SEASONAL AGRICULTURAL SURVEY

2014

National Institute of Statistics of Rwanda

The National Institute of Statistics of Rwanda

Po. Box 6139 Kigali Rwanda
Website: www.statistics.gov.rw
Email: info@statistics.gov.rw

Seasonal Agricultural Survey

2014

May 2015


BANQUE AFRICAINE DE DEVELOPPEMENT
AFRICAN DEVELOPMENT BANK


UKaid
from the British people

FOREWORD

The Government of Rwanda conducted the 2014 Seasonal Agriculture Survey (SAS) from November 2013 to October 2014 to gather up-to-date information for monitoring progress on agriculture programs and policies in Rwanda, including the Second Economic Development and Poverty Reduction Strategy (EDPRS II) and Vision 2020.

The 2014 SAS covered three agricultural seasons (A, B and C) for the year 2014 in Rwanda. Respondents have been grouped in two categories: Agricultural Operators and Large Scale Farmers (LSF). The survey provides data on background characteristics of the agricultural operators, farm characteristics (area, yield and production), agricultural practices, agricultural equipments and use of crop production.

The 2014 SAS was implemented by the National Institute of Statistics of Rwanda (NISR) in partnership with the Ministry of Agriculture and Animal Resources (MINAGRI), National Agriculture Export Board (NAEB), Rwanda Agricultural Board (RAB), Ministry of Finance and Economic Planning (MINECOFIN), the National Bank of Rwanda, Rwanda Natural Resources Authority (RNRA) and the Rwanda Environmental Management Authority (REMA).

Results of the 2014 SAS indicated that the main crops grown in 2014 Season A were Cassava followed by banana, beans and maize. In Season B, the main crops grown were banana followed by cassava, beans, sorghum and maize. Season C was quite different as the main crops were Irish potatoes followed by beans and vegetables.

This report is an important tool that addresses key agricultural information needs that inform policy makers and other stakeholders of priority areas of intervention.

We are grateful to the NISR staff and other partners who worked tirelessly to ensure the survey was successfully implemented.

We hope this report will be of value to users.

Yusuf MURANGWA
Director General, NISR

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS

AAIC	Agricultural Assessment International Corporation
AfDB	African Development Bank
CSPro	Census and Survey Processing System
GIS	Geographic Information System
GPS	Global Positioning System
Ha	Hectare
Kg	Kilogram
Kg/Ha	Kilogram per Hectare
LSF	Large Scale Farmers
MFS	Multiple Frame Survey
MINAGRI	Ministry of Agriculture and Animal Resources
MT	Metric Tones
NISR	National Institute of Statistics of Rwanda
PDA	Personal Digital Assistant
PPS	Probability Proportional to Size
PSU	Primary Sampling Units
RNRA	Rwanda Natural Resources Authority
RWF	Rwandan Franc (currency)
SAS	Seasonal Agricultural Survey
SPSS	Statistical Package for Social Science.
Sq.m.	Square meter.
SSU	Secondary Sampling Units.

EXECUTIVE SUMMARY

The National Institute of Statistics of Rwanda (NISR) conducts the annual Seasonal Agricultural Surveys (SAS) covering all three agricultural seasons in Rwanda:

- ✓ Season A that starts in September and ends with February of the following year;
- ✓ Season B that starts in March and ends with June of the same year; and
- ✓ Season C that starts inJulyandend in September of the same year.

Sampling methodology and sample size

The SAS sample is composed of two categories of respondents: Agricultural Operators[1] and Large Scale Farmers (LSF)[2].

For the 2014 SAS, NISR used as sampling method a dual frame sampling design combining selected area frame sample[3] segments and a list of Large Scale Farmers. NISR used also imagery from RNRA with a very high resolution of 25 centimeters to divide the total land of the country into twelve strata.

A total number of 540 segments were spread throughout the country as coverage of the survey with 24,475 and 25,167 agricultural operators in Season A and Seson B respectively. From these numbers of agricultural operators, sub-samples were selected during the Second Phases.

Furthermore, enumerated Large Scale Farmers were 498 in 2014 Season A and 502 in Season B. Season C considered 152 segments counting 7,684 Agricultural Operators from which 609 Agricultural Operators were selected for survey interviews.

[1] Agricultural operators: These are Small Scale Farmers within the Segments

[2] Large Scale Farmer: The person, institution or agricultural or livestock cooperatives, that satisfies the unit measurements defined by survey rules e.g. farmer growing crops on ten hectare of land or more or any farmer raising 70 or more cattle, 350 goats and sheep, 140 pigs, 1,500 chicken or managing 50 bee hives.

[3] Area frame sampling: A method in which an area to be sampled is sub-divided into smaller blocks that are then selected at random and then again sub-sampled or fully surveyed. This method is typically used when a complete frame of reference is not available to be used.

Field work

The field work consisted of screening land areas on maps and completing screening forms and farm questionnaires and it has been conducted as follows:

- In Season A, the fieldwork commenced on 14 November 2013 and concluded on 22 March 2014,
- In Season B, the fieldwork started on 15 April and ended on 5July 2014,
- In Season C, the field work started on 15 September and ended on 7 October 2014.

Data analysis

The main areas of data analysis included the demographic and social characteristics of Agricultural Operators and LSF; farm characteristicsi.e Area, yield and production; agricultural practices; small agricultural equipments; and use of crop production.

Results from 2014 SAS

Crop land

In 2014 Season A, the main crops were Cassava (22.6% of the total cultivated area), Banana (22.5% of the total cultivated area), Beans (17.8% of the total cultivated area), and Maize (12.3%of the total cultivated area); other crops took 24.8% of the total cultivated area.

In 2014 Season B, the main crops were Banana (23.6%of the total cultivated area), Cassava (23.3% of the total cultivated area), Beans (16.6% of the total cultivated area), Sorghum (8.5% of the total cultivated area) and Maize (5.2% of the total cultivated area). Other crops took 22.8% of the total cultivated area.

Season C was quite different as the main crops were Irish Potatoes (52.2% of the total cultivated area), Beans (22.2% of the total cultivated area) and Vegetables (16.9% of the total cultivated area). Other crops took 8.7% of the total cultivated area.

The average size of farm land was 0.23 hectares in Season A, 0.22 hectares in Season B, and 0.16 Hectares in Season C for each Agricultural Operator. However, fallow land represented 22.6% in season A and 22.5% in season B of the total arable land of Rwanda with more than 75 % in Stratum 1.1.

Agricultural Inputs

Use of seeds and fertilizers:

For Agricultural operators, the survey illustrated the following information:

- ***The use of traditional seeds***: between 87% and 94% of Agricultural operators used traditional seeds during all seasons,
- ***The use of organic fertilizers***: between 44% and 62% of Agricultural operators used organic fertilizers during all seasons,
- ***The use of inorganic fertilizers***: between 17% and 20% of Agricultural operators used inorganic fertlizers in season A and B while in season C they were 58%.

For Large Scale Farmers (LSF) and during all seasons, the survey provided the following information:

- ***The use of traditional seeds***: between 60% and 89% of all LSF,
- ***The use of organic fertilizers***: between 57% and 80% of all LSF,
- ***The use of inorganic fertilizers***: between 37% and 58% of all LSF.

Use of pesticides:

The survey illustrated that the use of pesticides varies with agriculture seasons. Therefore:

- In season A and B, the have been 10.9% and 11.1% of all Agricultural Operators respectively,
- In season C, they reached 64.1% of all Agricultural Operators.

Among the Large Scale farmers, the percentage of those who used pesticides was 32.2% and 33.3% during Season A and B respectively.

Agricultural practices

Land use

The survey results illustrated that the share of agricultural land used to grow crops varies with seasons and type of plots.
Therefore:

- In Season A, : 27.2% in pure stand[4] and 72.8% in mixed stand[5],
- In Season B: 19.1% in pure stand and 80.9% in mixed stand,
- In season C: 55.8% in pure stand and 44.2% in mixed stand.

For LSF the share between pure stand and mixed stand in season A was 75.9% and 24.1% respectively while in season B, the percentage share was 46.8% and 53.2% respectively.

Irrigation practices

In season A and B, between 2% and 3% of all agriculture operators' practised irrigation but in season C, their percentage was 26.1%.
The share of Large Scale Farmers who practised irrigation was between 13% and 15% during season A and B.

Anti-erosion activities

In seasons A and B, 49.2 % of all agriculture operators practised anti-erosion activities but in season C, their percentage was 73.2%.
The share of Large Scale Farmers who practised anti-erosion activities was 14.4% in Season A and B.

[4] Pure stand is a plot of land which is planted with one crop.

[5] Mixed stand is a plot of land which is planted with various crops.

Production

Season A

In Season A, Tubers and Roots (35.9%) gained the highest share of crop production by groups of crops in Rwanda followed by Banana (26.3%) and Cereals (9.9%). The contributions of the group of Vegetables and Fruits and the group of Legumes and Pulses were respectively 4.7% and 7.3%.

Season B

In Season B, the group of Tubers and Roots had again the highest share of crop production (39.2%) followed by Banana (26.4%) and Cereals (6.9%). Other crop groups contributed as follows: Vegetables and Fruits (3.9%) and Legumes and Pulses (6.1%).

Season C

In season C, the highest share of crop production was o Irish Potatoes (73.2%) followed by Vegetables (24.5%). Other individual crops contributed less than 2.0%.

Chapter 1: Introduction

1.1 Need for Agricultural Statistics

During the last decades, agriculture had a lot of transformation. It contributed more than 30% of the GDP and employing over 70% of the population. Over the course of EDPRS I, agriculture contributed significantly to poverty reduction. In recognition to its potential in economic development, food security and poverty reduction, the government has set a very ambitious agriculture agenda aiming at an annual average growth of 8.5% over the course of EDPRS II (2012-2017).

Therefore, to provide timely and reliable statistics for agriculture sector, the National Institute of Statistics of Rwanda (NISR) in collaboration with the Ministry of Agriculture and Animal Resources (MINAGRI) introduced a new program of agriculture surveys that uses a multiple frame sampling techniques, based on probability sampling and estimation methods combining an area frame and a list frame since 2013 agriculture year to regularly and accurately provide needed statistics. This is the Seasonal Agricutural Surveys (SAS).

1.2 Objectives of the survey

The main objective of the Seasonal Agriculture Survey is to provide timely, accurate, reliable and comprehensive agricultural statistics that describe the structure of agriculture in Rwanda in terms of land use, crop production and livestock to monitor current agricultural and food supply conditions and to facilitate evidence based decision making for the development of Agriculture sector.

1.3 Time frame

The 2014 SAS fieldwork commenced on 14 November 2013 and continued up to 22 March 2014 for Season A; from 15 April to 5 July 2014 for Season B and started from15th September to 7th October 2014 for Season C. The field work consisted of screening land areas on maps and completing screening forms and farm questionnaires.

Chapter 2: Methodology of the Survey

2.1 Coverage of the Survey

The survey covered the entire country. A sampling frame of Large Scale Farmers (LSF) was prepared to be used for enumeration. At the same time, the sampling units of an area frame called segments were constructed by professionals in Geographic Information System (GIS) from both NISR and MINAGRI using orthophotos from the Rwanda Natural Resource Authority (RNRA). Within segments, small scale Agricultural Operators were identified and enumerated using instruments previously prepared for the survey.

2.2 Multiple Frame Survey Design

The design of the Multiple Frame Survey (MFS) combined a probability sample of segments that were selected from the area frame, with a list of LSF that were enumerated with certainity.

2.3 Area Frame and List Frame Construction

2.3.1 Area Frame Construction

The area frames were constructed using satellite imagery. The total land cover was divided into land-use and homogeneous domain strata according to crop intensity.

In this regard, unless otherwise stated, when referring to an area sample, the word stratum will be used to denote land-use and domain definition strata.

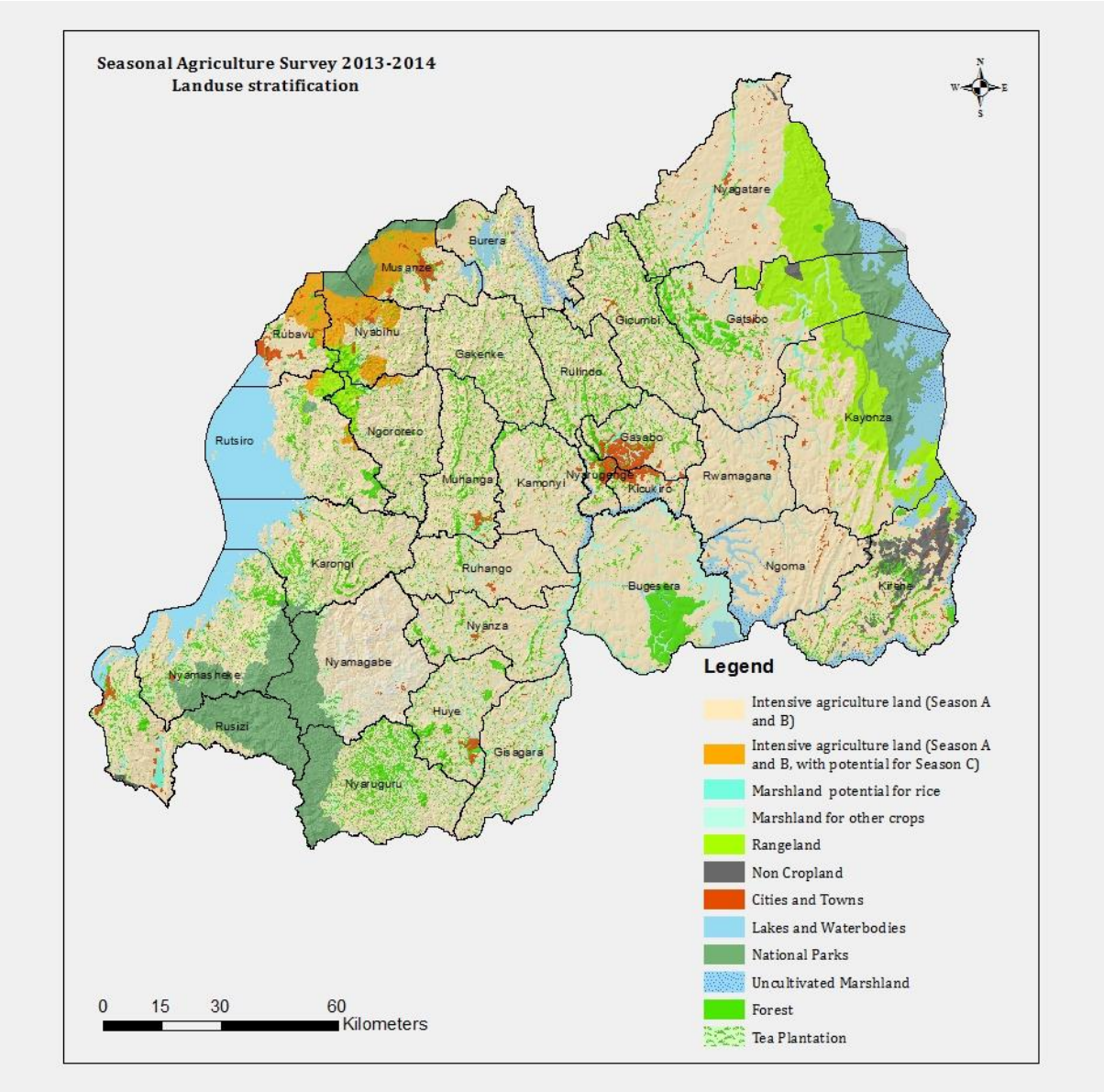
During the construction of the area sampling frame, the entire land area of Rwanda was subdivided into 12 non-overlapping land-use strata defined by proportion of cultivated land or other land-use characteristics, as shown in Table 1 and Figure 1.

Table 1. Land-Use Strata Codes, Definitions and Area

Stratum	Description	Total (Hectares)	Percent
1.1	Intensive agriculture land (Season A and B)	**1,479,081.4**	**81.9**
1.2	Intensive agriculture land (Season A and B, with potential for Season C)	**48,388.2**	**2.7**
2.1	Other marshlands	**95,820.7**	**5.3**
2.2	Marshlands potential for rice	**20,200.9**	**1.1**
3.0	Rangeland	**133,848.5**	**7.4**
10.0	Tea plantation	**28,763.1**	**1.6**
Total agriculture land		**1,806,102.9**	**100.0**

2014 Seasonal Agriculture Survey

Figure 1: Land Use Stratification



2014 Seasonal Agriculture Survey Season A

Among the 12 strata described in figure 1, only the first five strata in legend were used for sampling in 2014 SAS.

2.3.2 List Frame Construction

The list of LSF (sometimes called Big Farmers) included those farmers with the largest area for crops or those with the largest number of livestock as reporting unit is the farm.

2.3.3. Distribution of Strata in Districts

Definitions of various strata

- ***Stratum 1.1***: Intensive cropland for Season A and B essentially on hillsides. Almost all crops can be found in this Stratum.
- ***Stratum 1.2***: Intensive cropland for Season A, B and C on hillsides. The difference with stratum1.1 is that stratum 1.2 has potential for season C.
- ***Stratum 2.1***: Is located in marshlands and is cultivated during Seasons A, B and C. The crops found in it are comprised of all crops with the exception of perennial crops.
- ***Stratum 2.2***: Is also in Marshlands and is potentially cultivated with Paddy rice.
- ***Stratum 3.0***: Is Rangeland which is mainly lowland.

Only Strata 1.1, 1.2, 2.1, 2.2 and 3.0 were taken for the SAS purpose, as it is where the majority of cropland can be found.

The following table shows how Strata are spread across the country and their share in districts by the descending order.

Table 2. Share (%) of Area occupied by Strata within Districts by descending order

	District	Sratum '1.1	District	Sratum 1.2	District	Sratum '2.1	District	Sratum 2.2	District	Sratum 3.0
1	Nyagatare	7.9%	Nyabihu	37.7%	Bugesera	23.3%	Gisagara	12.1%	Kayonza	37.0%
2	Bugesera	5.4%	Musanze	31.5%	Gisagara	8.8%	Rusizi	11.5%	Nyagatare	29.9%
3	Kayonza	5.2%	Rubavu	21.8%	Gatsibo	8.7%	Nyanza	11.5%	Gatsibo	22.0%
4	Ngoma	4.7%	Rutsiro	5.9%	Nyagatare	7.9%	Huye	11.2%	Ngororero	3.3%
5	Gatsibo	4.6%	Ngororero	3.1%	Ruhango	4.9%	Bugesera	11.0%	Rutsiro	2.9%
6	Kirehe	4.3%	Nyagatare	0.0%	Nyanza	4.9%	Nyagatare	7.4%	Kirehe	2.1%
7	Gicumbi	4.2%	Bugesera	0.0%	Nyaruguru	4.4%	Gatsibo	6.7%	Nyabihu	2.1%
8	Rw amagana	4.1%	Kayonza	0.0%	Kamonyi	4.2%	Kayonza	5.9%	Rubavu	0.7%
9	Karongi	4.0%	Ngoma	0.0%	Nyamagabe	3.6%	Rw amagana	5.0%	Gisagara	0.0%
10	Nyamagabe	3.8%	Gatsibo	0.0%	Kayonza	3.1%	Ngoma	4.5%	Rusizi	0.0%
11	Gakenke	3.8%	Kirehe	0.0%	Huye	3.1%	Nyamasheke	4.5%	Nyanza	0.0%
12	Kamonyi	3.6%	Gicumbi	0.0%	Rw amagana	3.1%	Muhanga	2.6%	Huye	0.0%
13	Nyanza	3.6%	Rw amagana	0.0%	Gasabo	3.0%	Ruhango	2.2%	Bugesera	0.0%
14	Ruhango	3.5%	Karongi	0.0%	Gakenke	2.7%	Gasabo	1.7%	Rw amagana	0.0%
15	Muhanga	3.4%	Nyamagabe	0.0%	Rulindo	2.0%	Kirehe	0.9%	Ngoma	0.0%
16	Gisagara	3.3%	Gakenke	0.0%	Gicumbi	1.7%	Gakenke	0.4%	Nyamasheke	0.0%
17	Ngororero	3.3%	Kamonyi	0.0%	Ngororero	1.4%	Kamonyi	0.3%	Muhanga	0.0%
18	Rutsiro	3.2%	Nyanza	0.0%	Rusizi	1.2%	Ngororero	0.3%	Ruhango	0.0%
19	Nyamasheke	3.2%	Ruhango	0.0%	Muhanga	1.2%	Nyamagabe	0.2%	Gasabo	0.0%
20	Nyaruguru	3.2%	Muhanga	0.0%	Karongi	1.2%	Karongi	0.1%	Gakenke	0.0%
21	Burera	3.0%	Gisagara	0.0%	Burera	1.1%	Rulindo	0.1%	Kamonyi	0.0%
22	Rulindo	2.8%	Nyamashek	0.0%	Nyamasheke	1.0%	Nyabihu	0.0%	Nyamagabe	0.0%
23	Rusizi	2.8%	Nyaruguru	0.0%	Nyabihu	0.9%	Musanze	0.0%	Karongi	0.0%
24	Huye	2.7%	Burera	0.0%	Musanze	0.8%	Rubavu	0.0%	Rulindo	0.0%
25	Gasabo	1.8%	Rulindo	0.0%	Rutsiro	0.8%	Rutsiro	0.0%	Musanze	0.0%
26	Nyabihu	1.3%	Rusizi	0.0%	Kirehe	0.5%	Nyaruguru	0.0%	Nyaruguru	0.0%
27	Musanze	1.2%	Huye	0.0%	Kicukiro	0.2%	Gicumbi	0.0%	Gicumbi	0.0%
28	Rubavu	1.1%	Gasabo	0.0%	Nyarugenge	0.2%	Burera	0.0%	Burera	0.0%
29	Kicukiro	0.6%	Kicukiro	0.0%	Ngoma	0.1%	Kicukiro	0.0%	Kicukiro	0.0%
30	Nyarugenge	0.5%	Nyarugenge	0.0%	Rubavu	0.1%	Nyarugenge	0.0%	Nyarugenge	0.0%

2014 Seasonal Agriculture Survey

Chapter 3: Sampling and Data Collection Methodology

3.1 Sampling

3.1.1 Sampling Design and Selection of Segments in 2014

The country was demarcated into 12 Strata. Only the first five strata (defined above) were subject to agricultural land sampling. In the 2014 Seasonal Agricultural Survey, the sample selection was a two stage sampling design as follows:

a) In each Stratum, Primary Sampling Units (PSUs) were selected using Probability Proportional to Size (PPS) sampling where area was the size of measure; and
b) For each selected PSU, one Secondary Sampling Unit (SSU) or in this case Segment was randomly selected.

If for example stratum 1.1 is divided into large PSUs, Secondary Sampling units of 10-hectares will be assigned to each PSU. Then, if a PSU had 225 hectares, it would be divided into (22) sampling units of 10-hectares each. And if this PSU is selected, one of its 22 sampling units will be selected as the segment for data collection. However, the SSUs from Stratum 3.0 are 50 hectares instead of 10 hectares.

3.1.2 Distribution of Sampled Primary Sampling Units

In the entire country, 540 PSUs were selected in the five main agricultural strata with probability proportionally to the size. Table 3 below shows the distribution of selected PSUs in each of the five Strata.

Table 3. Selected Segments by Strata for SAS 2014

Stratum	Area (Km2)	Number of Sampled Segments
1.1	14,791	340
1.2	484	48
2.1	958	64
2.2	202	40
3.0	1,338	48
		540

2014 Seasonal Agriculture Survey

Each selected PSU having a size of 100 – 200 Hectares was subdivided into Second Stage Sampling Units (SSUs) of around 10 Hectares each, following natural boundaries. Note that for Stratum 3.0 PSUs, a segment had a size of around 50 Hectares.

All of the 540 segments are eligible to Season A and B while Season C considers only 152 Segments from Stratum 1.2, 2.1 and 2.2.

3.1.3 Sampling of Secondary Sampling Units

In every selected PSU, one SSU (or Segment) was randomly selected for data collection purposes.

3.1.4 Selection of Respondents in Phase I

Phase I was mainly used to collect data on area under crops, and crops planted. Phase II was mainly devoted to the collection of data on demographic, social characteristics of interviewees, yield and production of crops.

i. Large Scale Farmers

Enumerated Large Scale Farmers were 498 in 2014 Season A and 502 in Season B. The LSF were engaged in either Crop farming activities only or Livestock farming activities only or both Crop and Livestock farming activities.

ii. Agricultural Operators

Agricultural Operators are the Small Scale Farmers within the Segment. Every selected Segment was firstly screened using the appropriate materials among others: the segment maps, GIS devices and the Screening Form. That means enumerators accounted for every plot inside the segment. All Tracts[6] were classified as either Agricultural (cultivated land, pasture, and fallow land) or Non-Agricultural Land (water, forests, roads, rocky and bare soils and buildings).

[6]Tract: is the sum of all lands operated by one Agricultural Operator in the segment. It can be made of one or more fields or plots adjacent to each other or located in different places across the segment.

During Phase I, a complete enumeration of all farmers having agricultural land and operating within the 540 selected Segments was undertaken and counted 24,475 and 25,167 agricultural operators respectively in Season A and B. Season C considered only 152 segments counting 7,684 Agricultural Operators.

3.1.5 Selection of respondents in Phase II

i. Large Scale Farmers

In phase II, 50 % of the Large Scale Farmers undertaking Crop farming activities only and 50% of the Large Scale Farmers undertaking both Crop and Livestock farming are selected for interview. A sample of 177 and 174 Large Scale Farmers were interviewed in Season A and B respectively, using a Farm Questionnaire.

ii. Agricultural Operators

From Agricultural Operators enumerated in segments during Phase I, a sample of Agricultural Operators has been designed for Phase II as follows: 5,216 for Season A, 4,856 for Season B and 609 for Season C. The method of Probability Proportional to Size (PPS) at National Level has been used.

3.1.6 Estimation Methodology

i. Definition of the Notations and Parameters

Population weight: $W_i = \frac{N_i}{N}$

- N is the total population (Universe) being studied;
- For the stratum i: The population is N_i

- The average of variable Y is $\bar{Y}_i$ in the stratum i;
- The variance estimate of Y is equal to $S_i^2 = \frac{1}{N_i - 1}\sum_{\alpha_1=1}^{N_i}(Y_{\alpha i} - \bar{y}_i)^2$
- The sample size of the stratum k is equal to n_i with $(j_i = 1,...,n_i)$,
- $f_i = \frac{n_i}{N_i}$ is the corresponding sampling rate; $\bar{y}_i = \frac{1}{n_i}\sum_{j_i}^{n_i} y_{ji}$ is the mean of sample observations in each stratum,

- $S_i^2 = \frac{1}{n_i - 1}\sum_{j_i=1}^{n_i}(y_{ji} - \bar{y}_i)^2$ is the sample variance of the stratum i.

ii. Estimation of Mean

- The overall mean of the population is $\bar{Y}$ and is written as follows:

  $\bar{Y} = \sum_k W_k \bar{Y}_k$, where k is strata, numbered from 1 to k sub-populations

- The unbiased estimator of $\bar{Y}$ is $\bar{Y}_{st} = \sum_{i=1}^{k} W_i \bar{y}_i$

iii. Estimation of Total

For stratum i the total of Y is estimated by $N_i \bar{y}_i$, the unbiased estimate of the total Y to the universe is: $\hat{T}(Y) = \sum_{i=1}^{k} N_i \bar{y}_i$

The term used for data weighting of the sample is called “Extrapolation coefficient” or “Expansion factor”.

The estimators $\hat{T}(Y)$ and $\hat{\bar{Y}}$ are unbiased estimators of the total and the mean since they satisfy the following expressions: $E[\hat{T}(Y)] = T(Y)$ and $E[\hat{\bar{Y}}] = \bar{Y}$

iv. Variance of the Mean Estimator and the Total Estimator Abbreviated as Var

$$Var[\bar{Y}_{st}] = \sum_{i=1}^{k} W_i^2 (1 - f_i)\frac{S_i^2}{n_i} \text{ and } Var[\hat{T}(Y)] = \sum_{i=1}^{k} N_i^2 (1 - f_i)\frac{S_i^2}{n_i}$$

v. Estimation of Variances of Estimators

$$\hat{Var}[\bar{Y}_{st}] = \sum_{i=1}^{k} W_i^2 (1 - f_i)\frac{S_i^2}{n_i} \text{ and } \hat{Var}[\hat{T}(Y)] = \sum_{i=1}^{k} N_i^2 (1 - f_i)\frac{S_i^2}{n_i}$$

Estimates of variance estimators of the mean and the total are used to calculate the estimators standard deviation, and thus to propose confidence intervals for estimators.

3.2 Data Collection and Processing

3.2.1 Contents of Data Collection Tools

i. Screening Questionnaire

A Screening Questionnaire was used to collect information that enabled identification of an Agricultural Operator or Large Scale Farmer and his or her land use. The purpose of the screening form was to account for every square meter of land inside the Segment or Large Scale Farm.

