Republic of Rwanda

NISR
NATIONAL INSTITUTE OF STATISTICS OF RWANDA

SEASONAL AGRICULTURAL SURVEY

SEASON B

2024

The Seasonal Agricultural Survey report is produced by the National Institute of Statistics of Rwanda (NISR). Additional information about the Seasonal Agricultural Survey report, 2024, Season B may be obtained from NISR:

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Chapter

1

INTRODUCTION

1. Background

High-quality agricultural statistics plays a vital role in assessing the performance of national agricultural programs and hence, imperative for evidence-based decision making. While the use of statistics in decision-making processes continues to grow, the demand for agriculture data is also increasing. In this regard, the National Institute of Statistics of Rwanda (NISR) in collaboration with the Ministry of Agriculture and Animal Resource (MINAGRI) conducts the Seasonal Agricultural Survey (SAS) to gather agriculture information mainly related to potential agricultural land use, crop area, yield, and production, agricultural inputs, agricultural practices as well as other agricultural statistics.

The survey data are supplemented by administrative records collected by the National Agricultural Export Development Board (NAEB) through routine activities of monitoring coffee and tea production. NISR conducts the Seasonal Agricultural Survey (SAS) following three main agricultural seasons. Season A (September to February of the following year), Season B (March to June) while Season C (July-September) is a shorter season mainly for vegetables and sweet potato grown in swamps and Irish potato grown in the volcanic agro-ecological zone.

Every three years, SAS undergoes an upgrade to revise the sample frame based on changes in land classes and subsequently select new sample segments to be surveyed over the subsequent three-years. This report outlines the third upgrade of the Seasonal Agriculture Survey, detailing enhancements to the area frame, data collection activities, and key findings for the 2024 Season B.

2. Objectives of the Seasonal Agricultural Survey (SAS)

The main objective of SAS is to provide timely, accurate, reliable, and comprehensive agricultural statistics that describe the structure of agriculture in Rwanda mainly in terms of land use, crop area, yield, and crop production. The survey results are useful to monitor the current agricultural and food supply conditions to facilitate evidence-based decision making for the development of the agricultural sector.

The survey specifically captures data related to land use, including agricultural land, arable land, physical crop cultivated area, crop land, pastureland, and fallow land. It also gathers information on crop production, measuring the quantity of harvested crop in kilograms or tons. Additionally, the survey assesses crop yield, indicating the quantity of crop harvested per unit of land area in kilograms per hectare. Moreover, it examines the use of inputs such as improved seeds, fertilizers, and pesticides. Finally, the survey delves into various agricultural practices, including irrigation, soil erosion protection, agroforestry, and agriculture mechanisation

Chapter 2

SURVEY DESIGN

1. Sample frame design

To provide the basis for conducting probability surveys that comprehensively cover farm-level data and to enhance the precision of survey estimates, SAS uses a Multiple Frame Sampling (MFS) methodology. This approach involves constructing an area frame from which the survey sample is drawn. In addition, a list frame of Large-Scale Farmers (LSF), with at least 10 hectares of agricultural land, is done to complement the area frame. This ensures coverage of crops predominantly cultivated by large-scale farmers, which may not be adequately represented in the area frame alone. The construction of an area frame involves several steps, including land cover classification, land stratification and sampling of segments.

1.1. Land cover classification

Land classification is the first step in the designing of the sampling frame of the Seasonal Agriculture Survey. This process involves categorizing the total available land in the country into different land use or land cover types with the purpose of enhancing sampling precision by targeting the adequate land. With a combination of different spatial layers available in the country, plus a photo interpretation of a series (2010 to 2023) of high-resolution (50 to 30 cm) satellite images the total land of the country was divided into 14 land cover classes (as shown in Table 1).

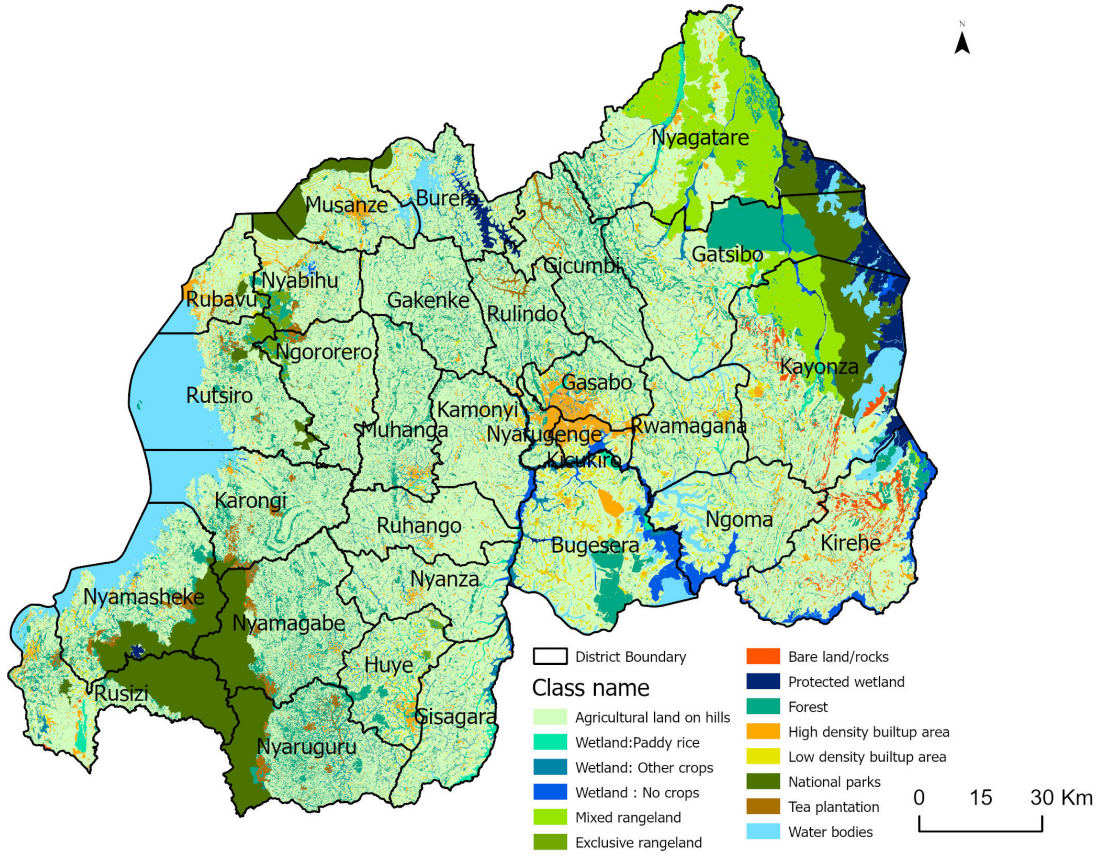
Table 1: List of Rwanda land cover classes

No	Class name	Area (Ha)	Percentage share
1	Agricultural land on hills	1,307,956	51.7
2	Non-rice Agricultural Wetland	56,905	2.2
3	Mixed rangeland	127,640	5.0
4	Low-density built-up area	95,740	3.8
5	Paddy rice wetland	22,825	0.9
6	Tea plantation	23,732	0.9
7	Non cropped wetlands	36,846	1.5
8	Forest	381,391	15.1
9	National parks	190,247	7.5
10	Water bodies	155,030	6.1
11	High-density built-up area	58,657	2.3
12	Protected wetland	45,883	1.8
13	Bare land/rocks	15,412	0.6
14	Exclusive rangeland	13,064	0.5

Source: NISR, SAS 2024

Among 14 land cover classes, only 6 are related to agricultural activities include Agricultural land on hillside, non-rice agricultural Wetland, mixed rangeland, Low-density built-up area, wetlands designated for Paddy rice and Tea plantation.

Map 1: Rwanda land classification map done in 2023



Source: NISR, SAS 2024

The subsequent step involves constructing the area frame which includes grouping the land cover classes linked to agricultural activities into strata to identify agricultural strata to be considered in the sampling frame

1.2. Land stratification.

The stratification is a result of a combination of sampling units (clusters) and land use/land cover. The stratification assigns each cluster a stratum based on the predominant land class type. Among the fourteen land cover classes, four are included in the agricultural survey frame, while the others are excluded.

The included land cover classes comprise hillside agricultural land, non-rice agricultural land, mixed rangeland, and Low-density built-up area (with potential for agricultural production, including kitchen gardens, fruit trees, and livestock). Certain agricultural land classes are excluded from the sampling frame. For instance, tea plantations are omitted due to regular monitoring by the National Agricultural Export Development Board (NAEB), and wetlands designated for paddy rice cultivation are typically considered in Large-Scale Farmers, making them another component of the survey frame. Moreover, Since the 2024 SAS, a new land cover class called Exclusive Rangeland has been introduced specifically for areas used for pastoral activities. This class is also excluded from the sampling frame.

By overlapping the clusters layer with land cover classes layer, each cluster is assigned a dominant land cover class as a stratum definition, basing on a defined threshold as follow:

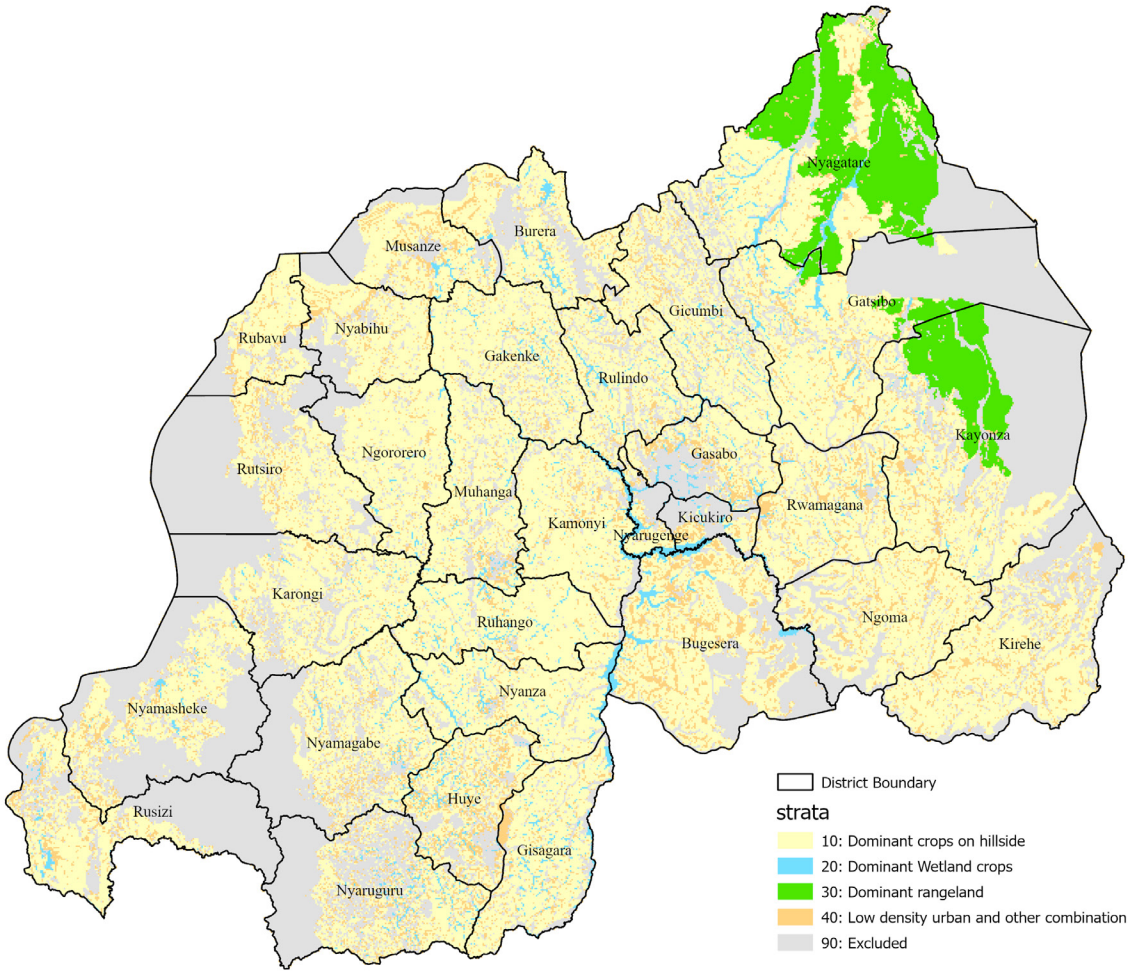
Table 2: List of strata

Stratum code	Stratum name	Definition
1.0	Dominant hill crop land	Clusters with Hillside agricultural land cover class greater or equal to 60 percent of the total area of the cluster
2.0	Dominant Wetland crops	Clusters with non-rice wetland land cover class greater than 25 percent of total area of the cluster
3.0	Dominant rangeland	Clusters with mixed rangeland land cover class greater or equal to 60 percent of the total area of the cluster
4.0	Mixed	The rest of other possible combinations
9.0	Excluded	All clusters with excluded land cover classes greater or equal to 50 percent of the total area of the cluster

Source: NISR, SAS 2024

The SAS sample is drawn from four main strata: dominant hill crop land, dominant wetland crops, dominant rangeland, and mixed land strata.

Map 2: Distribution of stratified clusters by district



Source: NISR, SAS 2024

1.3. Sampling Units

The Seasonal Agricultural Survey is an area-based sample survey. It uses land sampling units, small square land units of 300 by 300 meters (9ha). Geographic Information System (GIS) technology is used to create the units covering the whole country. In total the sampling frame has 269,989 square units (clusters). Each one of the clusters is identified with a unique cluster number as shown on the map below.

Map 3: SAS Sampling Units

Source: NISR, SAS 2024

Table 3: Population size per district by stratum (Number of segments)

District	Stratum					
	Dominant hill crop land	Dominant wetland crops	Dominant rangeland	Mixed stratum	Excluded stratum	Total
Nyarugenge	534	238	-	168	524	1,464
Gasabo	2,165	283	-	697	1,632	4,777
Kicukiro	461	179	-	233	1,000	1,873
Nyanza	5,688	520	-	500	744	7,452
Gisagara	5,197	397	-	824	1,077	7,495
Nyaruguru	3,568	343	-	1,300	6,027	11,238
Huye	3,160	346	-	1,466	1,496	6,468
Nyamagabe	5,344	263	-	1,154	5,352	12,113
Ruhango	5,663	336	-	489	487	6,975
Muhanga	4,983	237	-	760	1,200	7,180
Kamonyi	5,530	320	-	704	777	7,331
Karongi	5,757	117	-	726	2,159	8,759
Rutsiro	4,511	-	-	776	2,083	7,370
Rubavu	2,516	-	-	446	843	3,805
Nyabihu	3,481	-	-	671	1,896	6,048
Ngororero	5,580	134	-	461	1,276	7,451
Rusizi	3,731	155	-	886	5,500	10,272
Nyamasheke	4,584	134	-	953	4,839	10,510
Rulindo	4,144	304	-	625	1,219	6,292
Gakenke	5,934	249	-	671	966	7,820
Musanze	3,111	126	-	769	1,869	5,875
Burera	4,256	260	-	667	1,976	7,159
Gicumbi	5,883	208	-	950	2,176	9,217
Rwamagana	5,060	163	-	1,194	1,122	7,539
Nyagatare	6,591	516	9,112	1,112	4,050	21,381
Gatsibo	7,362	435	788	1,100	7,781	17,466
Kayonza	6,471	149	3,825	1,293	9,730	21,468
Kirehe	7,704			1,501	3,972	13,177
Ngoma	6,293		-	1,201	2,154	9,648
Bugesera	6,957	612	-	2,341	4,456	14,366
National	142,219	7,024	13,725	26,638	80,383	269,989

Source: NISR, SAS 2024

1.4. Sampling procedures

Out of Five defined strata, only dominant hill crop land stratum, dominant wetland crops stratum, dominant rangeland stratum and mixed stratum are considered as land potential for agriculture. The remaining stratum is the non-agricultural land. Note that clusters covered by tea plantations and wetlands designated for paddy rice cultivation are not considered in the area sample frame due to reasons stated above. Thus, SAS is conducted on 4 above mentioned strata. At first stage,1200 segments are selected and allocated at district level based on the power allocation approach (Bankier, 1988[1]). Sampled segments inside each district are distributed among strata with a proportional-to-area criterion.

1 Bankier M.D. (1988) Power allocations: determining sample sizes for subnational areas. The American Statistician, Vol. 42, n. 3 pp. 174-177.

Table 4: Allocation of 1200 sampled segments per district by stratum

District	Agricultural land on hillside	Agricultural land in marshland	Rangeland	Mixed	Total
Nyarugenge	12	6		2	20
Gasabo	22	4		3	29
Kicukiro	13	5		2	20
Nyanza	37	4		2	43
Gisagara	33	5		3	41
Nyaruguru	25	3		7	35
Huye	27	3		5	35
Nyamagabe	36	2		6	44
Ruhango	36	3		3	42
Muhanga	33	3		4	40
Kamonyi	36	3		4	43
Karongi	38	2		3	43
Rutsiro	34			4	38
Rubavu	21			4	25
Nyabihu	29			3	32
Ngororero	38	2		3	43
Rusizi	27	2		5	34
Nyamasheke	31	2		5	38
Rulindo	28	3		4	35
Gakenke	37	2		4	43
Musanze	24	2		4	30
Burera	30	2		3	35
Gicumbi	37	2		5	44
Rwamagana	34	2		6	42
Nyagatare	31	5	25	7	68
Gatsibo	38	3	5	5	51
Kayonza	32	2	13	5	52
Kirehe	45			9	54
Ngoma	39			6	45
Bugesera	45	3		8	56
Total	948	75	43	134	1,200

Source: NISR, SAS 2024

At the second stage, 25 sample points are systematically selected, following a special distance of 60 meters between points. Sample points serve as reporting units within each segment. Enumerators visit each point, identify and delineate the plots in which the sample point falls, and collect records of land use and related information.

