during 2019/2020 Agricultural Year (ask for each field)

Holder ID (from Section B11) **CAPI (INCLUDE NAME OF HOLDER FOR EASY ADMINISTRATION OF QUESTIONNAIRE)**	**C1_1.** How many fields does (Holder) operate? **(If B11=1 or 3)**	C1_2.Field No.	**C1.** Where is the field located? 1= Within PSU 2= Outside PSU but within District	**C2.** What is the Land use (LU) type for this field? ***(Refer to codes)***	**C3.** What is the area of the field by land use in acres? ***(Holder Estimate)***	**C4.** What is the tenure of the land? 1= Inherited 2= Purchased 3= Community land 4= Use right from Local Authority 5= Sharecropping 6= Borrowed 7= Rented 11= Other (Specify…) ***End of question for fallow fields***	**C5.** What were the soil conservation measures used in the field? *(multiple response)* A= Terraces/Contour B= Cover Cropping C= Crop Rotation D= Conservation Agriculture Q= None X= Other (specify)……	**C6.** Check C2, if holder has: 1. Temporary crops only, ***Continue to Cii;*** 2. Permanent Crops only, ***Skip to Ciii;*** 3. Both Temporary and Permanent Crops ***Continue to Cii and Ciii***	

Cii: Land Use Under Temporary Crops during 2019/2020 Agricultural Year (ask for each field) If a field is planted to more than one crop, field number must be divided by each crop

Holder ID (from Section B11) CAPI (INCLUDE NAME OF HOLDER FOR EASY ADMINISTRATION OF QUESTIONNAIRE)	Field No.	**C7_1.** Is this (field) Pure (Compact) stand or mixed? 1= Yes, pure 2= Yes, mixed	**C7.**What type of crop is planted on the field? (**See Crop Codes**)	C8.	C9. What proportion of the area was planted to temporary crops ? 01=1/4 of field 02=1/2 of field 03=3/4 of field 04=Whole field	**C10.** What proportion of the area planted was harvested ? 00=None 01=1/4 of field 02=1/2 of field 03=3/4 of field 04=Whole field If None Skip to next Field	**C11**. What was the purpose for harvested crop? *(multiple response)* A=Food for human consumption B=Feed for animals C=Biofuels X=Other uses (Specify)	**C12.** Was the area harvested fertilized ? ***1= Yes 2= No*** ***If no skip to C14_1***	**C13.** What type of fertilizer was used? ***(Refer to codes)***

Ciii: Land under Permanent Crops during 2019/2020 Agricultural Year. If a field is planted to more than one crop, field number must be divided by each crop

Holder ID (from B11) CAPI (INCLUDE NAME OF HOLDER FOR EASY ADMINISTRATION OF QUESTIONNAIRE)	Field No.	C14_1. Is this field Scattered or Compact? 1= Scattered 2= Compact	**C14.** What was the type of tree planted on the field? ***(See tree codes)*** ***Check if C14_1 =1 Skip to C21***	C15. What was the total number of trees in compact plantations?	C16. What proportion of the area was planted to compact plantations 01=1/4 of field 02=1/2 of field 03=3/4 of field 04=Whole field	C17. Was the area planted fertilized? 1= Yes 2= No ***(If No Skip to C19)***	C18. What type of fertilizer was used? ***(Refer to codes)***	C19. What was the total number of bearing trees in compact plantations?	C20. What was the purpose for harvested crop? 01=Food for human consumption 02=Feed for animals 03=Biofuels 05=Other uses (Specify)	C21. What was the total number of trees in scattered plantations? Write 00 if none
1										
2										
3										
4										
5										

Codes for Temporary Crops (C7)	**Codes for Permanent Crops (C14)**	**Land Use Codes(C2)**	**Codes for Types of Fertilizer(C13 and C18)**
A=Maize	A= Apple	01= Land under temporary crops	1= Mineral fertilizers (Inorganic fertiliser)
B=Wheat	B= Peach	02= Land under temporary meadows and pastures	2=Organo-mineral fertilizers
C=Sorghum	C= Grape	03= Land temporary fallow	3= Organic fertiliser
D=Beans	D= Pear	04= Land under permanent crops	4=Biofertilizers
E=Peas	E= Apricot	05= Land under permanent meadows and pastures	5=Manure
	F= Plum	06= Land under farm buildings and farmyards	9=Other organic materials to enhance plant growth
	G= Quince	07= Forest and other wooded land	
	H= Orange	08= Area used for aquaculture (including inland and coastal waters if part of the holding)	
I=Cabbage	I= Pomegranate	09= Land under temporary and permanent crops	
J=Tomato	J=Nectarines	013= Other area not elsewhere classified	
K=Spinach	K= Cherry		
L=Carrots	L= Blueberries		
M=Sepaile	M=Raspberry		
N=Rapa	N=Fig		
O=Beetroot	O= Chest Nuts		
P= Potatoes	P= Lemon		
Q=Onion	Q= Olives		
R=Lettuce	R= Prickle pears		
S=Spring onions			
T=Green pepper	X= Other (Specify)		
U=Bell pepper			

V=Pumpkin			
X= Other (Specify….)			

Civ: Production and disposition of crop products (sum of All crops from individual holders) (C23=C25+C27+C28+C29+C30+C31+C32+C33)

Holder ID (from B11)	**C22.**Crop Code ***(refer to crop codes)***	**C23.** What was the quantity harvested? ***(Response in kg)*** ***Enter 00 if no harvest and skip to next crop***	**C24.**	**C25.** What quantity of unprocessed crop harvested was sold? ***(If no sale, record 00 and skip to C27)***	**C26.** To whom was quantity mostly sold to? 1= Govt. organizations (through auction sales) 2=Parastatals 3= Private trader local market village 4= Private trader district market 5= Private trader at farm gate 6= Development Partners 7=NGOs 8= Neighbour/Relative 11= Other, specify
01					
02					
03					

Production and disposition of crop products Cont'd

Holder ID	Crop Name	Crop Code ***(refer to crop codes)***	**C27.**What quantity was processed for sale? **(if none record 00).**	**C28.**What quantity was used for animal feed? **(if none record 00).**	**C29.**What quantity was given to: **(if none record Q).** A. Land lord / proprietor B. For labour C. Friends/relatives D. Exchange for other goods Q. None X. Others (specify)	**C30.**What quantity was consumed by household? (including that before harvest)	**C31.**What quantity was used for seed? **(if none record 00). Not applicable to fruits and vegetables**	**C32.**What Quantity was stored/ currently in storage ? **(if none record 00).**	**C33**.How much was lost after harvest (%)? ***(Holder estimate)*** Write 00 if none then skip C34 to **D1**	**C34.**Where did MOST losses occur? 1= on the field 2= during the storage 3= during the transport 4=Loss at Processing 5=Loss at Packaging 6=Loss at Sales 8 = Others
01										
02										

SECTION D: AGRICULTURAL PRACTICES (THEME 6)