If a segment had about 10 hectares, then approximately 10 hectares was accounted for on the screening form. Theobjective was to ensure that not only all farm lands but also all non-agricultural land such as buildings, forest, etc. are taken into account as shown and delineated on the segment or Large Scale Farm map.

ii. Farm Questionnaire

The Phase II of the survey concerned the collection of data on characteristics of Agricultural Operators and large scale farmers, crop identification, inputs (seeds, fertilizers, labor …), agricultural practices, crop production and use of production.

3.2.2 Data Collection

i. Teams and Supervision

The 2014 SAS used 120 enumerators grouped in 40 field teams and 43 Team leaders, i.e one Team leader to 3 Enumerators. All field work staff in 2014 possess a degree in Agronomy Science and were trained before starting data collection. Higher level supervision staff from NISR visited the field teams during each phase of data collection to ensure quality control.

ii. Field work Materials

Each Enumerator and Team leader had adequate materials composed of Enumerator’s instruction manual, Screening questionnaire, Farm questionnaires, Measuring tapes, Ruler, Pens, Pencils, Calculator, Weighing scales, Global Positioning System (GPS), Personal Digital Assistant (PDA), maps, rain coats, boots, umbrella, first aid equipment, etc. Each team was assigned a vehicle.

iii. Field Procedures

Before proceeding to the field, Enumerators and their Team leaders used to check if they have all required materials for their field work. All staff were required to arrive early in the field (Segment or LSF).

Upon arrival in the field, the enumerators and their Team Leaders took the related geographical coordinate that were used by supervisors to know the real starting time of the field work.

The next step was the Segment delineation or LSF and taking of geographical coordinates for the identified landmarks to allow supervisors to check if the Segment was delineated appropriately and to ensure the collected data was relating to the plots inside the Segment or LSF.

iv. Screening Activity of the Segment

After delineation of the segment, enumerators used the segment map to mark all the tracts and related plots. They identified the land use and area measurement of each plot and indicated information on the Screening Questionnaire. Before leaving the Segment, under the supervision of the team leader, enumerators checked if each tract and its plots were well marked on the map and indicated on the Screening Questionnaire.

Both the marked map and completed Screening Questionnaire for each segment or LSF were sent to the Geographic Information System (GIS) unit at NISR for digitalization and plot area calculations.

v. Farm Interview and Data Quality Assurance

A Farm questionnaire was used during the second phase of each season. Digitalized map for each Segment or LSF were used by Enumerators to identify each tract (and its plots); and a Farm questionnaire was used to conduct an interview with each selected Agricultural Operator or LSF during Phase II (mainly for agricultural practices, inputs estimation and production).

It is important to mention that all Farm questionnaires were subjected to two/three rounds of data quality checking. The first round was conducted by the enumerator

and the second round was conducted by the team leader to check if questionnaires had been well completed by enumerators. And in most cases, questionnaires completed by one enumerator were peer-reviewed by another enumerator before being checked by the Team leader.

3.3 Data Processing and Analysis

Data entry of the completed and checked questionnaires was undertaken at NISR offices by 20 staff trained in using CSPro software. To ensure appropriate matching of data in questionnaires and plot area measurements from the GIS unit, a LOOKUP file was integrated in the CSPro data entry program to confirm the identification of each Agricultural Operator/LSF before starting data entry. Thereafter, data was entered in computers, edited and summarized in tables using SPSS and Excel.

3.4 Improvements

Some changes were done from 2013 SAS to improve the 2014 SAS. The table below illustrates those changes.

Comparison between 2013 and 2014 SAS	
1. Screening phase1 (2013) - In phase 1 the questionnaire included screening and other variable questions like on (demographic information, use of inputs, and other agricultural practices…) Forms attached	**1. Screening phase 1 (2014)** - In phase 1 only screening and anti erosion practices were retained to decongest the workload and get good quality screening. Other information moved to phase two on a sample basis. Forms are attached.
- Main crops in a plot were three.	- Main crops were increased to four to improve crop area coverage.
- Inputs usage (Fertilizers, pesticides, etc.) was collected in general (following operators' total plots).	- Inputs are collected plot by plot.
- In general the numbers of segments was 348 with huge area for each one: ±20 ha.	- In general the numbers of segments are 540 with moderate area for each one: ±10 ha. This improves

	representation.
- We collected information on 34 crops (See Annex1).	- We collected information on 61 crops (See Annex1).
- Land use type was aggregated: Strata were three; namely, 1.0 Intensive agriculture land, 2.0 Marshlands and 3.0 Rangeland.	- Disaggregate land use types into five Strata, namely 1.1 Intensive agriculture land for seasons A and B, 1.2 Intensive agriculture and for seasons A, B and potential for C, 2.1 marshlands for other crops, 2.2 Marshlands potential for Rice and 3.0 Rangeland.
- Season C frame developed during data collection for the season	- Season C frame integrated within overall frame in stratum 1.2, 2.1 and 2.2.
2. Farm questionnaire phase 2 - Only production aspects	**2. Farm questionnaire phase 2** - Added demographic information, use of inputs, and other agricultural practices…

Chapter 4: Results of the 2014 Season A

Details of demographic information, use of inputs, other agricultural practices, and production aspects are captured in phase II as described above.

A sample of 177 out of 498 LSF and 5,216 out of 24,475 Agricultural Operators were interviewed.

4.1 Demographic and Social Characteristics of Agricultural Operators

Characteristics of Agricultural Operators describe their number by type (individual or cooperative), gender, age, education level, residency, farming activities and cooperative membership.

4.1.1 Number of Agricultural farmers by type

Table 4 : Agricultural Operators and LSF by Stratum

	Strata	Total	
		Number	%
Agricultural Operators	1.1	3,098	59.4
	1.2	678	13.0
	2.1	609	11.7
	2.2	484	9.3
	3.0	347	6.7
	All Rwanda	5,216	100
LSF		177	100

2014 Seasonal Agriculture Survey - Season A

The distribution of Agricultural Operators (in segments) was highest in Stratum 1.1 (59.4%), followed by Stratum 1.2 (13.0%). In 2014 Season A phase II, 177 Large Scale Farmers were listed and enumerated in Rwanda.

Table 5. Agricultural Operators by type (%)

	Strata	Individual		Cooperative		Total	
		Number	%	Number	%	Number	%
Agricultural Operators	1.1	3,087	100	11	0.4	3,098	100
	1.2	678	100	0	0.0	678	100
	2.1	596	97.9	13	2.1	609	100
	2.2	476	98.4	8	1.7	484	100
	3.0	346	100	1	0.3	347	100
	All Rwanda	5,183	99.4	33	0.6	5,216	100
LSF						177	100

2014 Seasonal Agriculture Survey - Season A

The survey results showed that most of the Agricultural Operators in segments (99.4%) were individual Farmers and only about 0.6 % were cooperatives.

Table 6. Cooperative Membership

		Yes	No	Total
	Strata	Percent	Percent	Percent
Agricultural Operators	1.1	16.7	83.3	100
	1.2	17.6	82.4	100
	2.1	47.3	52.7	100
	2.2	81.2	18.8	100
	3.0	17.9	82.1	100
	All Rwanda	17.4	82.6	100
LSF		61.6	38.4	100

2014 Seasonal Agriculture Survey - Seasonal A

For the cooperative membership of Agricultural Operators, Stratum 2.2 had the highest proportion (81.2%) followed by the Stratum 2.1 (47.3%). For LSF, 61.6% were members of agricultural cooperatives.

4.1.2 Number of Agricultural Operators by Gender

In 2014 Season A, the distribution of Agricultural Operators in Rwanda by gender was 70.3% male and 29.7% female. The distribution of Agricultural Operators in Rwanda by Gender and strata is shown in Table 7.

Table 7. Distribution of Agricultural Operators by Gender and Stratum

	Agricultural Operators		
Strata	Male	Female	Total
1.1	70.4	29.6	100
1.2	63.7	36.3	100
2.1	68	32	100
2.2	65.5	34.5	100
3.0	78.9	21.1	100
All Rwanda	70.3	29.7	100

2014 Seasonal Agriculture Survey - Season A

4.1.3 Age distribution of Agricultural Operators

As it is illustrated, the majority of Agricultural Operators in Rwanda were in the age group of 55 years and above (25.3%) followed by Agricultural Operators in age-group of 25-34 years (25.2%). The age group distribution of Agricultural Operators by Stratum varied more in the age group of between 45 and 54 with Stratum 2.2 (23.5%) being highest, Stratum 2.1 (22.7%) and Stratum 3.0 (16.8%) being lowest. The age group of 35 - 44 years is the least heterogenous across strata. (see Table 8).

Table 8. Distribution of Agricultural Operators by Age groups

	Agricultural Operators				
Strata	14-24	25-34	35-44	45-54	55 and Above
1.1	5.1	25.2	22.8	21.5	25.4
1.2	8.3	29.8	23.3	17.8	20.8
2.1	3.7	22.3	25.3	22.7	26.0
2.2	6.5	24.2	25.8	23.5	20.0
3.0	6.9	28.3	26.3	16.8	21.7
All Rwanda	5.1	25.2	22.9	21.5	25.3

2014 Seasonal Agriculture Survey - Season A

The majority (29.3%) of male Agricultural Operators in Rwanda were in the age group of between 25 and 34 (see Table 9). This is followed by 24.7% of Agricultural Operators in age group of between 35 and 44.

Table 9. Distribution of Male Agricultural Operators by Age groups

	Agricultural Operators				
Strata	14-24	25-34	35-44	45-54	55 and Above
1.1	4.9	29.3	24.7	19.8	21.3
1.2	8.1	39.1	23.8	13.2	15.7
2.1	3.7	25.4	27.2	20.7	23.0
2.2	6.4	27.2	25.6	24.4	16.3
3.0	5.9	31.9	27.5	14.7	20.1
All Rwanda	4.9	29.3	24.7	19.8	21.2

2014 Seasonal Agriculture Survey - Season A

The distribution of female Agricultural Operators in Rwanda was high in the age group of 55 and above (35.0%) followed by 25.5% of female Agricultural Operators in age group of between 45 and 54, 18.6% of female Agricultural Operators in age group of between 35 and 44, 15.3% in age group of between 25 and 34 and 5.6% in age group of between 14 and 24 (see Table 10).

Table 10. Distribution of Female Agricultural Operators by Age groups

	Agricultural Operators				
Strata	14-24	25-34	35-44	45-54	55 and Above
1.1	5.6	15.3	18.5	25.5	35.2
1.2	8.5	13.4	22.4	26.0	29.7
2.1	3.7	15.7	21.5	26.7	32.5
2.2	6.7	18.3	26.2	22.0	26.8
3.0	11.0	15.1	21.9	24.7	27.4
All Rwanda	5.6	15.3	18.6	25.5	35.0

2014 Seasonal Agriculture Survey - Season A

4.1.4 Education Level of Agricultural Operators

The Survey results of the 2014 SAS Season A illustrated that 66.2% of Agricultural Operators had attended primary level education, 26.6 % had no education, 6.4% attended secondary level education and only 0.8% had attended tertiary level education. (see Table 11).

Table 11. Education Level of Agricultural Operators by Stratum (%)

	Agricultural Operators				
Strata	Primary	Secondary	Tertiary	No education	Total
1.1	66.3	6.3	0.8	26.6	100
1.2	57.2	11.1	1.9	29.8	100
2.1	63.4	8.2	1.2	27.2	100
2.2	74.6	6.9	0.6	17.9	100
3.0	66.2	6.4	0.6	26.9	100
All Rwanda	66.2	6.4	0.8	26.6	100

2014 Seasonal Agriculture Survey - Season A

Among Agricultural Operators who had attended primary level education (66.2%) their distribution across Strata was reasonably uniform with Stratum 2.2 and Stratum 1.1 having a higher percentage.

Table 12. Education level of Male Agricultural Operators (%)

	Agricultural Operators				
Strata	Primary	Secondary	Tertiary	No education	Total
1.1	71.2	7.0	1.0	20.8	100
1.2	64.6	13.2	2.8	19.4	100
2.1	68.9	9.1	1.2	20.7	100
2.2	77.6	5.8	0.3	16.3	100
3.0	71.4	5.5	0.7	22.3	100
All Rwanda	71.1	7.1	0.1	20.8	100

2014 Seasonal Agriculture Survey - Season A

In Rwanda, 71.1% of male Agricultural Operators attended primary level education, 20.8% had no education, 7.1% attended secondary level education and only 0.1 % had attended tertiary level education (see Table 12).

Table 13. Education Level of Female Agricultural Operators (%)

	Agricultural Operators				
Strata	Primary	Secondary	Tertiary	No education	Total
1.1	54.6	4.7	0.2	40.4	100
1.2	44.3	7.3	0.4	48	100
2.1	51.8	6.3	1.0	40.8	100
2.2	68.9	9.1	1.2	20.7	100
3.0	46.6	9.6	0.0	43.8	100
All Rwanda	54.5	4.8	0.2	40.5	100

2014 Seasonal Agriculture Survey - Season A

2014 SAS illustrated that 54.5% of female Agricultural Operators attened primary education. Stratum 2.2 had the highest female Agricultural Operators with primary education level (68.9%). The lowest percentage of female agricultural operators with no education (20.7%).

4.1.5 Residency of Agricultural Operators in Segments

An agricultural operator is considered to be resident in a segment if he/she lives in the segment and undertakes agricultural activities in the same segment.

An agricultural operator is considered non-resident of a segment if his/her agricultural activities are undertaken in the segment but lives outside the same segment.

Results of the 2014 SAS showed that in Rwanda the majority of Agricultural Operators (76.7%) were nonresident while 23.3 % were residents. (See Table 14)

Table 14. Agricultural Operators by Residency (%)

	Agricultural Operators		
Strata	Resident	Non resident	Total
1.1	27.9	72.1	100
1.2	25.0	75.0	100
2.1	2.5	97.5	100
2.2	1.0	99.0	100
3.0	92.1	7.9	100
All Rwanda	23.3	76.7	100

2014 Seasonal Agriculture Survey - Season A

In general, the Stratum 3.0 had the biggest percentage of resident's operators (92.1%), while in the rest of the Strata, resident Agricultural Operators are less than 28% of all Agricultural Operators.

4.2 Date of Sowing

For Agricultural Operators, sowing for some crops started before September 2013. The starting dates of sowing by Agricultural Operators in Segments and LSF for each main crop is summarized respectively in the Tables 15 and 16.

Table 15. Agricultural Operators Indicating the Sowing Date in Segments by Crop (%)

Crop name	Before September 2013	01-15 September 2013	16-30 September 2013	After September 2013	N/A	Total
Maize	12.1	35.3	22.0	30.6	0.1	100
Paddy rice	77.4	14.5	5.0	2.9	0.2	100
Sorghum	48.8	28.9	15.2	6.3	0.8	100
Wheat	18.1	35.1	6.4	40.4	0.0	100
Bush beans	3.1	33.2	29.2	34.4	0.1	100
Climbing beans	9.2	51.1	22.3	17.5	0.0	100
Peas	11.1	48.9	21.2	18.8	0.0	100
Cassava	12.4	13.5	8.7	15.0	50.4	100
Irish potato	22.4	34.4	15.7	27.4	0.1	100
Sweet potato	35.7	18.6	9.1	32.3	4.3	100
Yams & Taro	33.9	24.2	9.2	27.7	4.9	100
Cooking Bananas	4.0	1.1	0.5	1.0	93.4	100
Dessert Banana	4.8	1.8	0.3	1.0	92.1	100
Banana for beer	2.9	0.4	0.3	0.5	95.9	100
Soya beans	3.4	29.7	25.9	41.0	0.0	100
Ground nuts	2.4	28.2	31.4	38.1	0.0	100

2014 Seasonal Agriculture Survey - Season A

For the majority of crops, sowing of crops by Agricultural Operators started in September 2013. For climbing beans, Peas and Maize, the majority of Agricultural Operators indicated September as the sowing date while for Paddy rice and Sorghum, the date indicated by the majority of Agricultural Operators was before September 2013.

When comparing 2014 Season A with 2013 Season A, it is shown that the majority of crops in 2014 Season A have been sown in September, while in 2013 Season A it was after September.

Sowing dates for crops such as dessert Banana, Cooking Banana, Cassava were not applicable for the majority of Agricultural Operators. This may due to the fact that these crops may have been sown in the previous seasons especially with banana being perennial.

Table 16. Large Scale Farmers Indicating Sowing Date for Crops (%)

Crop name	Before September 2013	01-15 September 2013	16-30 September 2013	After September 2013	N/A	Total
Maize	6.6	49.6	28.3	15.5	0.0	100
Paddy rice	97.1	0.0	0.0	2.9	0.0	100
Sorghum	17.9	64.1	7.7	10.3	0.0	100
Wheat	10.0	30.0	5.0	55.0	0.0	100
Bush beans	4.2	53.8	16.1	25.9	0.0	100
Climbing beans	14.3	42.9	25.0	17.9	0.0	100
Peas	12.5	50.0	0.0	37.5	0.0	100
Cassava	15.7	32.6	5.6	4.5	41.6	100
Irish potatoes	13.3	26.7	16.0	44.0	0.0	100
Sweet potatoes	25.0	25.0	16.7	25.0	8.3	100
Yams & Taro	0.0	25.0	0.0	25.0	50.0	100
Cooking Bananas	1.8	2.7	0.9	2.7	91.8	100
Dessert Banana	4.0	0.0	0.0	0.0	96.0	100
Banana for beer	0.0	0.0	0.0	6.3	93.8	100
Soya beans	0.0	9.1	59.1	31.8	0.0	100
Ground nuts	9.5	28.6	23.8	38.1	0.0	100

2014 Seasonal Agriculture Survey - Season A

The majority of LSF (97.1%) indicated that they sowed Paddy rice before September 2013 (see Table 16). The majority of main crops were sown in September with the exception of Irish potatoes and Wheat which were sown by the majority of LSF after September 2013.

Sowing dates for crops such as dessert Banana, Cooking Banana and Cassava were also not applicable for the majority of LSF.

4.3 Farm Characteristics (Area, Yield and Production)

This section presents the key points from the detailed tables on area under crops, yield and crop production for the 2014 Season A (see Tables 17, 21 and 22).

4.3.1 Crop Areas

In Rwanda, in terms of land area under crops the main crops grown in Season A were Cassava (22.6%), Banana (22.5%), Beans (17.8%), and Maize (12.3%) (See Table 17).

Table 17. Area (Ha) Cultivated by Crop and Group of Crops by Stratum (Hectares)

	Agricultural Operators						LSF	All Rwanda	
Crops / Strata	1.1	1.2	2.1	2.2	3.0	S/Total_1	S/Total_2	Total	Percent
Cereals	**152,547**	**9,076**	**19,789**	**7,620**	**7,719**	**196,751**	**4,562**	**201,313**	**15.3**
Maize	131,743	5,947	16,981	1,727	3,386	159,784	2,052	161,837	12.3
Sorghum	14,219	2,175	591	113	4,268	21,366	123	21,488	1.6
Paddy rice	1,336	-	2,124	5,778	-	9,239	2,266	11,505	0.9
Wheat	2,590	948	-	-	-	3,537	115	3,652	0.3
Other cereals	2,659	6	92	2	66	2,824	7	2,831	0.2
Tubers and Roots	**399,906**	**12,302**	**13,817**	**731**	**5,855**	**432,610**	**702**	**433,312**	**32.9**
Cassava	285,154	5	7,448	244	5,424	298,276	261	298,537	22.6
Sweet Potatoes	63,350	915	4,199	302	136	68,902	18	68,920	5.2
Irish Potatoes	38,290	11,358	591	72	218	50,529	422	50,951	3.9
Yams & Taro	13,111	23	1,578	112	77	14,903	1	14,904	1.1
Banana	**288,639**	**28**	**2,912**	**148**	**4,019**	**295,747**	**468**	**296,214**	**22.5**
Cooking Banana	99,762	5	922	40	3,234	103,963	319	104,282	7.9
Dessert banana	37,313	1	439	21	548	38,322	108	38,430	2.9
Banana for beer	151,564	21	1,552	88	238	153,462	40	153,502	11.6
Legumes & Pulses	**269,598**	**7,308**	**6,435**	**687**	**3,819**	**287,846**	**627**	**288,474**	**21.9**
Beans	***219,456***	***5,956***	***5,051***	***609***	***3,216***	***234,288***	***427***	***234,715***	***17.8***
Bush beans	130,838	14	4,586	568	3,090	139,096	341	139,436	10.6
Climbing beans	88,618	5,943	465	41	126	95,193	86	95,279	7.2
Peas	19,410	1,351	130	2	341	21,233	22	21,255	1.6
Groundnuts	14,556	-	442	4	201	15,203	19	15,222	1.2
Soya beans	16,144	0	812	73	60	17,091	159	17,250	1.3
Other legumes & Pulses	32	-	-	-	-	32	-	32	0.0
Vegetables and Fruits	**18,553**	**1,441**	**2,276**	**262**	**538**	**23,071**	**328**	**23,399**	**1.8**
Vegetables	9,776	1,049	2,197	253	62	13,338	57	13,396	1.0
Fruits	8,777	392	78	9	476	9,732	271	10,003	0.8
Other crops	**65,632**	**3,096**	**4,211**	**337**	**1,686**	**74,962**	**581**	**75,543**	**5.7**
Total developped crop land	**1,194,875**	**33,251**	**49,440**	**9,785**	**23,636**	**1,310,987**	**7,267**	**1,318,254**	**100**
Total Physical crop land	**934,871**	**33,114**	**45,421**	**9,639**	**19,112**	**1,042,157**	**6,998**	**1,049,155**	**100**
Fallow land	**195,586**	**2,774**	**16,937**	**3,214**	**2,127**	**220,639**	**1,648**	**222,287**	**21.2**

2014 Seasonal Agriculture Survey - Season A

In general, all crops are highly cultivated in Stratum 1.1. However, Paddy Rice makes an exception as it is mainly found in Strata 2.2 and 2.1. The total developed crop land means simply the cropland with regards to perennial crops cultivation standards and being sometimes mixed with seasonal crops while the physical cropland means the real size in terms of cultivated plot area.

Figure 2: Share of Agriculture Land by Crops

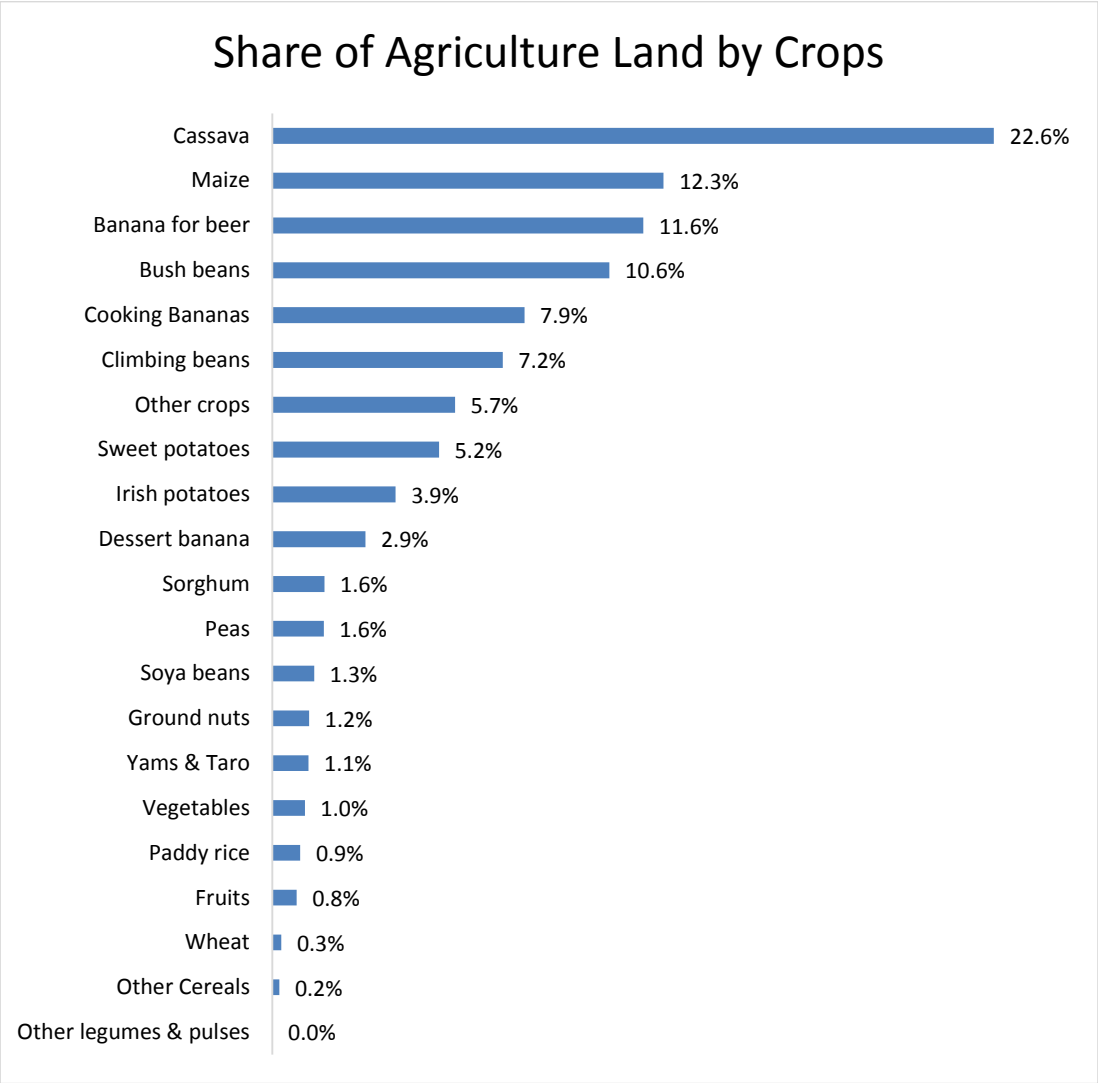
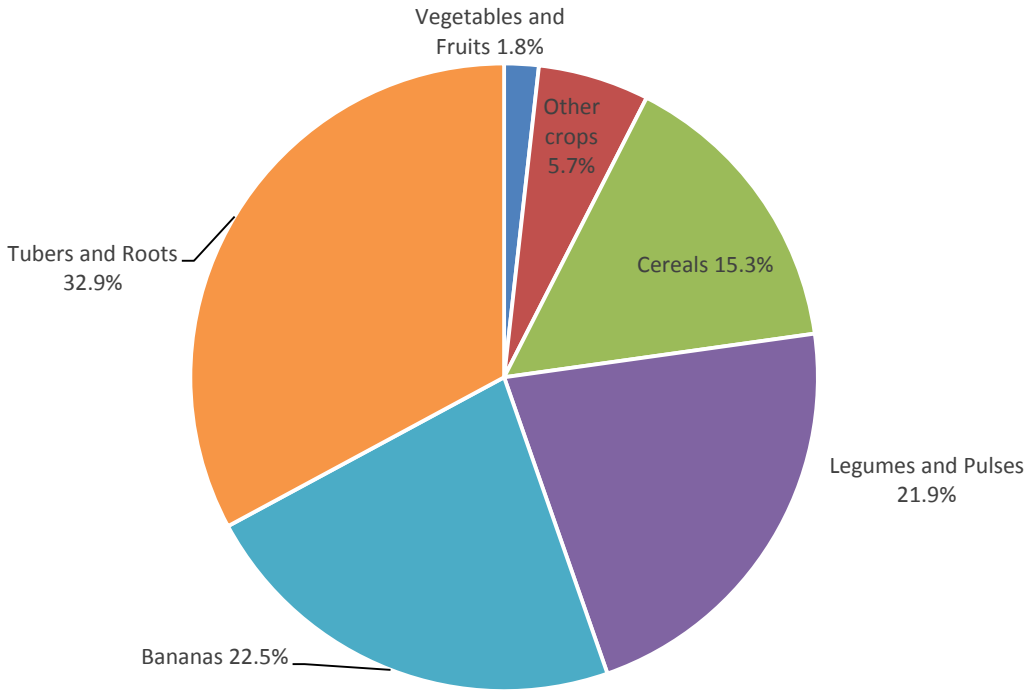


Figure 3 : Share of Agriculture Land by Group of Crops (%)



The Figure 3 shows the percentage share of agricultural land cultivated by group of crops. The survey results showed that the dominant groups of agricultural crops in Rwanda continued to be: Tubers and Roots (32.9%), Banana (22.5%), Legumes and Pulses (21.9%), Cereals (15.3%), while Fruits and Vegetables and other crops accounted for less than 10 % of the total share of agricultural land.

The survey results (see Table 18) showed that the average size of tracts for Agricultural Operators in Rwanda was 0.23 hectares.

Table 18. Average Size of Tract by Stratum

Strata	Average (Ha)
1.1	0.22
1.2	0.16
2.1	0.17
2.2	0.17
3.0	2.56
Total	0.23

2014 Seasonal Agriculture Survey-Season A

The Stratum 3.0 had the largest average size of tract for Agricultural Operators (2.56 Ha.) followed by Stratum 1.1 (0.22 Ha.), Stratum 2.1 (0.17 Ha), Stratum 2.2(0.17 Ha.) and Stratum 1.2 (0.16 Ha.).