The recorded information represents the characteristics of the whole segment which are extrapolated to the stratum level and hence the combination of strata within each district provides district area related statistics.

Map 4: Map showing square cluster(segment) with 25 sampled points

Source: NISR, SAS 2024

1.5. Weighting Procedures

Based on the stratified two-stage sample design used with the new area frame, the first stage sampling probability for the sample segments in each stratum is calculated as:

$$p_{1h} = \frac{n_h}{N_h}$$

Where:

p_{1h} = probability of selection of sample segments in stratum h (district by stratum)

n_h = number of sample segments selected in stratum h

N_h = total number of segments in the area frame for stratum h in each stratum

The second stage probability was calculated at the plot level based on the assumption that the plots within each sample segment were implicitly selected with PPS using the area of the plot as the measure of size. Therefore, the second stage probability of selection can be expressed as follows:

$$p_{2hi} = \frac{g_{hi} \times A_{hij}}{A_{hi} \times g_{hij}}$$

Where:

$p2_h$ = Probability of selection of the plot in segment h

ghi = Number of grid squares selected in the i-th sample segment of stratum h;

Ahij = Area of the j-th sample plot selected in the i-th sample segment of stratum h

Ahi = Area of the i-th sample segment of stratum h;

ghij = Number of selected grid squares in the j-th sample plot of the i-th sample segment of stratum h

The weight of a sample plot is equal to the inverse of the first and second stage probabilities of selection:

$$W_{Phij} = \frac{1}{p_{1h} \times p_{2hi}} = \frac{N_h \times A_{hi} \times g_{hij}}{n_h \times g_{hi} \times A_{hij}}$$

Where:

W_{Phij} = weight for the j-th sample plot in the i-th sample segment in stratum h

1.6. Sampling errors computation

The sample survey results can be subject to two types of errors: (i) sampling errors and (ii) non-sampling errors. Non-sampling errors encompass all sources of errors unrelated to sampling, occurring throughout all aspects of the survey process during data collection and processing. They are categorized into four types: coverage errors, measurement errors, non-response errors, and processing errors. While researchers take steps to minimize these errors during the survey design and implementation phases, it's practically impossible to eliminate them. Non-sampling errors, in particular, can be extremely challenging to identify and quantify accurately. Despite our best efforts, there's always some degree of uncertainty associated with survey results due to the presence of these errors.

Sampling errors are associated with the sampling selection process, arising from observing a sample instead of the entire population. They denote the disparity between the estimate derived from a sample survey and the true value that would result if a census of the whole population were conducted under the same conditions.

In order to examine the precision of the most important estimates from the SAS 2024 Season B data and the statistical efficiency of the agricultural area frame and sample design, it is important to calculate the sampling errors and corresponding coefficients of variation (CVs) for these estimates, such as the total area in each major crop. The sampling error of each estimate is measured by the standard error, which is the square root of the variance. The Complex Samples module of SPSS and Stata use a linearized Taylor series variance estimator that considers the stratification and clustering in the sample design.

The SPSS Complex Samples software had been used to calculate the sampling errors and CVs for estimates of the total area of major crops from the SAS data.

$$\hat{Y} = \sum_{h=1}^{L} \sum_{i=1}^{n_h} \sum_{j=1}^{m_h} W'_h \, y_{hij} \ ,$$

The formula for the estimate of a total can be expressed as follows:

Where:

L = number of strata

yhij = value of variable y for the j-th sample household in the i-th sample segment in stratum h

The variance estimator for a total used by the Complex Samples module of SPSS and Stata can be expressed as follows:

$$V(\hat{Y}) = \sum_{h=1}^{L} \left[\frac{n_h}{n_h - 1} \times \sum_{i=1}^{n_h} \left(\hat{Y}_h - \frac{\hat{Y}_h}{n_h} \right)^2 \right],$$

Variance Estimator for a Total

Where:

$$\hat{Y}_h = \sum_{j=1}^{m_h} W'_h \, y_{hij}$$

yhij = value of variable y for the j-th sample plot in the i-th sample segment of stratum h

$$\hat{Y}_h = \sum_{i=1}^{n_h} \hat{Y}_h$$

The survey estimate of a ratio is defined as follows:

$$\hat{R} = \frac{\hat{Y}}{\hat{X}},$$

where $\hat{Y}$ and $\hat{X}$ are estimates of totals for variables y and x, respectively, calculated as specified previously.

In the case of a stratified two-stage sample design, means and proportions are special types of ratios. In the case of the mean, the variable X, in the denominator of the ratio, is defined to equal 1 for each unit so that the denominator is the sum of the weights. For a proportion, the variable X in the denominator is also defined to equal 1 for all units; the variable Y in the numerator is binomial and is defined to equal either 0 or 1, depending on the absence or presence, respectively, of a specified characteristic for the unit.

The variance estimator for a ratio used by SPSS Complex Samples and Stata can be expressed as follows:

Variance Estimator for a Total

$$V(\hat{Y}) = \sum_{h=1}^{L}\left[(1-f_h)\times\frac{n_h}{n_h - 1}\sum_{i=1}^{n_h}\left(\hat{Y}_{hi} - \frac{\hat{Y}_h}{n_h}\right)^2\right],$$

Where:

Fh = first stage probability for stratum h; (1- fh) is the finite population correction (fpc) factor

$$\hat{Y}_{hi} = \sum_{j=1}^{m_h} W'_{hi}\, y_{hij}$$

yhij = value of variable y for the j-th sample plot in the i-th sample segment of stratum h

$$\hat{Y}_h = \sum_{i=1}^{n_h} \hat{Y}_{hi}$$

Variance Estimator for a Ratio

$$V(\hat{R}) = \frac{1}{\hat{X}^2}\left[V(\hat{Y}) + \hat{R}^2\, V(\hat{X}) - 2\,\hat{R}\, COV(\hat{X},\hat{Y})\right],$$

Where:

$$COV(\hat{X},\hat{Y}) = \sum_{h=1}^{L}\left[(1-f_h)\times\frac{n_h}{n_h - 1}\sum_{i=1}^{n_h}\left(\hat{X}_{hi} - \frac{\hat{X}_h}{n_h}\right)\left(\hat{Y}_{hi} - \frac{\hat{Y}_h}{n_h}\right)\right]$$

$V(\hat{Y})$ and $V(\hat{X})$ are calculated according to the formula for the variance of a total.In addition to calculating the standard error, the program also computes the Design Effect (DEFF) for the main indicator, which is the area under cultivation. The Design Effect is defined as the variance of an estimate based on the actual complex sample design divided by the corresponding variance from a simple random sample of the same size. It serves as a measure of the relative statistical efficiency of the sample design, taking into account both the

stratification and clustering present in the sample design.

The presence of clustering typically increases the design effect, owing to the intra-cluster correlation of plots within the segments. Simultaneously, the land-use stratification of the segments tends to decrease the design effects, as it proves to be more efficient than a simple random sample. This dual consideration of both factors provides a comprehensive assessment of the efficiency of the sample design in capturing the nuances of the area under cultivation. The estimates of the total area of major crops at the national level and the corresponding measures of precision (standard error (SE), the coefficient of variation (CV), the 95 percent confidence interval, the design effect (DEFF), and number of unweighted observation (n of sample plots)) from the SAS 20224 Season B data are presented in Table 33 on the Annexes.

2. Data collection procedures

SAS data collection is carried out into two distinct phases: the first phase, known as screening, is done during the planting period. It consists of delineating all plots containing the sampled points in all sampled segments all Large-Scale Farmers (LSF) who have grown crops in the current season and recording information related to agricultural land use, grown crops and crop area, and expected harvesting period. The second phase involves collecting data in the agricultural plots identified during screening activity, which relates to crop production, agricultural inputs, and the agricultural practices.

2.1. Time frame and coverage

During the data collection for Season B 2024, the SAS was carried out across all 30 districts of the country, gathering data from 1,200 segments and 384 large-scale farmers. The season's data collection started on April 21st, 2024, and was concluded on August 15th, 2024. Specifically, the screening phase took place from April 21st, 2024, to June 9th, 2024, while the harvesting period started on June 10th ,2024 and ended on August 15th, 2024. The survey achieved a 100% response rate, with full coverage of all sampled segments and active participation from all operators of the sampled plots as well as all sample large scale farmers.

2.2. Field staff

During this season, experienced 147 enumerators and 28 team leaders served in the field data collection after a refresher training. To ensure data quality, high-level supervision was conducted throughout the data collection activities.

2.3. Data collection tools

2.3.1. Survey questionnaires

SAS utilizes two main questionnaires: the Screening questionnaire and the Plot interview questionnaire. The Screening Questionnaire is designed to gather information on the plot, focusing primarily on aspects such as land use, plot area, and the crops grown. On the other hand, the Plot Interview questionnaire is specifically designed to collect detailed information about the sampled plots, including crop production, agricultural inputs used, and agricultural practices applied.

2.3.2. Data collection applications

The SAS data collection applications were based on three main software applications:

- Arc GIS field map, which utilizes GIS software and external GPS linked to tablets via Bluetooth to accurately measure crop areas.
- CSPro software, known for its efficiency in census and survey administration, facilitating data collection, entry, and management processes. Csentry data collection tool has been developed by an IT staff specialized for the SAS survey, enabling data collection from sampled plots and large-scale farmers.
- Survey123 is used to collect screening data for large-scale farmers.

3. Data quality assurance

Data quality assurance is achieved through a comprehensive approach, involving enumerator training, continuous data monitoring, supervision of data collection activities, and data editing throughout the season.

3.1. Training of enumerators

Prior to data collection, enumerators underwent training from 15th to 19th April 2024, at the NISR training center, which covered the overview of the new upgrade of the SAS, data collection procedures and ethics, screening procedures, plot interview questionnaire content, and the use of data collection applications such as Survey 123, Arc GIS field map, and CSEntry.

3.2. Fieldwork monitoring

3.2.1 Monitoring attendance and performance of enumerators

Effective monitoring of enumerator attendance and performance is vital for ensuring task efficiency and contribution. The monitoring system used during 2024 SAS season B relies on capturing GPS metadata, including location and GPS time, which differs from the device time and cannot be modified by the user. Whenever the enumerator sent data to the server, the metadata accompanies it, enabling analysis of attendance (starting and ending time), location during data collection, and performance metrics such as the number of completed tasks.

3.2.2. Attending the sample location and Use of high precision GPS

The SAS collects data from observation points grouped into square segments of 300 by 300 meters. Enumerators were required to collect data within a one-meter distance buffer around each observation point, enforced to ensure accuracy. Any observation outside this buffer is marked as an error and rejected by the central database. To measure plot areas, high-precision GPS units are employed, along with correction services, achieving 95 percent sub-meter measurement accuracy and addressing precision challenges.

3.2.3 Field Monitoring Dashboard

A field monitoring dashboard used is an online web application offering a visual representation of real-time data collected from various field operations. It provides a centralized and accessible platform for monitoring and managing activities, resources, and performance in the field.

3.2.4. Field supervision

In the 2024 Season B, intensive field supervision was conducted to ensure the data quality. The first supervision field visit comprising 30 NISR staff took place from May 2nd to 15th, 2024. Subsequently, during the harvesting phase, which took place, from June 17th to 28th, 2024 a team of 21 NISR staff was involved in the field supervision. Throughout both phases, supervisors were dispatched to all districts to provide continuous oversight and support to field personnel. Their responsibilities included providing technical guidance, monitoring the execution of data collection activities, and ensuring compliance with the data collection ethics and completeness of the workload, among others.

3.2.5. Data Editing

During the 2024 season B, a monitoring system involving the GIS tools and data editors was used to ensure quality assurance. The data collection is monitored using dashboard and Google Sheets. Editors conduct daily follow-ups to clean data, identifying and rectifying discrepancies using STATA do files based on logical patterns and feedback from training sessions, aiming to provide a cleaned raw dataset for further analysis.

4. Data processing and analysis process

The analysis involved several steps from organization of raw dataset, data management, cleaning, checking for outliers and dealing with missing data to ensure the quality and cleaned dataset before tabulation.

4.1. Data management process

SAS data are collected electronically using tablets and are then transmitted directly to the NISR servers. The data analyst team downloads and imports the data from CSPro into STATA software for further examination, including checking, cleaning, and tabulation.

Exploratory analysis of the dataset is conducted for all variables to assess the sample's completeness, identifying missing data or incomplete observations. Any identified cases are sent back to the field for verification and completion. Exploratory techniques such as descriptive statistics (summary statistics, frequency tables) and graphical methods (histograms, box plots, etc.) are employed to detect missing values, incomplete data, and potential abnormalities or outliers within the dataset.

4.2. Detecting outliers and dealing with missing values

4.2.1. Missing values and duplicates observation

During data collection, the CSPRo application's built-in validation rules detect missing, omitted, or skipped variables. Error messages appear on the tablet's screen during interviews when enumerators skip questions that require responses. After completing the interview but before sending data to the servers, an error message notifies users if any questions have been left unanswered or if duplicate questionnaire IDs are identified.

Once data is downloaded and imported into STATA from the servers, the data analyst merges the area dataset with the crop dataset and conducts preliminary checks, cleaning, and necessary transformations before analysis. A do file is developed to check the completeness of data for screening and plot/harvest datasets.

A team of data analysts checks the data on a daily basis, and any inconsistencies found are communicated to field workers for correction and clarification.

4.2.2. Detecting and dealing with outliers

Outliers are checked for all quantitative variables, including crop production, fertilizer quantity, seed quantity, agricultural input prices, irrigation costs, and other related expenses. Two approaches are employed to detect outliers for variables such as crop production and input quantities, while a single approach is applicable for the remaining variables.

The first approach involves comparing the value per hectare of land to the standard quantity optimum provided in the guidelines from the Ministry of Agriculture, known as "AGENDA AGRICOLE," for the same land size. Any values found to be 1.5 times greater than the standard values are flagged as potential outliers and subsequently sent back to field workers for verification and confirmation.

The second approach utilizes statistical processes to detect outliers. In SAS, various statistical methods such as standard deviation and graphical methods like normal box plots are utilized in combination to identify possible outliers within the dataset.

4.3. Methods for Estimating Area and Yield

4.3.1. Estimation of area Approach

NISR adheres to and applies methodologies and guidelines outlined by (FAO, 2017) and (EAC, 2022) regarding area and yield estimation. Among several method proposed, NISR has opted for the use of high precision GPS to measure crop area due to its high accuracy and efficiency compared to alternative methods. For yield measurement, NISR relies on farmer estimations.

4.3.2. Process of measuring the area

After the identification of the plot boundaries, the enumerators mark GPS points location in approximately every three meters and at each corner of the plot while moving around its perimeter. Then a polygon is obtained when the starting and final points connect. The area is finally computed automatically by GIS software linked to the enumerator's GPS and based on the resulting shape.

4.3.3. Process of measuring the yield

Yield data are calculated by considering both the plot and crop areas, alongside the crop production reported by the farmer within the sampled plot. This calculation involves dividing the total production, converted into kilograms, by the estimated crop areas measured in hectares.

4.4. Data analysis

The survey data are analysed using STATA software, which offers robust capabilities for data management, including importing, cleaning, merging, and manipulating datasets. These features facilitate data preparation for analysis. Additionally, STATA enables the development of tabulation commands and the generation of survey tables, graphs, and charts for inclusion in survey reports. Furthermore, SPSS and STATA softwares are utilized for estimating survey sampling errors, ensuring the accuracy and reliability of the survey results.