Holder ID (From B11) CAPI (INCLUDE NAME OF HOLDER FOR EASY ADMINISTRATION OF QUESTIONNAIRE)	**D1.**Which of the following seed inputs did (holder) use? **01=Yes** **02= No** ***(if no, skip to next input)*** ***Multiple response***	**D2**. What was the main source of seeds?	**D3.** Which of the following fertilizer inputs did (holder) use? **01=Yes** **02= No** ***If none skip to D5*** ***Multiple response***	**D4**. What was the main source of fertilizer used?	**D5**. Which of the following pesticides inputs did (holder) use? 01=Yes 02= No ***If none skip next holder*** ***Multiple response***	**D6.** What was main source of Pesticides?
	A. Self-production		A= Mineral fertilizers (Inorganic fertilizer)		A. Insecticides	
	B. Local seeds	1=Own	B=Organo-mineral fertilizers	1=Own	B. Herbicides	1=Own
	C. Improved seeds	2=Exchanges within community	C= Organic fertilizer	2=Markets	C. Fungicides	2=Markets
	D. Hybrid seeds	3=Markets	D=Biofertilizers	3=Cooperatives	D. Rodenticides	3=Cooperatives
	E. Geneticallly Modified (GM) seeds	4=Seed company	E=Manure	4=Government	Q=None	4=Government
	F. Seedlings	5=Donation	Q=None	5=NGOs	X. Other pesticides (Specify…)	5=NGOs
		6=Cooperatives	X=Other organic materials to enhance plant growth			
		7=Government				
		8=NGOs				

SECTION E: IRRIGATION SYSTEM (THEME 3)

E. IRRIGATION SYSTEM					
E1. Was any of the holding's field irrigated during 2019/2020 Agricultural Year?01= Yes (*Skip to E3*) 02=No if No, continue E2.What was the main reason for not irrigating? ***(Refer to codes)Skip to Next Section***					
Holder ID (From B11) CAPI (INCLUDE NAME OF HOLDER FOR EASY ADMINISTRATION OF QUESTIONNAIRE)	**Field No.**	E3. What was the main source of irrigation water?***(Refer to codes)***	E4. What was the main method of irrigation used?***(Refer to codes)***	E5. What area was irrigated (acres)?	
1					
2					

(E2)
Reasons for not Irrigating

01 No irrigation System
02 Inadequate Water
03 Adequate rains (no need)
09 Other (Specify) (*for each field*)

(E3)
Source of Irrigation Water
1= Surface water River /Lake/Pond/Mountain *(by gravity))*
2= Surface water (River /Lake/Pond (*pump*))
3= Dam /Reservoir /earth dam (Manual watering (buckets/cans)
4=Dam /Reservoir /earth dam (pump)
5= Ground water (Deep Well/Tube well) (Motor Pump)
6= Ground water (Shallow well) Dam /Reservoir /earth dam (Manual watering (buckets/cans)
7=Mixed surface water and groundwater
8= Standpipe
9= Harvested
10 = Borehole (manual)
11 = Borehole (mechanized)

(E4)
Irrigation Method

01 Gravity
02 Hand Pump
03 Motor Pump
04 Manual watering (buckets/cans)
07 Other (Specify) (*for each field*)

SECTION F: SERVICES FOR AGRICULTURE (THEME 7)
Fi: Extension Services

Holders ID (From B11)	**F1.**Did the holder receive extension services during 2019/2020 Agricultural Year? 1= Yes 2= No **(IF NO, skip to F5)**	**F2.** Which of the following extension service providers did the holder interact with? **(SELECT ALL THAT APPLY)** A. MAFS veterinary staff B. MAFS agricultural extension officer C. Farmers' unions D. Local/INGO E. Fisheries F. Forestry G. Private sector Dealers H Environmental Protection Agency (EPA) X. Other ……	**F3.** Which of the following extension services did holder receive? **(SELECT ALL THAT APPLY)** A. Farm management B. Selection of crop C. Input use D. Credit E. Farm mechanization F. Livestock husbandry G. Plant protection H. Environmental conservation I. Marketing J. Water irrigation and drainage K. Nutrition X. Other	**F4.** Which of the following extension service providers' best satisfied the holder's need? **(SELECT ALL THAT APPLY)** A. MAFS veterinary staff B. MAFS agricultural extension officer C. Farmers' unions D. Local/INGO E. Fisheries F. Forestry G. Private sector Dealers H. Environmental Protection Agency (EPA) I. Nutrition Q. None. X. Other ……	**F5.** Did the holder receive any agricultural related information? 1= Yes 2= No **IF NO, GO TO SE:CTION F8**	**F6.** What type of Information did holder receive? **(SELECT ALL THAT APPLY)** A. Weather B. Crop varieties C. New agricultural practices D. Farm machinery E. Credit facilities F. Plant diseases and pests G. Marketing H. Livestock husbandry & diseases I. Agronomic practices J. Water & Irrigation K. Fish farming L. HIV/AIDS M. Nutrition X. Other	F7. What was the MAIN source of information? 01= Radio 02= Television 03= Internet 04= Newspaper 05= Agric. Magazines/Bulletins 06= Extension officers 07= Farmer to farmer 08= Farmers' associations 09= Agric. show/exhibitions 10= Neighbour 15= Other (Specify…)

				(Note: evaluate only the selected responses in F2.)			
01							
02							
03							

Fii: Access to Agricultural Credit/Loan

Holder ID (From B11)	**F8.**Did this holder apply for a Credit/Loan for agricultural purposes in the last 5 years? **1= Yes 2 = NO, *Skip to F15***	**F9.**Was the credit/loan granted? **1= Yes 2 = No If No, Skip to F14**	**F10.What was the MAIN** Source of Credit/Loan received during last 5 years? 01= Commercial Banks 02=Microfinances institutions 03= Farmers' Union 04=Input supplier 05= Money lenders 06= Self-help group 07= Government 08= Cooperatives 09= NGO 10= Family and friends 15= Other	**F11.**What was the credit/Loan Period? 1= Less than 12 months 2= Between 12 and 36 months 3= More than 36 months 8= Others (specify)	**F12.**What was the **MAIN** purpose for the credit/Loan? 01= Agriculture labour 02= Seeds 03= Fertilizer 04= Agrochemicals 05= Farm implements and machinery 06= Irrigation structures 07= Livestock 08= Aquaculture (marine resources and fisheries) 09= Trading agricultural produce 10= Tractor 11= Borehole	**F13.**What was the **MAIN** Type collateral security? 0= No collateral 1= Land title 2= Crops 3= Livestock 4= Salary 5= Third party 6= Property (Movable/Immovable) 7= Investment 11= Other (specify)	**F14.** Why was the credit/loan not granted? ***(MAIN Reason)*** 1= Lack collateral security 2= Not profitable 3= Income too low 4= Previous debt problems 5=Could not get a guarantor 6= Amount applied for too high 7=Inappropriate purpose of loan 8=Did not meet requirements 9= Late application 12=Other	**F15.**What were the reasons for not seeking credit/loan? 01= No need for credit 02 = Unavailability of lending facilities 03= Interest too high 04= Negative Past experience 05= Unaware of the service 09= Other (specify)

					12= De-bushing (clearing of land) 13= Threshing 18= Other agricultural purpose (Specify)			
01								
02								

SECTION G: FARM IMPLEMENT AND ASSETS (household level)

		Farm implements and assets used and owned by the household during 2019/2020 Agricultural Year			
Machinery/Equipment		**G1.** Did the holding use (Name of Equipment) during the past 12 months? 01=Yes 02= No ***(If no, go to next equipment)***		**G2.** What was the source of ownership? 1=Owned solely by the holder 2= Owned by a member(s) of the holder's household 3=Owned by the household jointly with other households 4=Provided by the landlord 5=Provided by other private holders (excluding cooperatives) 6=Provided by a cooperative (farmers' Union) 7=Provided by a private agricultural service establishment 8=Provided by a government agency 9=Rented 10=Borrowed 14=other (specify)	**G3.** How many of the equipment used were owned by the holding? **(If G2=1)**
S/N	**Machinery**	**Crops**	**Livestock**		
1	Forage Harvester				
2	Combine Harvester/				
3	Truck/Other Vehicles				
4	Generator				
5	Sprayer				
6	Incubator				
7	Ridger				
8	Scotch Cart				
9	Tractor Seed Planter				
10	Tractor				
11	Tractor Plough				
12	Threshers				
13	Power Tiller				
14	Milking Machine				