The average size of crop area was below 0.10 Ha with the exception of Pyrethrum (0.18 Ha), Banana for Beer (0.11) and Sorghum (0.13 ha). Fallow land in Segments had an average size of 0.12 hectares whereby the Stratum 3.0 has the largest fallow land average size of 0.50 Hectares.

Table 19. Average Size of crop area per Agricultural Operators (Ha)

crop / Strata	1.1	1.2	2.1	2.2	3.0	Average Size
Maize	0.05	0.04	0.07	0.08	0.14	0.05
Paddy rice	0.07	.	0.08	0.14	.	0.10
Sorghum	0.13	0.05	0.19	0.18	0.39	0.13
Wheat	0.05	0.08	.	.	.	0.06
Other cereals	0.01	.	.	.	.	0.01
Bush beans	0.06	0.01	0.06	0.04	0.16	0.06
Climbing beans	0.06	0.05	0.03	0.05	0.10	0.06
Peas	0.03	0.03	0.02	0.01	0.16	0.03
Other legumes & pulses	0.01	.	.	.	.	0.01
Cassava	0.10	0.02	0.07	0.04	0.30	0.10
Irish potatoes	0.03	0.10	0.01	0.03	0.06	0.04
Sweet potatoes	0.03	0.05	0.03	0.03	0.04	0.03
Yams & Taro	0.02	0.02	0.02	0.02	0.03	0.02
Tomotoes	0.03	0.03	0.05	0.03	0.05	0.04
White cabbage	0.01	0.03	0.02	0.03	0.07	0.02
Flower cabage	0.04	0.02	.	.	.	0.03
Onions	0.02	0.04	0.01	0.29	.	0.03
Carrots	0.02	0.29	0.03	0.06	.	0.05
Eggplant	0.02	0.03	0.04	0.04	0.02	0.02
Other vegetables	0.00	.	0.00	.	.	0.00
Cooking Banana	0.09	0.01	0.10	0.06	0.25	0.09
Dessert banana	0.07	0.01	0.05	0.04	0.17	0.07
Banana for beer	0.11	0.02	0.09	0.11	0.14	0.11
Pineapple	0.08	.	0.01	.	0.09	0.08
Avocado	0.02	0.02	0.02	.	0.26	0.04
Passion fruits	0.06	0.07	.	.	.	0.06
Other fruits	0.02	.	0.02	0.03	.	0.02
Soya beans	0.03	0.00	0.03	0.03	0.03	0.03
Ground nuts	0.04	.	0.05	0.02	0.08	0.04
sun flower	0.02	0.01	0.02	0.02	0.04	0.02
coffee	0.07	.	0.06	0.10	0.09	0.07
Pyrethrum	.	0.18	.	.	.	0.18
Other crops	0.08	0.08	2.65	0.17	.	0.10
Pasture	2.01	0.35	2.32	1.37	8.58	2.84
Fallow land	0.11	0.09	0.10	0.12	0.50	0.12
Non agriculture land	0.11	0.09	0.84	0.81	2.70	0.13

2014 Seasonal Agriculture Survey - Season A

Table 20. Average Size of crop area per Large Scale Farmers (Ha)

Crops	Average Size
Paddy rice	41.19
Non agriculture land	12.38
Mucuna	10.72
Other fruits	8.75
Olive crop	7.98
Fallow land	7.12
Pineapple	4.89
Maize	4.66
Other crops	4.08
Soya beans	3.80
Wheat	3.59
Irish potatoes	3.49
Fodder crop	2.44
Mango	2.29
coffee	2.12
White Mulberry	2.06
Amaranths	1.68
Sorghum	1.63
Sugar cane	1.63
Cassava	1.57
Climbing beans	1.56
Cooking Bananas	1.40
Bush beans	1.36
Macadamia	1.30
Dessert banana	1.17
Banana for beer	0.92
Tomotoes	0.91
sun flower	0.86
Orange	0.85

Crops	Average Size
Avocado	0.82
Peas	0.81
White cabbage	0.74
Pyrethrum	0.69
Other cereals	0.66
Apple	0.65
Lemon	0.61
Ground nuts	0.61
Passion fruits	0.57
Sweet potatoes	0.55
Pepper	0.52
Sugar beet	0.36
French beans	0.34
Millet	0.32
Carrot	0.29
Tree tomato	0.25
Eggplant	0.22
Onion	0.21
Papaya	0.21
Napia grass	0.19
Yams & Taro	0.17
Jatropha	0.16
Other vegetables	0.15
Sweet pepper	0.11
Flower cabbage	0.10
Garlic	0.07
Spinach	0.04
Leeks	0.03
Pumpkins	0.03

2014 Seasonal Agriculture Survey - Season A

For LSF, the average size of crop area was as follows: Paddy Rice (41.19 Ha), Mucuna (10.72 Ha).

4.3.2 Crop Yields

Crop yield also known as “Agricultural output” refers to the measure of yield of a crop per unit area of land cultivation (see Table 21).

Table 21. Crops Yield by Stratum (Kg/Ha)

Crops	Strata					
	1.1	1.2	2.1	2.2	3.0	All Rwanda
Maize	1,752	1,118	1,901	1,854	1,619	1,752
Paddy rice	826		3,169	3,016		2,302
Sorghum	1,796	1,800	1,476	1,890	1,851	1,856
Wheat	959	740	-	-	-	933
Other cereals	1,371	-	562	-	532	1,318
Cassava	1,243	-	1,106	5,689	773	1,234
Sweet Potatoes	7,307	5,431	9,588	6,982	4,427	7,413
Irish Potatoes	5,743	9,833	4,048	6,540	3,516	6,648
Yams & Taro	4,419	-	4,906	5,027	5,707	4,474
Cooking Banana	3,550	-	3,244	2,126	3,111	3,534
Dessert banana	2,449	-	3,590	3,175	1,713	2,449
Banana for beer	3,129	3,904	2,008	1,216	4,356	3,118
Beans	996	815	1,110	1,179	843	993
Bush beans	938	-	1,067	1,184	825	942
Climbing beans	1,080	817	1,541	1,113	1,282	1,066
Peas	709	486	652	-	145	684
Groundnuts	374	-	237	-	305	369
Soya beans	516	-	500	627	354	516
Vegetables	10,314	4,055	8,684	6,861	3,807	9,432
Fruits	4,498	3,811	3,978	-	57	4,141

2014 Seasonal Agriculture Survey - Season A

4.3.3 Crop Production

The contribution of individual crop production by Stratum (see Table 22) was calculated using the product of yield and area under the crop.

Table22. Production of Main Crops (MT)

	Agricultural Operators						LSF	All Rwanda	
Crops / Strata	1.1	1.2	2.1	2.2	3.0	S/Total_1	S/Total_2	Total	Percent
Cereals	**263,595**	**11,265**	**39,941**	**20,842**	**13,415**	**349,059**	**7,965.1**	**357,024**	**10.0**
Maize	230,831	6,648	32,284	3,201	5,483	278,447	5,071.5	283,519	7.9
Paddy rice	1,104	-	6,732	17,427	-	25,263	1,219.9	26,483	0.7
Sorghum	25,534	3,916	873	214	7,897	38,434	1,451.3	39,885	1.1
Wheat	2,483	701	-	-	-	3,184	222.4	3,406	0.1
Other cereals	3,645	-	52	-	35	3,731	-	3,731	0.1
Tubers and Roots	**1,095,144**	**116,655**	**58,631**	**4,534**	**6,001**	**1,280,965**	**3,851.1**	**1,284,816**	**35.9**
Cassava	354,395	-	8,236	1,388	4,192	368,211	255.1	368,466	10.3
Sweet Potatoes	462,927	4,971	40,259	2,111	601	510,868	55.4	510,924	14.3
Irish Potatoes	219,886	111,684	2,394	469	766	335,200	3,540.5	338,740	9.5
Yams & Taro	57,937	-	7,743	566	441	66,686	-	66,686	1.9
Banana	**919,763**	**84**	**7,682**	**257**	**12,035**	**939,821**	**1,386.8**	**941,207**	**26.3**
Cooking Banana	354,200	-	2,991	85	10,062	367,337	1,157.0	368,494	10.3
Dessert banana	91,392	-	1,576	65	939	93,972	154.1	94,126	2.6
Banana for beer	474,170	84	3,115	107	1,035	478,511	75.7	478,587	13.4
Legumes & Pulses	**245,993**	**5,511**	**6,204**	**764**	**2,844**	**261,316**	**715.6**	**262,032**	**7.3**
Beans	218,474	4,855	5,609	718	2,712	232,368	609.7	232,978	6.5
Bush beans	122,787	-	4,891	673	2,550	130,901	501.3	131,402	3.7
Climbing beans	95,687	4,855	717	45	162	101,467	108.4	101,575	2.8
Peas	13,754	656	85	-	49	14,544	2.9	14,547	0.4
Groundnuts	5,440	-	105	-	61	5,606	8.2	5,615	0.2
Soya beans	8,325	-	406	46	21	8,798	94.8	8,893	0.2
Vegetables and Fruits	**140,320**	**5,749**	**19,395**	**1,739**	**262**	**167,465**	**297.0**	**167,762**	**4.7**
Vegetables	100,836	4,255	19,084	1,739	235	126,150	195.4	126,345	3.5
Fruits	39,484	1,494	311	-	27	41,316	101.6	41,417	1.2
Other crops	**536,145**	**3,186**	**10,906**	**410**	**259**	**550,907**	17,572.6	**568,479**	15.9
All Rwanda	**3,200,961**	**142,450**	**142,759**	**28,545**	**34,817**	**3,549,533**	**31,788**	**3,581,321**	**100**

2014 Seasonal Agriculture Survey - Season A

The share of crop production by groups of crops in Rwanda was significantly high for Tubers and Roots (35.9%) followed by Banana (26.3%). Other crop groups contributed as follows: Cereals 10.0%), Vegetables and Fruits (4.7%) and Legumes and Pulses (7.3%). The share of crop production for individual crop was highest for Sweet Potatoes (14.3%) followed by Banana for Beer

Figure4: Share of production by main crops (%)

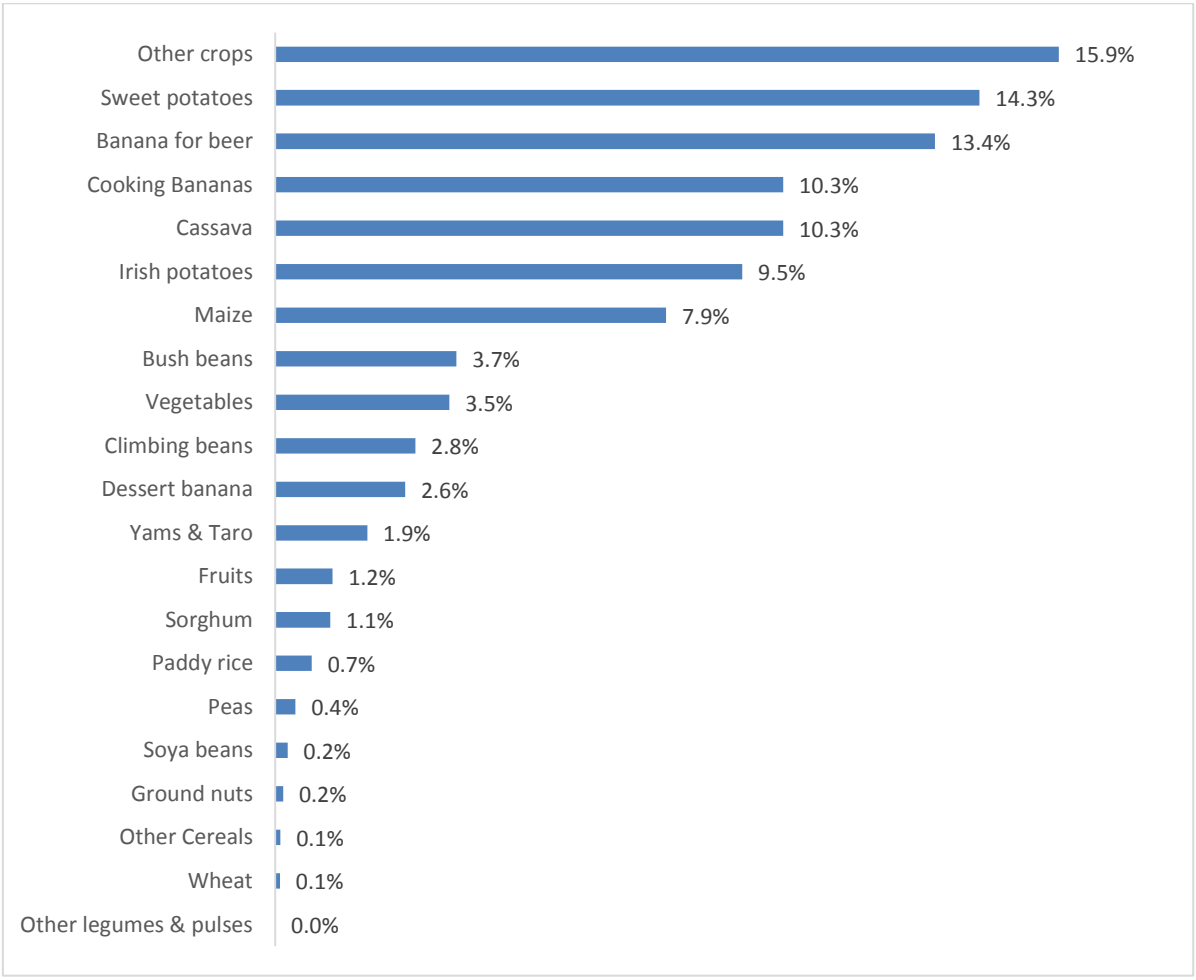
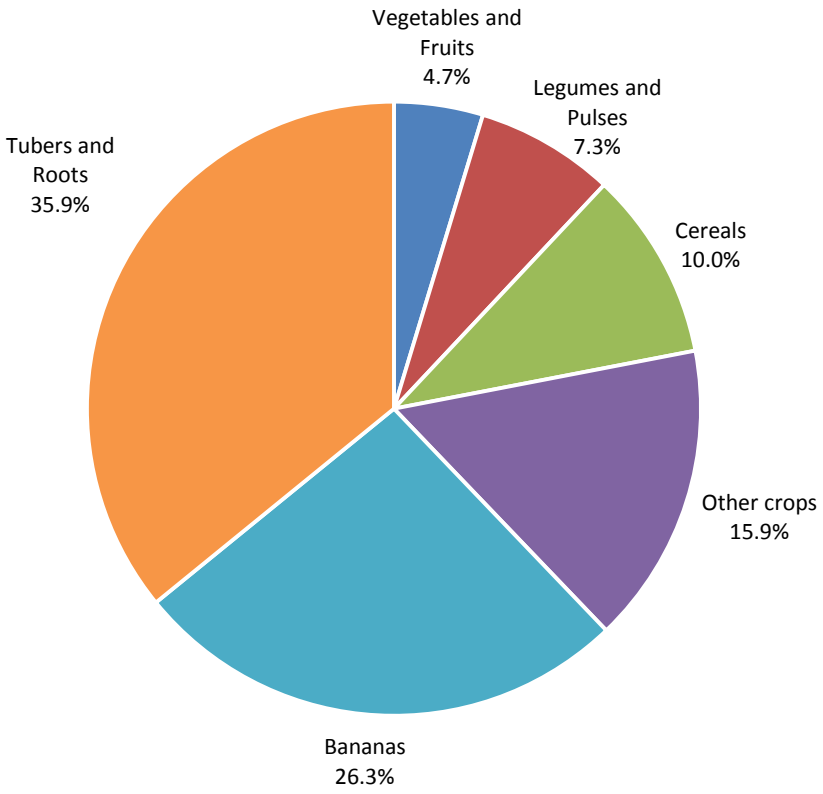


Figure 5 : Share of production by group of crops (%)



4.4 Agricultural Practices

4.4.1 Pure and Mixed Cropping

The survey results showed that the share of agricultural land used by Agricultural Operators to grow crops in pure stand and mixed stand in Rwanda was 21.7% and 78.3% respectively (see Table 23). For LSF, the share between pure stand and mixed stand was 75.9% and 24.1% respectively.

Table 23. Share of Pure and Mixed Crop Agricultural Land (%)

	Strata	Pure Crop Land	Mixed Crop Land	Total
Agricultural Operators	**1.1**	19.6	80.4	100
	1.2	41.3	58.7	100
	2.1	49.2	50.8	100
	2.2	82.7	17.3	100
	3.0	18.5	81.5	100
	All Rwanda	21.7	78.3	100
LSF		75.9	24.1	100

2014 Seasonal Agriculture Survey - Season A

In general, except stratu 2.2, Agricultural Operators in all strata used most of their agricultural land to cultivate mixed crops while LSF devoted most of their agricultural land to cultivate crops in pure stand.

Table 24. Distribution of Pure Crop Agricultural Land (Ha) in Segments by Type of Crop (%)

Strata \ Crop	Maize	Paddy rice	Sorghum	Cassava	Sweet potatoes	Irish potatoes	Banana	Bush beans	Climbing beans	Peas	Others	All Rwanda
1.1	9.6	0.6	0.9	32.1	11.3	3.0	10.8	1.7	9.3	2.1	18.5	100
1.2	6.8	-	4.7	-	4.2	37.9	-	-	12.2	1.9	32.3	100
2.1	43.6	8.7	0.4	9.7	11.1	0.1	1.4	2.0	0.4	0.1	22.4	100
2.2	15.3	71.4	0.3	0.9	2.8	0.2	0.3	2.9	0.3	-	5.8	100
3.0	4.3	-	22.9	24.4	0.7	1.4	1.8	0.6	-	5.8	38.0	100
All Rwanda	12.4	3.2	1.4	27.6	10.6	4.3	9.1	1.6	8.3	1.9	19.5	100

2014 Seasonal Agriculture Survey - Season A

Table 24 shows the use of agricultural land for growing main crops in pure stand in the country. Stratum 1.1 used 32.1% of total land for pure stand in mainly Cassava cultivation followed by Sweet potatoes (11.3%) and Banana (10.8%). Stratum 1.2 used 37.9% of total land for pure stand cropping mainly for Irish Potatoes. Stratum 2.1 used 43.6% of total land for pure stand cropping mainly for Maize and Stratum 2.2 used 71.4% of total land for pure cropping for Paddy rice.

4.4.2 Use of Organic Fertilizer

In segments, 62.3% of all Agricultural Operators in Rwanda reported that they used organic fertilizer (see Table 25). The organic fertilizers were mostly used in Stratum 2.1 (68.0%) followed by Stratum 1.1 (62.3%), Stratum 1.2 (57.7%), Stratum 2.2 (35.5%) and Stratum 3.0 (25.1%).

Table 25. Users of Organic Fertilizers (%)

	Strata	Used organic fertilizers
Agricultural Operators	1.1	62.3
	1.2	57.7
	2.1	68.0
	2.2	35.5
	3.0	25.1
	All Rwanda	62.3
LSF		79.7

2014 Seasonal Agriculture Survey - Season A

For Large Scale Farmers, 79.7% of LSF reported they used organic fertilizers.

Table 26. Users of organic fertilizers by crops (%)

	Agricultural operators						LSF
Crop \ Strata	1.1	1.2	2.1	2.2	3.0	All Rwanda	
Maize	68.3	48.6	73.4	62.8	24.0	68.1	66.4
Paddy rice	7.1	0.0	29.8	15.3	0.0	12.9	57.1
Sorghum	37.3	35.7	57.1	0.0	12.2	37.1	57.6
Wheat	66.7	41.5	0.0	0.0	0.0	65.1	55.6
Bush Beans	59.7	100.0	50.9	66.2	23.1	59.7	62.4
Climbing beans	79.2	43.0	93.8	50.0	28.6	78.7	71.4
Peas	73.9	65.4	52.6	50.0	16.7	73.6	71.4
Cassave	48.0	0.0	47.7	53.7	18.1	47.9	49.1
Irish potatoes	74.0	75.4	71.9	50.0	34.2	73.9	79.4
Sweet potatoes	58.1	58.6	60.7	41.2	38.7	58.2	50.0
Yam and Taro	75.6	100.0	80.3	45.7	31.6	75.7	75.0
Cooking banana	60.8	100.0	43.8	75.0	47.9	60.8	73.1
Banana for beer	57.6	75.0	44.4	0.0	33.3	57.5	70.0
Soybeans	63.5	0.0	63.0	46.7	41.7	63.5	77.8
Groundnuts	35.2	0.0	45.5	50.0	19.0	35.2	72.2
Vegetables	85.9	50.0	89.7	70.7	37.5	85.8	87.5
Fruits	61.3	61.5	58.3	66.7	13.6	42.0	65.3

2014 Seasonal Agriculture Survey - Season A

4.4.3 Use of Inorganic Fertilizer by Agricultural Operators and Large Scale Farmers

The survey results showed that 20.2% of Agricultural Operators used inorganic fertilizers while 43.5 % of LSF used inorganic fertilizers during 2014 Season A (see Table 27). This shows that a larger proportion of LSF used inorganic fertilizer than Agricultural Operators during this agricultural season.

Table 27. Use of Inorganic Fertilizer (%)

	Strata	Used inorganic fertilizers
Agricultural Operators	1.1	19.5
	1.2	41.6
	2.1	41.7
	2.2	67.6
	3.0	18.7
	All Rwanda	20.2
LSF		43.5

2014 Seasonal Agriculture Survey - Season A

Table 28. Users of Inorganic Fertilizers by Type and by Stratum (%)

	Strata	NPK	UREA	UREA (LIQUID)	DAP	OTHER Fertilizers	Total
Agricultural Operators	1.1	19.2	37.1	1.2	42.5	-	100
	1.2	66.2	11.3	6.9	15.4	0.3	100
	2.1	11.3	47.1	1.1	39.8	0.7	100
	2.2	37.5	46.4	3.1	12.9	0.2	100
	3.0	-	47.5	0.8	51.6	-	100
	All Rwanda	19.8	37.2	1.3	41.7	0.0	100
LSF		23.3	39.5	0.3	34.9	2.0	100

2014 Seasonal Agriculture Survey - Season A

For Agricultural Operators in segments, DAP was the most used (41.7%) followed by UREA (37.2%) and NPK (19.8%) while UREA was the most highly used by LSF (39.5%) followed by DAP (34.9%) and NPK (23.3%).

In Stratum 1.1 and Stratum 3.0, the survey showed that DAP was used by 42.5 and 51.6% of all agricultural operators within the Stratum respectively and NPK was mostly used in Stratum 1.2 (66.2% of all agricultural operators). UREA was also ranked first in the Strata 2.1 and 2.2 (respectively 47.1% and 46.4%).

Table 29. Users of inorganic fertilizers by crops (%)

Crops \ Strata	Agricultural operators						LSF
	1.1	1.2	2.1	2.2	3.0	All Rwanda	
Maize	24.3	7.5	56.8	50.0	17.2	24.8	43.7
Paddy rice	7.1	0.0	76.6	79.5	0.0	34.7	100.0
Sorghum	7.5	0.0	0.0	0.0	0.9	6.8	3.0
Wheat	44.4	7.3	0.0	0.0	0.0	42.2	55.6
Bush Beans	6.7	0.0	6.5	8.8	1.7	6.7	14.1
Climbing beans	14.3	2.3	12.5	12.5	0.0	14.1	38.1
Peas	11.6	1.9	5.3	0.0	0.0	11.4	14.3
Cassave	2.5	0.0	2.0	2.4	0.7	2.5	3.8
Irish potatoes	19.1	73.0	15.8	14.3	0.0	20.3	55.9
Sweet potatoes	2.2	0.0	1.6	3.9	0.0	2.2	12.5
Yam and Taro	2.1	0.0	1.5	11.4	0.0	2.1	25.0
Cooking banana	1.5	0.0	0.0	0.0	0.0	1.5	7.7
Banana for beer	1.4	0.0	0.0	0.0	0.0	1.4	20.0
Soybeans	3.1	0.0	0.0	26.7	0.0	3.1	11.1
Groundnuts	2.7	0.0	0.0	0.0	0.0	2.7	11.1
Vegetables	34.3	35.7	47.4	53.7	37.5	34.8	41.7
Fruits	2.5	7.7	16.7	16.7	38.6	1.8	8.2

2014 Seasonal Agriculture Survey - Season A

Agricultural operators used inorganic fertilizers mostly on Wheat (42.2%), Paddy rice and Vegetables (34.8%), Maize (24.8 %) and Irish potatoes (20.3%), while LSF mostly used inorganic fertilizers on Paddy rice (100%) and Irish potatoes (55.9%).

4.4.4 Use of Seeds

In 2014, Agricultural Operators used traditional seeds more than improved ones (88.8 % and 11.2% respectively). For LSF, on country level, traditional seeds are used at (59.5 %). The use of traditional seeds and improved seeds by Stratum is given in Table 31.

Table 30. Agricultural Operators by Type of Seeds Used (%)

	Strata	Traditional seeds	Improved seeds
Agricultural Operators	1.1	89.1	10.9
	1.2	93.9	6.1
	2.1	71.1	28.9
	2.2	78.7	21.3
	3.0	84.6	15.4
	All Rwanda	88.8	11.2
LSF		59.5	40.5

2014 Seasonal Agriculture Survey - Season A

Table 31. Users of Traditional Seeds by Type of Crop (%)

	Agricultural operators						LSF
Crops \ Strata	1.1	1.2	2.1	2.2	3.0	All Rwanda	
Maize	79.3	92.0	46.1	54.5	80.2	78.8	57.1
Sorghum	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Wheat	92.6	97.6	0.0	0.0	0.0	92.9	44.4
Bush Beans	99.4	100.0	96.3	98.5	99.4	99.4	87.1
Climbing beans	99.5	100.0	93.8	100.0	100.0	99.5	52.4
Peas	99.5	98.7	100.0	100.0	100.0	99.5	100.0
Cassave	99.5	0.0	98.7	95.1	100.0	99.5	98.1
Irish potatoes	99.5	98.2	98.2	100.0	100.0	99.5	85.3
Sweet potatoes	99.5	100.0	100.0	96.1	100.0	99.5	100.0
Yam and Taro	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Cooking banana	99.3	100.0	100.0	100.0	99.0	99.3	74.4
Banana for beer	99.5	100.0	100.0	100.0	100.0	99.5	90.0
Soybeans	96.5	0.0	91.3	100.0	100.0	96.5	66.7
Groundnuts	100.0	0.0	100.0	100.0	100.0	100.0	100.0
Vegetables	78.3	21.4	74.4	63.4	75.0	77.9	41.7
Fruits	98.4	92.3	100.0	100.0	63.6	67.5	59.2

2014 Seasonal Agriculture Survey - Season A

Traditional seeds were used for almost all crops by Agricultural operators as well as by LSF.

Table 32. Users of Improved Seeds by Type of Crop (%)

Crops \ Strata	Agricultural operators						LSF
	1.1	1.2	2.1	2.2	3.0	All Rwanda	
Maize	22.6	10.3	55.2	46.2	20.2	23.1	47.1
Wheat	7.4	2.4	0.0	0.0	0.0	7.1	55.6
Bush Beans	0.4	0.0	3.7	1.5	0.6	0.4	12.9
Climbing beans	0.5	0.0	0.0	0.0	0.0	0.4	47.6
Peas	0.5	1.3	0.0	0.0	0.0	0.5	0.0
Cassave	0.4	0.0	2.0	2.4	0.0	0.4	5.7
Irish potatoes	0.3	2.1	1.8	0.0	0.0	0.4	17.6
Sweet potatoes	0.2	0.0	0.0	2.0	0.0	0.2	0.0
Cooking banana	0.7	0.0	0.0	0.0	1.0	0.7	21.8
Banana for beer	0.1	0.0	0.0	0.0	0.0	0.1	10.0
Soybeans	3.8	0.0	8.7	0.0	0.0	3.9	44.4
Vegetables	27.3	92.9	34.6	39.0	25.0	27.7	75.0
Fruits	2.2	7.7	4.2	0.0	36.4	1.6	32.4

2014 Seasonal Agriculture Survey - Season A

Agricultural operators used improved seeds mostly to grow Vegetables (27.7%) and Maize (23.1%). Among LSF, the highest use of improved seeds has been to grow Vegetables (75%) followed by Wheat and Climbing beans as their percentages are (55.6% and 47.6% respectively).

4.4.5 Irrigation Practices

In Rwanda only 2.0% of Agricultural Operators practised irrigation in 2014. The few Agricultural Operators that practised irrigation were in the Stratum 2.2 (69.4%), Stratum 2.1 (21.4%), Stratum 3.0 (3.5%), Stratum 1.1 (1.5%) and Stratum 1.2 (0.1%). The distribution of Agricultural Operators and LSF that practised irrigation in Rwanda by Stratum is given in Table 33.

Table 33. Agricultural Operators and Large Scale Farmers Practising Irrigation (%)

	Strata	Practised Irrigation
Agricultural Operators	1.1	1.5
	1.2	0.1
	2.1	21.4
	2.2	69.4
	3.0	3.5
	All Rwanda	2.0
LSF		13.2

2014 Seasonal Agriculture Survey - Season A

The 2014 SAS results showed that about 2.0% of agricultural operators and 13.2 % of LSF practised irrigation (see Table 33).