Chapter

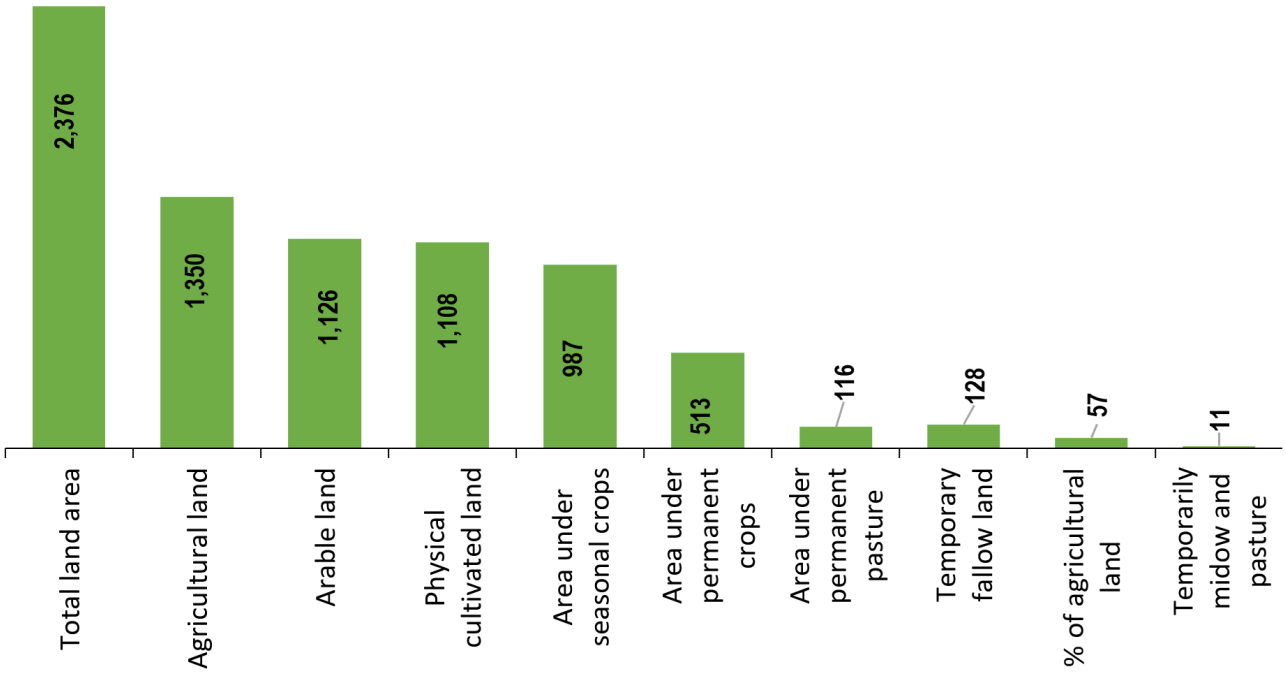
3

SURVEY FINDINGS

This section highlights key results of SAS 2024 Season B related to crop area (physical land use, cultivated area, and harvested area), yield, production, agricultural inputs, and agricultural practices in Rwanda.

1. Agricultural land use

Figure 1: 2024 Season B - Agricultural land use (in thousands of hectares)

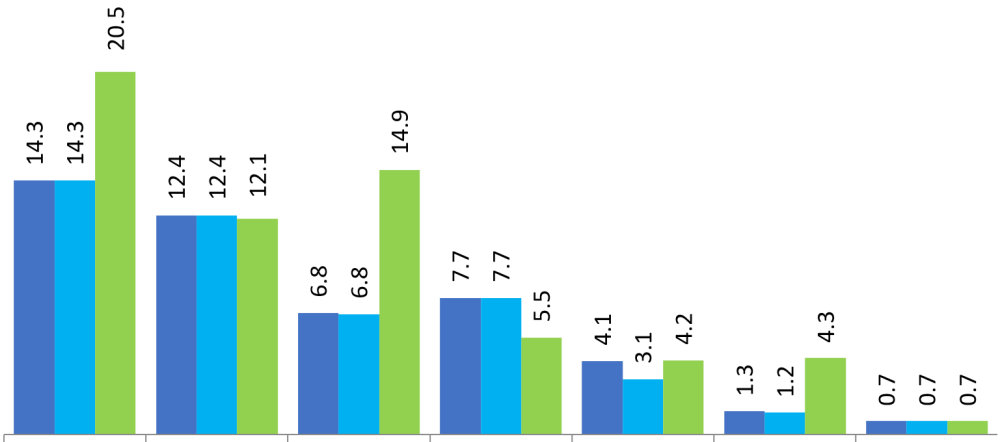


Source: NISR, SAS 2024

The total land area of the country is estimated to be 2.376 million hectares, with 1.350 million hectares (approximately 57% of the total land area) used for agricultural purposes. In 2024 Season B, 0.987 million hectares were allocated to Seasonal crops, 0.513 million hectares were allocated to permanent crops, while 0.116 million hectares were allocated to permanent pasture. (See district details in Table 6).

2. Crop area, yield and production estimates for major crops

Figure 2: 2024 Season B - Yield of major crops (MT/ha)



	Cassava	Banana	Irish potato	Sweet potato	Paddy rice	Maize	Bean
National	14.3	12.4	6.8	7.7	4.1	1.3	0.7
Small scale Farmer	14.3	12.4	6.8	7.7	3.1	1.2	0.7
Larger scale Farmer	20.5	12.1	14.9	5.5	4.2	4.3	0.7

Source: NISR, SAS 2024

The survey's estimates related to yield, cultivated area, and production for major crops are summarized below:

Maize: The national average yield was 1.3 tons per hectare, with small scale farmers harvesting 1.2 tons per hectares and Large-Scale Farmers harvesting 4.3 tons per hectares; the cultivated area was estimated at 92,944 hectares, a decrease of 1 percent from season B of 2023. The production was estimated at 119,101 metric tons, an increase of 1 percent from season B of 2023. (See district details in Tables 5, 8-12)

Beans: The national average yield of was 737 kilograms per hectare, with small scale farmers harvesting 737 kilograms per hectare and Large-Scale Farmers harvesting 735 kilograms per hectare; the cultivated area was estimated at 329,112 hectares, an increase of 6 percent season B of 2023. The production was estimated at 242,239 metric tons, a decrease of 1 percent when compared to season B of 2023. (See district details in Tables 5, 8-12).

Paddy rice: The national average yield was 4.1 tons per hectare, with small scale farmers harvesting 3.1 tons per hectares and Large-Scale Farmers harvesting 4.2 tons per hectare; the cultivated area was estimated at 17,994 hectares, an increase of 8 percent from season B of 2023. The production was estimated at 72,834 metric tons, an increase of 4 percent from season B of 2023. (See district details in Tables 5, 8-12).

Irish potato: The average yield was 6.8 tons per hectare, with small scale farmers harvesting 6.8 tons per hectares and Large-Scale Farmers harvesting 14.9 tons per hectare. the cultivated area was estimated at 41,836 hectares, a decrease of 13 percent from season B of 2023. The production was estimated at 285,596 metric tons, a decrease of 13 percent from season B of 2023. (See district details in Tables 5, 8-12).

Sweet potato: The national average yield was 7.7 tons per hectare; the cultivated area was estimated at 97,289 hectares, an increase of 1 percent from season B of 2023. The production was estimated at 666,814 metric tons, an increase of 8 percent from season B of 2023. (See district details in Tables 5, 8-12).

Cassava: The national average yield was 14.3 tons per hectare. The harvested area was estimated at 54,679 hectares while the cultivated area was estimated at 172,596 hectares, an increase of 8 percent from season B of 2023. The production of cassava was at 783,294 metric tons, an increase of 6 percent when compared to season B of 2023. (See district details in Tables 5, 8-12).

Banana: The average yield was 12.4 tons per hectare, with an average yield of 12.4 tons per hectare for small scale farmers and 12.1 tons per hectare for large-scale farmers. The harvested area was estimated at 92,501 hectares while the cultivated area was estimated at 258,564 hectares, an increase of 0.2 percent from season B of 2023. The production of banana was estimated at 1,142,552 metric tons, an increase of 5 percent when compared to 2023 season B. (See district details in Tables 5, 8-12).

Table 5: 2024 Season B Cultivated area, harvested area, production, and yield by crop.

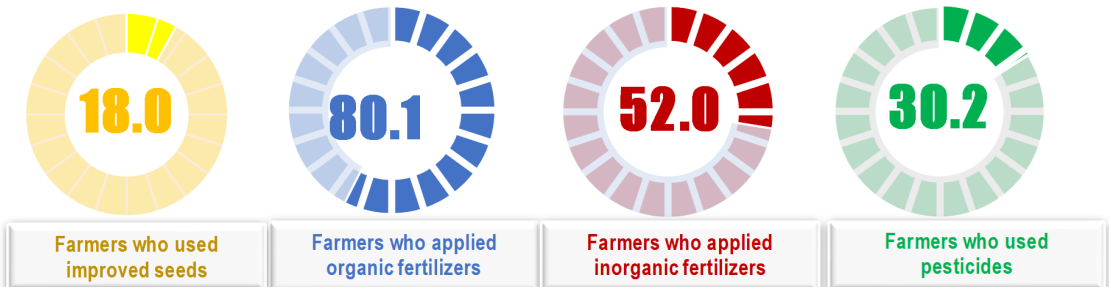
Crop/crop groups	Cultivated area (Ha)		Harvested area (Ha)		Production (MT)		Yield (MT/ha)	
	2024 B	2023 B	2024 B	2023 B	2024 B	2023 B	2024 B	2023 B
Cereals	**243,760**	**245,132**	**242,544**	**243,832**	**346,827**	**341,153**	**(NA)**	**(NA)**
Maize	92,944	93,927	92,749	93,816	119,101	117,613	1.3	1.3
Sorghum	120,005	121,079	120,005	121,054	140,314	139,425	1.2	1.2
Paddy rice	17,994	16,678	17,578	16,603	72,834	69,940	4.1	4.2
Wheat	10,294	10,375	10,294	10,375	13,045	13,129	1.3	1.3
Other cereals	2,523	3,073	2,506	3,073	1,532	1,646	0.6	0.5
Tubers and Roots	**328,446**	**319,545**	**198,309**	**194,693**	**1,848,075**	**1,790,212**	**(NA)**	**(NA)**
Cassava	172,596	159,089	54,679	49,655	783,294	736,686	14.3	14.8
Sweet potato	97,289	96,231	86,580	83,212	666,814	620,185	7.7	7.5
Irish potato	41,836	48,210	41,716	48,205	285,596	326,677	6.8	6.8
Taro &Yams	16,725	16,015	15,334	13,621	112,370	106,665	7.3	7.8
Banana	**258,564**	**258,094**	**92,501**	**88,361**	**1,142,552**	**1,089,377**	**12.4**	**12.3**
Cooking banana	90,123	87,735	30,323	28,294	515,798	493,865	17.0	17.5
Dessert banana	48,809	54,000	13,442	13,068	152,891	149,266	11.4	11.4
Banana for beer	119,632	116,359	48,737	46,998	473,863	446,246	9.7	9.5
Legumes and Pulses	**398,503**	**375,852**	**398,187**	**375,769**	**272,979**	**274,814**	**(NA)**	**(NA)**
Beans	329,112	309,489	328,858	309,410	242,239	244,194	0.7	0.8
Bush bean	207,112	192,994	206,871	192,965	134,866	138,870	0.7	0.7
Climbing bean	122,000	116,496	121,987	116,445	107,373	105,324	0.9	0.9
Pea	8,248	8,383	8,245	8,383	4,628	4,822	0.6	0.6
Groundnut	21,085	17,745	21,086	17,745	9,062	8,509	0.4	0.5
Soybean	40,059	40,235	39,999	40,231	17,051	17,288	0.4	0.4
Vegetables & Fruits	**30,624**	**29,672**	**25,188**	**22,479**	**204,768**	**197,613**	**(NA)**	**(NA)**
Vegetables	20,161	19,164	19,842	17,854	177,549	171,530	8.9	9.6
Fruits	10,463	10,507	5,346	4,625	27,219	26,084	5.1	5.6
Fodder crops	10,331	8,627	9,674	8,503	107,654	102,445	11.1	12.0
Other crops	58,639	57,896	27,508	27,848	117,267	122,632	4.3	4.4
Total	1,328,868	1,294,818	993,910	962,573	4,040,123	3,918,845	(NA)	(NA)

Source: NISR, SAS 2024

3. Use of inputs

The results related to the use of agricultural inputs (seeds, fertilizers, and pesticides) are presented in terms of percentage of farmers who applied such agricultural inputs throughout the season.

Figure 3: 2024 Season B_Use of inputs by farmers (in percentage)



Source: NISR, SAS 2024

3.1. Use of seeds

In season B of 2024, 18 percent of farmers used improved seeds. In regard to farmer type2, 16.6 percent of small-scale farmers (SSF) and 72.6 percent of Large-Scale Farmers (LSF) used improved seeds (See Figure 3). The major sources of improved seed were agro-dealers, accounting 35.8 percent, and NGO/companies accounting for 29.3 percent (See details in Tables 7, 17-20).

3.2. Use of fertilizers

In the 2024 Season B:

- 80.1 percent of farmers applied organic fertilizer, with 80.5 percent of small-scale farmers and 64.9 percent of Large-Scale Farmers utilizing it.
- 52 percent of farmers applied inorganic fertilizer, with 51.2 percent of small-scale farmers and 82.9 percent of Large-Scale Farmers using it (See Figure 3).
- The main sources of inorganic fertilizers were agro-dealers and NGOs/companies, accounting for 46.6 percent and 39.9 percent, respectively.
- The most commonly used inorganic fertilizers in this season were DAP, UREA, and NPK, comprising 40.6 percent, 36.8 percent, and 17.9 percent, respectively (See details in Tables 7, 21-25).

3.3. Use of pesticides

In season B of 2024, 30.2 percent of farmers applied pesticides. According to farmer type, 29.1 percent of small-scale farmers and 74.9 percent of Large-Scale Farmers applied pesticides respectively (See Figure 3). Rocket, Dithane and Cypermethrin were the most used pesticides with 30.2 percent of farmers, 24.7 percent and 19 percent respectively (See details in Tables 26 & 27).

2 Farmer type refers to category of farmers as defined in the survey; a farmer is either a small scale or a large scale.

4. Agricultural practices

The survey covered information related to agricultural practices used by farmers (irrigation, anti-erosion activities mechanization and agroforestry). Results are presented in terms of percentage of farmers involved in such practices throughout the 2024 Season B.

Figure 4: 2024 Season B - Use of agricultural practices

Source: NISR, SAS 2024

4.1. Irrigation practices

In season B of 2024, 12.1 percent of farmers practiced irrigation. This included 10.8 percent of small-scale farmers and 67 percent of Large-Scale Farmers (See Figure 4). Out of farmers who practiced irrigation 62.9 percent practiced the modern irrigation. In regard to source of water, Lakes/stream and underground water were the most used sources of water for irrigation with 50.2 percent and 28.3 percent respectively (See details in Tables 7,28-30).

4.2. Erosion control measures

In 2024 Season B, 89.2 percent of farmers practiced anti-erosion activities where 89.1 percent of small-scale farmers and 92.3 percent were Large-Scale Farmers protected their land against erosion (See Figure 3). Cover plants was the most used type of anti-erosion with 61.5 percent of farmers. The farmland experienced less erosion where the predominant erosion types were those with a low degree of erosion (splash and wind erosion, which accounted for 52.6 percent and 32.5 percent respectively. 47 percent of farmers practiced agroforestry, while 0.8 percent of farmers used mechanical equipment in their agricultural activities. (See details in Tables 7, 28, 31 and 32).

MAIN TABLES

Table 6: 2024 Season B_Agricultural land use per district (,000Ha)

District	Total land area	Agricultural land	% of agricultural land	Arable land	Physical cultivated land	Area under seasonal crops	Area under permanent crops	Temporary fallow land	Temporarily meadow and pasture	Area under permanent pasture
Nyarugenge	13.1	5.4	41.3	3.75	5.03	3.32	2.86	0.37	-	-
Gasabo	42.7	20.7	48.5	18.09	18.34	16.39	10.35	1.28	0.36	0.74
Kicukiro	16.6	5.3	32.0	4.82	4.81	4.40	2.21	0.39	0.02	0.07
Nyanza	67.0	45.7	68.2	44.49	40.99	40.12	13.77	4.03	0.34	0.35
Gisagara	67.5	45.6	67.6	43.84	38.48	36.94	14.19	6.90	-	0.24
Nyaruguru	101.0	34.4	34.1	30.80	28.64	25.00	9.63	5.57	0.24	-
Huye	58.1	34.1	58.7	32.69	29.78	28.97	11.90	3.62	0.05	1.48
Nyamagabe	109.1	44.1	40.4	38.53	37.77	32.16	13.83	6.18	0.12	0.01
Ruhango	62.6	43.9	70.1	39.31	38.66	34.15	15.10	4.38	0.84	-
Muhanga	64.1	39.1	61.0	35.01	32.74	28.65	17.60	5.60	0.76	-
Kamonyi	65.8	46.7	71.1	41.18	43.36	37.92	17.57	3.26	0.06	0.06
Karongi	78.8	43.0	54.5	36.39	37.28	30.40	19.25	5.05	0.63	0.06
Rutsiro	66.1	33.3	50.4	26.80	26.23	20.25	14.36	5.97	0.63	3.97
Rubavu	33.9	22.1	65.3	20.29	19.73	18.55	3.98	1.51	0.32	1.58
Nyabihu	54.0	29.9	55.3	28.75	24.00	23.05	3.08	5.52	0.18	4.80
Ngororero	66.7	42.5	63.8	37.82	35.88	31.20	16.40	6.34	0.22	3.08
Rusizi	91.6	36.1	39.4	32.16	34.80	30.59	12.48	1.34	-	-
Nyamasheke	94.8	36.7	38.7	30.62	34.63	28.54	14.88	1.88	0.14	0.06
Rulindo	56.6	32.7	57.8	26.87	28.81	23.03	14.92	3.72	0.18	-
Gakenke	70.0	44.1	63.0	38.02	37.49	31.48	17.16	6.28	0.37	-
Musanze	50.9	29.2	57.3	27.70	23.37	22.10	4.14	5.60	0.10	0.10
Burera	58.4	36.9	63.2	36.28	32.25	31.68	4.82	4.07	0.59	-
Gicumbi	82.5	48.5	58.8	44.60	43.67	40.25	14.14	3.48	0.92	0.45
Rwamagana	65.1	46.2	70.9	39.57	38.72	33.53	17.38	4.81	1.17	1.48
Nyagatare	191.5	140.3	73.3	77.32	77.57	71.40	77.33	5.75	0.17	56.81
Gatsibo	153.3	75.0	49.0	60.96	62.87	56.11	33.59	4.62	0.23	7.32
Kayonza	180.0	89.5	49.7	60.02	56.94	52.43	40.80	6.91	0.77	24.92
Kirehe	114.2	72.1	63.2	59.67	66.72	55.89	28.32	3.71	0.07	1.60
Ngoma	80.3	55.3	69.0	46.11	49.38	42.77	27.92	3.07	0.19	2.70
Bugesera	120.2	71.1	59.1	63.74	59.42	55.71	19.33	6.69	1.34	4.07
National	2,376	1,350	57	1,126	1,108	987	513	128	11	116