15	Disks Harrower				
16	Water Pump (Pompi)				
17	Honey Extractor				
18	Drip Irrigation				
19	Other (specify)……..				
	Manual				
20	Hoe				
21	Digging Fork				
22	Rake				
23	Spade				
24	Hand Pump And Other Hand Irrigation Devices				
25	Transplanter				
26	Sprayer (Knap Sack)				
27	Ox-Plough				
28	Seed Planter				
29	Scotch Cart				
30	Disks Harrower				
31	Cultivator (Sekofolo)				
32	Yoke				
33	Other (specify)				

SECTION H. Non- Residential Buildings (Holding Level)

H1. Did the holding use non-residential building for agricultural purposes during 2019/2020 Agricultural Year? 01= Yes02= No **(If No *Skip to Section J*)**

ID (CAPI generated)	**H2**. What was the purpose of the non-residential building? 1=Keeping livestock other than poultry 2=Keeping poultry 3=Storing agricultural products 4=Mixed or other purposes	**H3.** What was the Area (acres) for each type?	**H4.** What is the tenure of the building? 01=Owned 02=Rented 03=Borrowed 07=Other
1			
2			

SECTION J: LABOUR INPUT (WORK ON THE HOLDING) (THEME 9)

Ji: Labour Input of Household Members

J1. Did any member of the household work on this holding in the past agricultural year? Yes= 1, No=2 ***if No skip to J7***

Household member ID*(From B1, Col 1)*	J2. Names of Household member	J3. Was (*name*) male or female? 01=Male 02=Female	J4.What was (name's) age**?** ***(In completed years)***	J5. Did (name) work on the holding during the past agricultural year? 1= Yes 2= No **If No, end interview for member**	J6. What was (*name's*) working time on the holding? ***(Refer to codes)***

J7. Did this holding have any employees for the past agricultural year? Yes= 1, No=2 if No skip to Next Section

Employee ID (CAPI generated)	J8. Names of farm employees	J9. Was (*name*) male or female? 01=Male 02=Female	J10. What was (name's) age**?** ***(In completed years)***	J11. What was (*name's*) terms (nature) of employment?	J12. What was (*name's*) working time on the holding? ***(Refer to codes)***	J13. What types of services were provided by (*name*)?(*multiple response*) ***(Refer to codes)***	J14. Did (*name*) work for pay? 01=Yes 02= No ***(Skip to Next employee)***	J15.What was the form of payment? ***(Multiple response)*** ***(Refer to codes)***

Codes for Working Time	**Codes for Type of Service**	**Codes for Form of Payment**	**Codes for Terms (Nature) of Employment**
01= Full-time work for less than 1 month in a Year	01=Tree pruning	01= Money	01= Temporary
02=Full-time work 1-3 months in a Year	02= Crop harvesting	02= Farm produce	02= Permanent
03=Full-time work 4-6 months in a Year	03= Weeding	03= Exchange of Labour	
04= Full-time work 7+ months in a Year	04= Planting	05= Other forms of in-kind labour	
05= Part-time work for the less than 1 month in a Year	05= Applying pesticides		
06 = Part-time work 1-3 months in a Year	06= Herding		
07= Part-time work 4-6 months in a Year	07= Sheep/goat Shearing		
08= Part-time work 7 + months in a Year	08= Farm Administrations		
	11= Other (Specify)		

SECTION K: LIVESTOCK (THEME 5) (Holding)

Ki. Type of Livestock	**K1**. Does the holding keep/rear any livestock? (***Note that the reference period for the livestock is the day of enumeration)*** **01= Yes** **02= No** *(Multiple response)*	**K2**. What is **MAIN** the type of livestock system for the holding? ***(If Ki=01to06)*** **01= Grazing System** **02= Industrial System** **03= Mixed System**
01=Cattle		
02=Sheep		
03=Goats		
04=Horses		
05=Donkeys		
06=Mules		
07=Pigs		
08=Rabbits		
09=Chicken		
10=Duck		
11=Geese		
12=Turkey		

Kii. CATTLE

Type of Cattle	**K3a**. Did the holding keep any Improved Cattle (Exotic)? 1=Yes 2=No if No, skip to K3d	**K3b.** How many improved cattle does the holding have?	K3c.How many are owned by female holders?	**K3d.**Did the holding keep any indigenous cattle? 1=Yes 2=No if No, skip to next type	**K3e.** How many indigenous cattle does the holding have?	K3f.How many are owned by female holders?	**K4**. How many cattle are kept mainly for meat/milk/breeding/draught Power?			
							Meat	Dairy	Breeding	Draught Power
	A	**B**	**C**	**D**	**E**	**F**		**B**	**C**	**D**
Females Calves under 1 Year										
Female Calves 1 Year but less than 2 Years										
Males Calves under 1 Year										
Male Calves 1 Year but less than 2 Years										
Bulls (2 years and over)										
Cows (2 years and over)										
Oxen										
Total Cattle										

Kiii. SHEEP

Type of Sheep	K5a. Did the holding keep any Improved Sheep (Exotic)? 1=Yes 2=No if No, skip to K5d	K5b. How many improved sheep does the holding have?	5cHow many are owned by female holders?	K5d. Did the holding keep Sheep? 1=Yes 2=No if No, skip to next type	K5e. How many indigenous sheep does the holding have?	K5f. How many are owned by female holders?	K6. How many sheep are kept mainly for meat/wool/breeding?		
							Meat	**Wool**	**Breeding**
	A	**B**	**C**	**D**	**E**	**F**	**A**	**B**	**C**
	Improved Sheep (Exotic)			**Indigenous Sheep**					
Females Sheep under 1 Year									
Female Sheep 1 Year and above									
Males Sheep under 1 Year									
Male Sheep 1 Year and above									
Total Sheep									

Kiv. GOATS

Type of Goats	K7a.Did the holding keep any Improved Goats (Exotic)? 1=Yes 2=No if No, skip to K7d	K7b. How many improved goats does the holding have?	K7c. How many are owned by female holders?	K7d. Did the holding keep any Improved Goats (Exotic)? 1=Yes 2=No if No, skip to next type	K7e. How many improved goats does the holding have?	K7f. How many are owned by female holders?	K8. How many Goat are kept mainly for meat/mohair//breeding?		
							Meat	Mohair	Breeding
	A	**B**	**C**	**D**	**E**	**F**	**A**	**B**	**C**
	Improved Goats (Exotic)			**Indigenous goats**					
Females Kids under 1 Year									
Female Goats 1 Year and above									
Males Kids under 1 Year									
Male Goats 1 Year and above									
Total Goats									

Kv. PIGS

Type of Pigs		**K9a**. Did the holding keep any Improved Pigs (Exotic)? 1=Yes 2=No if No, skip to K9d	**K9b.** How many improved pigs does the holding have?	**K9c.**How many are owned by female holders?	**K9d**. Did the holding keep any indigenous Pigs? 1=Yes 2=No if No, skip to next type	**K9e.** How many indigenous pigs does the holding have?	**K9f.** How many are owned by female holders?	**K10.** How many pigs are kept mainly for meat/breeding?	
	A	**A**	**B**	**C**	**D**	**E**	**F**	**Meat**	**Breeding**
								A	B
Piglet less than 3months									
Pigs 3months to 6months									
Pigs Over 6months									
Total									

Kvi. EQUINES

Type	**K11.** How many male/female equines does the holding own, raise or manage?		**K12**. How many of each are owned by female holders?		**K13.** How many equines are kept mainly for transport/draught power/breeding?		
	Male	**Female**	**Male**	**Female**	**Transport**	**Breeding**	**Draught Power**
					A	B	C
Horses							
Donkeys							
Mules							

ii. POULTRY

Type of Poultry	**K14.** What is the number of poultry kept by the holding?	**K15. How many are owned by female holders?**	**K16. How many are kept mainly for meat/eggs/ breeding**		
			Meat	**Eggs**	**Breeding**
Improved Chicken					
Koekoek					
Other Improved					
Sub-Total					
Indigenous Chicken					
Total Chicken					
Ducks					
Geese					
Turkeys					
Grand Total					

Kviii. RABBITS

	Male	Female	Total
K17. How many male/female rabbits does the household own, raise or manage?			
K18. How many are owned by female holders?			