On the type of irrigation used by Agricultural Operators, the survey results showed that the majority of Agricultural Operators used Watering can for irrigation (47.9%), followed by those that used Water channels (31.4%) (SeeTable 34).

Table 34. Agricultural Operators and LSF by Type of Irrigation Practised (%)

	Strata	Pumps/tube wells/irrigation machines	Watering can	Water channels	Others	Total
Agricultural Operators	1.1	11.5	55.8	21.2	11.5	100
	1.2	-	100.0	-	-	100
	2.1	-	29.9	50.0	20.1	100
	2.2	-	11.6	87.6	0.8	100
	3.0	8.3	91.7	-	-	100
	All Rwanda	8.7	47.9	31.4	12.1	100
LSF		16.1	29.9	54.0		100

2014 Seasonal Agriculture Survey - Season A

The survey results showed that the use of Watering can for irrigation was predominantly used by agricultural operators in Strata 1.2, 3.0 and 1.1 (100%, 91.7% and 55.8% respectively). Agricultural operators from Strata 2.1 and 2.2 mostly used

Water channels as the irrigation practice (87.6% and 50% respectively). Among LSF, those who practised Water channels were 54%, followed by Watering can with 29.9% and Pumps wells or Irrigation machines whith 16.1%.

Table 35. Practice of irrigation by crop (%)

Crops \ Strata	Agricultural operators						LSF
	1.1	1.2	2.1	2.2	3.0	All Rwanda	
Maize	0.3	0.0	11.4	12.8	0.0	0.5	4.2
Paddy rice	57.1	0.0	85.1	98.4	0.0	70.8	100.0
Sorghum	0.0	0.0	0.0	16.7	0.0	0.0	3.0
Bush Beans	0.2	0.0	3.7	14.7	0.0	0.2	1.2
Climbing beans	0.1	0.0	6.3	0.0	0.0	0.1	0.0
Peas	0.0	0.0	5.3	0.0	0.0	0.0	0.0
Cassave	0.1	0.0	3.3	2.4	0.0	0.2	0.0
Irish potatoes	0.0	0.0	15.8	28.6	0.0	0.1	5.9
Sweet potatoes	0.3	0.0	6.6	15.7	3.2	0.4	0.0
Yam and Taro	0.3	0.0	10.6	11.4	0.0	0.6	0.0
Cooking banana	0.2	0.0	0.0	0.0	0.0	0.2	5.1
Banana for beer	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Soybeans	0.0	0.0	4.3	13.3	0.0	0.1	11.1
Groundnuts	0.0	0.0	0.0	0.0	0.0	0.0	5.6
Vegetables	16.7	7.1	55.1	78.0	50.0	18.1	37.5
Fruits	1.0	0.0	4.2	0.0	18.2	0.7	8.2

2014 Seasonal Agriculture Survey - Season A

4.4.6 Anti-erosive Activities

Erosion refers to the process in which the earth's surface is worn away. Due the mountainous landscape of Rwanda, most of the Agricultural Operators practise anti-erosive activities to prevent the wasting away of the topsoil. The survey results show the distribution of Agricultural Operators and LSF practising anti-erosive activities (see Table 36).

Table 36. Anti-erosive Activities by Agricultural Operators and Large Scale Farmers (%)

	Strata	Practised Anti-erosion
Agricultural Operators	1.1	48.8
	1.2	64.9
	2.1	61.6
	2.2	78.5
	3.0	4.1
	All Rwanda	49.2
LSF		14.4

2014 Seasonal Agriculture Survey - Season A

Anti-erosion was practised by 49.2% of Agricultural Operators and 14.4% of LSF. Most of the anti-erosion activities were practised by Agricultural Operators in the Stratum 2.2 (78.5%), followed by Stratum 1.2 (64.9%), Stratum 2.1 (61.6%), Stratum 1.1 (48.8%) and Stratum 3.0 (4.1%).

Table 37. Anti-erosive Activities by Agricultural Operators and LSF (%)

	Strata	Ditches	Trees	Radical Terracing	Progressive terracing	Grasses	Water drainage	Mulching	Beds	Other	Total
Agricultural Operators	**1.1**	9.3	3.3	5.0	12.6	65.3	2.1	0.6	1.8	0.1	100
	1.2	0.8	2.1	1.5	8.4	25.3	0.1	0.1	61.4	0.2	100
	2.1	3.5	0.1	0.2	0.7	23.0	49.8	0.1	15.6	7.1	100
	2.2	0.7	0.2	4.0	0.8	5.3	71.9	-	10.1	7.0	100
	3.0	29.3	19.6	-	1.1	47.8	-	2.2	-	-	100
	All Rwanda	9.1	3.2	4.9	12.4	64.3	3.0	0.6	2.3	0.2	100
LSF		16.7	10.3	5.1	10.3	11.5	6.4	35.9	-	3.8	100

2014 Seasonal Agriculture Survey - Season A

The Survey shows that, in Rwanda the most practised erosion control measures by Agricultural Operators in all Strata were Grasses (64.3%) and Progressive Terracing (12.4%) followed by Ditches (9.1%) (See Table 37). Other erosion control measures

such as planting of trees, radical terracing, waterway and mulching were also practised but with a small number of Agricultural Operators.

Table 38. Practice of anti-erosive activities by crops (%)

Crops \ Strata	Agricultural operators						LSF
	1.1	1.2	2.1	2.2	3.0	All Rwanda	
Maize	76.7	90.8	77.3	59.6	12.6	76.7	57.1
Paddy rice	100.0	0.0	80.9	98.1	0.0	96.1	85.7
Sorghum	61.2	92.2	71.4	33.3	13.0	62.8	30.3
Wheat	96.3	92.7	0.0	0.0	0.0	96.1	88.9
Bush Beans	76.5	100.0	64.8	76.5	15.0	76.3	50.6
Climbing beans	83.4	91.6	93.8	62.5	14.3	83.5	76.2
Peas	87.9	86.5	47.4	50.0	8.3	87.7	71.4
Cassave	72.3	0.0	74.8	43.9	18.1	72.3	39.6
Irish potatoes	82.3	93.5	73.7	71.4	10.5	82.5	73.5
Sweet potatoes	80.3	81.0	71.6	51.0	22.6	80.2	37.5
Yam and Taro	75.3	100.0	66.7	68.6	36.8	75.1	75.0
Cooking banana	71.1	100.0	62.5	62.5	29.2	71.1	51.3
Banana for beer	74.1	100.0	85.2	100.0	50.0	74.1	70.0
Soybeans	76.7	0.0	69.6	60.0	8.3	76.6	88.9
Groundnuts	70.3	0.0	72.7	100.0	0.0	70.3	38.9
Vegetables	73.2	92.9	73.1	68.3	25.0	73.3	70.8
Fruits	75.6	100.0	79.2	33.3	27.3	51.9	55.1

2014 Seasonal Agriculture Survey - Season A

The anti- erosive activities were generally undertaken on cropland. With regards to cropland for Paddy rice, Wheat, Peas, Climbing beans, Irish potatoes and Sweet Potatoes, more than 80.0% of agricultural operators reported that their plots are protected against erosion.

4.4.7 Use of Pesticides

The survey results showed that in Rwanda 10.9% of Agricultural Operators used pesticides in their farming activities against 32.2% of LSF. (see Table 39).

Table 39. Agricultural Operators and LSF using Pesticide (%)

	Strata	Used Pesticides
Agricultural Operators	1.1	10.8
	1.2	43.7
	2.1	20.7
	2.2	48.6
	3.0	2.6
	Rwanda	10.9
LSF	Rwanda	32.2

2014 Seasonal Agriculture Survey - Season A

The use of pesticides is less than 50% of Agricultural operators in all strata. Stratum 2.2 (48.6%) and Stratum 1.2 (43.7%) were having the highest Agricultural Operators who used of pesticides followed by Strata 2.1, 1.1 and 3.0 (20.7%, 10.8% and 2.6% respectively).

The most used pesticide in Rwanda has been Cypermetrine that counted 30.8% of all Agricultural Operators, mostly in Strata 2.1, 2.2 and 3.0 with 34.4%, 51.7% and 63.6% Agricultural Operators respectively. The Dithane was ranked first in Strata 1.1 and 1.2 (33.8% and 44.0%). (See Table 40).

Table 40.**Type of Pesticide used by Agricultural operators and LSF**

	Strate	DITHANE	RIDOMIL	DIMETHOATE	CYPERMETRINE	DURSIBAN	PILKARE	OTHER PESTICIDE	Total
Agricultural Operators	11	33.8	9.1	11.3	31.4	11.7	-	2.8	100
	12	44.0	27.6	13.0	14.9	0.2	-	0.3	100
	21	11.7	0.6	28.6	34.4	15.6	-	9.1	100
	22	0.9	0.9	26.5	51.7	5.0	-	14.8	100
	30	18.2	-	9.1	63.6	-	-	9.1	100
	All Rwanda	33.4	9.8	12.0	30.8	11.1	-	3.0	100
LSF		19.7	13.1	8.9	31.9	7.5	0.9	17.8	100

2014 Seasonal Agriculture Survey - Season A

The Table 40 shows that, Countrywide, for Agricultural Operators, Dithane is the most used pesticide (33.4% of all Agricultural operators) followed by Cypermetrine (30.8%). For the LSF, most of them used Cypermetrine pesticide (31.9%), followed by Dithane pesticide (19.7%), Ridomil pesticide (13.1%), Dimethoate pesticide (8.9%) and Dursiban (7.5%).

Table 41. Users of pesticides by crops (%)

Crops \ Strata	Agricultural operators						LSF
	1.1	1.2	2.1	2.2	3.0	All Rwanda	
Maize	4.6	1.1	13.6	10.9	0.0	4.7	10.1
Paddy rice	0.0	0.0	55.3	63.3	0.0	23.2	85.7
Sorghum	0.0	0.0	0.0	0.0	0.9	0.0	3.0
Wheat	0.0	2.4	0.0	0.0	0.0	0.1	22.2
Bush Beans	1.5	0.0	4.6	5.9	1.7	1.5	3.5
Climbing beans	5.2	3.2	6.3	25.0	0.0	5.2	23.8
Peas	4.7	2.6	0.0	0.0	0.0	4.6	14.3
Cassave	0.3	0.0	0.0	0.0	0.0	0.3	0.0
Irish potatoes	16.1	81.5	0.0	7.1	0.0	17.4	52.9
Sweet potatoes	0.3	0.0	1.1	0.0	0.0	0.3	0.0
Yam and Taro	0.8	0.0	0.0	0.0	0.0	0.7	0.0
Cooking banana	0.5	0.0	0.0	0.0	0.0	0.5	0.0
Banana for beer	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Soybeans	0.3	0.0	0.0	0.0	0.0	0.3	0.0
Groundnuts	4.4	0.0	0.0	0.0	4.8	4.4	0.0
Vegetables	40.4	78.6	64.1	56.1	50.0	41.4	58.3
Fruits	2.2	61.5	12.5	0.0	4.5	1.6	12.2

2014 Seasonal Agriculture Survey - Season A

The survey results showed that agricultural operators used pesticides mostly on vegetables (41.4%), Paddy rice (23.2%) and Irish potatoes (17.4%).

The use of pesticides by agricultural operators was less than 10% for other grown crops.

For LSF, the percentage of users of pesticides was also high on Paddy rice (85.7%), vegetables (58.3%) and Irish potatoes (52.9%).

4.5 Small Agricultural Equipment

Expenditureon small agricultural equipment by agricultural operators and LSF was mainly on the Hoe (22.5%) followed by Bike and Sheeting for agricultural operators (respectively 11.2% and 10.2%) while LSF spent mainly on Sheeting and Sacks (22.2% and 14.7 respectively). Expenditures on the other tools that were used for cultivation by Agricultural operators and LSFs were below 10% each of the total expenditure.

Table 42.Expenditureby Type of Small Agricultural Equipment (%)

Small Agricultural Equipment	Agricultural Operators						LSF
	1.1	1.2	2.1	2.2	3.0	All Rwanda	
Hoe	22.5	14.9	26.0	15.6	20.6	22.5	22.5
Spring Hoe	1.5	0.6	2.0	0.2	0.8	1.5	0.6
Fork hoe	6.5	1.3	2.2	3.7	9.0	6.4	0.8
Rake	0.1	0.1	0.0	0.2	0.2	0.1	0.2
Pick/ Ipiki	1.5	0.3	1.1	0.5	1.1	1.4	1.4
Wheelbarrow	2.1	.	1.6	1.1	1.4	2.1	3.5
Shovel/igitiyo	1.4	0.8	1.2	1.1	1.2	1.4	0.7
Watering pump	0.8	.	.	0.0	0.0	0.8	1.9
Sprayer	3.3	27.3	7.2	7.7	.	3.5	7.1
Watering can	0.6	0.2	1.9	2.6	0.8	0.6	0.5
Scie	0.9	.	0.1	0.2	0.0	0.9	0.0
Sickle	2.4	1.3	2.2	2.4	0.4	2.4	2.5
Secataur	0.2	0.0	0.0	0.1	0.0	0.2	0.2
Scythe	0.2	.	0.1	0.1	0.3	0.2	0.1
Machete	3.4	2.4	2.7	2.9	4.0	3.4	6.6
Billhook	0.1	0.1	0.0	0.0	.	0.0	
Basket	3.0	2.0	2.7	1.2	2.1	2.9	0.3
Sack	7.5	16.0	4.9	12.3	11.4	7.6	14.7
Big basket	0.2	1.3	0.0	0.0	0.0	0.2	0.1
Winnower	2.2	1.7	2.1	2.3	3.5	2.2	1.7
Basket(ikibo)	1.1	0.4	0.3	0.4	0.2	1.1	0.1
Basket(inkangara)	0.1	0.4	0.1	0.1	.	0.1	0.0
Scale	3.3	4.2	1.9	1.2	0.4	3.2	3.7
Jerry-can	5.6	5.5	4.5	4.2	4.8	5.6	1.2
Barrel	2.2	1.9	1.8	0.6	0.7	2.2	0.9
Bike	11.2	3.7	11.0	12.4	14.2	11.2	1.8
Craft bike	0.1	.	.	0.0	.	0.1	
Bowl	0.4	0.7	0.4	0.4	0.3	0.4	0.1
Sheeting	10.0	8.9	18.5	20.1	18.7	10.2	22.2
Hoe sleeve	2.6	2.9	2.4	1.9	3.3	2.6	2.3
Others (Specify)	2.8	1.0	1.1	4.2	0.5	2.8	2.4
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**

2014 Seasonal Agriculture Survey-Season A

The survey results on the value of donations received by Agricultural operators, Wheel barrows (36.2%) were the largest donation followed by Hoes (16.2%) and Sheeting (10.6%). For LSF, hoes were the largest donation (64.3%) followed by Machetes (12.0%).

Table 43. Value of Small Equipment Received from Non Agricultural Donors (%)

Small Agricultural Equipment	Agricultural Operators						LSF
	1.1	1.2	2.1	2.2	3.0	All Rwanda	
Hoe	17.3	100.0	1.8	92.0	-	16.2	64.3
Fork hoe	8.7	-	-	-	-	8.0	7.7
Rake	2.6	-	-	-	-	2.4	0.2
Wheelbarrow	39.5	-	-	-	-	36.2	0.6
Shovel/igitiyo	2.0	-	0.8	-	-	1.9	9.0
Sprayer	5.3	-	-	-	-	4.8	5.3
Watering can	1.0	-	-	-	-	0.9	0.2
Scie	0.8	-	-	-	-	0.8	-
Machete	1.4	-	-	-	-	1.3	12.0
Basket	0.2	-	-	-	-	0.2	
Sack	0.2	-	97.3	-	-	6.9	
Basket(ikibo)	1.0	-	-	-	-	0.9	
Scale	0.3	-	-	-	-	0.3	
Jerry-can	3.4	-	-	-	-	3.1	0.2
Craft bike	-	-	-	-	87.0	1.1	
Bowl	0.5	-	-	-	-	0.5	
Sheeting	11.4	-	-	-	13.0	10.6	0.2
Hoe sleeve	0.3	-	-	8.0	-	0.3	
Others (Specify)	4.3	-	-	-	-	3.9	0.4
Total	100	100	100	100	100	100	100

2014 Seasonal Agriculture Survey - Season A

4.6 Use of Crop Production by Agricultural Operators and by Large Scale Farmers

The majority of the crop production was consumed by the agricultural operator households (autoconsumption). The rest of the crop production for some crops was sold, offered as gifts to others, used as seeds or stored. A small

age of the crop production for some crops was used for payment of hired labour.

With respect to LSF, a substantial percentage of the production was sold. The rest of the crop production for some crops was consumed by the household, used as wages for hired labour, offered as gifts to others and used as seed or put in storage.

The survey results on the use of crop production by agricultural operators are given in Table 44 and 45.

Table 44. Use of Production by Agricultural Operators (%)

	Sold	Stored	Auto-consumption	Used as wage for hired labour	Used as Farm rent	Offered as Gift to Other	Exchanged with other things	Used as seeds	Used as fodder	Damaged	Used in any other way	Total
Maize	17.8	3.9	70.1	.7	.2	3.0	.1	3.5	.1	.2	.3	100
Paddy rice	66.9	1.1	24.9	1.6	.4	2.7	.2	1.8	.0	.2	.3	100
Sorghum	57.7	5.5	31.2	.6	.2	1.8	.1	3.0	.0	.0	.0	100
Wheat	25.1	3.5	51.8	.0	.2	4.7	.1	14.2	.0	.3	.1	100
Other cereals												
Bush beans	12.2	3.4	67.7	1.0	.4	2.1	.1	12.7	.0	.1	.2	100
Climbing beans	9.7	3.1	70.6	.2	.2	3.5	.3	12.3	.0	.0	.1	100
Peas	13.6	1.5	69.6	.2	.0	1.6	.1	13.5	.0	.1	.0	100
Other legumes & pulses												
Cassava	24.2	1.3	68.8	1.6	.0	3.0	.0	.0	.0	.1	.8	100
Irish potatoes	22.0	1.8	60.3	1.4	.2	2.3	.1	11.4	.0	.5	.1	100
Sweet potatoes	14.9	1.2	79.0	1.3	.1	2.8	.0	.0	.5	.2	.0	100
Yams & Taro	15.0	.1	80.3	.8	.0	2.3	.0	.8	.0	.1	.6	100
Tomotoes	66.6	.0	26.1	.3	.0	4.1	.4	.1	.0	2.5	.0	100
White cabbage	51.5	.0	41.5	.0	.0	5.7	.0	.0	.0	.6	.7	100
Flower cabage	45.0	.0	40.0	.0	.0	15.0	.0	.0	.0	.0	.0	100
Onions	70.3	.0	26.1	.0	.0	3.3	.0	.0	.0	.1	.2	100
Carrots	68.2	.0	30.3	.0	.0	1.3	.0	.0	.0	.1	.0	100
Eggplant	50.2	.0	44.1	.1	.0	5.2	.0	.2	.0	.1	.0	100
Other vegetables	12.5	.0	80.0	.0	.0	7.5	.0	.0	.0	.0	.0	100
Cooking Bananas	19.2	.0	76.3	1.1	.0	1.9	.0	.0	.0	.2	1.3	100
Dessert banana	60.8	.0	37.0	.5	.0	.9	.0	.0	.0	.1	.7	100
Banana for beer	73.7	.0	22.7	.1	.0	2.5	.1	.0	.0	.2	.8	100
Pineapple	32.9	.0	59.0	.0	.0	4.0	.0	.0	.0	.0	4.1	100
Avocado	81.3	.0	13.3	.9	.0	2.2	.0	.0	.0	2.3	.0	100
Passion fruits	84.8	.0	14.4	.0	.0	.9	.0	.0	.0	.0	.0	100
Other fruits												
Soya beans	10.8	2.7	67.5	.3	.4	1.2	.3	16.7	.0	.0	.0	100
Ground nuts	13.8	4.9	55.5	.0	.0	1.5	.6	23.6	.0	.0	.0	100
sun flower	9.9	2.4	82.0	.0	.0	1.6	.0	2.7	.0	1.4	.0	100
Coffee	100.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	100

2014 Seasonal Agriculture Survey - Season A

Table 44. Use of Production by Agricultural Operators (%), cont'd

	Sold	Stored	Auto-consumption	Used as wage for hired labour	Used as Farm rent	Offered as Gift to Other	Exchanged with other things	Used as seeds	Used as fodder	Damaged	Used in any other way	Total
Pyrethrum	100.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	100
Other crops	75.1	.0	1.5	.0	.0	.3	.0	.0	.0	.0	23.1	100
Sweet pepper	80.6	.0	13.2	1.0	.0	4.6	.0	.0	.0	.5	.1	100
Pepper	75.3	.0	22.4	.0	.0	1.9	.0	.0	.0	.4	.0	100
Amaranths	44.8	.0	46.7	.0	.0	8.5	.0	.0	.0	.0	.0	100
Celery	96.8	.0	.1	.6	.0	2.5	.0	.0	.0	.0	.0	100
Spinach	60.0	.0	30.0	.0	.0	10.0	.0	.0	.0	.0	.0	100
Small red beans	.0	.0	72.3	.0	.0	.0	.0	27.7	.0	.0	.0	100
Sugar beet	78.3	.0	11.1	.0	.0	10.6	.0	.0	.0	.0	.0	100
Garlic												
Leeks	47.0	.0	47.5	.0	.0	5.5	.0	.0	.0	.0	.0	100
French beans	82.9	.0	13.5	.0	.0	3.6	.0	.0	.0	.0	.0	100
Napia grass												
Sugar cane	54.5	.0	34.1	.7	.0	5.9	.0	.0	.0	1.9	2.9	100
Fodder crop	8.0	.0	.0	.0	.0	.5	.6	1.5	88.6	.8	.0	100
Macadamia	100.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	100
Mango	30.0	.0	50.0	.0	.0	20.0	.0	.0	.0	.0	.0	100
Papaya	61.5	.0	38.5	.0	.0	.0	.0	.0	.0	.0	.0	100
Tree tomato	79.0	.0	19.9	.0	.0	1.1	.0	.0	.0	.0	.0	100
Orange												
Lemon												
Guava	.0	.0	65.0	.0	.0	35.0	.0	.0	.0	.0	.0	100
White Mulberry												
Millet	10.5	9.5	72.9	.0	.0	1.3	.0	5.8	.0	.0	.0	100
Jatropha	3.0	.0	81.2	4.5	.0	9.4	.0	1.9	.0	.0	.0	100
Pumpkins												
Cucumber	53.0	.0	19.3	.0	1.5	1.3	.0	.0	.0	25.0	.0	100

2014 Seasonal Agriculture Survey - Season A

Table 45. Use of Production by Large Scale Farmer (%)

	Sold	Stored	Auto-consumption	Used as wage for hired labour	Used as Farm rent	Offered as Gift to Other	Exchanged with other things	Used as seeds	Used as fodder	Damaged	Used in any other way	Total
Maize	53.6	7.2	25.8	3.4	.0	2.9	.0	3.9	1.7	1.3	.3	100
Paddy rice	71.2	.1	24.6	.0	.0	.0	.0	1.1	.0	2.9	.0	100
Sorghum	75.9	6.6	10.2	3.4	.0	.7	.0	2.9	.0	.2	.0	100
Wheat	85.1	8.3	.7	.0	.0	.1	.0	5.8	.0	.0	.0	100
Other cereals												
Bush beans	44.3	6.7	32.9	3.1	.0	2.3	.0	10.5	.0	.2	.0	100
Climbing beans	60.1	5.8	25.0	.0	.0	.1	.0	8.5	.0	.1	.3	100
Peas	39.4	2.8	46.5	.4	.0	.0	.0	10.8	.0	.0	.0	100
Other legumes & pulses												
Cassava	42.2	.2	53.1	1.6	.0	1.8	.2	.0	.0	.9	.1	100
Irish potatoes	45.8	4.3	32.9	1.4	.1	1.4	.5	13.2	.0	.4	.0	100
Sweet potatoes	29.2	.0	25.5	8.6	.0	3.4	.0	.0	33.3	.0	.0	100
Yams & Taro	.0	.0	100.0	.0	.0	.0	.0	.0	.0	.0	.0	100
Tomotoes	94.6	.0	3.2	.5	.0	1.7	.0	.0	.0	.0	.0	100
White cabbage	48.4	.0	41.6	.0	.0	6.4	.0	.0	.0	3.6	.0	100
Flower cabage												
Onions	68.6	.0	31.5	.0	.0	.0	.0	.0	.0	.0	.0	100
Carrots	55.9	.0	39.8	.0	.0	4.3	.0	.0	.0	.0	.0	100
Eggplant	46.5	.0	50.3	1.3	.0	1.9	.0	.1	.0	.0	.0	100
Other vegetables	.0	.0	100.0	.0	.0	.0	.0	.0	.0	.0	.0	100
Cooking Banana	39.7	.0	53.0	2.3	.0	3.9	.0	.0	.0	1.1	.1	100
Dessert banana	54.1	.0	38.7	.7	.0	4.1	.0	.0	.0	2.0	.3	100
Banana for beer	78.1	.0	8.0	6.3	.0	7.6	.0	.0	.0	.0	.0	100
Pineapple	73.5	.0	19.9	.0	.0	1.3	.0	.0	.0	3.9	1.4	100
Avocado	.0	.0	100.0	.0	.0	.0	.0	.0	.0	.0	.0	100
Passion fruits												
Other fruits												
Soya beans	31.1	5.6	26.7	.0	.0	10.5	.0	22.9	.0	3.3	.0	100
Ground nuts	39.7	7.9	34.4	.1	.1	1.4	.1	16.0	.0	.4	.0	100
sun flower												
Coffee	100.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	100

2014 Seasonal Agriculture Survey - Season A

Table 45. Use of Production by Large Scale Farmer (%) Cont'd

	Sold	Stored	Auto-consumption	Used as wage for hired labour	Used as Farm rent	Offered as Gift to Other	Exchanged with other things	Used as seeds	Used as fodder	Damaged	Used in any other way	Total
Pyrethrum	100.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	100
Other crops												
Sweet pepper	99.4	.0	.7	.0	.0	.0	.0	.0	.0	.0	.0	100
Pepper	52.0	.0	3.0	.0	.0	3.0	.0	2.0	.0	40.0	.0	100
Amaranths	41.8	.0	55.9	.0	.0	2.4	.0	.0	.0	.0	.0	100
Celery												
Spinach												
Small red beans												
Sugar beet	.0	.0	100.0	.0	.0	.0	.0	.0	.0	.0	.0	100
Garlic	.0	50.0	.0	.0	.0	.0	50.0	.0	.0	.0	.0	100
Leeks	.0	.0	100.0	.0	.0	.0	.0	.0	.0	.0	.0	100
French beans												
Napia grass												
Sugar cane												
Fodder crop												
Macadamia	100.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	100
Mango	.0	.0	100.0	.0	.0	.0	.0	.0	.0	.0	.0	100
Papaya	100.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	100
Tree tomato	90.0	.0	10.0	.0	.0	.0	.0	.0	.0	.0	.0	100
Orange	.0	.0	100.0	.0	.0	.0	.0	.0	.0	.0	.0	100
Lemon												
Guava												
White Mulberry												
Millet												
Jatropha												
Pumpkins												
Cucumber												

2014 Seasonal Agriculture Survey - Season A

Chapter 5: Results of the 2014 Season B

Details of demographic information, use of inputs, other agricultural practices, and production aspects are captured in phase II as described above.

A sample of 174 out of 502 LSF and 4,856 out of 25,167 Agricultural Operators were interviewed.

5.1 Demographic and Social Characteristics of Agricultural Operators

Characteristics of Agricultural Operators describe their number by type (individual or cooperative), gender, age, education level, residency, farming activities and cooperative membership.

5.1.1 Agricultural Operators and Large Scale Farmers by Stratum

The distribution of Agricultural Operators (in segments) was highest in Stratum 1.1(65.1%), followed by Stratum 2.1 (11.6%). In 2014 Season B Phase II, 174 Large Scale Farmers were listed and enumerated in Rwanda.

Table 46. Agricultural Operators and Large Scale Farmers by Stratum

	Strata	Total	
		Number	%
Agricultural Operators	1.1	**3,162**	**65.1**
	1.2	451	9.3
	2.1	564	11.6
	2.2	389	8.0
	3.0	290	6.0
	All Rwanda	4,856	100
LSF		174	100

2014 Seasonal Agriculture Survey -Season B

The survey results showed that most of the Agricultural Operators in segments (99.5%) were individual Farmers and only 0.5 % of them were cooperatives.

Table 47. Agricultural Operators by type (%)

	Strata	Individual		Cooperative		Total	
		Number	%	Number	%	Number	%
Agricultural Operators	1.1	3147	99.5	15	0.5	3162	100
	1.2	451	100.0	0	0.0	451	100
	2.1	558	98.9	6	1.1	564	100
	2.2	385	99.0	4	1.0	389	100
	3.0	289	99.7	1	0.3	290	100
	All Rwanda	4830	99.5	26	0.5	4856	100
LSF						174	100

2014 Seasonal Agriculture Survey-Season B

According to the 2014 SAS results, 70.2% of Agricultural Operators in Stratum 2.2 are part of Agricultural Cooperatives, compared with 31.9% of Stratum 2.1. Among LSF, 58.0% of them are members of agricultural cooperatives.