Source: NISR, SAS 2024

Table 7: 2024 Season B_Area under agricultural practices (In Hectares)

District	Modern irrigated agricultural land (Ha)	Agricultural area under erosion control	Agricultural area under agroforestry trees	Agricultural area under fertilizer application	
				Inorganic fertilizer	Organic fertilizer
Nyarugenge	-	2,306	2,495	322	1,988
Gasabo	390	13,854	9,222	4,957	11,935
Kicukiro	114	2,378	3,455	744	2,276
Nyanza	799	33,968	25,291	5,396	18,967
Gisagara	3,180	31,880	16,111	8,880	25,497
Nyaruguru	250	28,843	12,377	10,448	17,497
Huye	1,052	26,242	11,373	5,119	18,290
Nyamagabe	90	35,375	16,017	12,228	23,086
Ruhango	965	34,806	15,207	4,385	22,523
Muhanga	197	36,386	10,419	4,268	21,204
Kamonyi	306	38,988	26,139	4,897	21,370
Karongi	105	39,472	16,471	9,582	23,596
Rutsiro	-	28,369	15,613	7,565	16,977
Rubavu	-	18,324	7,788	9,837	7,097
Nyabihu	-	25,289	10,864	12,397	15,714
Ngororero	223	37,561	18,776	12,279	25,696
Rusizi	1,561	22,061	21,405	11,974	15,294
Nyamasheke	413	31,073	21,885	11,736	19,901
Rulindo	852	25,545	15,710	8,188	20,305
Gakenke	81	41,747	15,676	14,944	26,885
Musanze	60	23,145	13,676	9,767	15,550
Burera	-	29,861	14,471	13,889	24,675
Gicumbi	127	45,379	19,450	13,133	33,646
Rwamagana	1,818	31,516	24,238	11,440	19,289
Nyagatare	3,190	46,896	90,030	41,255	29,102
Gatsibo	2,642	58,008	40,795	21,299	34,599
Kayonza	2,165	40,765	16,369	16,180	19,226
Kirehe	2,503	45,152	44,648	15,942	21,253
Ngoma	1,160	38,740	35,320	5,991	12,120
Bugesera	2,125	33,354	36,203	16,635	25,226
National	26,367	947,284	627,499	325,679	590,784

Source: NISR, SAS 2024

Table 8: 2024 Season B_Cultivated area by crop type and district (Ha)

District	Maize	Sorghum	Paddy rice	Wheat	Other cereals	Cassava	Sweet potato	Irish potato	Yams & Taro	Banana	Cooking banana	Dessert banana	Banana for beer	Beans	Bush bean	Climbing bean	Pea	Groundnut	Soybean	Vegetables	Fruits	Fodder Crops	Other crops	Total developed land
Nyarugenge	411	388	-	-	-	496	299	13	82	1,628	465	314	849	1,611	1,546	65	-	53	193	178		59	898	6,309
Gasabo	1,284	3,724	300	-	-	1,761	1,374	372	106	3,873	1,198	1,198	1,477	4,104	3,713	391	22	274	688	828	220	382	340	19,653
Kicukiro	552	698	84	-	2	299	201	-	249	982	308	247	428	1,483	1,462	21	-	50	164	154	19	32	83	5,053
Nyanza	2,575	5,125	704	-	119	7,161	2,363	269	669	7,564	2,428	2,113	3,023	13,236	10,998	2,238	186	945	2,447	778	157	319	1,309	45,926
Gisagara	2,524	4,222	3,301	-	427	7,060	3,443	27	345	9,603	2,351	2,877	4,375	13,242	11,386	1,856	-	695	3,603	479	139		1,189	50,299
Nyaruguru	230	3,424	31	279	10	4,371	5,070	1,858	459	3,460	948	814	1,698	7,336	974	6,362	285	-	935	634	128	245	3,641	32,394
Huye	1,070	5,932	983	39	129	7,599	3,162	186	151	6,307	2,173	1,849	2,286	8,975	5,691	3,284	281	118	2,492	582	1,086	98	1,151	40,341
Nyamagabe	950	4,282	29	2,651	122	7,491	6,839	1,700	622	6,085	918	985	4,183	7,001	827	6,174	1,024	-	773	261	122	263	4,825	45,043
Ruhango	1,018	2,642	911	-	41	18,706	3,224	25	801	7,130	979	1,527	4,625	10,851	7,986	2,865	110	2,225	4,199	439	8	687	1,569	54,585
Muhanga	1,008	67	202	58	-	12,459	5,617	191	2,834	19,448	3,395	2,993	13,059	6,544	2,345	4,198	179	65	2,258	480	317	673	1,038	53,437
Kamonyi	2,190	3,237	247	-	-	11,837	4,053	382	957	12,647	2,032	2,313	8,302	10,332	8,620	1,711	108	1,020	4,353	964	97	34	2,434	54,893
Karongi	803	2,213	-	180	-	7,226	4,053	360	1,051	9,190	1,291	1,675	6,223	7,803	1,733	6,069	379	154	1,668	925	268	858	2,300	39,431
Rutsiro	1,535	142	-	205	-	1,896	2,769	3,205	537	6,843	1,606	1,893	3,344	5,327	675	4,652	472	-	1,289	196	95	528	3,477	28,516
Rubavu	1,760	138	-		-	396	1,796	5,669	78	2,427	721	542	1,164	5,107	732	4,375	600	-	470	2,201	68	436	1,821	22,966
Nyabihu	3,700		-	1,662	-	639	3,292	6,709	40	1,195	449	323	423	2,841	79	2,762	562	-	132	712	684	174	1,997	24,339
Ngororero	3,900		-	1,899	-	3,268	7,007	1,190	1,443	11,005	1,220	1,869	7,917	5,116	559	4,557	443	-	1,375	457	276	241	1,506	39,127
Rusizi	980	55	1,441		-	18,418	2,668	70	548	4,084	1,411	573	2,100	11,725	8,861	2,864	37	277	1,148	443	1,178	194	2,992	46,258
Nyamasheke	564	24	371		-	10,852	4,503	91	624	6,074	1,547	1,068	3,459	6,680	1,327	5,353	77	935	1,318	552	372	195	4,987	38,220
Rulindo	1,289	4,167	17	51	18	4,416	3,898	1,039	267	6,680	2,031	1,644	3,005	9,301	3,399	5,902	371	103	575	949	96	68	3,909	37,212
Gakenke	1,426	436	17	122	-	6,000	5,410	1,097	1,618	14,759	3,128	2,770	8,861	12,150	1,098	11,052	309	61	758	278	474	157	2,153	47,225
Musanze	2,629	1,665	-	1,339	-	89	2,859	3,931	132	2,449	1,265	561	623	7,897	318	7,579	286	-	8	1,115	576	84	1,110	26,214
Burera	2,432	6,085	-	1,004	16	113	4,954	4,276	27	2,527	1,068	311	1,148	11,698	506	11,191	1,129	-	52	933	181	507	229	36,163
Gicumbi	2,290	11,968	-	802	19	3,214	6,396	2,061	144	6,945	2,582	1,761	2,602	14,594	3,517	11,078	861	459	165	487	378	802	1,064	52,651
Rwamagana	4,072	9,348	489	-	7	5,131	1,712	683	143	12,719	6,803	2,581	3,335	11,144	10,837	306	88	1,585	505	1,068	674	1,133	1,320	51,822
Nyagatare	24,520	4,736	2,222	-	17	1,881	1,537	589	108	12,861	6,904	1,826	4,131	30,934	29,406	1,528		2,186	1,173	977	50	136	895	84,823
Gatsibo	8,847	7,531	1,711	-	162	1,832	2,851	1,943	578	21,826	11,236	3,906	6,684	19,610	17,098	2,512	74	2,774	2,007	875	310	230	2,565	75,726
Kayonza	7,018	13,300	1,724	-	250	7,446	1,637	1,554	422	12,303	7,379	2,135	2,789	19,598	19,319	279	86	1,054	615	801	433	623	866	69,729
Kirehe	2,488	10,441	999	2	395	8,439	1,168	1,288	1,110	19,163	10,345	1,956	6,862	22,868	15,162	7,705	229	1,038	1,360	343	226	67	4,274	75,898
Ngoma	2,058	7,843	890	-	660	4,195	1,438	726	252	16,471	8,259	2,249	5,963	18,963	16,098	2,865	50	1,167	1,493	355	1,491	270	1,703	60,027
Bugesera	6,820	6,171	1,321	-	130	7,906	1,694	332	329	10,318	3,683	1,939	4,696	20,995	20,838	157	0	3,848	1,843	715	338	836	993	64,590
National	92,944	120,005	17,994	10,294	2,523	172,596	97,289	41,836	16,725	258,564	90,123	48,809	119,632	329,112	207,112	122,000	8,248	21,085	40,059	20,161	10,463	10,331	58,639	1,328,868
SSF	91,063	119,946	411	10,210	2,505	172,549	97,265	41,499	16,724	258,417	90,011	48,789	119,617	328,079	206,092	121,987	8,241	21,081	39,215	19,964	10,006	9,900	57,618	1,304,693
LSF	1,881	59	17,583	84	18	47	24	337	2	147	113	20	15	1,033	1,020	13	7	5	843	197	457	432	1,021	24,176

Source: NISR, SAS 2024

Table 9: 2024 Season B_Harvested area by crop type and district (Ha)

District	Maize	Sorghum	Paddy rice	Wheat	Other cereals	Cassava	Sweet potato	Irish potato	Yarms & Taro	Bananas	Cooking banana	Dessert banana	Banana for beer	Beans	Bush bean	Climbing bean	Pea	Groundnut	Soybean	vegetables	Fruits	Fodder crops	Other crops	All crops
Nyarugenge	411	388	-	-	-	235	270	13	82	693	156	116	421	1,611	1,546	65	-	53	193	174	-	59	843	5,025
Gasabo	1,283	3,724	311	-	-	530	1,374	372	99	1,356	416	408	532	4,104	3,713	391	22	274	692	808	63	364	230	15,606
Kicukiro	552	698	85	-	2	133	107	-	247	403	112	86	205	1,483	1,462	21	-	50	165	154	8	32	21	4,141
Nyanza	2,575	5,125	709	-	119	2,072	2,177	269	664	1,743	476	440	827	13,236	10,998	2,238	186	945	2,447	720	22	318	854	34,181
Gisagara	2,524	4,222	3,259	-	427	3,238	3,075	27	345	2,053	372	612	1,069	13,242	11,386	1,856	-	695	3,549	479	95	-	785	38,016
Nyaruguru	230	3,424	32	279	10	1,723	4,026	1,871	282	901	239	228	434	7,336	974	6,362	285	-	935	634	24	245	740	22,975
Huye	1,070	5,932	1,020	39	129	1,341	3,116	186	132	1,358	395	337	626	8,974	5,691	3,284	281	118	2,492	582	420	95	708	27,993
Nyamagabe	953	4,282	20	2,651	122	1,403	6,004	1,712	538	2,046	167	151	1,728	7,001	827	6,174	1,024	-	773	255	122	202	1,271	30,379
Ruhango	1,018	2,642	891	-	41	4,777	3,059	25	781	2,126	164	296	1,666	10,851	7,986	2,865	110	2,225	4,199	439	8	608	826	34,625
Muhanga	1,008	67	203	58	-	2,720	5,483	188	2,828	7,178	678	668	5,831	6,544	2,345	4,198	179	65	2,258	480	239	673	532	30,702
Kamonyi	2,190	3,237	251	-	-	1,913	3,984	382	906	5,294	671	731	3,891	10,332	8,620	1,711	108	1,020	4,353	964	59	-	1,422	36,414
Karongi	803	2,213	-	180	-	2,128	3,726	218	941	4,350	393	363	3,594	7,803	1,733	6,069	379	154	1,668	925	153	777	630	27,049
Rutsiro	1,535	142	-	205	-	985	2,680	3,205	537	2,528	427	614	1,487	5,327	675	4,652	472	-	1,289	196	95	449	1,332	20,977
Rubavu	1,698	138	-	-	-	242	1,750	5,669	78	1,078	300	160	618	5,107	732	4,375	600	-	470	2,201	46	436	944	20,458
Nyabihu	3,700	-	-	1,662	-	85	2,728	6,709	31	322	90	115	117	2,828	79	2,749	562	-	132	712	195	174	533	20,373
Ngororero	3,900	-	-	1,899	-	579	6,346	1,190	1,307	3,863	212	469	3,182	5,116	559	4,557	443	-	1,375	449	214	241	621	27,544
Rusizi	980	55	1,458	-	-	10,580	2,030	70	502	1,623	626	198	800	11,730	8,867	2,864	37	277	1,148	443	221	148	2,231	33,533
Nyamasheke	564	24	335	-	-	4,441	4,200	91	602	1,757	448	238	1,072	6,680	1,327	5,353	77	935	1,318	545	150	119	2,943	24,781
Rulindo	1,289	4,167	17	51	18	1,090	3,012	1,038	157	2,523	582	621	1,320	9,301	3,399	5,902	371	103	575	949	96	68	611	25,434
Gakenke	1,426	436	20	122	-	1,466	5,082	1,097	1,495	6,182	898	1,196	4,089	12,150	1,098	11,052	309	61	758	278	404	157	1,645	33,090
Musanze	2,629	1,665	-	1,339	-	36	2,791	3,927	132	725	315	206	204	7,943	318	7,626	286	-	8	1,115	229	83	657	23,565
Burera	2,432	6,085	-	1,004	16	40	3,864	4,276	21	757	362	45	350	11,698	506	11,191	1,129	-	52	933	126	452	214	33,099
Gicumbi	2,290	11,971	-	802	19	743	5,083	2,062	102	2,491	687	603	1,200	14,595	3,517	11,079	858	459	165	487	144	802	380	43,455
Rwamagana	4,070	9,344	493	-	7	1,759	1,529	684	114	4,839	2,909	794	1,136	11,128	10,822	306	88	1,585	505	1,044	362	1,009	659	39,218
Nyagatare	24,507	4,736	1,987	-	-	854	1,517	588	91	5,366	2,846	455	2,065	30,899	29,371	1,528	-	2,186	1,174	896	13	129	436	75,381
Gatsibo	8,747	7,531	1,732	-	162	666	2,441	1,943	372	6,738	3,541	997	2,199	19,596	17,084	2,512	74	2,774	1,997	766	217	227	1,072	56,986
Kayonza	6,995	13,300	1,740	-	250	3,396	1,578	1,558	402	4,121	2,819	384	917	19,517	19,238	279	86	1,054	615	803	180	623	696	56,817
Kirehe	2,495	10,441	927	2	395	1,825	1,091	1,288	1,022	5,970	3,406	430	2,134	22,780	15,075	7,705	229	1,038	1,360	343	165	67	2,474	53,664
Ngoma	2,059	7,844	898	-	660	1,805	1,254	726	195	6,747	3,909	601	2,238	18,966	16,101	2,865	50	1,167	1,493	355	1,228	266	883	46,421
Bugesera	6,818	6,171	1,190	-	130	1,875	1,202	331	329	5,371	1,706	883	2,783	20,979	20,823	156	0	3,848	1,840	714	46	849	314	52,010
National	92,749	120,005	17,578	10,294	2,506	54,679	86,580	41,716	15,334	92,501	30,323	13,442	48,737	328,858	206,871	121,987	8,245	21,086	39,999	19,842	5,346	9,674	27,508	993,910
SSF	91,001	119,946	411	10,210	2,505	54,667	86,563	41,357	15,332	92,436	30,270	13,434	48,732	328,066	206,092	121,974	8,241	21,081	39,162	19,668	5,171	9,298	26,880	971,994
LSF	1,748	59	17,167	84	2	12	17	359	2	66	53	8	5	792	779	13	4	5	837	175	175	376	627	22,505

Source: NISR, SAS 2024

Table 10: 2024 Season B_Average yield by crop type and district (Kg/Ha)