Kix. Livestock Feeding Practices during 2019/2020 Agricultural Year

Type	Improved	Unimproved
Cattle		
Sheep		
Goats		
Pigs		
Horse		
Donkeys		
Mules		
Poultry		
Rabbits		

Type of Feeding

01 Forages/Roughages
02 Agro-industrial by-products
03 Swill/Household Waste
04 Supplements/Additives
05 N/A

09 Other (Specify)

B COMMERCIAL QUESTIONNAIRE

SECTION A: IDENTIFICATION

A.	IDENTIFICATION INFORMATION	Codes Office Use	
A1. District			
A2. Constituency			
A3. Community Council			
A4. Village			
A5. Chief/Headman			
A6. PSU Code			
A7. Agro-Zone			
A8. Location of farm (Coordinates)			
A9. Postal Address			
A10. Name of Respondent			
A11. Contact number of respondent		**A12. Email**	
A13. Respondent position/function on the farm			
A14. What is *Holding's* Main agricultural activity? 1= Mainly crop 2=Mainly livestock 3=Mixed		A15. How many fields does (holding) operate? (If A14=1 or 3) Skip to C1[3] If A14 =2 only, skip to Section E	A16. Holder Number

STAFF DETAILS			
Name of Enumerator			
Number of Visits	**1**	**2**	**3**
Date of Interview			
Name of Supervisor			
Date of Inspection			

[3] There is no Section B

SECTION C: LAND USE AND CROPS (THEME 2 AND THEME 4)

Ci: Land Use during 2019/2020 Agricultural Year (*ask for each field*)

C1_1. How many fields does (Holder) operate?	C1_2. Field No.	**C1.** Where is the field located? 1= Within PSU 2= Outside PSU but within District	**C2.** What is the Land use (LU) type for this field? ***(Refer to codes)***	**C3.** What is the area of the field by land use in hectares? ***(Holder Estimate)***	**C4.** What is the tenure of the land? 1= Inherited 2= Purchased 3= Community land 4= Use right from Local Authority 5= Sharecropping 6= Borrowed 7= Rented 11= Other (Specify…..) ***End of question for fallow fields***	**C5.** What were the soil conservation measures used in the field? *(multiple response)* A= Terraces/Contour B= Cover Cropping C= Crop Rotation Q= None X= Other (specify)……	**C6.** Check C2, if holder has: 1. Temporary crops only, ***Continue to Cii;*** 2. Permanent crops only, ***Skip to Ciii;*** 3. Both temporary and permanent crops, 4. Both Temporary and Permanent Crops ***Continue to Cii and Ciii***	

Cii: Land Use Under Temporary Crops during 2019/2020 Agricultural Year (ask for each field) If a field is planted to more than one crop, field number must be divided by each crop

Field No.	**C7_1.** Is this (field) Pure (Compact) stand or mixed?	**C7.** What type of crop is planted on the field? (**See Crop Codes**)	C8.	C9. What proportion of the area was planted to temporary crops? 01=1/4 of field 02=1/2 of field 03=3/4 of field 04=Whole field	**C10.** What proportion of the area planted was harvested? 00=None 01=1/4 of field 02=1/2 of field 03=3/4 of field 04=Whole field	**C11**. What was the purpose for harvested crop? *(multiple response)* A=Food for human consumption B=Feed for animals C=Biofuels X=Other uses (Specify)	**C12.** Was the area harvested fertilized? ***1= Yes 2= No If no Skip to C14_1***	**C13.** What type of fertilizer was used? ***(Refer to codes)***		
	1= Yes, pure									
	2= Yes, mixed									

Ciii: Land under Permanent Crops during 2019/2020 Agricultural Year. If a field is planted to more than one crop, field number must be divided by each crop

Field No.	C14_1. Is the plantation Scattered or Compact? 1= scattered 2= Compact	**C14.** What was the type of tree planted on the field? ***(See tree codes) Check if C14_1= 1 . Skip to C21***	C15. What was the total number of trees in compact plantations?	C16. What proportion of the area was planted to compact plantations 01=1/4 of field 02=1/2 of field 03=3/4 of field 04=Whole field	C17. What area planted was fertilized? 1= Yes 2= No ***Skip to C19***	C18. What type of fertilizer was used? ***(Refer to codes)***	C19. What was the total number of bearing trees in compact plantations?	C20. What was the area of bearing trees in compact plantations by purpose? 01=Food for human consumption 02=Feed for animals 03=Biofuels 05=Other uses (Specify)	C21. What was the total number of trees in scattered plantations?		

Codes for Temporary Crops	**Codes for Permanent Crops**	**Land Use Codes**	**Codes for Types of Fertilizer (C13 and C18)**
A=Maize	A= Apple	01= Land under temporary crops	1= Mineral fertilizers (Inorganic fertilizer)
B=Wheat	B= Peach	02= Land under temporary meadows and pastures	2=Organo-mineral fertilizers
C=Sorghum	C= Grape	03= Land temporary fallow	3= Organic fertilizer
D=Beans	D= Pear	04= Land under permanent crops	4=Biofertilizers
E=Peas	E= Apricot	05= Land under permanent meadows and pastures	5=Manure
	F= Plum	06= Land under farm buildings and farmyards	9=Other organic materials to enhance plant growth
	G= Quince	07= Forest and other wooded land	
	H= Orange	08= Area used for aquaculture (including inland and coastal waters if part of the holding)	
I=Cabbage	I= Pomegranate	09= Land under temporary and permanent crops	
J=Tomato	J=Nectarines	013= Other area not elsewhere classified	
K=Spinach	K= Cherry		
L=Carrots	L= Blueberries		
M=Sepaile	M=Raspberry		
N=Rapa	N=Fig		
O=Beetroot	O= Chest Nuts		
P= Potatoes	P= Lemon		
Q=Onion	Q= Olives		
R=Lettuce	R= Prickle pears		
S=Spring onions			
T=Green pepper	X= Other (Specify)		
U=Bell pepper			
V=Pumpkin			
X= Other (Specify….)			