Table 48. Cooperative Membership

	Strata	Yes	No	Total
		Percent	Percent	Percent
Agricultural Operators	1.1	14.3	85.7	100
	1.2	8.6	91.4	100
	2.1	31.9	68.1	100
	2.2	70.2	29.8	100
	3.0	11.7	88.3	100
	All Rwanda	14.6	85.4	100
LSF		58.0	42.0	100

2014 Seasonal Agriculture Survey - Season B

5.1.2 Number of Agricultural Operators by Gender

In 2014 Season B, the percentage distribution of Agricultural Operators in Rwanda by gender was 68.3 % male and 31.7 % female. The percentage distribution of Agricultural Operators in Rwanda by Gender is shown in Table 49.

Table 49. Distribution of Agricultural Operators by Gender and Stratum

	Agricultural Operators		
Strata	Male	Female	Total
1.1	68.3	31.7	100
1.2	67.0	33.0	100
2.1	71.1	28.9	100
2.2	57.1	42.9	100
3.0	79.2	20.8	100
Rwanda	68.3	31.7	100

2014 Seasonal Agriculture Survey - Season B

5.1.3 Distribution of Agricultural Operators by Age

The majority (26.6%) of Agricultural Operators in Rwanda were in the age group of between 25 and 34 (see Table 50). This was followed by 25.3% of Agricultural Operators in age group of 55 and above. The age group distribution of Agricultural Operators by Stratum varied more in the age group of between 45 and 54 with Stratum 2.2 (22.1%) being the highest and Stratum 1.2 (14.0%) being lowest. The least variation was in the age group of 55 and above with the Stratum 2.1 being the highest (26.5%) and Stratum 3.0 (23.2%) being the lowest.

Table 50. Distribution of Agricultural Operators by Age

	Agricultural Operators				
Strata	14-24	25-34	35-44	45-54	55 and Above
1.1	5.8	26.6	21.8	20.5	25.3
1.2	7.3	33.9	20.4	14.0	24.4
2.1	5.7	26.7	21.5	19.5	26.5
2.2	3.6	23.4	26.2	22.1	24.7
3.0	8.0	25.6	27.3	15.9	23.2
All Rwanda	5.8	26.6	21.8	20.5	25.3

2014 Seasonal Agriculture Survey - Season B

The majority (31.2%) of male Agricultural Operators in Rwanda were in the age group of between 25 and 34 (see Table 51). This is followed by 23.1% of Agricultural Operators in age group of between 35 and 44.

Table 51. Age Distribution of Male Agricultural Operators

	Agricultural Operators				
Strata	14-24	25-34	35-44	45-54	55 and Above
1.1	6.0	31.1	23.1	19.4	20.4
1.2	7.3	42.1	20.9	12.3	17.5
2.1	6.0	29.5	24.4	19.4	20.7
2.2	2.7	26.4	24.5	24.5	21.8
3.0	8.3	26.2	31.4	12.2	21.8
All Rwanda	6.0	31.2	23.1	19.4	20.4

2014 Seasonal Agriculture Survey - Season B

The distribution of female Agricultural Operators in Rwanda was high in the age groupof 55 and above (36.0%) followed by 22.9% of female Agricultural Operators in age groupof between 45 and 54, 18.9% of female Agricultural Operators in age group of between 35 and 44, 16.8% in age groupof between 25 and 34 and 5.4% in age group of between 14 and 24 (see Table52).

Table 52. Age Distribution of Female Agricultural Operators

	Agricultural Operators				
Strata	14-24	25-34	35-44	45-54	55 and Above
1.1	5.4	16.7	18.9	22.9	36.0
1.2	7.4	17.4	19.5	17.4	38.3
2.1	5.0	19.9	14.3	19.9	41.0
2.2	4.8	19.4	28.5	18.8	28.5
3.0	6.7	23.3	11.7	30.0	28.3
All Rwanda	5.4	16.8	18.9	22.9	36.0

2014 Seasonal Agriculture Survey - Season B

5.1.4 Education Level of Agricultural Operators

The Survey results of the 2014 Season B showed that in Rwanda, 68.6% of Agricultural Operators had attended primary level education, 23.8% had no education, 7.1% attended secondary level education and only 0.6% had attended tertiary level education (see Table53).

Table 53. Distribution of Agricultural Operators by Education Level and Stratum (%)

	Agricultural Operators				
Strata	Primary	Secondary	Tertiary	No education	Total
1.1	68.6	7.1	0.6	23.7	100
1.2	61.6	8.4	0.9	29.0	100
2.1	67.2	5.2	0.4	27.2	100
2.2	75.3	7.0	0.3	17.4	100
3.0	61.9	7.6	0.7	29.8	100
All Rwanda	68.5	7.1	0.6	23.8	100

2014 Seasonal Agriculture Survey - Season B

For those Agricultural Operators that had attented primary level education (68.6%) their distribution by Stratum was reasonably uniform with Stratum 2.2 and Stratum 1.1 having a higher percentage of 75.3 and 68.6% respectively.

Table 54. Distribution of Male Agricultural Operators by Education level (%)

	Agricultural Operators				
Strata	Primary	Secondary	Tertiary	No education	Total
1.1	74.1	7.3	0.7	17.9	100
1.2	68.2	10.6	1.3	19.9	100
2.1	69.5	6.0	0.0	24.4	100
2.2	77.7	7.3	0.5	14.5	100
3.0	64.6	7.0	0.9	27.5	100
All Rwanda	74.0	7.3	0.0	18.0	100

2014 Seasonal Agriculture Survey - Season B

In Rwanda, 74.0% of male Agricultural Operators had attended primary education, 18.0% of Agricultural operators did not attend school, 7.3% attended secondary education (see Table 54).

Table 55. Education Level of Female Agricultural Operators (%)

	Agricultural Operators				
Strata	Primary	Secondary	Tertiary	No education	Total
1.1	56.8	6.8	0.3	36.1	100
1.2	48.3	4.0	0.0	47.7	100
2.1	61.5	3.1	1.2	34.2	100
2.2	72.1	6.7	0.0	21.2	100
3.0	51.7	10.0	0.0	38.3	100
All Rwanda	56.9	6.7	0.3	36.1	100

2014 Seasonal Agriculture Survey - Season B

As Table 55 shows, Stratum 2.2 had the highest female Agricultural Operators with primary education (72.1%) and the lowest percentage of female agriculture operators with no education level (21.2%).

5.1.5 Residency of Agricultural Operators in Segments

An agricultural operator is considered to be resident in a segment if he/she lives in the segment and undertakes agricultural activities in the same segment. An agricultural operator is considered non-resident of a segment if his/her agricultural activities are undertaken in the segment but lives outside the segment. Results of the survey (see Table 56) showed that in Rwanda the majority of Agricultural Operators (77.6%) were non-resident while 22.4% were residents.

Table 56. Agricultural Operators by Residency (%)

	Agricultural Operators		
Strata	**Resident**	**Non resident**	**Total**
1.1	25.6	74.4	100
1.2	23.9	76.1	100
2.1	2.2	97.8	100
2.2	1.0	99.0	100
3.0	96.2	3.8	100
All Rwanda	22.4	77.6	100

2014 Seasonal Agriculture Survey - Season B

Stratum 3.0 had the lowest percentage of non-resident operators (3.8%) and the biggest percentage of resident operators (96.2%), while the rest of the Strata had above 70% of non-residents.

5.2 Date of Sowing

The starting dates of sowing by Agricultural Operators in Segments and LSF for each main crop is summarized respectively in the Tables 57 and 58. The start date of sowing by Agricultural Operators, for some crops was before February 2014.

Table 57. Agricultural Operators Indicating the Sowing Date in Segments by Crop (%)

Crop name	Before 31/12/2013	01-31 /01/2014	01-28/02/2014	After February 2014	N/A	Total
Maize	1.5	11.4	48.9	38.1	0.0	100
Paddy rice	4.7	40.2	42.5	12.4	0.3	100
Sorghum	7.9	68.6	21.3	2.2	0.0	100
Wheat	0.0	0.0	7.6	92.4	0.0	100
Other cereals	20.0	0.0	0.0	80.0	0.0	100
Bush beans	0.5	4.3	51.5	43.7	0.0	100
Climbing beans	0.7	3.8	39.3	56.1	0.1	100
Peas	0.4	4.8	39.8	55.0	0.0	100
Other legumes & cereals	0.0	0.0	0.0	0.0	100.0	100
Cassava	19.3	4.4	5.0	7.0	64.4	100
Irish potato	2.3	11.1	25.9	60.7	0.0	100
Sweet potato	16.0	19.4	20.8	43.7	0.1	100
Yams & Taro	57.0	10.9	8.4	12.8	11.0	100
Cooking Bananas	1.4	0.3	0.3	0.3	97.8	100
Dessert Banana	0.9	0.6	0.4	0.6	97.6	100
Banana for beer	0.2	0.2	0.4	0.4	98.7	100
Soya beans	0.7	6.9	61.7	30.7	0.0	100
Ground nuts	1.0	7.7	51.7	39.6	0.0	100

2014 Seasonal Agriculture Survey - Season B

For some crops, sowing of crops by Agricultural Operators started in December 2014. For Sorghum, the majority of Agricultural Operators indicated January as the sowing date while for Paddy Rice, Bush Beans and Soya Beans, February was the sowing date. Finally, Irish and Sweet potatoes were generally sown after February 2014.

Sowing dates for crops such as Banana fruit, Cooking Banana, and Cassava were not applicable for the majority of Agricultural Operators. This may due to the fact that these crops may have been sowed in the previous seasons especially with banana being perennial.

Table 58. Large Scale Farmers Indicating Sowing Date for Crops (%)

Maize	1.1	5.1	54.3	38.3	1.1	100
Paddy rice	4.8	33.3	45.2	16.7	0.0	100
Sorghum	3.8	68.8	17.5	10.0	0.0	100
Wheat	0.0	7.1	0.0	92.9	0.0	100
Bush beans	0.0	1.0	53.1	45.9	0.0	100
Climbing beans	0.0	0.0	58.3	41.7	0.0	100
Peas	0.0	7.1	7.1	85.7	0.0	100
Cassava	17.0	3.0	6.0	3.0	71.0	100
Irish potatoes	0.0	1.3	26.6	72.2	0.0	100
Sweet potatoes	13.3	16.7	23.3	45.0	1.7	100
Yams & Taro	50.0	0.0	0.0	12.5	37.5	100
Cooking Bananas	0.8	0.0	0.0	0.8	98.3	100
Dessert Banana	0.0	3.6	0.0	0.0	96.4	100
Banana for beer	0.0	0.0	0.0	0.0	100.0	100
Soya beans	0.0	2.4	73.2	24.4	0.0	100
Ground nuts	0.0	7.7	53.8	38.5	0.0	100

2014 Seasonal Agriculture Survey - Season B

The majority of main crops were sown in February with the exception of Sorghum sowed in January, Wheat and Irish Potatoes that were sown after February 2014.

5.3 Farm Characteristics (Area, Yield and Production)

From the detailed tables on area under crops, yield and crop production, the following are some of the highlights on the estimated production, area under crops and yield for the 2014 Season B (see Tables 59, 63 and 64)

5.3.1 Crop Areas

In Rwanda, in terms of land area under crops, the main crops grown inSeason Bwere Banana (23.6%), Cassava (23.3%), Beans (16.6%), Sorghum (8.5%) and Maize (5.2%) (See Table 59).

Table 59. Area (Ha) Cultivated by Crop and Group of Crops by Stratum (Hectares)

Crops \ Strata	Agricultural Operators						LSF	All Rwanda	
	1.1	1.2	2.1	2.2	3.0	S/Total_1	S/Total_2	Total	Percent
Cereals	**173,776**	**4,927**	**12,385**	**8,415**	**6,297**	**205,800**	**2,674**	**208,474**	**15.3**
Maize	59,137	3,861	3,882	671	2,788	70,340	973	71,313	5.2
Sorghum	105,078	54	6,439	362	3,474	115,407	331	115,738	8.5
Paddy rice	1,722	-	1,991	7,381	-	11,094	1,171	12,265	0.9
Wheat	6,092	1,012	4	-	-	7,108	103	7,210	0.5
Other cereals	1,746	-	69	1	35	1,851	97	1,948	0.1
Tubers and Roots	**418,515**	**15,772**	**14,617**	**838**	**6,150**	**455,891**	**779**	**456,669**	**33.5**
Cassava	305,290	22	6,615	237	5,500	317,664	368	318,032	23.3
Sweet Potatoes	65,335	586	5,334	441	199	71,895	162	72,057	5.3
Irish Potatoes	33,520	15,120	1,139	60	334	50,173	247	50,420	3.7
Yams & Taro	14,370	44	1,529	99	117	16,158	2	16,160	1.2
Banana	**313,603**	**155**	**2,505**	**247**	**5,051**	**321,560**	**534**	**322,095**	**23.6**
Cooking Bananas	113,445	57	795	110	3,901	118,309	398	118,707	8.7
Dessert banana	38,727	9	551	37	349	39,673	97	39,770	2.9
Banana for beer	161,431	89	1,158	100	800	163,579	40	163,618	12.0
Legumes & Pulses	**250,063**	**3,024**	**9,432**	**802**	**7,755**	**271,074**	**2,497**	**273,571**	**20.1**
Beans	***208,136***	***1,957***	***7,609***	***387***	***6,995***	***225,084***	***1,541***	***226,625***	***16.6***
Bush beans	129,669	11	5,758	326	6,854	142,619	1,424	144,043	10.6
Climbing beans	78,467	1,945	1,851	61	140	82,465	117	82,581	6.1
Peas	12,672	1,065	124	2	400	14,264	762	15,026	1.1
Groundnuts	11,726	-	234	10	308	12,278	14	12,292	0.9
Soya beans	17,503	2	1,464	402	52	19,422	180	19,603	1.4
Other legumes & Pulses	27	-	-	-	-	27	-	27	0.0
Vegetables and Fruits	**19,695**	**1,235**	**2,643**	**355**	**1,944**	**25,872**	**302**	**26,175**	**1.9**
Vegetables	9,823	754	2,342	322	93	13,332	85	13,417	1.0
Fruits	9,872	481	302	34	1,851	12,540	218	12,757	0.9
Other crops	**67,881**	**3,762**	**2,932**	**338**	**1,685**	**76,598**	**587.6**	**77,186**	**5.7**
Total developped crop land	**1,243,533**	**28,874**	**44,513**	**10,995**	**28,881**	**1,356,796**	**7,374.4**	**1,364,171**	**100**
Total Physical crop land	**936,877**	**28,717**	**40,545**	**10,732**	**21,516**	**1,038,387**	**6,864.7**	**1,045,251**	**100**
Fallow land	**184,411**	**7,050**	**24,405**	**4,047**	**3,217**	**223,130**	**1,119**	**224,249**	**21.5**

2014 Seasonal Agriculture Survey-Season B

In general, all crops are highly cultivated in Stratum 1.1. However, Paddy Rice makes an exception as it is mainly found in Strata 2.2 and 2.1. The total developed crop land means simply the cropland with regards to perennial crops cultivation standards and being sometimes mixed with seasonal crops. Physical crop land means the real size in terms of cultivated plot area.

Figure 6: Shareof Agriculture Land by Crops (%)

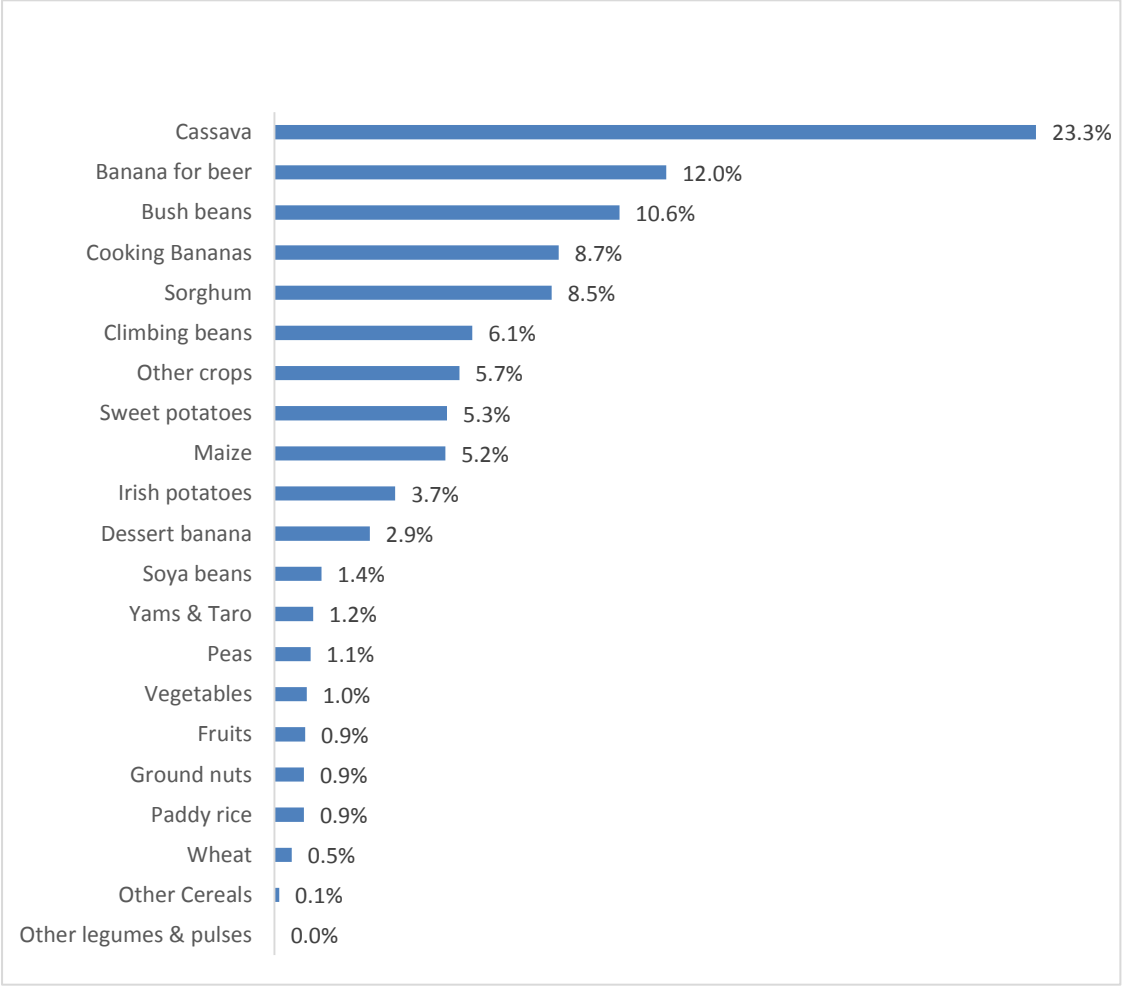
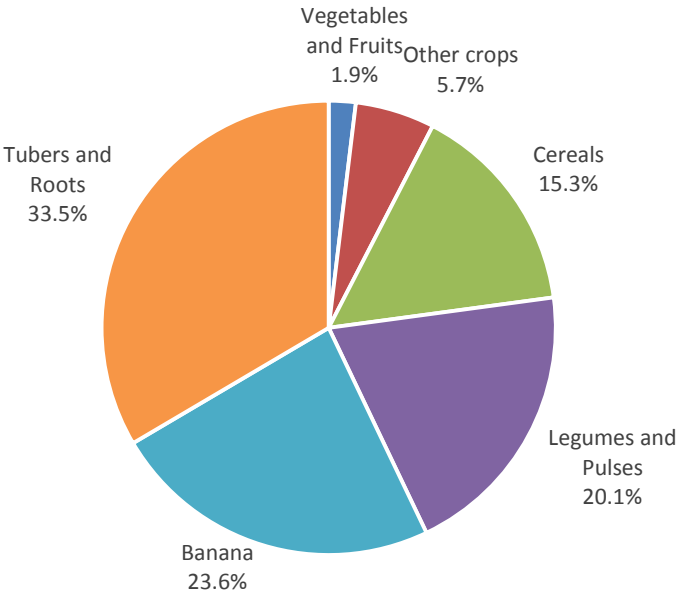


Figure 7: Shareof Agriculture Land by Group of Crops (%)



The Figure 7 shows the percentage share of agricultural land cultivated by group of crops. The survey results showed that the dominant groups of agricultural crops in Rwanda in season B were: Tubers and Roots (33.5%), Legumes and Pulses (19.9%), Cereals (20.1%), Banana (23.6%), while Fruits and Vegetables and other crops accounted for less than 10 % of the total share of agricultural land.

The survey results showed that the average size of tracts for Agricultural Operators in Rwanda in 2014 Season B was 0.22 hectares (see Table 60).

Table 60. Average Size of Tracts by Stratum

Strata	Average (Ha)
1.1	0.22
1.2	0.16
2.1	0.17
2.2	0.18
3.0	2.21
All Rwanda	0.22

2014 Seasonal Agriculture Survey - Season B

The Stratum 3.0 had the largest average size of tract for Agricultural Operators (2.21 Ha) followed by Stratum 1.1 (0.22 Ha), Stratum 2.2 (0.18 Ha), Stratum 2.1(0.17 Ha) and Stratum 1.2 (0.16 Ha).

The survey results confirmed the already known information that plot sizes for the Agricultural Operators in Rwanda tend to be very small (See Table 61).

Table 61. Average Size of crop area per Agricultural Operators (Ha)

Crops / Strata	1.1	1.2	2.1	2.2	3.0	Average Size
Maize	0.03	0.05	0.04	0.05	0.11	0.03
Paddy rice	0.07	0.01	0.06	0.15	0.03	0.11
Sorghum	0.08	0.07	0.08	0.07	0.30	0.09
Wheat	0.06	0.09	0.02	.	.	0.07
Other cereals	0.03	.	.	.	.	0.03
Bush beans	0.07	0.04	0.09	0.06	0.24	0.07
Climbing beans	0.05	0.04	0.03	0.04	0.11	0.05
Peas	0.02	0.04	0.03	0.01	0.07	0.03
Other legumes & pulses	0.02	.	.	.	.	0.02
Cassava	0.06	0.03	0.03	0.03	0.12	0.06
Irish potatoes	0.03	0.10	0.02	0.03	0.05	0.04
Sweet potatoes	0.03	0.04	0.03	0.03	0.04	0.03
Yams & Taro	0.02	0.01	0.02	0.02	0.03	0.02
Tomotoes	0.04	0.01	0.06	0.04	0.05	0.04
White cabbage	0.02	0.03	0.02	0.05	0.10	0.02
Flower cabage	0.01	0.15	.	.	.	0.04
Onions	0.02	0.09	0.02	.	.	0.02
Carrots	0.02	0.13	0.02	0.02	.	0.03
Eggplant	0.02	0.04	0.03	0.04	0.04	0.02
Other vegetables	0.00	.	.	.	.	0.00
Cooking Bananas	0.04	0.01	0.04	0.06	0.10	0.05
Dessert banana	0.03	0.01	0.02	0.02	0.05	0.03
Banana for beer	0.06	0.03	0.04	0.05	0.08	0.06
Pineapple	0.06	.	0.01	.	0.13	0.06
Avocado	0.01	0.02	0.02	.	0.05	0.02
Passion fruits	0.03	0.06	0.01	.	0.01	0.03
Other fruits	0.02	.	.	0.40	.	0.03
Soya beans	0.03	0.02	0.04	0.04	0.03	0.03
Ground nuts	0.04	.	0.05	0.04	0.08	0.04
sun flower	0.01	.	0.01	0.01	0.04	0.01
other oil seeds	0.00	.	.	.	.	0.00
coffee	0.04	.	0.03	0.04	0.04	0.04
Pyrethrum	.	0.17	.	.	.	0.17
Other crops	0.09	0.05	0.14	0.23	.	0.08
Pasture	1.99	0.33	2.54	1.36	7.74	2.76
Fallow land	0.11	0.10	0.11	0.17	0.71	0.11
Non agriculture land	0.11	0.09	0.80	0.54	2.51	0.13

2014 Seasonal Agriculture Survey - Season B

The average size of crop area was below 0.10 Ha with the exception of Pyrethrum (0.17 Ha) and Paddy Rice (0.11 Ha). Fallow land in Segments had an average size of 0.11 Hectares whereby the Stratum 3.0 has the largest fallow land average size of 0.71 Hectares.

For LSF, the average size of crop area were as follows: Paddy Rice (26.9 Ha), Peas (24.6Ha) and Olive Crop (15.7 Ha).

Table 62. Average Size of crop area per Large Scale Farmers (Hectares)

Crops	Average Size
other oil seeds	27.4
Paddy rice	26.9
Pasture	25.2
Peas	24.6
Olive crop	15.7
Fallow land	5.5
Soya beans	5.2
Bush beans	3.8
sun flow er	3.6
Irish potatoes	3.5
Wheat	3.4
Pineapple	3.4
Maize	3.0
Fodder crop	2.9
Avocado	2.8
coffee	2.5
Sorghum	2.3
Climbing beans	2.2
Pepper	2.1
Sw eet potatoes	2.1
Other crops	2.1
Dessert banana	2.1
Cassava	2.0
Macadamia	2.0
Non agriculture land	1.9
Cooking Bananas	1.8

Crops	Average Size
White Mulberry	1.6
Mango	1.5
Tomotoes	1.3
Banana for beer	1.2
Amaranths	1.1
Pyrethrum	1.1
White cabbage	1.1
Apple	1.1
Pumpkins	0.9
Millet	0.9
Sw eet pepper	0.7
Orange	0.6
Ground nuts	0.6
Eggplant	0.5
Tree tomato	0.4
Carrot	0.4
Passion fruits	0.3
Other vegetables	0.2
Napia grass	0.2
Sugar beet	0.2
Other fruits	0.1
Yams & Taro	0.1
Celery	0.1
Onion	0.1
Lemon	0.1
Spinach	0.1
Flow er cabbage	0.0
Garlic	0.0

2014 Seasonal Agriculture Survey - Season B

5.3.2 Crop Yields

Crop yield also known as “Agricultural output” refers to the measure of yield of a crop per unit area of land cultivation (see Table 63)

Table 63. Crops Yield by Stratum (Kg/Ha)

	Strata					
Crops	**1.1**	**1.2**	**2.1**	**2.2**	**3.0**	**All Rwanda**
Maize	1,082	767	643	1,021	827	1,032
Paddy rice	4,356	-	3,544	3,951	-	3,770
Sorghum	849	-	1,271	743	818	870
Wheat	637	411	-	-	-	621
Other cereals	540	-	904	-	2,610	563
Cassava	1,675	-	2,556	3,157	486	1,672
Sweet Potatoes	5,901	4,182	6,957	7,048	7,483	5,966
Irish Potatoes	4,162	7,889	2,481	1,630	1,924	5,244
Yams & Taro	3,324	-	4,389	2,955	1,214	3,398
Cooking Bananas	3,384	5,509	4,820	956	2,055	3,346
Dessert banana	2,284	-	2,523	868	589	2,268
Banana for beer	2,295	1,891	2,750	3,069	2,282	2,299
Beans	790	1,253	788	892	734	793
Bush beans	709	651	742	939	704	713
Climbing beans	922	1,256	930	648	2,184	933
Peas	370	392	255	-	241	363
Groundnuts	378	-	119	-	358	372
Soya beans	404	-	605	539	207	420
Vegetables	7,913	4,178	9,643	12,066	492	8,032
Fruits	1,875	1,575	-	-	-	1,530

2014 Seasonal Agriculture Survey - Season B

5.3.3 Crop Production

The contribution of individual crop production by Stratum was calculated using the product of yield and area under the crop (see Table 64).