District	Maize	Sorghum	Paddy rice	Wheat	Other cereals	Cassava	Sweet potatoes	Irish potatoes	Yams & Taro	Bananas	Cooking Banana	Dessert banana	Banana for beer	Beans	Bush bean	Climbing bean	Peas	Ground nuts	Soya beans	Vegetables	Fruits	Fodder crops	Other crops
Nyarugenge	928	840	-	-	-	11,080	5,706	3,106	8,396	11,116	16,830	8,518	9,718	614	615	584	-	411	468	5,729	-	45,254	12,757
Gasabo	1,311	1,058	3,979	-	-	11,628	6,663	3,538	4,202	12,843	16,607	13,354	9,512	664	661	693	490	377	348	9,393	4,935	4,242	10,227
Kicukiro	799	1,254	5,282	-	193	12,250	7,638	-	5,419	12,667	17,512	12,736	9,986	707	707	669	-	266	455	10,943	5,347	3,650	2,286
Nyanza	1,254	1,061	3,414	-	259	14,427	7,561	3,650	6,171	9,773	11,029	9,445	9,224	585	578	620	882	417	334	6,981	10,310	11,878	2,328
Gisagara	1,057	961	3,784	-	659	16,820	6,894	3,777	9,321	10,734	15,321	9,747	9,701	664	622	919	-	359	452	6,715	22,629	-	1,277
Nyaruguru	1,064	693	2,101	609	564	13,514	9,388	8,006	9,375	9,968	14,007	9,171	8,162	755	496	795	726	-	379	9,766	5,720	14,740	2,466
Huye	995	994	3,586	-	440	18,094	7,589	3,674	7,275	10,264	11,979	11,578	8,475	628	560	747	462	502	340	5,514	3,921	5,588	1,331
Nyamagabe	1,165	938	2,289	1,218	229	12,958	7,863	7,085	7,900	6,713	9,475	11,851	5,998	631	427	658	536	-	448	8,613	4,086	3,850	1,621
Ruhango	1,088	966	4,303	-	997	18,179	5,344	2,548	7,920	9,659	15,271	12,171	8,661	632	638	616	490	420	378	6,330	5,358	6,803	2,690
Muhanga	949	1,171	3,024	1,160	-	15,188	7,515	3,846	7,070	10,001	14,650	11,453	9,294	640	614	655	536	378	443	9,602	7,043	9,404	4,685
Kamonyi	1,194	1,111	3,673	-	-	14,348	6,336	5,201	8,496	10,006	14,485	10,564	9,129	560	545	632	419	555	371	5,584	6,713	-	9,025
Karongi	1,028	1,122	-	657	-	14,574	8,242	3,288	9,874	11,256	16,002	12,735	10,587	908	669	976	608	558	459	8,559	4,917	12,527	1,354
Rutsiro	1,074	756	-	699	-	14,631	7,162	4,479	9,011	11,876	16,718	13,952	9,628	797	613	824	456	-	380	7,862	2,951	5,777	6,789
Rubavu	1,393	729	-	-	-	12,324	7,735	8,781	5,926	12,346	16,587	11,800	10,426	745	539	779	503	-	613	11,735	6,179	16,080	7,370
Nyabihu	1,218	-	-	1,472	-	10,354	7,100	8,915	8,023	10,164	15,149	8,586	7,865	995	673	1,004	844	-	684	13,441	4,709	8,738	332
Ngororero	1,140	-	-	1,199	-	11,706	6,968	5,233	7,635	11,148	15,026	12,031	10,759	980	528	1,036	575	-	460	8,567	5,415	9,731	6,571
Rusizi	986	894	5,188	-	-	10,627	8,209	6,250	8,723	12,978	16,575	12,307	10,331	755	709	900	511	618	421	8,174	7,240	12,118	2,501
Nyamasheke	972	1,022	4,459	-	-	12,312	7,917	2,772	6,742	11,386	13,639	11,359	10,452	771	542	828	620	444	390	7,743	5,431	1,303	2,175
Rulindo	1,068	1,122	3,617	1,100	467	15,817	8,811	4,627	4,676	12,246	16,914	12,112	10,250	880	659	1,007	382	534	487	8,181	3,302	12,685	7,968
Gakenke	934	1,095	3,848	937	-	15,707	10,015	5,174	7,494	11,656	17,876	14,065	9,585	821	683	835	453	395	392	12,505	5,592	4,990	9,168
Musanze	1,537	1,299	-	1,650	-	11,658	9,609	8,980	9,409	9,953	12,261	7,769	8,595	1,071	748	1,084	608	-	484	9,734	5,084	4,756	9,316
Burera	1,297	1,498	-	1,366	447	12,512	8,082	7,300	7,811	12,845	17,027	13,351	8,460	1,080	573	1,103	456	-	297	9,761	5,057	13,367	9,776
Gicumbi	1,062	1,459	-	1,041	134	14,672	7,852	6,430	6,496	12,096	17,964	9,821	9,878	846	637	912	644	279	519	8,363	4,179	10,364	7,060
Rwamagana	867	1,124	4,520	-	494	16,688	6,986	3,536	5,943	14,597	18,245	10,146	8,365	594	594	593	567	389	532	8,945	4,226	17,813	2,344
Nyagatare	1,602	1,360	4,676	-	-	19,072	5,467	4,725	8,012	14,381	18,051	9,170	10,469	744	734	922	-	479	504	9,729	4,838	20,617	1,306
Gatsibo	1,292	1,345	3,719	-	1,249	18,005	9,150	4,760	7,462	14,116	16,408	12,061	11,357	671	632	932	584	366	493	7,961	5,438	10,977	1,323
Kayonza	1,183	1,225	3,322	-	580	15,731	6,421	4,215	5,285	15,597	18,222	12,322	8,904	652	647	978	497	247	460	9,045	5,248	1,670	8,369
Kirehe	2,199	1,139	4,560	2,553	650	15,535	6,570	3,975	4,468	15,258	19,116	10,421	10,077	708	647	826	666	388	791	5,136	4,919	3,565	1,437
Ngoma	844	1,179	4,402	-	663	15,350	6,551	5,170	3,950	14,896	18,069	8,418	11,091	769	745	904	371	447	418	7,776	3,768	23,790	1,644
Bugesera	934	972	5,159	-	794	13,250	5,843	2,712	6,017	11,693	14,159	12,091	10,056	654	655	512	343	508	382	9,689	2,897	13,985	1,423
National	1,284	1,169	4,143	1,267	622	14,325	7,702	6,846	7,328	12,352	17,010	11,375	9,723	737	652	880	561	430	426	8,948	5,092	11,128	4,263
SSF	1,226	1,169	3,115	1,268	622	14,324	7,702	6,776	7,329	12,352	17,019	11,375	9,723	737	652	880	561	430	408	8,987	5,129	10,537	4,289
LSF	4,306	2,109	4,168	1,205	255	20,451	5,458	14,919	5,573	12,141	12,172	11,164	13,355	735	725	1,314	395	504	1,299	4,588	4,003	25,748	3,170

Source: NISR, SAS 2024

Table 11: 2024 Season B_Average yield of Large-Scale Farmers by crop type and district (Kg/Ha)

District	Maize	Sorghum	Paddy rice	Wheat	Other cereals	Cassava	Sweet potatoes	Irish potatoes	Yams & Taro	Bananas	Cooking Banana	Dessert banana	Banana for beer	Beans	Bush bean	Climbing bean	Peas	Ground nuts	Soya beans	Vegetables	Fruits	Fodder crops	Other crops
Gasabo	3,159	2,216	3,979	-	-	-	8,752	-	-	12,518	10,903	18,681	15,920	582	582	-	-	-	855	7,480	3,322	10,842	5,403
Kicukiro	-	-	5,282	-	-	-	-	-	-	5,584	5,584	-	-	854	854	-	-	-	589	-	4,682	5,009	-
Nyanza	-	-	3,457	-	-	-	-	-	-	7,885	3,318	9,173	13,020	338	338	-	-	-	-	7,749	1,578	-	16,227
Gisagara	2,353	-	3,806	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nyaruguru	-	-	2,101	-	-	-	8,773	17,362	-	13,775	9,311	14,371	6,273	-	-	-	-	-	250	-	-	29,106	-
Huye	1,268	-	3,592	-	-	-	-	-	-	-	-	-	-	508	508	-	-	-	-	13,157	-	45,384	-
Nyamagabe	2,653	-	2,289	1,485	-	-	-	10,200	-	-	-	-	-	224	-	224	408	-	-	-	-	-	-
Ruhango	2,903	-	4,303	-	-	35,528	-	-	-	11,886	6,259	11,703	13,933	982	982	-	-	358	-	-	-	41,329	2,883
Muhanga	-	-	3,078	-	-	-	-	16,446	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kamonyi	4,281	-	3,552	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43
Karongi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4,507	-	-	1,618
Rubavu	2,801	-	-	-	-	-	-	10,377	-	7,308	7,346	4,763	-	-	-	-	-	-	-	-	-	3,069	267
Rusizi	3,545	2,648	5,196	-	-	13,316	6,742	-	-	-	-	-	-	844	844	-	-	-	640	-	5,052	-	134
Nyamasheke	-	-	4,459	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3,675
Rulindo	4,067	-	3,617	1,179	-	-	-	9,339	7,462	10,200	8,596	12,336	-	2,075	-	2,075	750	-	-	1,528	-	-	9,430
Gakenke	-	-	3,848	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Musanze	-	-	-	1,497	-	-	-	15,518	-	-	-	-	-	-	-	-	-	-	-	-	645	18,782	1,468
Gicumbi	-	82	-	479	-	-	-	4,580	-	12,199	12,215	11,681	-	998	-	998	136	-	-	13,597	4,260	33,781	33,968
Rwamagana	3,188	2,706	4,520	-	255	-	4,385	3,460	-	17,419	18,535	10,208	-	679	679	-	-	80	350	6,603	2,781	37,411	14,000
Nyagatare	4,016	-	4,681	-	-	-	-	4,633	-	16,080	16,527	14,756	10,415	706	706	-	-	-	1,900	2,689	4,838	6,127	553
Gatsibo	3,338	2,774	3,735	-	-	-	-	2,703	-	16,087	16,642	13,226	12,055	499	499	-	-	892	792	5,705	-	15,164	12,997
Kayonza	6,590	1,016	3,292	-	-	4,681	2,220	8,572	-	5,872	5,732	9,766	11,751	895	895	-	-	248	-	1,732	2,459	8,019	8,003
Kirehe	5,533	-	4,715	2,553	-	-	-	-	-	-	-	-	-	814	814	-	-	-	1,448	6,458	-	-	3,050
Ngoma	2,605	1,077	4,402	-	-	7,413	6,857	-	-	7,766	6,992	6,205	15,050	588	587	1,361	-	391	704	3,898	5,063	8,139	14,806
Bugesera	3,249	701	5,234	-	-	14,516	6,760	3,335	5,526	15,312	18,287	10,865	13,849	800	795	1,242	343	808	184	11,741	4,058	30,371	1,136
National	4,306	2,109	4,168	1,205	255	20,451	5,458	14,919	5,573	12,141	12,172	11,164	13,355	735	725	1,314	395	504	1,299	4,588	4,003	25,748	3,170

Source: NISR, SAS 2024

Table 12: 2024 Season B_Crop production by crop type and district (MT)

District	Maize	Sorghum	Paddy rice	Wheat	Other Cereals	Cassava	Sweet potatoes	Irish potatoes	Yams & Taro	Banana	Cooking banana	Dessert banana	Banana for beer	Beans	Bush bean	Climbing bean	Pea	Ground nuts	Soya bean	Vegetables	Fruits	Fodder crops	Other crops	Total
Nyarugenge	381	326	-	-	-	2,606	1,540	40	693	7,701	2,621	985	4,095	988	951	38	-	22	90	997	-	2,673	10,750	28,806
Gasabo	1,682	3,938	1,239	-	-	6,161	9,153	1,317	415	17,420	6,902	5,454	5,064	2,724	2,453	271	11	103	241	7,585	310	1,545	2,353	56,197
Kicukiro	441	876	450	-	0	1,630	817	-	1,339	5,101	1,965	1,090	2,046	1,048	1,034	14	-	13	75	1,690	42	117	48	13,688
Nyanza	3,229	5,436	2,419	-	31	29,896	16,464	982	4,095	17,034	5,252	4,152	7,630	7,742	6,354	1,388	164	394	817	5,029	229	3,780	1,987	99,727
Gisagara	2,669	4,058	12,330	-	281	54,463	21,202	101	3,218	22,041	5,704	5,963	10,374	8,792	7,085	1,707	-	250	1,604	3,215	2,144	-	1,002	137,371
Nyaruguru	244	2,371	68	170	5	23,292	37,791	14,978	2,640	8,981	3,347	2,092	3,542	5,538	483	5,055	207	-	354	6,188	137	3,609	1,824	108,396
Huye	1,064	5,897	3,659	-	57	24,263	23,644	683	962	13,934	4,728	3,901	5,305	5,638	3,187	2,451	130	59	848	3,210	1,645	533	941	87,169
Nyamagabe	1,110	4,018	45	3,230	28	18,179	47,211	12,128	4,248	13,731	1,581	1,784	10,365	4,416	353	4,063	549	-	346	2,200	498	777	2,061	114,775
Ruhango	1,108	2,551	3,834	-	40	86,845	16,348	64	6,184	20,534	2,500	3,600	14,434	6,859	5,094	1,764	54	934	1,585	2,776	46	4,140	2,221	156,122
Muhanga	956	79	615	68	-	41,308	41,209	724	19,993	71,785	9,938	7,651	54,196	4,188	1,439	2,748	96	25	1,000	4,607	1,683	6,332	2,492	197,157
Kamonyi	2,615	3,597	922	-	-	27,448	25,240	1,985	7,695	52,971	9,725	7,726	35,520	5,782	4,701	1,081	45	566	1,614	5,383	397	-	12,837	149,097
Karongi	825	2,484	-	118	-	31,020	30,704	717	9,295	48,962	6,294	4,616	38,051	7,082	1,159	5,923	230	86	766	7,920	753	9,738	853	151,555
Rutsiro	1,648	107	-	143	-	14,406	19,195	14,355	4,838	30,021	7,135	8,572	14,314	4,248	414	3,833	215	-	490	1,543	280	2,595	9,043	103,129
Rubavu	2,366	101	-	-	-	2,985	13,536	49,776	462	13,314	4,984	1,885	6,446	3,802	395	3,407	302	-	288	25,823	285	7,016	6,957	127,013
Nyabihu	4,505	-	-	2,448	-	884	19,372	59,814	245	3,269	1,366	985	918	2,813	53	2,760	474	-	91	9,564	916	1,521	177	106,093
Ngororero	4,446	-	-	2,278	-	6,778	44,222	6,226	9,976	43,064	3,190	5,645	34,229	5,015	295	4,720	255	-	632	3,846	1,160	2,348	4,083	134,329
Rusizi	966	49	7,563	-	-	112,426	16,667	439	4,382	21,070	10,373	2,431	8,265	8,861	6,285	2,576	19	171	483	3,623	1,603	1,792	5,578	185,692
Nyamasheke	548	25	1,494	-	-	54,676	33,250	253	4,058	20,011	6,104	2,707	11,200	5,154	720	4,434	47	415	514	4,216	813	155	6,401	132,030
Rulindo	1,376	4,677	63	56	8	17,237	26,536	4,802	735	30,900	9,848	7,521	13,531	8,186	2,240	5,946	142	55	280	7,763	315	860	4,865	108,857
Gakenke	1,332	477	77	114	-	23,034	50,902	5,677	11,204	72,057	16,054	16,816	39,187	9,980	750	9,230	140	24	297	3,476	2,262	784	15,079	196,918
Musanze	4,039	2,163	-	2,209	-	417	26,818	35,270	1,240	7,211	3,859	1,599	1,753	8,507	237	8,270	174	-	4	10,850	1,166	396	6,125	106,589
Burera	3,154	9,118	-	1,372	7	499	31,227	31,218	166	9,720	6,157	602	2,961	12,638	290	12,347	514	-	15	9,108	637	6,048	2,089	117,530
Gicumbi	2,432	17,462	-	835	3	10,897	39,910	13,260	661	30,127	12,349	5,919	11,858	12,344	2,241	10,102	553	128	86	4,075	603	8,312	2,685	144,371
Rwamagana	3,529	10,504	2,229	-	4	29,349	10,680	2,418	678	70,629	53,076	8,051	9,502	6,615	6,433	182	50	617	269	9,340	1,529	17,967	1,544	167,949
Nyagatare	39,272	6,441	9,291	-	-	16,286	8,294	2,781	731	77,169	51,380	4,170	21,618	22,979	21,569	1,409	-	1,046	592	8,721	65	2,652	570	196,890
Gatsibo	11,303	10,126	6,440	-	176	11,991	22,339	9,247	2,774	95,110	58,102	12,028	24,980	13,144	10,802	2,342	43	1,017	984	6,094	1,181	2,487	1,418	195,873
Kayonza	8,272	16,296	5,781	-	117	53,429	10,133	6,567	2,127	64,276	51,371	4,736	8,169	12,725	12,452	273	43	260	283	7,260	947	1,041	5,826	195,382
Kirehe	5,486	11,887	4,225	5	242	28,345	7,170	5,121	4,564	91,097	65,110	4,479	21,509	16,122	9,757	6,365	153	402	1,075	1,762	811	239	3,555	182,261
Ngoma	1,737	9,249	3,952	-	430	27,705	8,216	3,756	772	100,507	70,634	5,056	24,816	14,591	12,000	2,591	19	521	624	2,764	4,628	6,320	1,452	187,243
Bugesera	6,365	6,000	6,138	-	103	24,841	7,024	898	1,982	62,806	24,149	10,673	27,984	13,718	13,638	80	0	1,954	704	6,923	134	11,878	447	151,915
National	119,101	140,314	72,834	13,045	1,532	783,294	666,814	285,596	112,370	1,142,552	515,798	152,891	473,863	242,239	134,866	107,373	4,628	9,062	17,051	177,549	27,219	107,654	117,267	4,040,123