Civ: Production and disposition of crop products (C23=C25+C27+C28+C29+C30+C31+C32+C33)

C22. Crop Code ***(refer to crop codes)***	**C23.** What was the quantity harvested?	~~C24.~~	**C25.** What quantity of unprocessed crop harvested was sold? ***(If no sale, record 00 and skip to C27)***	**C26.** To whom was quantity mostly sold to? 1= Govt. organizations (through auction sales) 2=Parastatals 3= Private trader local market village 4= Private trader district market 5= Private trader at farm gate 6= Development Partners 7=NGOs 8= Neighbour/Relative 11= Other, specify

Production and disposition of crop products Cont'd

Crop Name	Crop Code ***(refer to crop codes)***	**C27.** What quantity was processed for sale? **(if none record 00).**	**C28.** What quantity was processed for animal feed? **(if none record 00).**	**C29.** What quantity was given to: **(if none record 00).** A. Land lord / proprietor B. For labour C. Friends/relatives D. Exchange for other goods Q. None X. Others (specify)	**C30.** What quantity was consumed by household? (including that before harvest)	**C31.** What quantity was used for seed? **(if none record 00).**	**C32.** What Quantity was stored/ currently in storage? **(if none record 00).**	**C33**. How much was lost after harvest (%)? ***(Holder estimate)*** Write 00 if none then skip 34 to D1	**C34.** Where did MOST losses occur? 1= on the field 2= during the storage 3= during the transport 4=Loss at Processing 5=Loss at Packaging 6=Loss at Sales 8 = others

SECTION D: AGRICULTURAL PRACTICES (THEME 6)

D1. Which of the following seed inputs did (holder) use? **01=Yes** **02= No** ***(if no, skip to next input)*** ***Multiple response***	D2. What was the Main Source of seeds?	D3. Which of the following fertilizer inputs did (holder) use? 01=Yes 02= No ***(if no, skip to D5)*** ***If none skip to D5*** ***Multiple response***	D4. What was the Main Source of Fertilizer used?	D5. Which of the following Pesticides inputs did (holder) use? 01=Yes 02= No ***If none skip to Section E***	D6. What was Main Source of Pesticides?
A. Self-production		A= Mineral fertilizers (Inorganic fertilizer)		A. Insecticides	
B. Local seeds	1=Own	B=Organo-mineral fertilizers	1=own	B. Herbicides	1=own
C. Improved seeds	2=Exchanges within community	C= Organic fertilizer	2=markets	C. Fungicides	2=markets
D. Hybrid seeds	3=Local markets	D=Biofertilizers	3=cooperatives	D. Rodenticides	3=cooperatives
E. Genetically Modified (GM) seeds	4=Seed company	E=Manure	4=government	Q=None	4=government
F. Sethopo	5=Donation	Q=None	5=NGOs	X. Other pesticides (Specify…)	5=NGOs
	6=Cooperatives	X=Other organic materials to enhance plant growth			
	7=Government				
	8=NGOs				

SECTION E: IRRIGATION SYSTEM (THEME 3)

E. IRRIGATION SYSTEM

E1. Was any of the holding's field irrigated during 2019/2020 Agricultural Year? 01= Yes (*Skip to E3*)
02= No if No, continue

E2. What was the main reason for not irrigating?
(Refer to codes) Skip to Next Section

Holder ID	**Field No.**	E3. What was the main source of irrigation water? ***(Refer to codes)***	E4. What was the main method of irrigation used? ***(Refer to codes)***	E5. What area was irrigated (acres)?	
1					
2					

(E2)
Reasons for not Irrigating

01 No irrigation System
02 Inadequate Water
03 Adequate rains (no need)
09 Other (Specify) (*for each field*)

(E3)
Source of Irrigation Water
1= Surface water River /Lake/Pond/Mountain *(by gravity))*
2= Surface water (River /Lake/Pond (*pump*))
3= Dam /Reservoir /earth dam (Manual watering (buckets/cans)
4=Dam /Reservoir /earth dam (pump)
5= Ground water (Deep Well/Tube well) (Motor Pump)
6= Ground water (Shallow well) Dam /Reservoir /earth dam (Manual watering (buckets/cans)
7=Mixed surface water and groundwater
8= Standpipe
9= Harvested
10 = Borehole (manual)
11 = Borehole (mechanized)
12 = Treated Waste water/untreated
15= Other Canal

(E4)
Irrigation Method

01 Gravity
02 Hand Pump
03 Motor Pump
04 Manual watering (buckets/cans)
07 Other (Specify) (*for each field*)

SECTION F: SERVICES FOR AGRICULTURE

Fi: Extension Services

F1. Did the holding receive extension services during 2019/2020 Agricultural Year? 1= Yes 2= No **(IF NO, skip to F5)**	F2. Which of the following extension service providers did the holding interact with? **(SELECT ALL THAT APPLY)** A. MAFS veterinary staff B. MAFS agricultural extension officer C. Farmers' unions D. Local/INGO E. Fisheries F. Forestry G. Private sector Dealers H Environmental Protection Agency (EPA) X. Other	F3. Which of the following extension services did holding receive? **(SELECT ALL THAT APPLY)** A. Farm management B. Selection of crop C. Input use D. Credit E. Farm mechanization F. Livestock husbandry G. Plant protection H. Environmental conservation I. Marketing J. Water irrigation and drainage K. Nutrition X. Other	F4. Which of the following extension service providers' best satisfied the holding's need? **(SELECT ALL THAT APPLY)** A. None B. MAFS veterinary staff C. MAFS agricultural extension officer D. Farmers' unions E. Local/INGO F. Fisheries G. Forestry H. Private sector Dealers I. Environmental Protection Agency (EPA) J. Nutrition Q. None X. Other	F5. Did the holding receive any agricultural related information? 1= Yes 2= No **IF NO, GO TO SECTION F8**	F6. What type of Information did holding receive? **(SELECT ALL THAT APPLY)** A. Weather B. Crop varieties C. New agricultural practices D. Farm machinery E. Credit facilities F. Plant diseases and pests G. Marketing H. Livestock husbandry & diseases I. Agronomic practices J. Water & Irrigation K. Fish farming L. HIV/AIDS M. Nutrition X. Other	F7. What was the MAIN source of information? 01= Radio 02= Television 03= Internet 04= Newspaper 05= Agric. Magazines/ Bulletins 06= Extension officers 07= Farmer to farmer 08= Farmers' associations 09= Agric. show/exhibitions 10= Neighbour 15= Other

Fii. Access to Agricultural Credit/Loan

F8. Did this holding apply for a Credit/Loan for agricultural purposes in the last 5 years? 1= Yes 2 = NO Skip to E15	F9. Was the credit/loan granted? 1= Yes 2 = No Skip to E14	F10. What was the MAIN Source of Credit/Loan received during last 5 years? 01= Commercial Banks 02= Micro finances institutions 03= Farmers' Union 04=Input supplier 05= Money lenders 06= Self-help group 07= Government 08= Cooperatives 09= NGO 10= Family and friends 15= Other	F11. What was the credit/Loan Period? 1= Less than 12 months 2= Between 12 and 36 months 3= More than 36 months 8= Others (specify)	F12. What was the **MAIN** purpose for the credit/Loan? 01= Agriculture labour 02= Seeds 03= Fertilizer 04= Agro chemicals 05= Farm implements and machinery 06= Irrigation structures 07= Livestock 08= Aquaculture (marine resources and fisheries) 09= Trading agricultural produce 10= Tractor 11= Borehole 12= De-bushing (clearing of land) 13= Threshing 18= Other agricultural purpose (Specify)	F13. What was the **MAIN** Type collateral security? 0= No collateral 1= Land title 2= Crops 3= Livestock 4= Salary 5= Third party 6= Property (Movable/Immovable) 7= Investment 11= Other (specify)	F14. Why was the credit/loan not granted? ***(MAIN reason)*** 1= Lack collateral security 2= Not profitable 3= Income too low 4= Previous debt problems 5=Could not get a guarantor 6= Amount applied for too high 7=Inappropriate purpose of loan 8=Did not meet requirements 9= Late application 12=Other	F15. What were the reasons for not seeking credit/loan ? 01 No need for credit 02 Unavailability of lending facilities 03 Interest too high 04 Negative Past experience 05 Unaware of the service 09 Other (specify)