Table 64. Production of Main Crops (MT)

	Agricultural Operators						LSF	All Rwanda	
Crops / Strata	**1.1**	**1.2**	**2.1**	**2.2**	**3.0**	**S/Total_1**	**S/Total_2**	**Total**	**Percent**
Cereals	**165,516**	**3,376**	**17,803**	**30,113**	**5,239**	**222,047**	**4,025.7**	**226,073**	**6.9**
Maize	63,967	2,960	2,498	686	2,307	72,417	1,146.8	73,564	2.2
Paddy rice	7,504	-	7,056	29,158	-	43,717	2,523.0	46,240	1.4
Sorghum	89,221	-	8,187	269	2,841	100,518	174.8	100,693	3.1
Wheat	3,883	416	-	-	-	4,298	181.1	4,480	0.1
Other cereals	942	-	62	-	92	1,096	-	1,096	0.0
Tubers and Roots	**1,084,177**	**121,724**	**63,551**	**4,251**	**4,948**	**1,278,651**	**2,307.6**	**1,280,959**	**39.2**
Cassava	511,336	-	16,908	750	2,675	531,668	92.8	531,761	16.3
Sweet Potatoes	385,573	2,449	37,106	3,111	1,490	429,730	132.7	429,863	13.1
Irish Potatoes	139,501	119,275	2,827	98	642	262,343	2,081.1	264,425	8.1
Yams & Taro	47,767	-	6,709	292	142	54,910	1.0	54,911	1.7
Banana	**842,873**	**482**	**8,410**	**444**	**10,047**	**862,256**	**1,186.3**	**863,442**	**26.4**
Cooking Bananas	383,907	313	3,834	105	8,015	396,174	961.2	397,135	12.1
Dessert banana	88,451	-	1,390	32	206	90,079	105.1	90,184	2.8
Banana for beer	370,515	169	3,185	308	1,826	376,003	120.0	376,123	11.5
Legumes & Pulses	**180,547**	**2,869**	**6,939**	**562**	**5,351**	**196,268**	**1,674.7**	**197,943**	**6.1**
Beans	164,358	2,451	5,994	345	5,134	178,283	1,421.3	179,704	5.5
Bush beans	91,992	7	4,274	306	4,828	101,406	1,281.7	102,688	3.1
Climbing beans	72,365	2,444	1,721	40	307	76,876	139.6	77,016	2.4
Peas	4,693	418	32	-	96	5,239	207.8	5,447	0.2
Groundnuts	4,428	-	28	-	110	4,566	0.8	4,567	0.1
Soya beans	7,068	-	885	217	11	8,181	44.8	8,226	0.3
Vegetables and Fruits	**96,230**	**3,908**	**22,579**	**3,882**	**46**	**126,644**	**647.7**	**127,291**	**3.9**
Vegetables	77,723	3,150	22,579	3,882	46	107,380	389.7	107,769	3.3
Fruits	18,507	757	-	-	-	19,264	258.0	19,522	0.6
Other crops	**535,507**	**1,216**	**28,948**	**1,752**	**-**	**567,422**	6,508.0	**573,930**	17.6
All Rwanda	**2,904,848**	**133,575**	**148,230**	**41,004**	**25,632**	**3,253,289**	**16,350**	**3,269,639**	**100**

2014 Seasonal Agriculture Survey - Season B

The share of crop production by groups of crops was significantly high for Tubers and Roots (39.2%) followed by Banana (26.4%) and Celeals (6.9%). Other crop groups contributed as follows: Legumes and Pulses (5.9%) and Vegetables and Fruits (3.9%). The share of crop production for individual crops was highest for

Cassava (17.6%) followed by Sweet Potatoes (13.1%), cooking banana (12.1%) and banana for beer (11.5%).

Figure 8: Share of production by main crops (%)

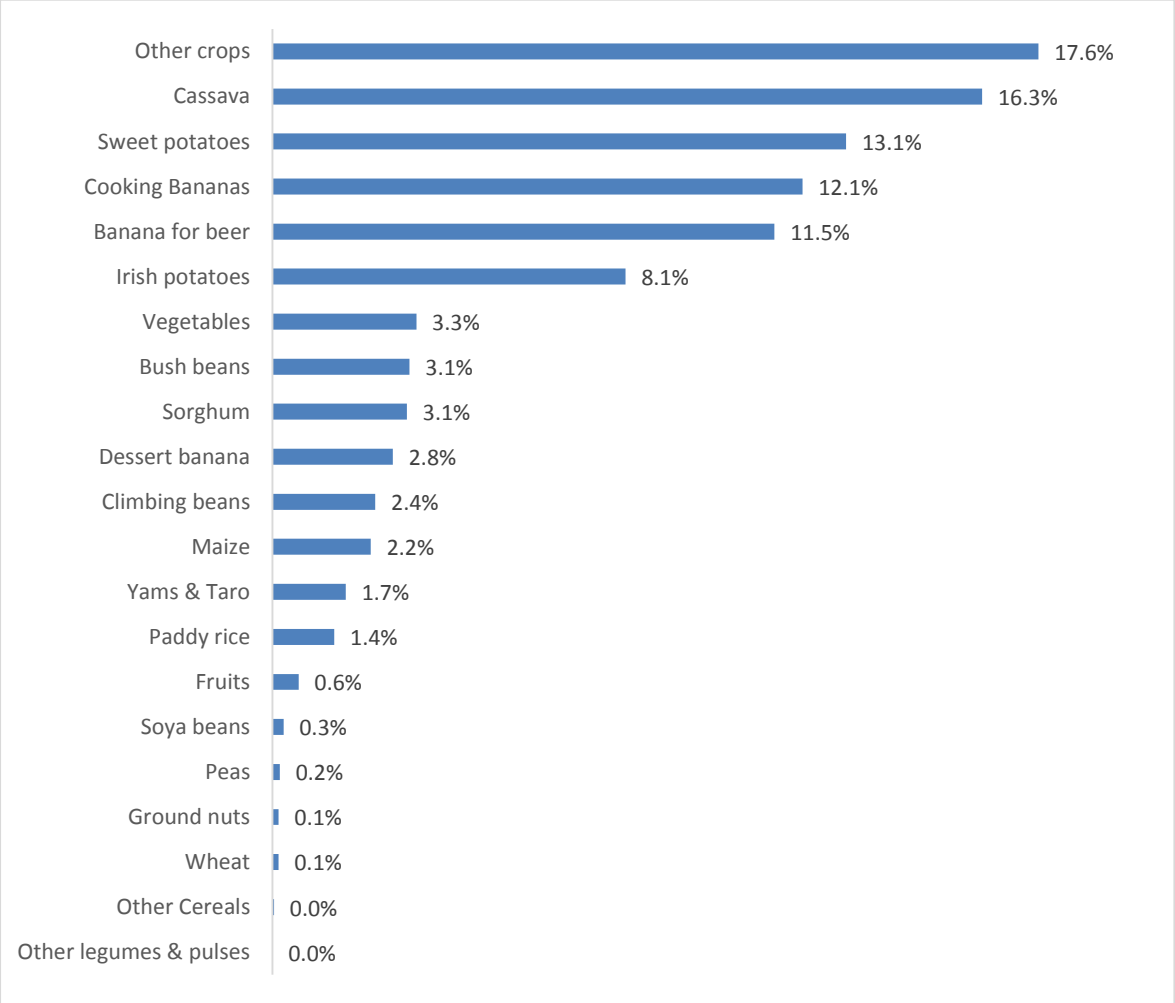
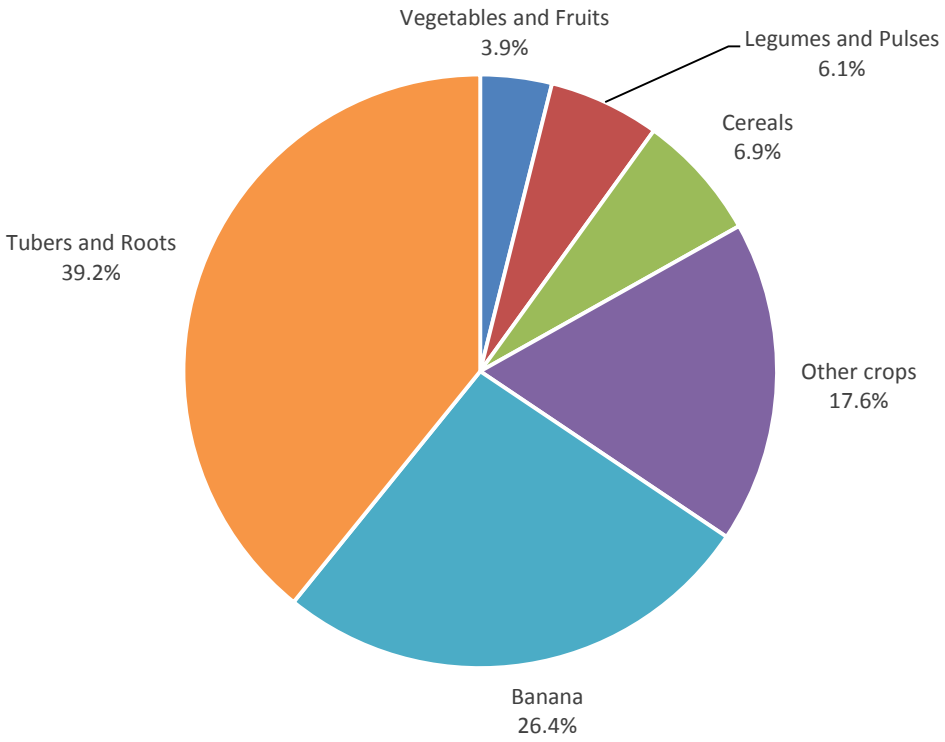


Figure 9: Share of production by group of crops (%)



5.4 Agricultural Practices

5.4.1 Pure and Mixed Cropping

The survey results showed that the percentage share of agricultural land used by Agricultural Operators to grow crops in pure stand and mixed stand in Rwanda was 19.1% and 80.9% respectively (see Table 65). For LSF the share between pure stand and mixed stand was 53.2% and 46.8% respectively.

Table 65. Share of Pure and Mixed Crop Agricultural Land (%)

	Strata	Pure Crop Land	Mixed Crop Land	Total
Agricultural Operators	1.1	17.4	82.6	100
	1.2	52.3	47.7	100
	2.1	36.2	63.8	100
	2.2	80.4	19.6	100
	3.0	11.9	88.1	100
	All Rwanda	19.1	80.9	100
LSF		46.8	53.2	100

2014 Seasonal Agriculture Survey-Season B

In general, Agricultural Operators used most of their agricultural land to cultivate mixed crops while LSF devoted most of their agricultural land to cultivate crops in pure stand.

Table 66. Pure Crop Agricultural Land (Ha) in Segments by Type of Crop (%)

Strata	Maize	Paddy rice	Sorghum	Cassava	Sweet potatoes	Irish potatoes	Banana	Bush beans	Climbing beans	Peas	Others	All Rwanda
1.1	3.0	0.8	8.6	28.0	10.4	5.4	10.4	3.2	8.8	1.7	19.6	100
1.2	7.6	0.0	0.0	0.0	2.6	52.5	0.0	-	4.3	3.2	29.6	100
2.1	5.0	12.4	12.3	12.1	20.6	2.5	1.2	1.9	4.0	0.1	27.8	100
2.2	1.8	83.5	2.1	0.8	3.7	0.2	0.2	0.1	0.2	-	7.3	100
3.0	1.9	0.0	32.9	6.9	1.4	0.7	4.7	1.5	0.1	-	49.9	100
All Rwanda	3.4	4.3	8.4	24.2	10.3	7.7	8.8	2.8	7.8	1.7	20.7	100

2014 Seasonal Agriculture Survey-Season B

Table 66 shows the use of agricultural land for growing main crops in pure stand in the country. Stratum 1.1 used 28.0% of total land for pure stand in mainly Cassava cultivation followed by sweet potatoes (10.4%) and Banana (10.4%). Stratum 1.2 used 52.5% of total land for pure stand cropping mainly for Irish Potatoes, Stratum 2.1 for Sweet Potatoes (20.6%), Stratum 2.2 used 83.5% of total land for pure cropping for Paddy rice and stratum 3.0 used 32.9% of total land for pure cropping for Sorghum.

5.4.2 Use of Organic Fertilizer

In segments, 44.1% of all Agricultural Operators in Rwanda reported that they used fertilizer. For LSF, 66.7% used fertilizers (see Table 67).

Organic fertilizers were mostly use in Stratum 1.2 (49.2%) followed by Stratum 1.1 (44.2%), Stratum 2.1 (40.6%), Stratum 2.2(30.1%) and Stratum 3.0 (11.4%).

Table 67. Users of Organic Fertilizers (%)

	Strata	Used organic fertilizers
Agricultural Operators	1.1	44.2
	1.2	49.2
	2.1	40.6
	2.2	30.1
	3.0	11.4
	All Rwanda	44.1
LSF		66.7

2014 Seasonal Agriculture Survey -Season B

Table 68. Users of organic fertilizers by crop (%)

	Agricultural operators						LSF
Crops \ Strata	1.1	1.2	2.1	2.2	3.0	All Rwanda	All Rwanda
Maize	52.5	60.1	40.3	60.0	10.2	52.4	52.5
Paddy rice	25.0	0.0	14.0	20.4	0.0	19.9	60.0
Sorghum	44.2	0.0	24.1	30.8	9.7	43.8	46.5
Wheat	77.8	29.2	0.0	0.0	0.0	76.1	66.7
Bush Beans	47.4	50.0	30.3	46.2	6.8	47.2	51.9
Climbing beans	76.8	39.1	90.8	70.0	25.0	76.8	68.8
Peas	61.2	50.0	20.0	100.0	2.7	61.0	66.7
Cassava	36.2	0.0	23.2	26.1	13.2	36.1	33.3
Irish potatoes	64.4	67.3	68.4	68.4	12.2	64.5	72.7
Sweet potatoes	52.0	36.4	35.2	44.1	16.7	51.7	48.0
Yam and Taro	50.1	33.3	60.2	24.0	0.0	50.3	62.5
Cooking banana	48.4	0.0	19.0	0.0	26.5	48.3	58.0
Banana for beer	43.0	80.0	32.3	0.0	22.7	43.0	75.0
Soybeans	59.1	0.0	45.2	35.1	25.0	58.9	41.2
Groundnuts	26.4	0.0	11.1	0.0	5.3	26.3	46.2
Vegetables	78.3	46.7	77.0	81.0	33.3	78.1	83.3
Fruits	47.2	37.5	41.7	0.0	8.0	47.1	52.9

2014 Seasonal Agriculture Survey -Season B

5.4.3 Use of Inorganic Fertilizers by Agricultural Operators and Large Scale Farmers

The survey results showed that 16.5% of Agricultural Operators used inorganic fertilizers while 36.8% of LSF used inorganic fertilizers during 2014 Season B (see

Table 69). This shows that a larger proportion of LSF used inorganic fertilizer than Agricultural Operators during this agricultural season.

Table 69. Use of Inorganic Fertilizer

	Strata	Used inorganic fertilizers
Agricultural Operators	1.1	15.9
	1.2	68.7
	2.1	29.1
	2.2	60.7
	3.0	6.2
	All Rwanda	16.5
LSF		36.8

2014 Seasonal Agriculture Survey -Season B

Table 70. Users of Inorganic Fertilizers by Type and by Stratum (%)

	Agricultural Operators						
	Strata	NPK	UREA	UREA (LIQUID)	DAP	OTHER Fertilizers	Total
Agricultural Operators	1.1	26.9	31.2	1.8	39.7	0.4	100
	1.2	62.9	18.1	4.0	15.1	-	100
	2.1	25.7	35.7	2.4	35.2	1.0	100
	2.2	36.1	42.2	0.9	20.5	0.2	100
	3.0	12.5	41.7	-	45.8	-	100
	All Rwanda	27.8	31.1	1.8	38.9	0.4	100
LSF		37.5	35.0	0.0	23.0	4.5	100

2014 Seasonal Agriculture Survey -Season B

For Agricultural Operators in segments, DAP was highly used (38.9%) followed by UREA (31.1%) and NPK (27.8%) while NPK was the most highly used by LSF (37.5%) followed by UREA (35.0%) and DAP (23.0%).

In Stratum 1.1 and Stratum 3.0, the survey showed that DAP was highly used by 39.7% and 45.8% of all agricultural operators within the Stratum respectively and NPK was highly used in Stratum 1.2 by 62.9% of all agricultural operators within the Stratum. UREA was also ranked first in the Strata 2.2 and 2.1 (42.2% and 35.7% respectively).

Table 71.Users of Inorganic fertilizers by Crop (%)

Crops / Strata	Agricultural operators						LSF
	1.1	1.2	2.1	2.2	3.0	All Rwanda	
Maize	11.7	13.5	14.4	63.5	6.1	11.8	24.2
Paddy rice	75.0	0.0	97.7	83.3	0.0	85.2	100.0
Sorghum	4.3	0.0	2.1	7.7	4.8	4.2	7.0
Wheat	55.6	4.2	0.0	0.0	0.0	53.7	77.8
Bush Beans	3.8	0.0	6.4	10.3	2.4	3.8	15.4
Climbing beans	14.2	4.3	53.9	40.0	25.0	14.5	50.0
Peas	6.8	5.9	0.0	0.0	0.0	6.8	22.2
Cassava	0.7	0.0	0.0	4.3	0.8	0.7	5.3
Irish potatoes	21.8	89.5	26.6	15.8	2.4	23.4	47.7
Sweet potatoes	1.0	0.0	0.9	0.0	0.0	1.0	4.0
Yam and Taro	1.4	0.0	1.9	0.0	0.0	1.4	0.0
Cooking banana	1.1	0.0	0.0	0.0	0.0	1.1	0.0
Banana for beer	0.2	0.0	0.0	0.0	0.0	0.2	8.3
Soybeans	4.8	0.0	2.4	29.7	0.0	4.8	17.6
Groundnuts	1.3	0.0	0.0	0.0	0.0	1.3	0.0
Vegetables	39.9	46.7	55.0	57.1	0.0	40.4	50.0
Fruits	1.9	6.3	4.2	0.0	0.0	1.9	5.9

2014 Seasonal Agriculture Survey -Season B

Agricultural operators used inorganic fertilizers mostly on paddy rice (85.2%), vegetables (40.4%) and Irish potatoes (23.4%). The use of inorganic fertilizers by LSF was also important on paddy rice (100%) followed by Wheat (77.8%).

5.4.4 Use of Seeds

In Rwanda, Agricultural Operators used more traditional seeds (93.8%) than improved seeds (6.2%). The use of traditional seeds and improved seeds by LSF is also given in Table 72.

Table 72. Agricultural Operators by Type of Seeds Used (%)

	Strata	Traditional seeds	Improved seeds
		Percent	Percent
Agricultural Operators	1.1	93.7	6.3
	1.2	94.0	6.0
	2.1	96.7	3.3
	2.2	75.9	24.1
	3.0	95.6	4.4
	All Rwanda	93.8	6.2
LSF		89.0	11.0

2014 Seasonal Agriculture Survey-Season B

For Agricultural Operators, Stratum 2.1 had the largest share of users of traditional seeds (96.7%) and stratum 2.2 had the largest share of users of improved seeds (24.1%). For LSF, on country level, traditional seeds are the mostly used (89.0%).

Table 73. Users of Traditional Seeds by Type of Crop (in %)

Crops \ Strata	Agricultural operators						LSF
	1.1	1.2	2.1	2.2	3.0	All Rwanda	
Maize	85.3	86.5	93.5	45.9	95.4	85.4	86.9
Sorghum	100.0	0.0	100.0	100.0	100.0	100.0	100.0
Wheat	88.9	91.7	0.0	0.0	0.0	89.0	55.6
Bush Beans	99.4	100.0	93.6	100.0	98.1	99.3	86.5
Climbing beans	99.3	100.0	100.0	100.0	100.0	99.3	50.0
Peas	100.0	100.0	100.0	100.0	100.0	100.0	77.8
Cassava	99.7	0.0	99.4	100.0	100.0	99.7	96.5
Irish potatoes	99.6	99.4	98.7	100.0	100.0	99.6	90.9
Sweet potatoes	99.9	100.0	98.7	100.0	100.0	99.9	100.0
Yam and Taro	99.8	100.0	100.0	100.0	100.0	99.8	100.0
Cooking banana	99.6	100.0	100.0	100.0	100.0	99.6	90.9
Banana for beer	100.0	100.0	100.0	100.0	100.0	100.0	83.3
Soybeans	99.7	0.0	97.6	94.6	100.0	99.7	64.7
Groundnuts	98.7	0.0	100.0	100.0	100.0	98.7	100.0
Vegetables	71.1	26.7	74.0	19.0	66.7	71.1	50.0
Fruits	98.4	87.5	100.0	100.0	40.0	98.3	76.5

2014 Seasonal Agriculture Survey-Season B

Traditional seeds were used for almost all cropsby Agricultural operators as well as by LSF.

Table 74. Users of Improved Seeds by Type of Crop (%)

Crops \ Strata	Agricultural operators						LSF
	1.1	1.2	2.1	2.2	3.0	All Rwanda	
Maize	15.4	14.9	5.8	55.3	4.6	15.3	17.2
Wheat	11.1	8.3	0.0	0.0	0.0	11.0	66.7
Bush Beans	0.9	0.0	5.5	0.0	1.9	0.9	17.3
Climbing beans	0.7	0.0	0.0	0.0	0.0	0.7	56.3
Peas							22.2
Cassava	0.2	0.0	0.6	0.0	0.0	0.2	3.5
Irish potatoes	0.2	0.6	0.0	0.0	0.0	0.2	15.9
Sweet potatoes	0.0	0.0	1.3	0.0	0.0	0.0	4.0
Cooking banana	0.4	0.0	0.0	0.0	0.0	0.4	10.2
Banana for Beer							16.7
Soybeans	0.0	0.0	0.0	13.5	0.0	0.0	35.3
Vegetables	32.4	80.0	28.0	85.7	33.3	32.4	61.1
Fruits	2.1	18.8	4.2	0.0	58.0	2.2	32.4

2014 Seasonal Agriculture Survey -Season B

Improved seeds were used mostly on Vegetables (32.4%), Maize (15.3%) and wheat (11.0%) by Agricultural operators. The remaining crops had a small percentage of users of improved seeds. LSF used improved seeds mostly on Wheat (66.7%) and Vegetables (61.1%) (See table 74).

5.4.5 Irrigation Practice

Table 75. Agricultural Operators and Large Scale Farmers Practising Irrigation

	Strata	Practiced Irrigation
Agricultural Operators	1.1	2.4
	1.2	0.2
	2.1	20.9
	2.2	57.6
	3.0	12.1
	All Rwanda	2.8
LSF		14.9

2014 Seasonal Agriculture Survey -Season B

The survey results showed that about 2.8% of agricultural operators in segments and 14.9% of LSF in Rwanda in season B practised irrigation (see Table 75). The irrigation is more practised in Stratum 2.2 and 2.1 where the high percentage of operators in those Strata practised irrigation (57.6% and 20.9% respectively).

Table 76.Agricultural Operators and LSF by Type of Irrigation Practised (%)

	Strata	Pumps/tube wells/irrigation machines	Watering can	Water channels	Others	Total
Agricultural operators	1.1	2.4	52.4	19.0	26.2	100
	1.2	-	100.0	-	-	100
	2.1	0.8	48.4	34.7	16.1	100
	2.2	-	8.5	89.8	1.7	100
	3.0	-	8.6	-	91.4	100
	All Rwanda	2.1	50.3	23.1	24.4	100
LSF		19.5	28.7	47.1		100

2014 Seasonal Agriculture Survey -Season B

On the type of irrigation used by Agricultural Operators, the survey results showed that the majority of Agricultural Operators used Watering Can (50.3%) for irrigation followed by Water Channels (see Table 76).

Use of water channels for irrigation was predominantly in Stratum 2.2 (89.8%). There was very little use of Pumps/Tube wells/Irrigation machines by Agricultural Operators in Rwanda (2.1%).

Most of the LSF in Rwanda practised the water channels type of irrigation (47.1%) and Watering can (28.7%) type of irrigation.

Table 77.Irrigation practice by Crops (%)

Crops \ Strata	Agricultural operators						LSF
	1.1	1.2	2.1	2.2	3.0	All Rwanda	
Maize	0.5	0.0	8.6	1.2	0.0	0.6	2.0
Paddy rice	100.0	0.0	97.7	93.2	0.0	97.2	100.0
Sorghum	0.0	0.0	0.0	7.7	0.0	0.0	0.0
Bush Beans	0.2	0.0	4.6	7.7	0.0	0.2	1.0
Climbing beans	0.1	0.0	5.3	10.0	0.0	0.2	0.0
Cassava	0.1	0.0	0.6	4.3	0.0	0.1	0.0
Irish potatoes	0.7	0.0	21.5	5.3	0.0	0.9	4.5
Sweet potatoes	0.8	0.0	7.9	1.5	4.2	0.9	4.0
Yam and Taro	1.6	0.0	14.8	20.0	0.0	1.9	12.5
Cooking banana	0.3	0.0	0.0	0.0	0.0	0.3	1.1
Banana for Beer	0.0	0.0	0.0	0.0	0.0	0.0	16.7
Soybeans	0.3	0.0	2.4	8.1	0.0	0.3	11.8
Vegetables	20.9	6.7	52.0	81.0	33.3	22.0	50.0
Fruits	0.9	0.0	8.3	0.0	60.0	1.0	5.9

2014 Seasonal Agriculture Survey -Season B

5.4.6 Anti-erosive Activities

Erosion refers to the process in which the topsoil is worn away. Due to the mountainous landscape of Rwanda, most of the Agricultural Operators practice anti-erosion activities to prevent the wasting away of earth. The survey results show the distribution of Agricultural Operators and LSF practising anti-erosion activities (see Table 78).

Anti-erosion was practised by 49.2% of Agricultural Operators and 14.4% of LSF in season B. Most of the anti-erosion activities were practised by Agricultural Operators in the Stratum 2.2 (78.2%), followed by Stratum 1.2 (64.8%), Stratum 2.1 (61.7%), Stratum 1.1 (48.5%) and Stratum 3.0 (4.6%) (See Table78).

Table 78. Anti-erosive Activities by Agricultural Operators and Large Scale Farmers (%)

	Strata	Practiced Anti-erosion
Agricultural Operators	1.1	48.8
	1.2	64.9
	2.1	61.6
	2.2	78.5
	3.0	4.1
	All Rwanda	49.2
LSF		14.4

2014 Seasonal Agriculture Survey-Season B

Table 79. Distribution of Type Anti-erosive Activities by Agricultural Operators and LSF (%)

	Strata	Ditches	Trees	Radical Terracing	Progressive terracing	Grasses	Water drainage	Mulching	Other	Total
Agricultural Operators	1.1	9.3	3.3	5.0	12.6	65.3	2.1	0.6	0.1	100
	1.2	0.8	2.1	1.5	8.4	25.3	0.1	0.1	0.2	100
	2.1	3.5	0.1	0.2	0.7	23.0	49.8	0.1	7.1	100
	2.2	0.7	0.2	4.0	0.8	5.3	71.9	-	7.0	100
	3.0	29.3	19.6	-	1.1	47.8	-	2.2	-	100
	All Rwanda	9.1	3.2	4.9	12.4	64.3	3.0	0.6	0.2	100
LSF		16.7	10.3	5.1	10.3	11.5	6.4	35.9	3.8	100

2014 Seasonal Agriculture Survey -Season B

The Survey shows that in Rwanda the most practised erosion control measures by Agricultural Operators in all Strata were Grasses (64.3%) and Progressive Terracing (12.4%) followed by Ditches (9.1%) (See Table 79). Other erosion control measures such as planting of trees, radical terracing, waterway and mulching were also practised by a small number of Agricultural Operators.

Table 80. Practice of anti-erosion by Crop (%)

Crops \ Strata	Agricultural operators						LSF
	1.1	1.2	2.1	2.2	3.0	All Rwanda	
Maize	61.4	94.6	62.6	49.4	8.6	61.5	30.3
Paddy rice	100.0	0.0	97.7	98.2	0.0	98.7	80.0
Sorghum	64.9	0.0	53.2	23.1	6.5	64.6	25.6
Wheat	81.5	66.7	0.0	0.0	0.0	81.0	100.0
Bush Beans	59.7	100.0	50.5	43.6	7.2	59.6	21.2
Climbing beans	71.7	91.3	90.8	90.0	25.0	71.9	68.8
Peas	76.9	76.5	60.0	100.0	2.7	76.8	100.0
Cassava	63.0	0.0	61.3	60.9	13.2	63.0	24.6
Irish potatoes	71.3	93.4	83.5	78.9	24.4	71.9	65.9
Sweet potatoes	70.1	45.5	75.3	50.0	8.3	70.2	56.0
Yam and Taro	64.1	33.3	79.6	76.0	20.0	64.4	75.0
Cooking banana	58.6	50.0	42.9	66.7	19.3	58.5	22.7
Banana for beer	63.1	40.0	54.8	50.0	27.3	63.1	50.0
Soybeans	70.4	0.0	42.9	58.1	0.0	70.1	58.8
Groundnuts	49.7	0.0	44.4	100.0	0.0	49.6	38.5
Vegetables	67.2	93.3	83.0	71.4	0.0	67.8	72.2
Fruits	63.8	56.3	54.2	0.0	14.0	63.7	26.5

2014 Seasonal Agriculture Survey-Season B

The anti-erosion activities were generally for all cropland. With regards to cropland for paddy rice, Irish potatoes, wheat and climbing beans, more than 70.0% of agricultural operators reported that their plots are protected against erosion.

5.4.7 Use of Pesticides

The survey results showed that in Rwanda 11.1% of Agricultural Operators used pesticides in their farming activities while 33.3% of LSF used pesticides in the farming activities (see Table 81).

Table 81. Agricultural Operators and LSF using Pesticides (%)

	Strata	Used Pesticides
Agricultural Operators	1.1	10.8
	1.2	43.7
	2.1	20.7
	2.2	48.6
	3.0	2.6
	All Rwanda	11.1
LSF		33.3

2014 Seasonal Agriculture Survey-Season B

Among all Agricultural Operators, those in Stratum 2.2 were the best users of pesticides (48.6%) followed by the ones in Stratum 1.2 (43.7%), Stratum 2.1 (20.7%), Stratum 1.1(10.8%) and Stratum 3.0 (2.6%).