Source: NISR, SAS 2024

Table 13: 2024 Season B_the Use of production by farmers (in percentage)

Crops	Sold	Own consumption	Wages for hired labour	Farm rent	Offered as gift	Barter trade / Exchanged with other things	Seeds	Fodder purpose	Stored	Post harvesting losses	Other usage
Maize	33.1	54.3	1.6	2.4	5.1	0.0	0.7	0.9	1.4	0.2	0.3
Sorghum	56.7	30.7	0.5	2.2	5.6	0.0	3.1	0.0	0.6	0.3	0.3
Paddy rice	81.3	16.2	0.1	0.1	0.2	0.0	0.5	0.0	0.0	1.5	0.3
Wheat	56.6	29.9	0.2	0.0	4.2	0.4	6.3	1.0	1.5	0.0	0.1
Other cereals	37.2	47.8	0.9	1.5	4.1	0.0	6.8	0.1	0.3	0.5	0.8
Sweet potato	27.7	59.5	1.8	0.7	6.1	0.0	0.0	3.6	0.2	0.1	0.2
Irish potato	55.4	26.7	0.6	0.3	3.2	0.1	12.8	0.1	0.2	0.4	0.1
Yam & Taro	33.0	54.2	1.6	0.6	6.6	0.1	3.8	0.0	0.0	0.0	0.2
Cassava	58.2	35.3	1.0	1.6	3.3	0.0	0.0	0.0	0.4	0.0	0.2
Bush bean	22.9	53.5	1.6	2.5	4.1	0.1	13.2	0.0	1.4	0.3	0.5
Climbing bean	17.2	57.3	1.0	0.9	7.4	0.1	14.4	0.0	1.3	0.2	0.2
Pea	33.4	49.1	0.0	0.1	2.3	0.1	14.6	0.0	0.2	0.1	0.1
Groundnut	31.8	38.7	0.5	1.7	5.5	0.1	20.7	0.0	0.8	0.1	0.1
Soybean	28.3	49.0	0.4	1.0	3.8	0.1	15.5	0.7	0.9	0.2	0.1
Cooking banana	53.4	40.8	1.0	0.1	4.1	0.0	0.0	0.0	0.0	0.1	0.4
Dessert banana	72.2	23.6	0.1	0.1	3.3	0.0	0.0	0.0	0.0	0.3	0.5
Banana for beer	80.7	11.6	0.1	0.1	6.0	0.0	0.0	0.0	0.0	1.0	0.4
Vegetables	83.7	10.8	0.1	0.1	3.0	0.0	1.2	0.2	0.1	0.6	0.1
Fruits	90.5	6.6	0.1	0.0	2.4	0.0	0.0	0.0	0.0	0.2	0.1
Fodder crops	2.9	0.0	1.9	0.0	0.9	0.0	0.0	92.7	1.1	0.0	0.5
Other crops	93.8	3.6	0.0	0.0	0.8	0.0	0.6	0.0	0.0	0.1	1.1

Source : NISR, SAS 2024

Table 14: 2024 Season B_Cultivated area by cropping system and district (Percentage)

District	Cropping system	
	Pure Cropping	Mixed Cropping
Nyarugenge	43.42	56.58
Gasabo	30.96	69.04
Kicukiro	21.69	78.31
Nyanza	25.82	74.18
Gisagara	22.30	77.70
Nyaruguru	47.35	52.65
Huye	30.82	69.18
Nyamagabe	53.08	46.92
Ruhango	35.41	64.59
Muhanga	29.24	70.76
Kamonyi	32.86	67.14
Karongi	42.83	57.17
Rutsiro	50.62	49.38
Rubavu	66.47	33.53
Nyabihu	62.52	37.48
Ngororero	40.24	59.76
Rusizi	37.62	62.38
Nyamasheke	41.04	58.96
Rulindo	42.79	57.21
Gakenke	45.81	54.19
Musanze	67.37	32.63
Burera	51.73	48.27
Gicumbi	47.70	52.30
Rwamagana	39.32	60.68
Nyagatare	57.76	42.24
Gatsibo	43.19	56.81
Kayonza	56.30	43.70
Kirehe	43.05	56.95
Ngoma	32.72	67.28
Bugesera	23.55	76.45
National	43.24	56.76
SSF	43.11	56.89
LSF	75.42	24.58

Source: NISR, SAS 2024

Table 15: 2024 Season B_Sowing dates by district (Percentage)

District	Before January	Between 01-15/01	Between 16-31/01	Between 01-15/02	Between 16-28/02	Between 01-15/03	Between 16-31/03	After 31/03	Other season	Total
Nyarugenge	7.45	4.22	3.05	7.56	20.44	11.61	2.23	3.22	40.21	100
Gasabo	3.59	8.78	3.29	17.89	16.65	8.76	2.92	2.01	36.11	100
Kicukiro	11.84	4.7	3.77	8.49	21.36	8.2	1.05	0.69	39.91	100
Nyanza	7.65	8.38	8.62	27.59	12.76	3.15	1.36	3.26	27.23	100
Gisagara	3.84	3.57	6.78	22.51	19.59	5.94	1.34	4.98	31.44	100
Nyaruguru	7.17	5.45	5.46	16.04	12.73	8.54	3.94	7.69	32.98	100
Huye	3.17	8.24	1.76	30.72	11.73	9.66	2.21	5.31	27.2	100
Nyamagabe	14.12	8.26	4.82	10.75	20.08	11.1	4.7	8.99	17.19	100
Ruhango	9.68	12.15	5.42	24.74	11.98	4.04	1.99	4.07	25.94	100
Muhanga	16.71	6.37	3.76	17.49	8.87	5.92	1.39	4.25	35.25	100
Kamonyi	5.6	8.54	4.4	26.68	15.66	3.43	1.27	3.7	30.73	100
Karongi	10.33	4.93	2.66	20.57	17.73	4.01	2.63	6.77	30.37	100
Rutsiro	5.1	3.97	2.73	11.66	12.07	10.54	3.42	10.47	40.03	100
Rubavu	3.1	7.31	2.55	14.51	16.3	19.18	9.62	8.66	18.77	100
Nyabihu	11.08	4.55	3.91	15.95	17.22	14.65	8.23	14.65	9.76	100
Ngororero	12.51	6.9	3.19	20.07	12.89	11.94	2.66	4.61	25.23	100
Rusizi	7.04	1.3	1.37	10.4	15.67	6.79	1.26	2.84	53.33	100
Nyamasheke	8.44	3.17	2.89	17.92	12.97	9.47	1.02	3.58	40.55	100
Rulindo	5.98	9.52	5.63	6.76	11.88	20.46	6.76	8.54	24.47	100
Gakenke	12.53	5.01	3.18	4.07	13.29	15.75	5.78	5.64	34.75	100
Musanze	8.1	11.33	4.13	12.16	7.09	21.34	11	9.93	14.93	100
Burera	10.78	12.9	4.39	12.99	7.95	16.75	12.88	9.39	11.99	100
Gicumbi	5.91	8.82	5.73	12.09	12.39	17.89	7.14	6.26	23.77	100
Rwamagana	3.27	6.09	5.06	20.58	17.4	5.7	2.3	2.95	36.64	100
Nyagatare	2.2	1.58	1.99	13.01	30.39	22.58	2.91	0.89	24.45	100
Gatsibo	2.33	6.5	2.52	8.14	18.98	17	3.61	3.01	37.91	100
Kayonza	8.42	7.83	1.92	3.98	7.68	24.37	3.99	3.67	38.13	100
Kirehe	4.63	3.87	2.97	14.05	19.42	9.91	1.52	0.88	42.75	100
Ngoma	2.61	2.85	0.92	9.43	20.03	11.23	1.83	0.56	50.53	100
Bugesera	2.39	2.89	4.43	10.8	21.76	22.7	4.35	0.54	30.14	100
National	7.29	6.38	3.88	15.77	15.39	11.73	3.69	4.94	30.91	100

Source: NISR, SAS 2024

Table 16: 2024 Season B_Sowing date by crops (Percentage)

Crops	Before January	Between 01-15/01	Between 16-31/01	Between 01-15/02	Between 16-28/02	Between 01-15/03	Between 16-31/03	After 31/03	Other season	Total
Maize	0.62	4.25	5.56	33.39	35.71	16.38	2.55	1.52	0.02	100
Sorghum	7.36	52.34	22.58	13.22	2.75	1.62	0.00	0.01	0.12	100
Paddy rice	8.65	20.68	14.65	15.72	24.96	5.80	0.00	9.53	0.00	100
Wheat	0.34	0.00	1.06	1.93	8.82	20.53	31.93	35.38	0.00	100
Other cereals	0.97	0.72	2.07	39.38	36.16	15.36	2.74	2.28	0.32	100
Sweet potato	23.87	12.79	6.47	14.90	9.77	10.39	5.00	16.77	0.04	100
Irish potato	0.80	4.17	5.09	15.99	16.59	25.82	13.04	18.49	0.00	100
Taro & Yams	77.22	5.38	1.32	4.84	2.24	3.92	0.55	4.52	0.00	100
Cassava	2.03	4.39	1.37	4.59	3.29	2.38	0.98	3.61	77.37	100
Bush bean	0.04	0.90	1.88	29.16	34.01	27.58	4.82	1.41	0.18	100
Climbing bean	0.08	1.02	1.78	27.53	31.79	26.55	8.74	2.48	0.04	100
Pea	0.01	1.39	1.34	20.73	23.32	21.78	15.37	16.07	0.00	100
Groundnut	0.17	2.08	10.76	37.97	31.36	15.27	2.07	0.32	0.00	100
Soybean	0.31	4.74	4.88	37.12	34.51	14.13	3.20	0.55	0.57	100
Cooking banana	0.00	0.06	0.08	0.05	0.17	0.07	0.01	0.71	98.86	100
Dessert banana	0.05	0.13	0.07	0.25	0.00	0.12	0.00	0.36	99.02	100
Banana for beer	0.07	0.05	0.07	0.10	0.08	0.02	0.00	0.43	99.18	100
Vegetables	17.88	6.17	3.62	11.50	10.92	17.29	11.66	20.97	0.00	100
Fruits	3.48	0.00	0.15	1.25	0.00	4.39	5.04	0.83	84.85	100
Fodder crops	0.00	0.53	0.05	1.27	1.14	0.50	0.10	8.51	87.90	100
Other crops	16.62	0.22	0.48	0.25	1.38	0.95	0.78	2.16	77.18	100

Source: NISR, SAS 2024

Table 17: 2024 Season B_Use of seeds by farmer type per district (Percentage)

District	Percentage of farmers who used improved seeds			Percentage of sampled plots in which improved seeds was used			Percentage of land size in which improved seeds were used		
	Overall	SSF	LSF	Overall	SSF	LSF	Overall	SSF	SSF
Nyarugenge	15.3	15.3		13.0	13.0		15.5	15.5	
Gasabo	23.0	21.2	64.3	20.5	18.5	35.9	22.3	20.8	80.8
Kicukiro	18.0	15.9	100.0	16.7	14.4	75.0	15.2	12.6	97.7
Nyanza	24.2	23.7	71.4	22.7	22.0	58.3	23.9	22.8	82.4
Gisagara	17.0	15.0	81.3	16.0	14.2	81.3	22.6	14.8	97.9
Nyaruguru	5.7	4.9	27.3	4.2	3.6	20.0	3.8	3.6	17.1
Huye	17.5	14.3	85.0	15.6	12.7	73.1	17.2	14.6	85.9
Nyamagabe	9.3	9.0	40.0	8.0	7.5	37.5	8.5	8.4	31.1
Ruhango	11.0	8.8	92.9	9.5	7.5	62.5	9.8	7.5	94.4
Muhanga	9.2	8.4	80.0	7.4	6.8	80.0	7.0	6.4	93.2
Kamonyi	19.0	18.2	100.0	15.1	14.4	100.0	15.4	14.9	100.0
Karongi	5.7	5.5	100.0	4.7	4.4	50.0	4.7	4.7	4.4
Rutsiro	8.3	8.3		7.6	7.6		7.3	7.3	
Rubavu	25.0	24.7	50.0	24.2	23.8	42.9	25.1	25.0	38.5
Nyabihu	33.7	33.7		28.0	28.0		28.4	28.4	
Ngororero	18.1	18.1		16.0	16.0		15.8	15.8	
Rusizi	6.7	5.6	60.0	5.9	5.0	33.3	9.5	5.3	85.2
Nyamasheke	8.4	7.7	44.4	7.6	6.9	44.4	6.7	5.9	68.5
Rulindo	15.7	15.1	60.0	14.4	13.6	31.6	13.5	13.3	58.3
Gakenke	9.9	10.0	-	8.6	8.6	-	8.4	8.4	-
Musanze	14.3	13.3	100.0	14.2	11.2	100.0	12.9	12.6	100.0
Burera	15.6	15.6		14.8	14.8		15.8	15.8	
Gicumbi	16.6	16.2	50.0	14.0	13.1	40.9	13.0	12.9	50.9
Rwamagana	18.7	15.1	73.3	18.7	13.4	33.8	16.9	15.5	76.8
Nyagatare	57.3	55.6	79.1	49.3	47.5	59.0	54.6	53.3	92.3
Gatsibo	24.1	21.7	84.6	21.6	17.8	58.2	22.9	20.1	91.3
Kayonza	20.5	17.4	72.4	19.2	16.0	38.5	19.6	16.5	87.9
Kirehe	4.4	3.5	87.5	4.5	3.2	78.6	6.6	3.2	97.7
Ngoma	7.7	5.8	66.7	9.1	5.0	51.4	6.7	4.9	81.3
Bugesera	43.0	41.5	69.2	38.5	36.4	50.0	38.4	36.4	84.4
National	18.0	16.6	72.6	16.5	14.5	48.5	18.2	16.5	88.3

Source : NISR, SAS 2024

Table 18: 2024 Season B Seed type by crops (Percentage)

Crop	Traditional seeds	Improved seeds	Total
Maize	45.45	54.55	100
Paddy rice	79.58	20.42	100
Wheat	89.79	10.21	100
Irish potato	98.43	1.57	100
Cassava	99.60	0.40	100
Bush bean	99.87	0.13	100
Climbing bean	99.71	0.29	100
Pea	100.00	-	100
Soybean	99.54	0.46	100
Cooking banana	99.94	0.06	100
Dessert banana	99.54	0.46	100
Banana for beer	99.73	0.27	100
Vegetables	63.54	36.46	100
Fruits	97.77	2.23	100
Fodder crops	99.14	0.86	100
Other crops	86.52	13.48	100
National	93.60	6.40	100

Source: NISR, SAS 2024

Table 19: 2024 Season B_Percentage of farmers by source of improved seeds per district

District	Sources of improved seeds							
	Government (MINAGRI/ RAB/NAEB)	Recognized seed multipliers	Agro-dealers	NGOs/ Companies	Market	Agriculture cooperative	Other source	Total
Nyarugenge	50.00	-	50.00	-	-	-	-	100
Gasabo	2.70	5.41	64.86	-	18.92	8.11	-	100
Kicukiro	6.67	20.00	60.00	6.67	-	6.67	-	100
Nyanza	10.64	4.26	17.02	34.04	23.40	6.38	4.26	100
Gisagara	5.13	5.13	30.77	33.33	2.56	15.38	7.69	100
Nyaruguru	20.00	10.00	20.00	30.00	20.00	-	-	100
Huye	11.63	18.60	16.28	27.91	4.65	16.28	4.65	100
Nyamagabe	27.27	4.55	27.27	27.27	4.55	9.09	-	100
Ruhango	2.94	14.71	23.53	23.53	8.82	26.47	-	100
Muhanga	13.33	26.67	6.67	20.00	20.00	6.67	6.67	100
Kamonyi	-	7.89	44.74	18.42	5.26	21.05	2.63	100
Karongi	25.00	8.33	33.33	25.00	8.33	-	-	100
Rutsiro	-	-	47.06	41.18	5.88	5.88	-	100
Rubavu	12.00	4.00	40.00	10.67	16.00	9.33	8.00	100
Nyabihu	5.32	11.70	32.98	31.91	12.77	5.32	-	100
Ngororero	5.88	-	38.24	47.06	8.82	-	-	100
Rusizi	16.67	11.11	22.22	22.22	11.11	11.11	5.56	100
Nyamasheke	33.33	-	33.33	4.76	9.52	19.05	-	100
Rulindo	-	9.52	47.62	23.81	14.29	-	4.76	100
Gakenke	16.67	-	29.17	54.17	-	-	-	100
Musanze	11.11	6.67	26.67	24.44	26.67	4.44	-	100
Burera	7.14	2.38	40.48	40.48	9.52	-	-	100
Gicumbi	8.00	4.00	32.00	20.00	24.00	2.00	10.00	100
Rwamagana	6.98	20.93	44.19	16.28	9.30	2.33	-	100
Nyagatare	2.33	4.07	51.74	37.21	0.58	2.91	1.16	100
Gatsibo	6.94	8.33	33.33	41.67	2.78	5.56	1.39	100
Kayonza	7.69	15.38	38.46	21.15	3.85	11.54	1.92	100
Kirehe	-	5.88	23.53	41.18	5.88	23.53	-	100
Ngoma	33.33	20.00	6.67	33.33	3.33	3.33	-	100
Bugesera	2.44	4.88	32.52	39.02	6.50	14.63	-	100
National	8.04	7.81	35.80	29.26	9.07	7.97	2.05	100