SECTION G: FARM IMPLEMENT AND ASSETS

Machinery/Equipment		**G1.** Did the holding use (Name of Equipment) during the past 12 months? 01=Yes 02= No ***(If no, go to next equipment)***		**G2.** What was the source of ownership? 1=Owned solely by the holder 2=Owned by Members of the holder's household 3=Owned by the household jointly with other households 4=Provided by the landlord 5=Provided by other private holders (excluding cooperatives) 6=Provided by a cooperative (farmers' Union) 7=Provided by a private agricultural service establishment 8=Provided by a government agency 9=Rented 10=Borrowed 14=other (specify)
S/N	**Machinery**	**Crops**	**Livestock**	
1	Forage Harvester			
2	Combine Harvester/			
3	Truck/Other Vehicles			
4	Generator			
5	Sprayer			
6	Incubator (***livestock***)			
7	Ridger (Ripara)			
8	Scotch Cart			
9	Tractor Seed Planter			
10	Tractor			
11	Tractor Plough			
12	Threshers			
13	Power Tiller			
14	Milking Machine (***livestock***)			
15	Disks Harrower			
16	Water Pump (Pompi)			
17	Honey Extractor (***livestock***)			
18	Drip Irrigation			
19	Other (specify).....			
	Manual			
20	Hoe			
21	Digging Fork			
22	Rake			
23	Spade			
24	Hand Pump And Other Hand Irrigation Devices			
25	Transplanter			
26	Sprayer (Knap Sack)			
27	Ox-Plough			
28	Seed Planter			
29	Scotch Cart			
30	Disks Harrower			
31	Cultivator (Sekofolo)			
32	Yoke			

33	Other (specify)			

SECTION H. Non- Residential Buildings

H1. Did the holding use non-residential building for agricultural purposes during 2019/2020 Agricultural Year? 01= Yes 02= No (*Skip to Section J)*	H2. What was the purpose of the non-residential building?	H3. What was the Area (acres) for each type?	H4. What is the tenure of the building? 01=Owned 02=Rented 03=Borrowed 07=Other	H5. What type of Storage Facility does the holding have? 1=Unimproved granary 2=Improved granary 3=Under shelter outside 4=Silo 5=Cold Storage 6=Sealed Container 7=Store/Warehouse 11=Other
	1.For keeping livestock other than poultry			
	2.For keeping poultry			
	3.For storing agricultural products			
	4.For mixed or other purposes			

SECTION J: LABOUR INPUT (WORK ON THE HOLDING) THEME 9

J1. Did this holding have any employees for the past agricultural year?

Yes= 1, No=2 if No skip to Next Section

Employee ID (CAPI generated)	J2. Names of farm employees	J3. Was (*name*) male or female? 01=Male 02=Female	J4.What was (name's) age? ***(In completed years)***	J5. What was (*name's*) terms (nature) of employment?	J6. What was (*name's*) working time on the holding? ***(Refer to codes)***	J7. What types of services were provided by (*name*)? (*multiple response*) ***(Refer to codes)***	J8. Did (*name*) work for pay? 01=Yes 02= No ***(Skip to Next employee)***	J9.What was the form of payment? ***(Multiple response)*** ***(Refer to codes)***

Codes for Working Time (J6)	**Codes for Type of Service (J7)**	**Codes for Form of Payment (J9)**	**Codes for Terms (Nature) of Employment (J5)**
01= Full-time work for less than 1 month in a Year	01=Tree pruning	01= Money	01= Temporary
02= Full-time work 1-3 months in a Year	02= Crop harvesting	02= Farm produce	02= Permanent
03=Full-time work 4-6 months in a Year	03= Weeding	03= Exchange of Labour	
04= Full-time work 7+ months in a Year	04= Planting	05= Other forms of in-kind labour	
05= Part-time work for the less than 1 month in a Year	05= Applying pesticides		
06 = Part-time work 1-3 months in a Year	06= Herding		
07= Part-time work 4-6 months in a Year	07= Sheep/goat Shearing		
08= Part-time work 7 + months in a Year	08= Farm Administrations		
	11= Other (Specify)		

SECTION K: LIVESTOCK (THEME 5)

Type of Livestock	K1. Does the holding keep any of the following livestock? (***Note that the reference period for the livestock is the day of enumeration)*** 01= Yes 02= No ***(Multiple response)***	K2. What is the type of livestock system for the holding? *(If J1= 01-06)* 01= Grazing System 02= Industrial System 03= Mixed System
01=Cattle		
02=Sheep		
03=Goats		
04=Horses		
05=Donkeys		
06=Mules		
07=Pigs		
08=Rabbits		
09=Chicken		
10=Duck		
11=Geese		
12=Turkey		

CATTLE

Type of Cattle	K3a. Did the holding keep any of the following Improved Cattle (Exotic)? 1=Yes 2=No if No, skip to K3c	K3b.How many improved cattle does the holding have?	K3c. Did the holding keep any of the following indigenous cattle 1=Yes 2= No	K3d.How many indigenous cattle does the holding have?	K4. How many cattle are kept mainly for meat/milk/breeding/draught Power?			
	A	**B**	**C**	**D**	Meat	Dairy	Breeding	Draught Power
Females Calves under 1 Year								
Female Calves 1 Year but less than 2 Years								
Males Calves under 1 Year								
Male Calves 1 Year but less than 2 Years								
Bulls (2 years and over)								
Cows (2 years and over)								
Grand Total								

SHEEP

	K5a. Did the holding keep any of the following Improved sheep (Exotic)? 1=Yes 2=No if No, skip to K5c	K5b.How many improved sheep does the holding have?	K5c. Did the holding keep any of the following indigenous sheep 1=Yes 2= No	K5d.How many indigenous sheep does the holding have?	K6. How many sheep are kept mainly for meat/wool/breeding?			
Type of Sheep	**A**	**B**	**C**	**D**	Meat	Wool	Breeding	
Females Sheep under 1 Year								
Female Sheep 1 Year and above								
Males Sheep under 1 Year								
Male Sheep 1 Year and above								
Total Sheep								

GOATS

	K7a. Did the holding keep any of the following Improved goats (Exotic)? 1=Yes 2=No if No, skip to K7c	K7b.How many improved does the holding have?	K7c. Did the holding keep any of the following indigenous goats 1=Yes 2= No	K7d.How many indigenous goats does the holding have?	K8. How many Goats are kept mainly for meat/mohair//breeding?			
Type of Goats	**A**	**B**	**C**	**D**	Meat	Mohair	Breeding	
Females Kids under 1 Year								
Female Goats 1 Year and above								
Males Kids under 1 Year								
Male Goats 1 Year and above								
Total Goats								

PIGS

	K9a. Did the holding keep any of the following Improved Pigs (Exotic)? 1=Yes 2=No if No, skip to K9c	K9b.How many improved Pigs does the holding have?	K9c. Did the holding keep any of the following indigenous pigs 1=Yes 2= No	K9d.How many indigenous pigs does the holding have?	K10. How many pigs are kept mainly for meat/breeding?	
Type of Pigs					**Meat**	**Breeding**
Improved Pigs						
Male						
Piglet less than 3months						
Pigs 3 months to 9 months						
Pigs Over 9 months						
Total Pig						

EQUINES

	K11. How many male/female equines does the holding own, raise or manage?		K12. How many equines are kept mainly for transport/draught power/breeding?		
Type	**Male**	**Female**	**Transport**	**Breeding**	**Draught Power**
Horses					
Donkeys					
Mules					

POULTRY

	K13. What is the number of poultry kept by the holding?	K14. How many are kept mainly for meat/eggs/ breeding		
Type of Poultry		Meat	Eggs	Breeding
Improved Chicken				
Koekoek				
Other Improved				
Sub-Total				
Indigenous Chicken				
Total Chicken				
Ducks				
Geese				
Turkeys				
Grand Total				

Rabbits			
	Male	**Female**	**Total**
K15. How many male/female improved rabbits does the household own, raise or manage?			