Table 82. Type of Pesticide used by Agricultural Operators and LSF (%)

	Strata \ Pesticides	DITHANE	RIDOMIL	DIMETHOATE	CYPERMETRINE	DURSIBAN	TILT	PILKARE	OTHER PESTICIDE	All Rwanda
Agricultural Operators	1.1	32.7	10.8	20.6	27.5	2.4		0.2	5.0	100
	1.2	49.0	27.5	7.0	16.2	0.2		-	0.2	100
	2.1	16.6	-	21.9	45.7	10.6		-	4.0	100
	2.2	1.8	-	16.5	42.9	1.8		1.8	35.3	100
	3.0	27.3	-	9.1	45.5	18.2		-	-	100
	All Rwanda	33.2	11.4	20.1	27.6	2.5		0.2	4.9	100
LSF		20.2	7.9	14.2	22.1	4.1		-	31.5	100.0

2014 Seasonal Agriculture Survey - Season B

Dithane was the highly used pesticide by Agricultural Operators of the Strata 1.1 and 1.2 while the Cypermetrine was the mostly used pesticides by Agricultural Operators of the Strata 2.1, 2.2 and 3.0 and Ridomil was predominantly used in Stratum 1.2.

Countrywide, for Agricultural Operators, table 82 indicates that Dithane is the most used pesticide (33.2%) followed by Cypermetrine (27.7%) while the majority of LSF used Cypermetrine pesticide (22.1%), followed by Dithane pesticide (20.2%), Dimethoate pesticide (14.2%), Ridomil pesticide (7.9%), and Dursiban (4.1%).

Table 83. Users of pesticides by crops (%)

Crops \ Strata	Agricultural operators						LSF
	1.1	12	2.1	2.2	3.0	All Rwanda	
Maize	1.9	0.0	2.9	1.2	0.0	1.9	8.1
Paddy rice	0.0	0.0	39.5	52.5	0.0	28.8	90.0
Sorghum	0.1	0.0	0.0	0.0	0.0	0.1	0.0
Wheat	0.0	4.2	0.0	0.0	0.0	0.1	55.6
Bush Beans	0.4	0.0	2.8	5.1	0.0	0.5	8.7
Climbing beans	7.4	7.2	46.1	0.0	0.0	7.7	18.8
Peas	9.5	2.9	0.0	100.0	0.0	9.5	33.3
Cassava	0.2	0.0	0.0	0.0	0.0	0.2	3.5
Irish potatoes	18.3	91.6	7.6	0.0	0.0	19.8	38.6
Sweet potatoes	0.1	0.0	0.4	0.0	0.0	0.1	0.0
Yam and Taro	0.2	0.0	0.0	0.0	0.0	0.2	12.5
Cooking banana	0.3	0.0	0.0	0.0	0.0	0.3	1.1
Soybeans	0.3	0.0	0.0	2.7	0.0	0.3	17.6
Groundnuts							7.7
Vegetables	41.1	66.7	52.0	66.7	44.4	41.6	66.7
Fruits	2.8	31.3	12.5	0.0	2.0	2.9	14.7

2014 Seasonal Agriculture Survey -Season B

The survey results showed that agricultural operators used pesticides mostly on vegetables (41.6%), paddy rice (28.8%) and Irish potatoes (19.8%). The use of pesticides by LSF was considerably high on Paddy rice (90%).

5.5 Small Agricultural Equipment

The survey results showed that countrywide, most of the expenditure by Agricultural Operators was on the Hoe (26.4%) followed by Sheeting (10.4%) (See Table 84).

The expenditures on the other tools that were used for cultivation by Agricultural Operators were below 10% of the total expenditure.

Table 84. Expenditure by Type of Small Agricultural Equipment

Small Agricultural Equipment	Agricultural Operators						LSF
	1.1	1.2	2.1	2.2	3.0	All Rwanda	
Hoe	26.4	24.0	31.2	16.1	20.7	26.4	8.5
Spring Hoe	1.8	0.3	2.1	0.1	0.4	1.8	0.2
Fork hoe	9.6	1.2	3.1	2.3	10.3	9.5	0.3
Rake	0.1	0.2	-	-	0.1	0.1	0.0
Pick/ Ipiki	1.3	-	0.7	0.2	1.7	1.3	0.1
Wheelbarrow	1.4	2.8	0.4	-	0.2	1.4	0.7
Shovel/igitiyo	1.2	1.0	1.0	1.0	1.7	1.2	0.1
Watering pump	-	0.1	-	-	-	0.0	1.5
Crops Sprayer	5.0	22.3	3.0	6.7	1.7	5.0	2.7
Watering can	1.0	0.6	3.0	1.8	0.2	1.0	0.4
Scie	0.0	0.2	-	-	-	0.0	0.0
Sickle	1.8	1.5	1.4	2.3	0.6	1.8	2.2
Secataur	0.1	-	0.1	0.1	-	0.1	0.0
Scythe	0.3	-	0.1	0.1	0.2	0.3	0.0
Machete	3.7	2.2	2.6	1.7	3.9	3.7	3.1
Billhook	0.1	-	0.1	0.1	0.3	0.1	0.0
Basket	3.4	2.7	3.5	2.1	0.4	3.4	0.1
Sack	6.5	18.5	7.2	11.5	7.6	6.6	36.6
Big basket	0.1	0.8	0.1	0.1	-	0.1	0.0
Winnower	2.8	1.5	2.3	2.4	3.1	2.8	1.0
Basket(ikibo)	0.9	0.7	0.3	0.1	0.2	0.8	0.0
Basket(inkangara)	0.1	-	-	0.1	-	0.1	0.0
Scale	2.1	1.3	0.1	0.8	0.5	2.0	1.4
Jerry-can	4.4	4.7	3.2	1.7	2.3	4.3	0.2
Barrel	1.2	1.0	0.2	-	-	1.2	0.2
Bike	8.4	3.4	17.6	13.4	21.3	8.7	0.4
Craft bike	0.0	-	2.1	1.4	-	0.0	
Bowl	0.4	0.0	0.4	0.3	0.4	0.4	0.1
Sheeting	10.3	3.2	9.0	28.9	11.3	10.4	37.8
Hoe sleeve	2.8	4.6	3.2	2.0	3.7	2.9	0.9
Others (Specify)	2.7	1.0	1.9	2.4	7.3	2.8	1.5
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**

2014 Seasonal Agriculture Survey-Season B

Expenditure on small agricultural equipment by LSF was mainly on Sheeting (37.8%) and Sacks (36.6%).

Table 85. Small Equipment Received from Non Agricultural Donors (%)

Small Agricultural Equipment received	Agricultural Operators					LSF
	1.1	1.2	2.1	2.2	All Rwanda	
Hoe	8.9	100	22.1	-	9.0	75.0
Spring Hoe	2.0	-	-	-	2.0	
Fork hoe	4.6	-	-	-	4.6	
Rake	0.9	-	-	33.3	0.9	7.1
Pick/ Ipiki	0.2	-	-	-	0.2	
Wheelbarrow	25.9	-	-	-	25.7	
Shovel/igitiyo	2.8	-	-	-	2.7	10.7
Crops Sprayer	43.1	-	-	-	42.9	
Watering can	5.2	-	32.5	23.8	5.3	7.1
Machete	2.9	-	-	-	2.9	
Sack	0.6	-	6.5	-	0.6	
Jerry-can	2.4	-	-	-	2.4	
Bowl	0.0	-	-	-	0.0	
Others (Specify)	0.7	-	39.0	42.9	0.8	
Total	**100**	**100**	**100**	**100**	**100**	**100**

2014 Seasonal Agriculture Survey-Season B

The survey results showed on the value of donations received by Agricultural Operators, Crop Sprayer (42.9%) were the largest donation followed by Wheelbarrow (25.7%) and Hoe (9.0%). For LSF the largest donation was Hoe (75.0%) followed by Shovel (10.7) and Watering can (7.1%).

5.6 Use of Crop Production by Agricultural Operators and by Large Scale Farmers

Clearly the majority of the crop production was consumed by the agricultural operator households (auto consumption). The rest of the crop production for some crops was sold, offered as gifts to others, used as seeds or stored. A small percentage of the crop production for some crops was used for payment of hired labour.

With respect to LSF, a substantial percentage of the production was sold. The rest of the crop production for some crops was consumed by the household, used as wages for hired labour, offered as gifts to others and used as seed or put in storage.

The survey results on the use of crop production by agricultural operators are given in Table 86 and 87.

Table 86. Use of Production by Agricultural Operators (%)

Crops	Sold	Stored	Autoconsumption	Used as wage for hired labour	Used as Farm rent	Offered as Gift to Other	Exchanged with other things	Used as seeds	Used as fodder	Damaged	Used in any other way	Total
Maize	11.0	.3	80.9	.1	3.0	.0	3.2	.7	.3	.0	.3	100
Paddy rice	62.3	1.6	28.4	.9	3.4	.3	3.0	.0	.0	.1	.1	100
Sorghum	27.6	.3	58.2	.6	4.2	.1	7.5	.1	1.1	.1	.2	100
Wheat	23.6	.0	66.4	.0	.8	.0	9.1	.0	.0	.0	.0	100
Other cereals	.0	.0	100.0	.0	.0	.0	.0	.0	.0	.0	.0	100
Bush beans	12.1	.4	68.8	.2	2.0	.2	15.2	.0	1.0	.0	.1	100
Climbing beans	10.6	.3	69.8	.1	3.4	.3	15.1	.0	.4	.0	.0	100
Peas	9.5	.0	69.5	.1	1.8	.0	19.0	.0	.0	.0	.0	100
Other pulses	.0	.0	92.5	.0	.0	.0	7.5	.0	.0	.0	.0	100
Cassava	20.4	1.0	75.0	.0	3.0	.0	.0	.0	.2	.2	.1	100
Irish potatoes	19.0	.3	65.9	.0	2.2	.1	12.4	.0	.0	.0	.1	100
Sweet potatoes	14.4	.9	81.1	.0	2.9	.0	.0	.6	.0	.0	.0	100
Yams & Taro	10.4	.7	83.9	.1	2.6	.0	2.1	.0	.0	.0	.2	100
Tomotoes	71.5	.1	23.4	.0	3.5	.0	.8	.0	.1	.6	.0	100
Cabbage	54.7	.0	38.8	.1	5.1	.0	.0	1.1	.0	.2	.0	100
Cauliflowers	91.7	.0	5.0	.0	3.3	.0	.0	.0	.0	.0	.0	100
Onion	83.3	.0	14.4	.0	2.3	.0	.0	.0	.0	.0	.0	100
Carrot	56.3	.8	35.3	.0	6.4	.0	.0	1.0	.0	.1	.0	100
Eggplant	43.2	.0	49.6	.3	6.4	.0	.1	.0	.0	.3	.0	100
Other vegetables	17.0	.0	65.7	.0	17.3	.0	.0	.0	.0	.0	.0	100
Cooking Bananas	17.5	.6	78.2	.0	3.0	.1	.0	.0	.0	.0	.5	100
Dessert Banana	60.2	.0	38.3	.0	1.4	.0	.0	.0	.0	.0	.1	100
Banana for beer	74.1	.0	22.5	.0	3.1	.0	.0	.0	.0	.1	.2	100
Pineapple	25.8	.0	63.4	.0	7.0	.0	.0	.0	.0	.0	3.8	100
Avocado	46.9	.0	46.5	.0	6.7	.0	.0	.0	.0	.0	.0	100
Passion fruits	59.3	.0	36.9	.0	3.7	.0	.0	.0	.0	.0	.0	100
Soya beans	11.8	.0	69.0	.2	1.2	.6	17.0	.0	.0	.1	.0	100
Ground nuts	13.6	.1	63.5	.0	.5	.3	21.3	.0	.7	.0	.0	100
sun flower	1.1	.0	88.3	.0	.8	.4	9.4	.0	.0	.0	.0	100
coffee	99.1	.0	.4	.0	.4	.0	.0	.0	.0	.0	.2	100
Pyrethrum	100.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	100
Other crops	59.3	.0	8.9	.0	1.3	.0	.0	.0	.0	.0	30.4	100
Black eggplants	50.7	.0	43.7	.0	4.7	.0	.3	.0	.0	.7	.0	100
Sweet pepper	85.5	.0	11.6	.0	2.1	.0	.4	.0	.0	.4	.0	100
Pepper	60.4	.0	23.9	.0	15.7	.0	.0	.0	.0	.0	.0	100
Amaranths	49.2	.0	44.0	.0	6.0	.7	.0	.0	.0	.0	.0	100
Small red beans	.0	.0	66.6	.0	.0	.0	33.4	.0	.0	.0	.0	100
Sugar beet	58.8	.0	31.1	.0	8.5	.0	.0	.0	.0	1.6	.0	100
Leeks	.0	.0	93.8	.0	6.2	.0	.0	.0	.0	.0	.0	100
French beans	.0	.0	100.0	.0	.0	.0	.0	.0	.0	.0	.0	100
Napier glass	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	100.0	100
Sugar cane	40.1	.0	48.0	.0	9.0	.0	.0	.0	.0	1.6	1.3	100
Fodder crops	11.2	.0	.0	.0	1.2	.0	1.7	85.9	.0	.0	.0	100
Macadamia	50.0	.0	50.0	.0	.0	.0	.0	.0	.0	.0	.0	100
Mango	72.5	.0	17.8	.0	4.8	.0	.0	.0	.0	5.0	.0	100
Papaya	44.5	.0	46.5	.0	9.0	.0	.0	.0	.0	.0	.0	100
Tree tomato	75.7	.0	22.8	.0	1.4	.0	.0	.0	.0	.0	.0	100
Millet	.0	33.3	16.7	.0	.0	.0	50.0	.0	.0	.0	.0	100
Pumpkin	14.1	.0	74.9	1.1	7.5	.0	.1	.0	.0	2.3	.0	100
Total	24.6	0.4	63.6	0.1	2.8	0.1	6.5	1.3	0.3	0.1	0.3	100

2014 Seasonal Agriculture Survey -Season B

Table 87. Use of Production by Large Scale Farmer (%)

Crops	Sold	Stored	Autoconsumption	Used as wage for hired labour	Used as Farm rent	Offered as Gift to Other	Exchanged with other things	Used as seeds	Used as fodder	Damaged	Used in any other way	Total
Maize	33.3	1.4	49.1	.3	.0	3.3	1.1	6.3	5.2	.0	.0	100
Paddy rice	79.5	.0	19.3	.0	.0	.2	.0	.9	.0	.0	.0	100
Sorghum	64.5	2.1	22.7	1.0	.0	1.7	.0	4.2	3.7	.0	.0	100
Wheat	78.8	.0	14.6	.0	.0	.0	.0	6.6	.0	.0	.0	100
Other cereals												
Bush beans	36.3	3.2	40.1	.3	.0	2.2	.0	17.9	.0	.0	.0	100
Climbing beans	47.2	3.1	33.0	.0	.0	.6	.0	16.0	.0	.0	.0	100
Peas	28.8	.0	32.8	.0	.0	.0	.0	38.4	.0	.0	.0	100
Other legumes & p												
Cassava	45.0	.0	48.1	.0	.0	6.9	.0	.0	.0	.0	.0	100
Irish potatoes	33.4	.0	38.6	.4	.0	1.7	.0	26.0	.0	.1	.0	100
Sweet potatoes	37.3	.0	56.6	.0	.0	6.1	.0	.0	.0	.0	.0	100
Yams & Taro	21.8	.0	70.0	2.6	.0	4.4	.0	1.3	.0	.0	.0	100
Tomotoes	95.3	.0	4.0	.0	.0	.0	.0	.7	.0	.0	.0	100
White cabbage	73.2	.0	25.8	.0	.0	.9	.0	.0	.0	.0	.0	100
Flower cabage												
Onions	33.3	.0	66.7	.0	.0	.0	.0	.0	.0	.0	.0	100
Carrots	50.0	.0	50.0	.0	.0	.0	.0	.0	.0	.0	.0	100
Eggplant	83.5	.0	16.5	.0	.0	.0	.0	.0	.0	.0	.0	100
Other vegetables	.0	.0	100.0	.0	.0	.0	.0	.0	.0	.0	.0	100
Cooking Bananas	39.1	.0	53.1	1.8	.0	6.1	.1	.0	.0	.0	.0	100
Dessert banana	65.8	.0	32.0	.0	.0	2.2	.0	.0	.0	.0	.0	100
Banana for beer	82.9	.0	17.1	.0	.0	.0	.0	.0	.0	.0	.0	100
Pineapple	88.1	.0	6.2	.0	.0	3.1	.0	.0	.0	2.6	.0	100
Avocado	100.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	100
Passion fruits												
Other fruits												
Soya beans	51.7	6.7	27.4	.0	.0	1.8	.0	10.1	.0	.0	2.4	100
Ground nuts	21.7	.0	48.4	.0	.0	1.3	2.1	26.6	.0	.0	.0	100
Sun flower	75.0	.0	25.0	.0	.0	.0	.0	.0	.0	.0	.0	100

2014 Seasonal Agriculture Survey -Season B

Table 88. Use of Production by Large Scale Farmer (%) (cont'd)

Crops	Sold	Stored	Autoconsumption	Used as wage for hired labour	Used as Farm rent	Offered as Gift to Other	Exchanged with other things	Used as seeds	Used as fodder	Damaged	Used in any other way	Total
coffee	100.0	.0	.0	.0	.0	.0	.0	.0		.0	.0	100.0
Pyrethrum												
Other crops												
Sweet pepper	98.3	.0	1.7	.0	.0	.0	.0	.0		.0	.0	100.0
Pepper	100.0	.0	.0	.0	.0	.0	.0	.0		.0	.0	100.0
Amaranths	62.3	.0	37.7	.0	.0	.0	.0		.0	.0	.0	100.0
Celery												
Spinach	70.0	.0	30.0	.0	.0	.0	.0		.0	.0	.0	100.0
Small red beans												
Sugar beet	95.0	.0	5.0	.0	.0	.0	.0			.0	.0	100.0
Garlic												
Leeks												
French beans	40.0	.0	60.0	.0	.0	.0	.0			.0	.0	100.0
Napia grass												
Sugar cane												
Fodder crop												
Macadamia	75.0	25.0	.0	.0	.0	.0	.0	.0		.0	.0	100.0
Mango	.0	.0	100.0	.0	.0	.0	.0			.0	.0	100.0
Papaya												
Tree tomato												
Orange	50.0	.0	20.0	.0	.0	30.0	.0			.0	.0	100.0
Lemon	90.0	.0	10.0	.0	.0	.0	.0			.0	.0	100.0
Guava												
White Mulberry												
Millet												
Jatropha												
Pumpkins												
Cucumber												

2014 Seasonal Agriculture Survey -Season B

Chapter 6: Results of the 2014 Season C

Details of demographic information, use of inputs, other agricultural practices, and production aspects are captured in phase II as described above.

A sample of 609 out of 7,684 Agricultural Operators was interviewed.

6.1 Demographic and Social Characteristics of Agricultural Operators

Characteristics of Agricultural Operators describe their number by type (individual or cooperative), gender, age, education level, residency, farming activities and cooperative membership.

6.1.1 Agricultural Operators by Stratum

The distribution of Agricultural Operators (in segments) was highest in Stratum 1.2 (69.0%), followed by Stratum 2.1 (23.2%).

Table 88. Agricultural Operators by Stratum

	Strata	Total	
		Number	%
Agricultural Operators	1.2	420	69.0
	2.1	141	23.2
	2.2	48	7.9
	All Rwanda	609	100

2014 Seasonal Agriculture Survey - Season C

Table 89. Agricultural Operators by type (%)

	Strata	Individual		Cooperative		Total	
		Number	%	Number	%	Number	%
Agricultural Operators	1.2	420	100.0	0	0.0	420	100
	2.1	138	97.9	3	2.1	141	100
	2.2	48	100.0	0	0.0	48	100
	All Rwanda	606	99.5	3	0.5	609	100

2014 Seasonal Agriculture Survey -Season C

The survey results showed that most of the Agricultural Operators in segments (99.5%) were individual Farmers and only about 0.5 % were cooperatives.

22.5% of Agricultural Operators were members of Agricultural Cooperatives in season C, the highest proportion being in Stratum 2.1 followed by the Stratum 2.2 (33.3%).

Table 90. Cooperative Membership

		Yes	No	Total
	Strata	Percent	Percent	Percent
Agricultural Operators	1.2	11.9	88.1	100
	2.1	36.9	63.1	100
	2.2	33.3	66.7	100
	All Rwanda	22.5	77.5	100

2014 Seasonal Agriculture Survey - Season C

6.1.2 Number of Agricultural Operators by Gender

In 2014 Season C, the percentage distribution of Agricultural Operators in Rwanda by gender was 66.4% male and 33.6% female. The percentage distribution of Agricultural Operators in Rwanda by Gender is shown in Table 91.

Table 91. Percentage of Agricultural Operators by Gender and Stratum

	Agricultural Operators		
Strata	Male	Female	Total
1.2	65.5	34.5	100
2.1	67.4	32.6	100
2.2	72.9	27.1	100
Rwanda	66.4	33.6	100

2014 Seasonal Agriculture Survey - Season C

6.1.3 Age Distribution of Agricultural Operators

The majority (27.2%) of Agricultural Operators in Rwanda were in the age group of between 25 and 34 (see Table 92). This is followed by 23.0% of Agricultural Operators in age group of 55 and above. The age group distribution of Agricultural Operators by Stratum varied more in the age group of between 45 and 54 with Stratum 2.1 (28.3%) being the highest and Stratum 1.2 (16.4%) being lowest. The

least variation was in the age group of between 14 and 24 with the Stratum 1.2 being the highest (7.1%) and Stratum 2.1 (4.3%) being the lowest.

Table 92. Age Distribution of Agricultural Operators

	Agricultural Operators				
Strata	**14-24**	**25-34**	**35-44**	**45-54**	**55 and Above**
1.2	7.1	29.0	23.3	16.4	24.0
2.1	4.3	24.6	21.0	28.3	21.7
2.2	6.3	27.1	29.2	22.9	14.6
All Rwanda	6.0	27.2	22.5	21.3	23.0

2014 Seasonal Agriculture Survey - Season C

The majority (33.2%) of male Agricultural Operators in Rwanda in season C were in the age group of between 25 and 34 (see Table 93). This is followed by 22.2% of Agricultural Operators in age group of between 35 and 44.

Table 93. Age Distribution of Male Agricultural Operators

	Agricultural Operators				
Strata	**14-24**	**25-34**	**35-44**	**45-54**	**55 and Above**
1.2	8.0	37.1	22.5	13.5	18.9
2.1	4.3	28.0	21.5	29.0	17.2
2.2	5.7	31.4	25.7	22.9	14.3
All Rwanda	6.4	33.2	22.2	20.0	18.1

2014 Seasonal Agriculture Survey - Season C

The distribution of female Agricultural Operators in Rwanda in season C was high in the age groupof 55 and above (32.5%) followed by 23.9% of female Agricultural Operators in age group ofbetween 45 and 54, 23.1% of female Agricultural Operators in age groupof between 35 and 44, 15.4% in age group of between 25 and 34 and 5.1% in age group of between 14 and 24 (see Table 94).

Table 94. Age Distribution of Female Agricultural Operators

	Agricultural Operators				
Strata	14-24	25-34	35-44	45-54	55 and Above
1.2	5.5	13.8	24.8	22.1	33.8
2.1	4.4	17.8	20.0	26.7	31.1
2.2	7.7	15.4	38.5	23.1	15.4
All Rwanda	5.1	15.4	23.1	23.9	32.5

2014 Seasonal Agriculture Survey - Season C

6.1.4 Education Level of Agricultural Operators

The Survey results of the 2014 Season C showed that in Rwanda, 66.2% of Agricultural Operators had attended primary level education, 25.3% had no education, 8.0% attended secondary level education and only 0.6% had attended tertiary level education (see Table 95).

Table 95. Education Level of Agricultural Operators by Stratum (%)

	Agricultural Operators				
Strata	Primary	Secondary	Tertiary	No education	Total
1.2	60.5	10.5	1.0	28.1	100
2.1	73.9	4.3	0.0	21.7	100
2.2	77.1	10.4	2.1	10.4	100
All Rwanda	66.2	8.0	0.6	25.3	100

2014 Seasonal Agriculture Survey - Season C

For those Agricultural Operators that had attented primary level education (66.2%) their distribution by Stratum was reasonably uniform with Stratum 2.2 and Stratum 2.1 having a higher percentage of 77.1 and 73.9% respectively.

Table 96. Education level of Male Agricultural Operators (%)

	Agricultural Operators				
Strata	Primary	Secondary	Tertiary	No education	Total
1.2	69.1	13.1	1.1	16.7	100
2.1	74.2	4.3	0.0	21.5	100
2.2	77.1	11.4	2.9	8.6	100
All Rwanda	71.3	9.4	0.7	18.6	100

2014 Seasonal Agriculture Survey - Season C

In Rwanda, 71.3% of male Agricultural Operators had attended primary education, 18.6% of Agricultural operators did not attend school, 9.4% attended secondary education (see Table 96).

Table 97. Education Level of Female Agricultural Operators (%)

	Agricultural Operators				
Strata	Primary	Secondary	Tertiary	No education	Total
1.2	44.1	5.5	0.7	49.7	100
2.1	73.3	4.4	0.0	22.2	100
2.2	76.9	7.7	0.0	15.4	100
All Rwanda	56.0	5.1	0.4	38.5	100

2014 Seasonal Agriculture Survey - Season C

As Table 97 shows, Stratum 2.2 had the highest percentage of female Agricultural Operators with primary education (76.9%) and the lowest percentage of female agriculture operators with no education level (15.4%).

6.1.5 Residency of Agricultural Operators in Segments

An agricultural operator is considered to be resident in a segment if he/she lives in the segment and undertakes agricultural activities in the same segment. An agricultural operator is considered non-resident of a segment if his/her agricultural activities are undertaken in the segment but lives outside the segment.

Results of the survey showed that in Rwanda the majority of Agricultural Operators (90.3%) were non-resident while 9.7% were residents. (See Table 98)

Table 98. Agricultural Operators by Residency (%)

	Agricultural Operators		
Strata	Resident	Non resident	Total
1.2	25.0	75.0	100
2.1	1.6	98.4	100
2.2	2.5	97.5	100
All Rwanda	9.7	90.3	100

2014 Seasonal Agriculture Survey - Season C

Stratum 1.2 had the lowest percentage of non-resident operators (75.0%) and the biggest percentage of resident operators (25.0%), while the rest of the Strata had above 90.0% of non-residents.

6.2 Date of Sowing

The starting dates of sowing by Agricultural Operators in Segments for each main crop is summarized in Tables 102. For the majority of Agricultural Operators, sowing for 2014 Season C crops was mainly done in May, June and July 2014.

Table 99. Agricultural Operators Indicating the Sowing Date in Segments by Crop (%)

Crop name	Before 30/04/2014	01-31 /05/2014	01-30/06/2014	After june 2014	All Rwanda
Bush beans	0.0	9.3	52.3	38.4	100
Climbing beans	36.4	27.3	18.2	18.2	100
Peas	12.5	25.0	50.0	12.5	100
Irish potatoes	15.4	18.9	28.6	37.2	100
Tomotoes	8.0	28.0	32.0	32.0	100
White cabbage	8.7	26.1	33.3	31.9	100
Onions	8.3	41.7	8.3	41.7	100
Carrots	14.3	14.3	14.3	57.1	100
Soya beans	0.0	8.1	54.1	37.8	100
Sweet pepper	16.7	16.7	33.3	33.3	100
Amaranths	5.3	21.1	42.1	31.6	100
Sugar beet	0.0	50.0	0.0	50.0	100
Leeks	20.0	20.0	20.0	40.0	100
French beans	0.0	0.0	50.0	50.0	100

2014 Seasonal Agriculture Survey - Season C

For some crops, sowing of crops by Agricultural Operators started earlier than May 2014 such as Climbing beans, Leeks, sweet pepper, Irish potatoes, carrots and peas.

6.3 Farm Characteristics (Area, Yield and Production)

From the detailed tables on area under crops, yield and crop production see Tables 100, 103 and 104, the following are some of the highlights on the estimated production, area under crops and yield for the 2014Season C.

6.3.1 Crop Areas

In Rwanda, in terms of land area under crops the main crops grown in Season C were Irish potatoes (52.2%), Beans (22.2%), and vegetables (16.9%) (See Table 100).

Table 100. Area (Ha) Cultivated by Crop and Group of Crops by Stratum (Hectares)

	Strata			All Rwanda	
Crops	**12**	**21**	**22**	**All Rwanda**	**Percent**
Irish Potatoes	7,920	2,701	13	10,635	52.2
Legumes & Pulses	**71**	**5,812**	**417**	**6,300**	**30.9**
Beans	41	4,184	300	4,525	22.2
Peas	30	769	2	801	3.9
Soya beans	-	859	115	975	4.8
Vegetables	357	2,513	577	3,447	16.9
Total developped crop land	**8,348**	**11,027**	**1,007**	**20,382**	**100**
Total Physical crop land	**8,348**	**11,027**	**1,007**	**20,382**	**100**

2014 Season Bgriculture Survey - Season C

The total developed land means simply the cropland with regards to perennial crops cultivation standards and being sometimes mixed with seasonal crops while the physical land means the real size in terms of cultivated plot area. Total developed crop land remains the same with total physical crop land since there are no perennial crops in Season C.