Source: NISR, SAS 2024

Table 20: 2024 Season B_Percentage of crops by source of seeds

Crop	Government (MINAGRI/ RAB/	Recognized seed multipliers	Agro dealers	NGOs/	Market	Agriculture cooperative	Other source	Total
Maize	1.77	1.30	44.83	42.96	6.62	1.68	0.84	100
Paddy rice	2.50	34.17	0.83	-	-	56.67	5.83	100
Wheat	35.71	-	39.29	14.29	3.57	7.14	-	100
Irish potato	25.42	52.54	13.56	3.39	3.39	1.69	-	100
Cassava	33.33	50.00	-	-	6.67	6.67	3.33	100
Bush bean	41.46	7.32	19.51	21.95	7.32	-	2.44	100
Climbing bean	17.65	5.88	41.18	11.76	17.65	5.88	-	100
Pea	50.00	-	-	-	-	50.00	-	100
Soybean	33.33	3.70	44.44	7.41	7.41	3.70	-	100
Cooking banana	17.65	76.47	-	5.88	-	-	-	100
Dessert banana	19.23	30.77	7.69	3.85	7.69	3.85	26.92	100
Banana for beer	9.09	63.64	9.09	-	-	-	18.18	100
Vegetables	1.59	5.41	45.86	9.55	30.57	1.59	5.41	100
Fruits	26.83	51.22	12.20	2.44	7.32	-	-	100
Fodder crops	41.94	12.90	32.26	-	9.68	-	3.23	100
Other crops	60.12	13.29	1.16	0.58	2.31	17.92	4.62	100

Source: NISR, SAS 2024

Table 21: 2024 Season B_Use of organic fertilizer by farmer type per district (Percentage)

District	Percentage of farmers who applied organic fertilizer			Percentage of plots in which organic fertilizer was applied			Percentage of land size in which organic fertilizer was applied		
	Overall	SSF	LSF	Overall	SSF	LSF	Overall	SSF	LSF
Nyarugenge	61.2	61.2		74.2	74.2		70.0	70.0	
Gasabo	90.2	91.6	57.1	66.4	66.4	78.7	70.6	70.1	91.7
Kicukiro	58.4	59.2	25.0	78.3	78.3	50.0	78.6	80.8	25.0
Nyanza	74.0	74.0	71.4	66.9	66.9	88.9	66.5	65.9	99.0
Gisagara	87.7	88.3	68.8	69.6	69.6	100.0	75.2	73.2	100.0
Nyaruguru	94.6	94.4	100.0	76.1	76.1	80.0	76.1	75.8	98.9
Huye	81.7	81.3	90.0	76.4	76.4	100.0	74.2	73.1	100.0
Nyamagabe	90.2	90.1	100.0	74.7	74.7	100.0	76.8	76.7	100.0
Ruhango	87.4	88.1	64.3	68.4	68.4	66.7	69.6	68.8	99.6
Muhanga	96.2	96.1	100.0	62.8	62.8	100.0	68.8	68.6	100.0
Kamonyi	87.1	87.2	80.0	61.8	61.8	75.0	62.3	62.3	59.9
Karongi	94.9	94.9	100.0	69.8	69.8	100.0	72.2	72.1	100.0
Rutsiro	92.5	92.5		70.7	70.7		77.3	77.3	
Rubavu	68.6	68.5	75.0	53.4	53.4	60.0	54.0	53.9	75.3
Nyabihu	95.6	95.6		77.8	77.8		78.2	78.2	
Ngororero	97.7	97.7		76.4	76.4		78.7	78.7	
Rusizi	75.0	76.1	20.0	67.2	67.2	22.2	64.6	64.6	42.7
Nyamasheke	93.6	94.2	66.7	73.9	73.9	100.0	69.2	69.0	100.0
Rulindo	96.7	96.9	80.0	86.4	86.4	71.4	85.7	85.7	67.6
Gakenke	97.8	98.0	50.0	73.7	73.7	100.0	76.8	76.8	100.0
Musanze	88.4	88.2	100.0	76.9	76.9	60.0	77.1	77.2	60.1
Burera	91.8	91.8		82.6	82.6		87.0	87.0	
Gicumbi	96.6	96.5	100.0	82.6	82.6	81.8	81.8	81.8	92.9
Rwamagana	69.2	67.6	93.3	71.3	71.3	55.1	74.9	74.6	82.3
Nyagatare	61.8	63.6	37.2	59.4	59.4	84.2	62.6	62.5	87.6
Gatsibo	80.0	80.5	69.2	67.1	67.1	75.0	69.7	69.1	92.3
Kayonza	60.2	61.3	41.4	51.0	51.0	51.0	59.7	59.6	68.8
Kirehe	41.8	41.9	37.5	77.6	77.6	100.0	79.6	78.9	100.0
Ngoma	51.0	51.2	47.6	46.2	46.2	61.3	48.7	48.3	87.3
Bugesera	70.1	70.1	71.8	66.3	66.3	70.0	63.0	61.7	93.1
National	80.1	80.5	64.9	71.2	71.2	69.8	71.4	71.1	93.3

Source : NISR, SAS 2024

Table 22: 2024 Season B Use of inorganic fertilizer by farmer type per district (Percentage)

District	Percentage of farmers who used inorganic fertilizers			Percentage of plots in which inorganic fertilizer was applied			Percentage of land under which inorganic fertilizer was applied		
	Overall	SSF	LSF	Overall	SSF	LSF	Overall	SSF	LSF
Nyarugenge	14.1	14.1		5.2	5.2		7.4	7.4	
Gasabo	48.0	47.3	64.3	23.0	23.0	47.2	26.7	25.2	87.0
Kicukiro	32.3	31.2	75.0	10.8	10.8	62.5	16.2	13.8	94.6
Nyanza	31.7	31.0	85.7	11.4	11.4	54.6	13.9	12.3	98.6
Gisagara	40.6	38.7	100.0	15.9	15.9	100.0	22.6	14.4	100.0
Nyaruguru	72.8	71.9	100.0	32.5	32.5	73.3	43.1	42.5	98.1
Huye	45.2	42.6	100.0	13.4	13.4	76.9	17.3	14.2	98.9
Nyamagabe	59.6	59.1	100.0	33.0	33.0	100.0	36.9	36.7	100.0
Ruhango	30.1	28.4	92.9	9.9	9.9	52.2	11.7	9.2	98.9
Muhanga	40.3	39.9	80.0	12.3	12.3	80.0	13.5	12.9	93.2
Kamonyi	35.1	34.7	80.0	9.5	9.5	80.0	12.4	11.9	94.2
Karongi	59.5	59.6	0.0	27.9	27.9	0.0	27.8	27.9	0.0
Rutsiro	58.6	58.6		25.9	25.9		31.4	31.4	
Rubavu	69.4	69.3	75.0	46.8	46.8	42.9	51.7	51.7	62.7
Nyabihu	78.9	78.9		47.4	47.4		58.7	58.7	
Ngororero	70.3	70.3		35.7	35.7		36.8	36.8	
Rusizi	61.0	60.4	90.0	27.6	27.6	50.0	35.6	32.7	87.6
Nyamasheke	72.6	72.0	100.0	36.1	36.1	100.0	38.3	37.5	100.0
Rulindo	60.4	60.1	80.0	31.8	31.8	66.7	33.1	32.9	87.2
Gakenke	81.0	81.1	50.0	36.1	36.1	50.0	41.7	41.7	29.8
Musanze	72.1	71.8	100.0	36.1	36.1	73.3	43.0	42.8	96.9
Burera	65.5	65.5		37.9	37.9		44.8	44.8	
Gicumbi	58.1	57.8	83.3	26.5	26.5	40.9	31.0	30.9	68.1
Rwamagana	39.2	37.0	73.3	26.7	26.7	26.4	29.7	28.7	73.6
Nyagatare	70.5	69.3	86.1	31.8	31.8	58.2	52.3	50.9	92.7
Gatsibo	51.1	50.1	76.9	23.9	23.9	50.6	33.5	31.2	88.5
Kayonza	46.4	43.7	93.1	17.1	17.1	46.2	28.7	25.7	91.9
Kirehe	31.7	31.1	87.5	16.9	16.9	85.7	23.8	21.1	98.2
Ngoma	23.7	21.8	81.0	6.9	6.9	35.8	12.0	10.2	87.2
Bugesera	47.6	46.8	61.5	22.6	22.6	42.8	28.9	26.6	83.5
National	52.0	51.2	82.9	25.3	25.3	47.8	30.6	29.1	92.2

Source: NISR, SAS 2024

Table 23: 2024 Season B_Percentage of farmers by source of inorganic fertilizers per district

District	Government (MINAGRI/ RAB/NAEB)	Agro dealers	NGOs/ Companies	Market	Agriculture cooperative	Other source	Total
Nyarugenge	4.2	62.5	-	33.3	-	-	100.0
Gasabo	3.5	77.7	-	14.7	4.1	-	100.0
Kicukiro	3.9	96.2	-	-	-	-	100.0
Nyanza	6.9	24.0	52.6	5.7	10.9	-	100.0
Gisagara	1.0	34.8	42.0	10.1	12.1	-	100.0
Nyaruguru	1.7	30.3	64.9	0.4	2.2	0.4	100.0
Huye	3.4	54.4	28.4	0.5	12.8	0.5	100.0
Nyamagabe	3.4	38.7	48.0	8.2	1.9	-	100.0
Ruhango	11.3	34.6	42.1	2.5	9.4	-	100.0
Muhanga	3.9	17.7	65.2	6.1	7.2	-	100.0
Kamonyi	5.2	45.1	28.5	4.2	17.1	-	100.0
Karongi	2.1	46.7	47.4	2.5	1.4	-	100.0
Rutsiro	4.8	50.9	38.6	5.3	0.4	-	100.0
Rubavu	1.9	74.2	21.5	0.8	1.5	-	100.0
Nyabihu	0.7	73.3	24.9	1.1	-	-	100.0
Ngororero	1.1	45.1	46.2	6.3	1.4	-	100.0
Rusizi	2.9	25.2	64.4	6.5	1.0	-	100.0
Nyamasheke	7.4	17.9	63.7	8.6	2.1	0.3	100.0
Rulindo	12.7	59.7	16.7	3.2	7.7	-	100.0
Gakenke	1.7	55.3	40.1	2.2	0.7	-	100.0
Musanze	1.6	66.1	30.7	1.6	-	-	100.0
Burera	11.6	49.7	33.2	1.8	3.4	0.3	100.0
Gicumbi	10.9	43.5	34.5	11.2	-	-	100.0
Rwamagana	6.7	53.9	37.3	0.5	1.6	-	100.0
Nyagatare	1.4	60.2	33.7	0.9	3.0	0.7	100.0
Gatsibo	4.3	42.2	47.6	3.7	1.7	0.6	100.0
Kayonza	4.1	62.0	27.3	2.9	3.3	0.4	100.0
Kirehe	15.6	22.4	42.2	3.8	15.6	0.4	100.0
Ngoma	11.0	42.9	35.6	2.5	7.4	0.6	100.0
Bugesera	1.8	31.6	50.4	7.1	9.1	-	100.0
National	4.8	46.6	39.9	4.4	4.2	0.2	100.0

Source: NISR, SAS 2024

Table 24: 2024 Season B_Source of inorganic fertilizer by type of fertilizer

Fertilizer name	Government (MINAGRI/ RAB/ NAEB)	Agro dealers	NGOs/ Companies	Market	Agriculture cooperative	Other source	Total
NPK 17-17-17	3.1	64.8	24.3	3.9	3.7	0.2	100
NPK 20-10-10;	54.7	9.4	14.1	4.7	17.2	-	100
NPK 25-5-5;	45.0	20.0	25.0	5.0	5.0	-	100
NPK 22-6-12;	67.9	10.7	17.9	3.6	-	-	100
Other NPK;	4.0	76.0	10.0	4.0	6.0	-	100
Urea;	3.1	48.8	40.4	4.5	2.9	0.2	100
liquid urea (Mbonea M	-	82.9	17.1	-	-	-	100
DAP	4.2	45.5	43.8	4.3	1.9	0.3	100
KCL/MOP,	-	100.0	-	-	-	-	100
Omax;	-	86.7	6.7	-	6.7	-	100
Winner;	12.5	50.0	25.0	12.5	-	-	100
Yara Viva;	-	100.0	-	-	-	-	100
Amidas;	-	80.0	20.0	-	-	-	100
Cereal;	-	45.5	18.2	-	36.4	-	100
DI Grow;	1.5	45.5	30.3	1.5	21.2	-	100
Dyna gro;	-	100.0	-	-	-	-	100
Lime/Ishwagara	3.7	51.4	41.1	3.7	-	-	100
Other type of fertilizer	1.2	77.2	11.1	4.9	5.6	-	100

Source: NISR, SAS 2024

Table 25: 2024 Season B Percentage of plots by type of inorganic fertilizer per district

District	NPK	Urea	DAP	KCL/MOP	Lime	Others	Total
Nyarugenge	7.1	64.3	14.3	-	-	14.3	100
Gasabo	18.0	43.1	35.1	-	-	3.8	100
Kicukiro	5.7	34.0	56.6	-	-	3.8	100
Nyanza	21.4	49.3	25.7	-	0.7	2.9	100
Gisagara	15.3	43.3	35.0	-	-	6.4	100
Nyaruguru	14.3	29.8	46.9	-	6.2	2.7	100
Huye	27.4	47.0	20.8	-	-	4.8	100
Nyamagabe	11.9	27.4	50.2	-	9.8	0.7	100
Ruhango	28.2	38.8	30.1	-	-	2.9	100
Muhanga	22.5	31.6	43.9	-	-	2.0	100
Kamonyi	16.8	44.5	35.8	-	-	2.9	100
Karongi	2.5	39.1	56.0	-	2.5	-	100
Rutsiro	29.6	29.1	31.5	0.5	8.9	0.5	100
Rubavu	48.2	24.5	22.1	-	-	5.2	100
Nyabihu	41.1	28.0	21.7	-	-	9.2	100
Ngororero	8.9	37.3	50.7	-	2.6	0.6	100
Rusizi	24.4	26.6	46.9	-	-	2.2	100
Nyamasheke	21.3	31.7	43.0	-	3.7	0.3	100
Rulindo	19.6	39.3	40.2	-	-	0.9	100
Gakenke	10.1	33.1	56.0	-	0.3	0.5	100
Musanze	33.5	32.1	26.5	-	0.4	7.7	100
Burera	20.8	20.1	56.0	-	0.7	2.4	100
Gicumbi	16.7	37.2	41.8	-	1.4	2.8	100
Rwamagana	12.6	42.9	41.0	-	1.0	2.5	100
Nyagatare	4.3	49.4	43.7	-	-	2.6	100
Gatsibo	11.1	46.1	38.7	0.2	0.2	3.7	100
Kayonza	15.8	42.2	33.3	0.3	0.3	7.9	100
Kirehe	14.1	38.3	44.1	-	1.2	2.3	100
Ngoma	20.0	43.9	29.7	-	0.7	5.8	100
Bugesera	11.5	34.0	48.7	-	0.2	5.5	100
National	17.9	36.8	40.6	0.0	1.4	3.3	100

Source: NISR, SAS 2024

Table 26: 2024 Season B_Use of pesticides by farmer type per district (Percentage)