Livestock Feeding Practices during 2019/2020 Agricultural Year

K16. What is the type of feeding for each type of livestock? (*multiple response)*

Type	**Improved**	**Unimproved**
Cattle		
Sheep		
Goats		
Pigs		
Horse		
Donkeys		
Mules		
Poultry		
Rabbits		

Type of Feeding

01 Forages/Roughages
02 Agro-industrial by-products
03 Swill/Household Waste
04 Supplements/Additives
05 Other (Specify)

Stock Change

Livestock Serial No.	**Livestock Type**	**Livestock Intake 2019/2020**			**Livestock Off-take 2019/2020**				**Livestock Losses (2019/2020**					
		K17 What was the Number of livestock bought or received from others?	**K 18** How many were born alive?	**K19** What was the Total livestock intake?	**K20** What was the Number consumed by the holding?	**K21** What was the Number sold/traded, or otherwise disposed of for slaughter?	**K22** What was the Number given away (gifts, traditional fines, bridal price)?	**K23** What was the Total livestock off-take?	**K24** What was the Number of deaths due to disease?	**K25** How many of livestock were stolen or lost?	**K26** How many of livestock were lost to predator?	**K27** How many of livestock died due to starvation?	**K28** What was the Number of losses due to other reasons (Specify) e.g. drowning, accidents)?	**K29** What was the Total livestock Losses?
1	Cattle													
2	Sheep													
3	Goat													
4	Pig													

Agro-Processing and Marketing

K30. Did the holding produce any of the following special meat, dairy and other animal products during the last agricultural reference period? 1=Yes 2=No ***(Next product)***	K31. Total quantity produced (Kg.) ***(For milk give in litres)***
1 = Pork	
2 = Beef	
3 = Goat (meat)	
4 = Lamb (meat)	
5 = Milk (cow***) (litres)***	
6 = Butter	
7 = Cheese (cow)	
8 = Ice Cream	
11 = Others (specify)	

B. COMMUNITY PROFILE QUESTIONNAIRE

SECTION A: IDENTIFICATION

A.	IDENTIFICATION INFORMATION	Codes	
A1. District			
A2. Constituency			
A3. Community Council			
A4. Village			
A5. Chief/Headman			
A6. PSU Code			
A7. Serial Number of PSU			
A8. Zone			
A9. Location of Village (Coordinates)			
A10. Name of Respondent		A11. Contact number of respondent	

STAFF DETAILS			
Name of Enumerator			
Number of Visits	**1**	**2**	**3**
Date of Interview			
Name of Supervisor			
Date of Inspection			

Proximity of Village to Basic Services and Service Institutions						
	A	**B**	**C**	**D**	**E**	**F**
Facility	**Q1.** Is the facility present in this village? 1- Yes 2-No **(go to Q3)**	**Q2.** How many facilities are present in this village? (Next facility)	**Q3.** Name of Nearest Facility	**Q4.** What is distance from village center to the nearest facility? (km) 0 - 1 = 1 2 - 3 = 2 4 - 5 = 3 6 - 7 = 4 >7 = 5 (in km)	**Q5.** What is the common means of transport to the nearest facility? 1.Walking 2. Taxi (car) 3. Bus / Minibus 4. Horse 5. Other specify	**Q6.** What is the time taken to reach the nearest facility from village center (in Min)? 00 – 14 = 1 15 – 29 = 2 30 – 44 = 3 45 – 49 = 4 50 – 59 = 5 60 – 119 = 6 120+ = 7
Education Facility						
a. Day Care Centers						
b. Pre-School						
c. Primary School						
d. High School						
e. Vocational						
f. College/University						
g. Others, Specify						
Health Facility	**A**	**B**	**C**	**D**	**E**	**F**
	Q1. Is the facility present in this village? 1- Yes 2-No **(go to Q3)**	**Q2.** How many facilities are present in this village? (Next facility)	**Q3.** Name of Nearest Facility	**Q4.** What is distance from village center to the nearest facility? (km) 0 - 1 = 1 2 - 3 = 2 4 - 5 = 3 6 - 7 = 4 >7 = 5 (in km)	**Q5.** What is **the** common **m**eans of transport to the nearest facility? 1.Walking 2. Taxi (car) 3. Bus / Minibus 4. Horse 5. Other specify	**Q6.** What is the time taken to reach the nearest facility from village center (in Min)? 00 – 14 = 1 15 – 29 = 2 30 – 44 = 3 45 – 49 = 4 50 – 59 = 5 60 – 119 = 6 120+ = 7
a. Private Medical Clinic						
b. Hospitals						
c. Health Centers						
d. Family Planning Centers						
e. Health Posts						
f. Chemist/ Pharmacy						
g. Others, Specify						

Service Facility	**A**	**B**	**C**	**D**	**E**	**F**
	Q1. Is the facility present in this village? 1- Yes 2-No **(go to Q3)**	**Q2.** How many facilities are present in this village? (Next facility)	**Q3.** Name of Nearest Facility	**Q4.** What is distance from village center to the nearest facility? (km) 0 - 1 = 1 2 - 3 = 2 4 - 5 = 3 6 - 7 = 4 >7 = 5 (in km)	**Q5.** What is the common means of transport to the nearest facility? 1.Walking 2. Taxi (car) 3. Bus / Minibus 4. Horse 5. Other specify	**Q6.** What is the time taken to reach the nearest facility from village center (in Min)? 00 – 14 = 1 15 – 29 = 2 30 – 44 = 3 45 – 49 = 4 50 – 59 = 5 60 – 119 = 6 120+ = 7
a. Post Office						
b. Police Station						
c. Bank						
d. Shop						
e. Business Center						
f. Public Phone						
g. Mortuary						
h. Others, Specify						
Agriculture Facility	**A**	**B**	**C**	**D**	**E**	**F**
	Q1. Is the facility present in this village? 1- Yes 2-No **(go to Q3)**	**Q2.** How many facilities are present in this village? (Next facility)	**Q3.** Name of Nearest Facility	**Q4.** What is distance from village center to the nearest facility? (km) 0 - 1 = 1 2 - 3 = 2 4 - 5 = 3 6 - 7 = 4 >7 = 5 (in km)	**Q5.** What is the common means of transport to the nearest facility? 1.Walking 2. Taxi (car) 3. Bus / Minibus 4. Horse 5. Other specify	**Q6.** What is the time taken to reach the nearest facility from village center (in Min)? 00 – 14 = 1 15 – 29 = 2 30 – 44 = 3 45 – 49 = 4 50 – 59 = 5 60 – 119 = 6 120+ = 7
a. Fertilizer Dealer						
b. Pesticides Dealer						
c. Seed Dealer						
d. Veterinary Services						
e. Agric. Processing Facilities						
f. Periodic or Permanent Agric. Produce Market						
g. Wool shed						
h. Sheep Stud						

Public Transport			
Q7. Do you have these types of public transportation in this village?		1. Bus……. 2. Taxi……. 3. Van……. 4. Others Specify……	1-Yes 2-No

Road Network			
Q8. Are any of the following roads present in this village?	1-Yes 2-No	**Q9**. What is the present condition of the roads?	Codes
1. Tarred Road…….			
2. Gravel…….			
3. Natural/Earth Surface…….			