Figure 10: Share of Agriculture Land by Crops

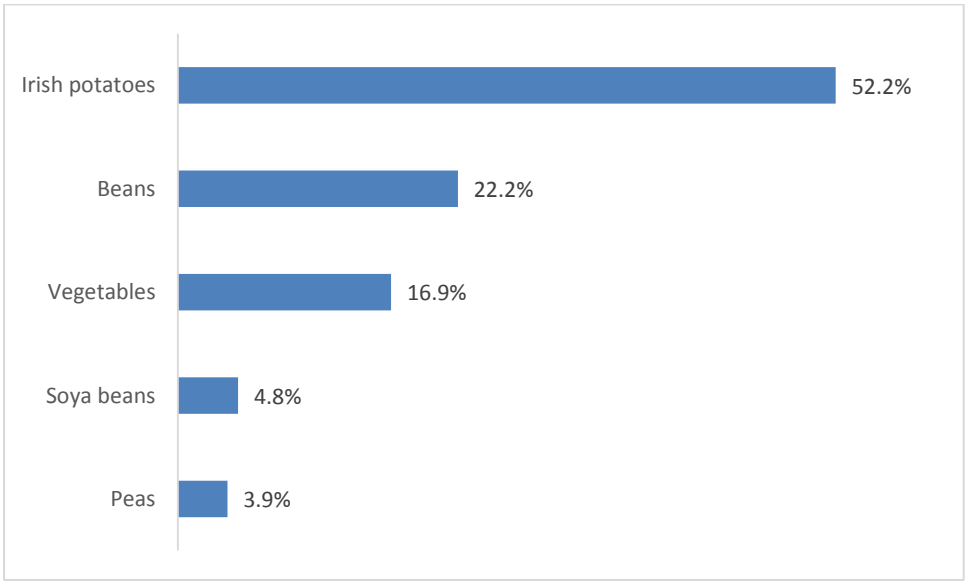
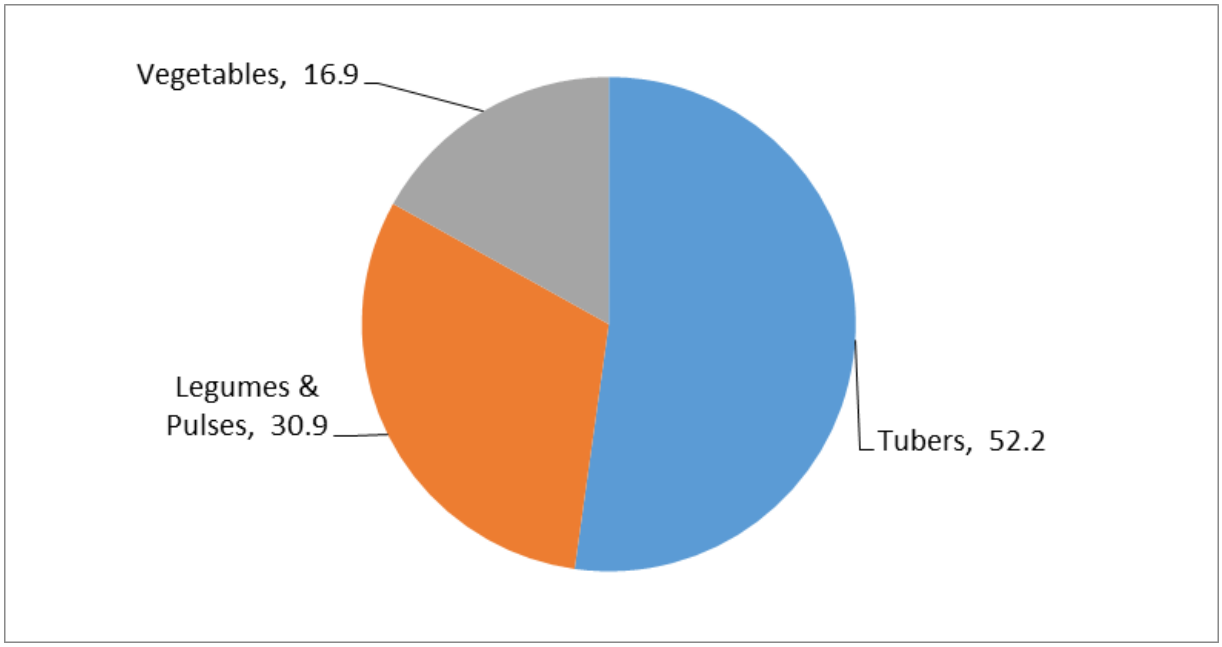


Figure 11: Shares of Agriculture Land by Group of Crops



The Figure 11 shows the percentage share of agricultural land cultivated by group of crops. The survey results showed that the dominant groups of agricultural crops in Rwanda were: Tubers (52.2%), Legumes and Pulses (30.9%) and vegetables (16.9%).

The survey results (see Table 101) showed that the average size of tracts for Agricultural Operators in Rwanda in 2014 Season C was 0.16 hectares.

Table 101. Average Size of Tracts by Stratum

Strata	Average (Ha)
1.2	0.15
2.1	0.17
2.2	0.16
All Rwanda	0.16

2014 Seasonal Agriculture Survey - Season C

Stratum 2.1had the largest average size of tract for Agricultural Operators (0.17Ha) followed by Stratum 2.2 (0.16 Ha) and Stratum 1.2 (0.15 Ha).

The survey results confirmed that plot sizes for the Agricultural Operators in Rwanda tend to be very small (See Table 101).

Table 102. Average Size of crop area per Agricultural Operators (Ha)

Crops \ Strata	12	21	22	All Rwanda
Bush beans	0.01	0.04	0.06	0.04
Peas	0.05	0.06	0.01	0.04
Irish potatoes	0.10	0.08	0.03	0.07
Tomotoes	0.01	0.03	0.04	0.03
White cabbage	0.05	0.03	0.05	0.04
Flower cabage	0.01	.	.	0.01
Onions	0.08	0.03	0.08	0.06
Carrots	0.05	0.03	0.03	0.03
Soya beans	.	0.03	0.01	0.02
Sweet pepper	.	0.03	0.04	0.03
Amaranths	0.00	0.01	0.01	0.01
Celery	.	.	0.01	0.01
Sugar beet	0.00	0.02	0.03	0.02
Leeks	0.05	0.01	.	0.03
French beans	.	0.04	0.02	0.03
Other Seasonal Vegetables	0.00	.	.	0.00

2014 Seasonal Agriculture Survey - Season C

The average size of crops area was below 0.10Ha for all crops during 2014 Season C.

6.3.2 Crop Yields

Crop yield also known as “Agricultural output” refers to the measure of yield of a crop per unit area of land cultivation.

The table 103 provides the crop yields for five crops of season C.

Table 103. Crops Yield by Stratum (Kg/Ha)

	Strata			
Crops	1.2	2.1	2.2	All Rwanda
Irish Potatoes	8,517	17,914	-	10,892
Beans	945	560	646	570
Peas	387	351	-	352
Soya beans	-	794	871	803
Vegetables	14,074	11,109	10,044	11,238

2014 Seasonal Agriculture Survey - Season C

6.3.3 Crop Production

The contribution of individual crop production by Stratum (see Table 104) was calculated using the product of yield and area under the crop.

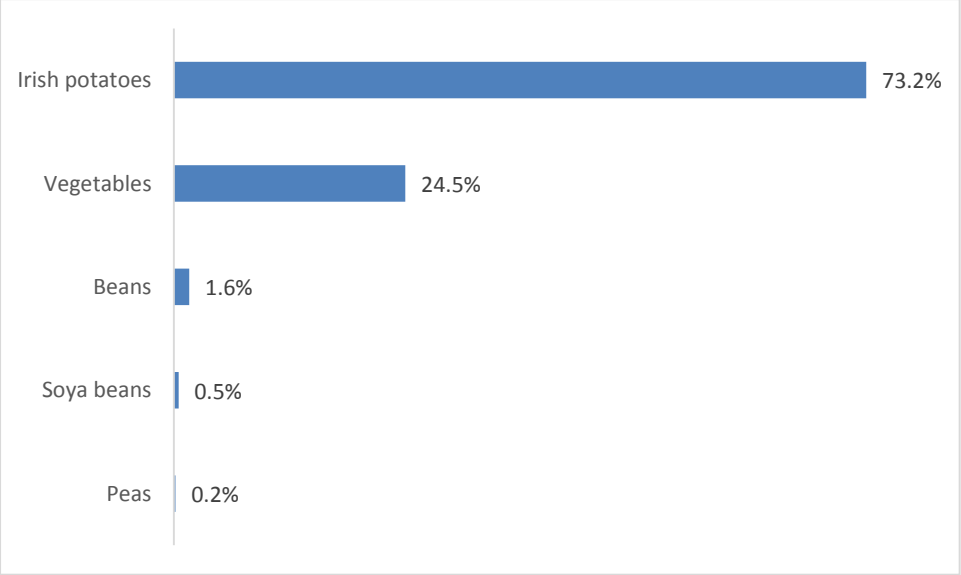
Table 104. Production of Main Crops (MT)

	Agricultural Operators All Rwanda				
Crops	**1.2**	**2.1**	**2.2**	**Total**	**Percent**
Irish Potatoes	67,455	48,386	-	115,841	73.2
Beans	39	2,345	194	2,577	1.6
Peas	12	270	-	282	0.2
Soya beans	-	682	100	782	0.5
Vegetables	5,020	27,921	5,791	38,731	24.5
All Rwanda	**72,525**	**79,604**	**6,085**	**158,214**	**100**

2014 Seasonal Agriculture Survey - Season C

The share of crop production was significantly high for Irish Potatoes (73.2%) followed by Vegetables (24.5%) and Beans (1.6%).

Figure 12: Share of production by main crops (%)



6.4 Agricultural Practices

6.4.1 Pure and Mixed Cropping

The survey results showed that the percentage share of agricultural land used by Agricultural Operators to grow crops in pure stand and mixed stand in Rwanda was 55.8% and 44.2% respectively (see Table 105).

Table 105. Share of Pure and Mixed Crop Agricultural Land (%)

	Strata	Pure Crop Land	Mixed Crop Land	Total
Agricultural Operators	1.2	74.7	25.3	100
	2.1	42.7	57.3	100
	2.2	43.0	57.0	100
	All Rwanda	55.8	44.2	100

2014 Season Agriculture Survey - Season C

In general, Agricultural Operators used most of their agricultural land to cultivate crops in pure stand.

Table 106. Pure Crop Agricultural Land (Ha) in Segments by Type of Crop (%)

Strata	Irish Potatoes	Beans	Peas	Soya beans	Vegetables	Total
1.2	95.0	-	0.3	-	4.7	100
2.1	24.8	31.2	13.6	4.8	25.7	100
2.2	3.0	11.8	-	-	85.2	100
All Rwanda	62.4	13.3	5.8	2.0	16.5	100

2014 Seasonal Agriculture Survey -Season C

Table 106 shows the use of agricultural land for growing main crops in pure stand in the country. Stratum 1.2 used 95.0% of total land for pure stand cropping mainly for Irish Potatoes, Stratum 2.1 for Beans (31.2%) and finally Stratum 2.2 used 85.2% of total land for pure cropping for Vegetables.

6.4.2 Use of Organic Fertilizer

In segments, 57.2% of all Agricultural Operators in Rwanda reported that they used organic fertilizer (see Table 107). Organic fertilizers were mostly used in Stratum 1.2 (58.8%) followed by Stratum 2.1 (55.3%) and Stratum 2.2 (47.9%) in season C.

Table 107. Users of Organic Fertilizers (%)

	Strata	Used organic fertilizers
Agricultural Operators	1.2	58.8
	2.1	55.3
	2.2	47.9
	All Rwanda	57.2

2014 Seasonal Agriculture Survey -Season C

Table 108. Users of organic fertilizers by crop (%)

	Agricultural operators			
Crops	12	21	22	All Rwanda
Beans	100.0	43.9	12.5	44.3
Peas	66.7	87.5	100.0	84.6
Irish potatoes	73.1	95.2	100.0	75.4
Soybeans		10.0	5.9	9.7
Vegetables	52.9	94.2	95.5	84.9

2014 Season Agriculture Survey - Season C

6.4.3 Use of Inorganic Fertilizers by Agricultural Operators

The survey results showed that 57.6% of Agricultural Operators used inorganic fertilizers during 2014 Season C (see Table 109).

Table 109. Use of Inorganic Fertilizer

	Strata	Used inorganic fertilizers
Agricultural Operators	1.2	70.7
	2.1	40.4
	2.2	22.9
	All Rwanda	57.6

2014 Seasonal Agriculture Survey -Season C

Table 110. Users of Inorganic Fertilizers by Type and by Stratum (%)

	Agricultural Operators						
	Strata	NPK	UREA	UREA (LIQUID)	DAP	OTHER Fertilizers	Total
Agricultural Operators	12	69.0	11.3	2.5	17.3	-	100
	21	34.7	36.1	6.9	20.8	1.4	100
	22	29.4	47.1	17.6	-	5.9	100
	All Rwanda	58.6	18.8	3.9	18.2	0.5	100

2014 Season Agriculture Survey - Season C

The survey results showedthatNPKwas highly used (58.6%) followed by UREA (18.8%) and DAP (18.2%). In Stratum 2.1 and Stratum 2.2, the survey showed that the UREA was highly used by 36.1% and 47.1% of all agricultural operators within the Stratum respectively and NPK was highly used in Stratum 1.2 by 69.0% of all agricultural operators within Stratum.

Table 111.Users of Inorganic fertilizers by Crop (%)

Crops \ Strata	Agricultural operators			
	12	21	22	All Rwanda
Bush Beans	50.0	15.2	0.0	15.4
Peas	0.0	12.5	0.0	10.5
Irish potatoes	73.4	57.1	0.0	71.7
Soybeans		5.0	0.0	4.6
Vegetables	50.0	67.3	50.0	62.8

2014 Season Agriculture Survey - Season C

Agricultural operators used inorganic fertilizers mostly on Irish potatoes (71.7%) and Vegetables (62.8%).

6.4.4 Use of Seeds

In Rwanda, Agricultural Operators used more traditional seeds (86.8%) than improved seeds (13.2%).

Table 112.Agricultural Operators by Type of Seeds Used (%)

	Strata	Traditional seeds	Improved seeds
		Percent	Percent
Agricultural Operators	**1.2**	94.0	6.0
	2.1	78.5	21.5
	2.2	62.7	37.3
	All Rwanda	86.8	13.2

2014 Seasonal Agriculture Survey -Season C

For Agricultural Operators, Stratum 1.2 had the largest share of users of traditional (94.0%) and stratum 2.2 had the largest share of users improved seeds (37.3%).

Table 113.Users of Traditional Seeds by Type of Crop (in %)

Crops \ Strata	Agricultural operators			
	1.2	2.1	2.2	All Rwanda
Beans	100	100	100	100
Peas	100	100	100	100
Irish potatoes	100	100	100	100
Soybeans	0.0	100	100	100
Vegetables	29.4	55.8	27.3	48.8

2014 Seasonal Agriculture Survey -Season C

Traditional seeds were used for almost all crops by Agricultural operators.

Table 114.Users of Improved Seeds by Type of Crop (%)

	Agricultural operators			
Cropsn \ Strata	1.2	2.1	2.2	All Rwanda
Vegetables	73.5	63.5	86.4	66.5

2014 Seasonal Agriculture Survey -Season C

Improved seeds were used only on Vegetables (66.5%) by all Agricultural operators who grew them during 2014 Season C (see table 114).

6.4.5 Irrigation Practice

The survey results showed that about 26.1% of agricultural operators in segments and practised irrigation (see Table 115). The irrigation is more practised in Stratum 2.2 and 2.1 where the high percentage of operators in those Strata practised irrigation (66.7% and 60.3% respectively).

Table 115. Agricultural OperatorsPractising Irrigation

	Strata	Practised Irrigation
Agricultural Operators	12	0.7
	21	60.3
	22	66.7
	All Rwanda	26.1

2014 Season Agriculture Survey - Season C

Table 116. Agricultural Operators by Type of Irrigation Practised (%)

	Strata	Pumps/tube wells/irrigation machines	Watering can	Water channels	Others	Total
Agricultural Operators	1.2	-	66.7	-	33.3	100
	2.1	4.6	37.0	19.4	38.9	100
	2.2	-	47.4	13.2	39.5	100
	All Rwanda	4.4	37.8	19.0	38.8	100

2014 Seasonal Agriculture Survey -Season C

On the type of irrigation used by Agricultural Operators, the survey results showed that the majority of Agricultural Operators used Watering Can (37.8%) for irrigation followed by Water Channels (see Table 116).

Use of water can for irrigation was predominantly in Stratum 1.2 (66.7%). There was very little use of Pumps/Tube wells/Irrigation machines by Agricultural Operators in Rwanda (4.4%).

Table 117.Practice of irrigation by Crops (%)

Agricultural operators				
Crops \ Strata	1.2	2.1	2.2	All Rwanda
Beans	0.0	37.9	100.0	38.1
Peas	0.0	100.0	100.0	85.2
Irish potatoes	0.0	57.1	100.0	5.9
Soybeans	0.0	10.0	5.9	9.7
Vegetables	8.8	92.3	100.0	73.6

2014 Seasonal Agriculture Survey -Season C

6.4.6 Anti-erosive Activities

Erosion refers to the process in which the topsoil is worn away. Due the mountainous landscape of Rwanda, most of the Agricultural Operators practice anti-erosion activities to prevent the wasting away of the earth. The survey results (see Table 118 and Figure 36) show the distribution of Agricultural Operators practising anti-erosion activities.

Anti-erosion was practised by 73.2% of Agricultural Operators in season C. Most of the anti-erosion activities were practised by Agricultural Operators in the Stratum 2.1 (73.9%), followed by Stratum 1.2 (71.5%), Stratum 2.2 (68.4%) (See Table 118).

Table 118. Anti-erosive Activities by Agricultural Operators (%)

	Strata	Practised Anti-erosion
Agricultural Operators	1.2	71.5
	2.1	73.9
	2.2	68.4
	All Rwanda	73.2

2014 Seasonal Agriculture Survey -Season C

The Survey shows that in Rwanda the most practised erosion control measures by Agricultural Operators in all Strata were water drainage (49.7%) and grasses (21.5%) followed by Ditches (3.4%) (SeeTable119).

Other erosion control measures such as planting of trees, radical terracing, progressive terracing, radical terracing and mulching were also practised by a small number of Agricultural Operators.

Table119. Distribution of Type Anti-erosive Activities by Agricultural Operators (%)

	Strata	Ditches	Trees	Radical Terracing	Progressive terracing	Grasses	Water drainage	Mulching	Other	Total
Agricultural Operators	1.2	7.2	3.2	1.4	8.0	21.7	0.1	0.0	-	100
	2.1	2.4	0.4	0.1	0.2	21.8	64.2	0.8	0.0	100
	2.2	0.6	0.3	-	0.2	8.0	70.2	3.3	0.6	100
	All Rwanda	3.4	1.1	0.4	2.0	21.5	49.7	0.7	0.0	100

2014 Seasonal Agriculture Survey-Season C

Table 120 : Practice of anti-erosion by Crop (%)

Crops \ Strata	Agricultural operators			
	1.2	2.1	2.2	All Rwanda
Beans	100	56.1	100	57.2
Peas	66.7	100	100	95.1
Irish potatoes	91.3	81.0	100	90.2
Soybeans	0.0	35.0	29.4	34.5
Vegetables	91.2	94.2	86.4	93.3

2014 Seasonal Agriculture Survey - Season C

The anti-erosion activities were generally for all cropland. With regards to cropland for Peas, Irish potatoes, and vegetables, more than 90.0% of agricultural operators reported that their plots are protected against erosion.

6.4.7 Use of Pesticides

The survey results showed that in Rwanda 64.1% of Agricultural Operators used pesticides in their farming activities (See Table 121).

Table 121. Agricultural Operators using Pesticide (%)

	Strata	Used Pesticides
Agricultural Operators	1.2	77.1
	2.1	45.4
	2.2	50.0
	All Rwanda	64.1

2014 Seasonal Agriculture Survey - Season C

For Agricultural Operators, Stratum 1.2 was high in the use of pesticides (77.1%) followed by the Stratum 2.2 (50.0%), Stratum 2.1 (45.4%).

The use of pesticides

Dithane was the most highly used pesticide by Agricultural Operators of the Strata 1.2 while Cypermetrine was the mostly used pesticides by Agricultural Operators in Strata 2.1 and 2.2.

Countrywide, for Agricultural Operators, Dithane is the most used pesticide (45.0%) followed by Cypermetrine (21.4%) (SeeTable122).

Table 122. Type of Pesticide used by Agricultural Operators (%)

	Strate	DITHANE	RIDOMIL	DIMETHOATE	CYPERMETRINE	DURSIBAN	TILT	PILKARE	OTHER PESTICIDE	All Rwanda
Agricultural Operators	1.2	53.7	22.3	6.3	17.4	0.3		-	-	100
	2.1	19.3	5.7	29.5	33.0	6.8		-	5.7	100
	2.2	21.2	3.0	27.3	39.4	-		1.8	9.1	100
	All Rwanda	45.0	18.1	12.1	21.4	1.9		0.1	1.5	100

2014 Seasonal Agriculture Survey - Season C

Table 123. Users of pesticides by crops (%)

Crops / Strata	Agricultural operators			
	1.2	2.1	2.2	All Rwanda
Bush Beans	0.0	25.8	62.5	25.9
Climbing beans	11.1	100.0	0.0	27.5
Peas	0.0	62.5	0.0	52.5
Irish potatoes	78.3	33.3	0.0	73.6
Soybeans		15.0	5.9	14.2
Vegetables	73.5	71.2	81.8	72.1

2014 Seasonal Agriculture Survey - Season C

The survey results showed that agricultural operators used pesticides mostly on Irish potatoes (73.6%), Vegetables (72.1%) and peas (52.5%).

6.5 Small Agricultural Equipment

The survey results showed that countrywide, most of the expenditure by Agricultural Operators was on the Hoe (30.0%) followed by craft bike (17.3%), crop sprayer (15.0%) and Big basket (10.5%). The expenditures on the other tools that were used for cultivation by Agricultural Operators were below 10% of the total expenditure (See Table 124).

Table 124. Expenditure by Type of Small Agricultural Equipment

Small Agricultural Equipment	Agricultural Operators			
	1.2	2.1	2.2	All Rwanda
Hoe	24.0	35.6	26.9	30.0
Spring Hoe	0.5	2.2	1.1	1.4
Fork hoe	2.9	1.2	2.3	2.1
Pick/ Ipiki	0.5	0.2	-	0.4
Shovel/igitiyo	0.4	0.6	-	0.5
Crops Sprayer	31.9	-	2.1	15.0
Scie	0.1	8.4	10.2	4.6
Sickle	0.2	0.6	-	0.4
Secataur	1.3	1.2	2.2	1.3
Scythe	-	-	0.6	0.0
Machete	-	0.1	0.6	0.1
Billhook	2.3	3.1	3.0	2.7
Basket	0.1	0.1	-	0.1
Sack	3.1	1.3	5.2	2.2
Big basket	18.8	3.0	4.1	10.5
Winnower	-	0.1	-	0.1
Basket(ikibo)	0.8	0.3	2.9	0.6
Basket(inkangara)	0.8	0.3	1.5	0.5
Scale	0.0	-	-	0.0
Jerry-can	1.3	-	-	0.6
Barrel	4.4	0.4	4.4	2.3
Bike	1.0	-	-	0.5
Craft bike	-	33.0	21.2	17.3
Bowl	0.1	0.1	0.9	0.1
Sheeting	1.6	3.9	5.1	2.8
Hoe sleeve	3.6	2.5	3.4	3.0
Others (Specify)	0.2	1.6	2.4	1.0
Total	100	100	100	100

2014 Seasonal Agriculture Survey-Season C

Table 125. Small Equipment Received from Non Agricultural Donors (%)

Small Agricultural Equipment received	Agricultural Operators			
	1.2	2.1	2.2	All Rwanda
Hoe	100.0	-	100.0	63.9
Jerry-can	-	100.0	-	36.1
Total	100.0	100.0	100.0	100.0

2014 Seasonal Agriculture Survey - Season C

The survey results showed the value of donations received by Agricultural Operators: hoe (63.9%) was the largest donation followed by jerry-can (36.1%).

6.6 Use of Crop Production by Agricultural Operators

Clearly, the majority of the crop production was sold and consumed by the agricultural operator households. The rest of the crop production for some crops was offered as gifts to others or used as seeds.

The survey results on the use of crop production by agricultural operators are given in Table 126.

Table 126. Use of Production by Agricultural Operators (%)

Crops	Sold	Stored	Autoconsumption	Used as wage for hired labour	Used as Farm rent	Offered as Gift to Other	Exchanged with other things	Used as seeds	Used as fodder	Damaged	Used in any other way	Total
Beans	6.8	.0	68.8	.0	.0	4.9	.3	19.1	.0	.2	.0	100
Peas	55.0	.0	36.2	.0	.0	.0	.0	8.8	.0	.0	.0	100
Irish potatoes	32.9	.0	41.8	.6	.1	5.0	.2	18.4	.0	.2	.8	100
Tomotoes	69.0	.0	17.8	.1	.0	8.1	.1	.5	.0	4.1	.3	100
White cabbage	55.3	.0	31.5	.0	.0	10.2	.0	.0	.9	2.1	.0	100
Onions	70.1	.0	17.5	.0	.0	1.5	.0	10.9	.0	.0	.0	100
Carrots	39.3	.0	53.9	.0	.0	6.8	.0	.0	.0	.0	.0	100
Soya beans	21.9	.0	48.6	.0	3.2	3.3	.3	20.8	.3	1.6	.0	100
Sweet pepper	68.0	.0	26.7	.0	.0	5.3	.0	.0	.0	.0	.0	100
Amaranths	36.9	.0	46.3	.0	.0	16.4	.0	.0	.5	.0	.0	100
Sugar beet	49.1	.0	44.3	.0	.0	6.7	.0	.0	.0	.0	.0	100
Leeks	54.0	.0	45.4	.0	.0	.6	.0	.0	.0	.0	.0	100
French beans	56.3	.0	39.0	.0	.0	4.7	.0	.0	.0	.0	.0	100
Other annual vegetables	.0	.0	98.0	.0	.0	2.0	.0	.0	.0	.0	.0	100

2014 Seasonal Agriculture Survey - Season C

General conclusion

The 2014 Seasonal Agriculture Survey highlighted efforts being made in agriculture sector to increase crop productivity. It clearly shows the link between agriculture modernization and output levels and supports further interventions with evidences.

Rwanda has experienced substantial growth in agriculture recently due to reforms introduced in the sector. Survey results indicated that there are still considerable opportunities to boost production and contribute more to food security, poverty reduction and overall development.

The 2014 Seasonal Agriculture Survey identifies room for improvement in agriculture sector, leading to further policy perspectives taking into account some key elements such as increase in the use of improved seeds, fertilizers and pesticides. This would be supported by strengthening irrigation and anti-erosion activities.

Finally, in all cases, a combination of improved farmer knowledge and farmers' operational capacity and high value crop prioritization are necessary. Moreover, linkage with agro-processing and markets are keys to sustain value addition.

Annex 1: Comparison table of crop's coverage between 2013 SAS and 2014 SAS

Crop Names	
2013	2014
Maize	Maize
Paddy rice	Paddy rice
Sorghum	Sorghum
Wheat	Wheat
Other cereals	Other cereals
Bush beans	Bush beans
Climbing beans	Climbing beans
Peas	Peas
Other legumes & pulses	Other legumes & pulses
Cassava	Cassava
Irish potatoes	Irish potatoes
Sweet potatoes	Sweet potatoes
Yams & Taro	Yams & Taro
Tomotoes	Tomotoes
White cabbage	White cabbage
Flower cabage	Flower cabage
Onions	Onions
Carrots	Carrots
Eggplant	Eggplant
Other vegetables	Other vegetables
Cooking Bananas	Cooking Bananas
Dessert banana	Dessert banana
Banana for beer	Banana for beer
Pineapple	Pineapple
Avocado	Avocado
Passion fruits	Passion fruits
Other fruits	Other fruits
Soya beans	Soya beans
Ground nuts	Ground nuts
sun flower	sun flower
other oil seeds	other oil seeds
coffee	coffee
Pyrethrum	Pyrethrum
Other crops	Other crops
	Black eggplants
	Sweet pepper
	Pepper
	Amaranths
	Celery

Crop Names	
2013	2014
	Small red beans
	Sugar beet
	Garlic
	Leeks
	French beans
	Broccoli
	Napia grass
	Sugar cane
	Fodder crop
	Macadamia
	Mango
	Papaya
	Tree tomato
	Orange
	Lemon
	Guava
	Desmodium
	Millet
	Jatropha
	Other tubers
	Pumpkins
	Cucumber