Q9 Codes (Roads Conditions through the year)
1. Good throughout
2. Fair (part of the year)
3. Poor throughout the year

(For those coded 2 for both tarred and gravel roads in ques. 8)		
Q10. If there are no tarred/gravel roads, how long does it take from this village to the nearest tarred/gravel roads?	(in min.)…….	
Q11. If there are no natural/earth surface, how long does it take from this village to the nearest tarred/gravel & natural/earth surface roads?	(in min.)…….	

Q12. **Is there community water supply in this village?** 1=Yes 2=No	Name of Supplier
Q12_1. What kind is it? 1. Piped water community supply……. 2. Public borehole…… 3. Public Well……	
Q12_2. Who supplied it? ***1.*** Company ***2.*** Department ***3.*** Donor Agency ***4.*** The community	
Q12_3. Mention the name of the supplier	

Q13. Are there village water committees established in this village?	1-Yes 2-No	

Electricity Service

Q14. Is there electricity supply in this village?	1-Yes 2-No

Groups or Cooperative societies and Credit Institutions

Q15. Are there any credit institutions/Groups or Cooperative societies in this village? *(If NO go to Next Q 17.)*	1-Yes 2-No

	Types of Credit Institution	**Codes**	**Types of Credit Institution**	**Codes**
Q16. What is the Types(s) of the credit institution/Groups or Cooperative societies?	1-Commercial Banks		5-Family or friends	
	2-Government		6-Input supplier	
	3-Cooperative Credit		7-Self-help group	
	4-Money Lenders		8-Other sources	

Source of Employment

Q17. What are the types of job opportunities in **this** village? *(multiple response)* 1. Weeding 2. Shearing 3. Tree pruning 4. Planting 5. Applying pesticides 6. Herding 7. Mining 8. Construction 9. Fatofato (PAP) poverty alleviation programme	

Land Tenure

Q18. What is the most common form of land tenure for people living in this village? 1. Inheritance 2. Form C 3. Leased 4. Title Deed	Code

Village Programmes and Services

Sr. No.	Q19. Are any of these development projects present in this village? 1-Yes 2-No **(Skip to Q22)** Items	**Q20**. Were any of the listed projects implemented in the village in the last Agricultural year?	1-Yes 2-No	**Q21**. Did the project address the needs of the village?	1-Yes 2-No
1.	Water provision				
2.	Infrastructure (roads, markets, bridges				
3.	School/classroom construction				
4.	Other school related				
5.	Health related (e.g. Vaccination)				
6.	Demonstration garden				
7.	Livestock improvement				
8.	Poultry and birds				
9.	Improved varieties/new crops				

10.	Improved Agricultural techniques		
11.	Environmental		
12.	Agriculture Shows		
13.	Electricity schemes		
15.	Other (specify)		

Other Agric. Services	
Q22 Do you have an area equipped for irrigation?	1- Yes 2-No
Q23. Do you have irrigation facilities in your area?	1- Yes 2-No
Q24. Do you have facilities for maintaining agricultural machinery in this village?	1- Yes 2-No
Q25. Do you have existing farmers' associations or cooperatives or any other providing support and services to the farmers? *If yes, specify* :.....	1- Yes 2-No
Q26. Are there any agricultural extension services available in your area?	1- Yes 2-No
Q27. What type of natural disaster is the community prone to? ***(Multiple response) if none, record 00.*** 1. Strong winds 2. Floods 3. Hail 4. Snow 5. Droughts 6. Pests 7. "letono/ thunder storms"	
Q28. Are there any agricultural related reported crimes?	1- Yes 2-No

GLOSSARY OF TERMS

Agricultural holder: civil person, group of civil persons or juridical person who makes the major decisions regarding resource use and exercises management control over the agricultural holding operation.

Agricultural holding: 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.

Census: statistical collection involving the enumeration of all units (large sample-based collections are sometimes also referred to as censuses).

Census classical approach: a census conducted as a single one-off operation in which all the census information is recorded.

Census of agriculture: statistical operation for collecting, processing and disseminating data on the structure of agriculture, covering the whole or a significant part of a country.

Typical structural data collected in a census of agriculture are size of holding, land tenure, land use, crop areas, irrigation, livestock numbers, labour and other agricultural inputs. In an agricultural census, data are collected at the holding level, but some community-level data may also be collected.

Census reference day: point in time used for data collection on livestock numbers and other inventory items.

Census reference year: period of twelve months, either a calendar year or an agricultural year, generally encompassing the various time reference dates or periods of data collection for individual census items.

Computer-Assisted Personal Interviewing (CAPI)**:** interviewing method whereby the enumerator records responses using an electronic questionnaire on mobile devices such as personal digital assistants, tablets, laptops or smartphones.

Enumeration area: small geographical unit defined for census enumeration purposes.

Field: piece of land in a parcel separated from the rest of the parcel by easily recognizable demarcation lines, such as paths, cadastral boundaries, fences, waterways or hedges.

Frame: the basis used for identifying all the statistical units to be enumerated in a statistical collection.

Global Positioning System (GPS)**:** system that makes it possible to find the geographic position of a point on the earth's surface by longitude and latitude. GPS allows geo-referencing of the holding, the household and the land to the appropriate administrative areas. GPS devices enable much more rapid measurement of areas than traditional objective methods for area measurement.

Household: arrangements made by persons, individually or in groups, for providing themselves with food or other essentials for living.

Livestock: all animals, birds and insects kept or reared in captivity mainly for agricultural purposes.

Paper and Pen Interview (PAPI): traditional interviewing method whereby enumerators interview the respondents and data is collected by the enumerators using paper questionnaires.

Permanent crops: crops with a more than one-year growing cycle.

Population census: the total process of planning, collecting, compiling, evaluating, disseminating and analyzing demographic, economic and social data at the smallest geographical level pertaining, at a specified time, to all persons in a country or in a well-delimited part of a country.

Primary Sampling Unit (PSU): This is an element or group of elements of a population, which is convenient for selecting samples. A sampling unit can be a group of persons, households or administrative are PSUs. The PSUs are sampled from a frame of agricultural PSUs. The boundaries of the PSUs are defined on a map. A description of the boundary of the PSUs and a locality list will be supplied as far as they are available.

Production: actual quantity of produce, after drying and processing, ready for sale or consumption.

Rural households: households living in areas designated as rural areas, usually defined by the population census.

Sample enumeration: sampling of the whole or part of the target population for the census.

Sample survey: collection of data from a sample of units, rather than all units, as in a census.

Sampling errors: errors in statistics obtained from a sample survey because data are collected from only sample units.

Sampling frame: list of units to be sampled.

Single-stage sampling: sampling scheme in which the sample is selected directly from a list of units covered by the survey.

Subsistence Farmer: farming whose products are intended to provide for the basic needs of the farmer, with little surplus for marketing.

Successive crops: temporary crops grown more than once on the same land in the same agricultural year.

Table: primary form of presentation of statistical data, involving the summarizing of the results.

Temporary crops: crops with a less than one-year growing cycle.