District	Percentage of farmers who used pesticides			Percentage of plots in which pesticides were used			Percentage of land size in which pesticides were used		
	Overall	SSF	LSF	Overall	SSF	LSF	Overall	SSF	LSF
Nyarugenge	13.5	13.5		42.7	42.7		57.7	57.7	
Gasabo	29.8	28.0	71.4	49.4	49.4	52.3	62.9	60.2	91.5
Kicukiro	13.7	12.1	75.0	39.3	39.3	57.1	46.8	50.3	33.4
Nyanza	27.1	26.2	100.0	44.3	44.3	80.0	49.1	45.4	99.6
Gisagara	28.2	25.9	100.0	23.8	23.8	100.0	48.8	26.1	100.0
Nyaruguru	31.3	29.1	90.9	34.8	34.8	71.4	46.6	44.8	97.9
Huye	28.5	25.4	95.0	22.2	22.2	95.0	40.8	33.6	99.8
Nyamagabe	28.6	27.8	100.0	46.3	46.3	87.5	56.3	55.9	85.0
Ruhango	22.5	20.9	78.6	31.5	31.5	52.6	28.0	18.8	99.3
Muhanga	30.9	30.3	80.0	30.7	30.6	100.0	23.3	21.7	100.0
Kamonyi	33.3	32.8	80.0	28.7	28.7	100.0	30.6	29.3	100.0
Karongi	13.6	13.6	0.0	50.2	50.2	0.0	45.4	45.4	0.0
Rutsiro	27.9	27.9		52.6	52.6		64.4	64.4	
Rubavu	65.1	64.7	100.0	81.2	81.2	85.7	81.6	81.6	99.5
Nyabihu	55.6	55.6		77.5	77.5		82.0	82.0	
Ngororero	36.8	36.8		46.8	46.8		48.8	48.8	
Rusizi	20.0	19.0	70.0	44.3	44.3	100.0	55.1	42.1	100.0
Nyamasheke	18.9	17.5	88.9	32.3	32.3	100.0	46.7	42.4	100.0
Rulindo	44.0	43.5	80.0	38.2	38.2	78.6	38.1	37.8	83.4
Gakenke	44.3	44.0	100.0	39.3	39.3	100.0	45.6	45.5	100.0
Musanze	72.6	72.2	100.0	58.4	58.4	80.0	63.9	63.7	98.4
Burera	45.5	45.5		56.4	56.4		60.9	60.9	
Gicumbi	37.4	36.8	100.0	40.9	40.9	38.1	46.1	46.2	27.5
Rwamagana	18.5	15.5	63.3	68.3	68.3	44.0	63.8	61.7	83.3
Nyagatare	23.7	20.9	60.5	43.4	43.4	67.4	58.3	53.6	95.9
Gatsibo	31.6	30.2	65.4	47.6	47.6	67.4	61.5	57.2	97.5
Kayonza	27.7	24.4	82.8	28.5	28.5	61.7	46.9	38.2	98.1
Kirehe	15.1	14.6	62.5	48.4	48.4	100.0	63.7	56.6	100.0
Ngoma	14.6	12.5	81.0	22.2	22.1	74.3	42.4	33.1	97.3
Bugesera	22.3	20.4	53.9	33.8	33.8	77.6	46.0	38.9	94.3
National	30.2	29.1	74.9	44.2	44.2	66.9	52.4	49.0	97.0

Source : NISR, SAS 2024

Table 27: 2024 Season B Percentage of plots by type of pesticides per district

		Type of pesticides								
District	Dithane	Ridomil	Dimethoate	Cypermetrin	Dursiban	Pilkare	Rocket	Beam	Other pesticide	Total
Nyarugenge	35.0	-	15.0	10.0	-	-	35.0	-	5.0	100
Gasabo	15.8	2.5	6.7	7.5	-	0.8	49.2	2.5	15.0	100
Kicukiro	14.8	-	7.4	7.4	-	-	51.9	-	18.5	100
Nyanza	15.0	2.8	1.9	10.3	0.9	-	59.8	4.7	4.7	100
Gisagara	6.4	-	3.9	25.6	-	-	48.7	14.1	1.3	100
Nyaruguru	28.1	1.6	1.6	18.8	-	-	29.7	-	20.3	100
Huye	10.1	-	2.5	26.6	-	-	38.0	12.7	10.1	100
Nyamagabe	32.1	1.8	-	39.3	-	-	23.2	-	3.6	100
Ruhango	2.2	-	-	13.3	-	-	71.1	13.3	-	100
Muhanga	7.8	9.8	-	21.6	-	-	52.9	5.9	2.0	100
Kamonyi	24.6	3.4	4.2	6.8	-	-	49.2	1.7	10.2	100
Karongi	18.4	-	13.2	26.3	-	-	39.5	-	2.6	100
Rutsiro	60.2	11.7	1.9	18.5	-	-	6.8	-	1.0	100
Rubavu	32.2	21.4	13.8	21.4	-	-	8.0	-	3.2	100
Nyabihu	38.0	5.3	5.1	29.3	-	-	13.0	-	9.3	100
Ngororero	19.3	3.4	0.8	14.3	-	-	59.7	-	2.5	100
Rusizi	18.7	-	15.4	27.5	-	-	24.2	1.1	13.2	100
Nyamasheke	10.5	3.5	7.0	42.1	-	-	21.1	3.5	12.3	100
Rulindo	28.9	1.9	8.7	9.6	-	-	37.5	1.0	12.5	100
Gakenke	3.9	0.8	-	56.3	-	-	28.1	-	10.9	100
Musanze	33.2	5.5	11.5	17.0	-	-	22.8	-	9.9	100
Burera	31.6	3.9	16.5	13.0	-	-	29.9	-	5.2	100
Gicumbi	40.1	2.6	0.7	11.2	-	-	42.1	0.7	2.6	100
Rwamagana	15.5	-	11.0	16.1	-	-	31.6	6.5	19.4	100
Nyagatare	7.0	0.5	16.3	14.0	-	-	33.5	6.5	22.3	100
Gatsibo	16.7	2.1	5.2	3.7	0.5	-	55.2	3.1	13.5	100
Kayonza	18.5	0.7	12.3	17.8	-	-	21.9	12.3	16.4	100
Kirehe	27.3	0.9	14.6	10.0	-	-	28.2	1.8	17.3	100
Ngoma	23.9	-	6.5	17.4	-	-	30.4	7.6	14.1	100
Bugesera	5.3	2.0	4.0	12.7	-	-	53.3	8.0	14.7	100
National	24.7	5.5	8.3	19.0	0.1	0.0	30.2	2.7	9.6	100

Source: NISR, SAS 2024

Table 28: 2024 Season B Percentage of farmers who practiced agricultural practices.

District	Farmers who protected land against erosion (%)			Farmers who used any mechanical equipment for agriculture activities %)			Farmers who practiced irrigation (%)			Farmers who practiced agroforestry (%)		
	Overall	SSF	LSF	Overall	SSF	LSF	Overall	SSF	LSF	Overall	SSF	LSF
Nyarugenge	60.0	60.0	-	1.2	1.2	-	2.9	2.9	-	45.9	45.9	-
Gasabo	92.2	91.9	100.0	0.6	-	14.3	12.1	9.9	64.3	45.3	44.3	71.4
Kicukiro	42.9	42.7	50.0	1.9	1.3	25.0	8.7	8.3	25.0	67.5	67.4	75.0
Nyanza	93.3	93.2	100.0	-	-	-	17.7	16.8	85.7	54.4	54.5	50.0
Gisagara	94.3	94.1	100.0	-	-	-	24.9	23.3	75.0	38.4	39.6	-
Nyaruguru	97.1	97.0	100.0	0.3	0.3	-	13.1	10.3	90.9	40.5	40.0	58.3
Huye	92.9	92.6	100.0	0.2	0.2	-	40.2	37.6	95.0	31.3	32.3	9.5
Nyamagabe	95.3	95.3	100.0	-	-	-	5.4	5.2	20.0	36.6	36.4	60.0
Ruhango	91.6	91.4	100.0	0.4	0.4	-	16.0	14.5	71.4	37.5	37.9	20.0
Muhanga	96.9	96.8	100.0	0.2	0.2	-	7.4	6.6	80.0	28.3	28.5	14.3
Kamonyi	93.4	93.7	60.0	0.2	0.2	-	15.4	14.8	80.0	56.0	56.2	44.4
Karongi	98.3	98.3	100.0	-	-	-	8.3	8.3	-	39.4	39.3	100.0
Rutsiro	95.8	95.8	-	0.3	0.3	-	3.4	3.4	-	47.6	47.6	-
Rubavu	90.6	90.5	100.0	-	-	-	2.4	2.5	-	34.5	34.1	75.0
Nyabihu	92.5	92.5	-	0.6	0.6	-	2.8	2.8	-	36.3	36.3	-
Ngororero	99.0	99.0	-	0.6	0.6	-	14.6	14.6	-	46.0	46.0	-
Rusizi	84.3	83.9	100.0	0.2	0.2	-	17.9	16.9	70.0	57.8	58.3	30.0
Nyamasheke	97.4	97.3	100.0	-	-	-	7.2	6.0	66.7	60.2	60.6	33.3
Rulindo	92.2	92.1	100.0	0.8	0.6	20.0	23.6	23.0	60.0	52.3	52.5	40.0
Gakenke	96.6	96.6	100.0	-	-	-	7.1	6.8	100.0	38.6	38.8	-
Musanze	90.9	90.8	100.0	0.5	-	40.0	4.9	4.7	20.0	48.9	48.4	100.0
Burera	97.4	97.4	-	0.2	0.2	-	2.2	2.2	-	40.1	40.1	-
Gicumbi	97.7	97.6	100.0	0.4	0.4	-	12.1	12.1	16.7	41.3	40.7	100.0
Rwamagana	90.8	90.6	93.3	0.6	0.4	3.3	13.1	9.4	70.0	56.8	56.2	65.6
Nyagatare	66.2	64.0	95.4	5.6	2.0	53.5	12.8	9.5	55.8	56.5	57.1	49.1
Gatsibo	92.7	92.4	100.0	1.5	0.3	30.8	10.7	8.7	61.5	54.9	54.1	72.4
Kayonza	77.4	77.3	79.3	2.3	0.4	34.5	13.1	9.2	79.3	24.6	24.6	24.2
Kirehe	79.4	79.2	100.0	0.4	0.1	25.0	8.4	7.5	87.5	60.4	60.9	22.2
Ngoma	83.9	83.5	95.2	0.7	0.3	14.3	6.8	4.6	76.2	65.7	66.1	54.6
Bugesera	75.6	75.8	71.8	2.1	0.9	23.1	17.1	14.5	61.5	54.1	53.6	63.0
National	89.2	89.1	92.3	0.8	0.3	18.3	12.1	10.8	67.0	47.0	47.0	47.4

Source: NISR, SAS 2024

Table 29: 2024 Season B Percentage of plots by types of irrigation used.

District	Modern irrigation					Traditional techniques
	Surface irrigation	Flood irrigation	Drip irrigation	Sprinkler irrigation	Pivot irrigation	
Nyarugenge	-	-	-	-	-	100.0
Gasabo	30.8	11.5	-	-	-	57.7
Kicukiro	20.0	20.0	-	-	-	60.0
Nyanza	13.5	43.2	-	-	-	43.2
Gisagara	39.1	52.2	-	-	-	8.7
Nyaruguru	50.0	12.5	-	-	-	37.5
Huye	6.8	52.3	-	-	-	40.9
Nyamagabe	14.3	14.3	-	-	-	71.4
Ruhango	-	52.6	-	-	-	47.4
Muhanga	7.1	42.9	-	-	-	50.0
Kamonyi	28.0	12.0	-	-	-	60.0
Karongi	-	-	-	-	-	100.0
Rutsiro						
Rubavu						
Nyabihu	-	-	66.7	-	-	33.3
Ngororero	-	-	-	-	-	100.0
Rusizi	36.4	-	-	-	-	63.6
Nyamasheke	26.7	20.0	-	-	-	53.3
Rulindo	7.1	42.9	-	-	-	50.0
Gakenke	42.3	3.9	3.9	3.9	-	46.2
Musanze	12.5	25.0	-	-	-	62.5
Burera	20.0	-	-	40.0	-	40.0
Gicumbi	9.1	-	-	-	-	90.9
Rwamagana	31.3	14.1	14.1	12.5	1.6	26.6
Nyagatare	19.0	27.6	1.7	-	20.7	31.0
Gatsibo	55.0	15.0	-	10.0	2.5	17.5
Kayonza	12.0	38.0	-	4.0	8.0	38.0
Kirehe	11.8	23.5	-	35.3	11.8	17.7
Ngoma	51.5	24.2	-	15.2	3.0	6.1
Bugesera	17.7	16.1	11.3	32.3	-	22.6
National	24.1	25.0	3.1	7.5	3.3	37.1

Source: NISR, SAS 2024

Table 30: 2024 Season B Percentage of plots by source of water used and district.

District	Source of water used				
	Rainwater	Water treatment	Underground	Lake / streams	Water catchment
Nyarugenge	100.0	-	-	-	-
Gasabo	-	-	42.9	46.4	10.7
Kicukiro	-	-	-	100.0	-
Nyanza	-	2.7	18.9	73.0	5.4
Gisagara	-	-	51.7	41.4	6.9
Nyaruguru	-	6.3	6.3	87.5	-
Huye	2.2	2.2	53.3	40.0	2.2
Nyamagabe	12.5	-	25.0	62.5	-
Ruhango	-	8.0	24.0	60.0	8.0
Muhanga	-	-	35.7	50.0	14.3
Kamonyi	-	-	16.0	76.0	8.0
Karongi	-	12.5	87.5	-	-
Rutsiro					
Rubavu					
Nyabihu	-	50.0	50.0	-	-
Ngororero	6.3	-	18.8	75.0	-
Rusizi	-	-	53.3	40.0	6.7
Nyamasheke	-	3.3	36.7	33.3	26.7
Rulindo	-	12.5	37.5	50.0	-
Gakenke	20.0	20.0	-	60.0	-
Musanze	-	-	-	100.0	-
Ngororero	-	-	54.6	45.5	-
Gicumbi	-	8.3	50.0	41.7	-
Rwamagana	3.1	12.5	10.9	42.2	31.3
Nyagatare	5.1	-	35.6	40.7	18.6
Gatsibo	2.4	2.4	31.7	39.0	24.4
Kayonza	-	6.0	18.0	24.0	52.0
Kirehe	-	-	36.8	63.2	-
Ngoma	13.3	20.0	24.4	35.6	6.7
Bugesera	1.6	3.2	6.5	85.5	3.2
National	2.6	5.0	28.3	50.2	13.9

Source: NISR, SAS 2024

Table 31: 2024 Season B Percentage of plots by type of anti-erosion activities and district

District	Type of anti-erosion activities									
	Ditches	Trees/Windbreak/ shelterbelt	Bench terraces	Progressive terraces	Cover plants	Water drainage	Mulching	Beds/ridges	Water channels	Others
Nyarugenge	10.8	16.8	-	-	66.1	1.6	1.2	1.6	1.9	-
Gasabo	2.6	2.4	-	0.9	84.2	0.0	0.4	3.5	6.0	-
Kicukiro	1.2	23.5	2.5	5.2	52.5	0.1	10.3	4.7	0.0	-
Nyanza	6.1	6.4	5.4	3.0	61.6	0.2	1.3	2.6	13.4	-
Gisagara	25.4	7.2	1.0	0.1	47.5	0.0	1.1	3.7	14.2	-
Nyaruguru	5.3	7.0	6.1	1.8	61.0	0.0	0.7	0.4	17.7	-
Huye	6.0	6.2	2.5	20.5	44.8	3.9	2.0	2.0	12.1	-
Nyamagabe	2.1	6.0	12.6	7.8	55.2	-	0.1	0.9	15.3	-
Ruhango	5.9	9.5	0.2	0.4	66.6	0.0	0.4	1.9	15.2	-
Muhanga	3.0	8.7	1.3	7.2	69.7	0.0	2.8	1.8	5.5	-
Kamonyi	14.3	9.0	0.2	0.1	59.9	0.0	1.3	5.8	9.4	-
Karongi	2.6	2.0	3.0	1.8	80.2	0.1	2.4	0.5	7.4	0.1
Rutsiro	1.3	4.8	7.0	4.9	78.0	0.1	1.6	-	2.5	-
Rubavu	0.3	19.6	16.6	0.2	20.1	-	1.5	41.0	0.7	-
Nyabihu	6.4	2.4	9.7	4.5	65.7	-	-	10.8	0.5	-
Ngororero	1.4	9.5	4.0	4.5	72.5	-	1.3	0.8	6.0	-
Rusizi	7.0	11.4	0.1	7.8	58.2	0.0	6.0	0.9	8.5	0.0
Nyamasheke	3.3	6.3	4.2	4.1	61.7	0.0	11.0	0.8	8.5	0.2
Rulindo	2.5	2.1	6.6	13.6	63.5	1.5	0.4	0.3	9.5	-
Gakenke	0.4	6.9	4.6	11.9	70.2	-	2.6	0.1	3.4	-
Musanze	4.5	18.9	1.3	0.5	42.5	-	0.5	30.0	1.8	-
Burera	2.3	7.6	5.2	18.0	53.0	-	0.2	10.0	3.8	-
Gicumbi	0.7	2.8	6.0	30.5	54.5	-	1.1	-	4.4	-
Rwamagana	6.8	2.0	6.3	5.4	65.9	2.2	-	10.6	0.8	-
Nyagatare	6.9	2.3	-	4.5	75.6	0.1	5.5	3.0	2.1	-
Gatsibo	1.0	2.9	0.9	18.0	61.6	0.0	4.0	2.8	8.9	-
Kayonza	2.8	1.3	6.3	2.8	54.2	0.1	4.8	11.1	16.6	-
Kirehe	11.1	5.0	3.9	0.6	64.8	0.3	12.9	-	1.4	0.2
Ngoma	2.4	11.2	2.4	2.3	72.3	0.1	7.2	0.0	2.0	0.1
Bugesera	7.1	9.4	2.5	25.1	50.4	0.1	3.5	1.2	0.8	-
National	4.6	6.7	4.4	8.2	61.5	0.3	2.3	4.2	7.8	0.02

Source: NISR, SAS 2024

Table 32: 2024 Season B_Percentage of plots by degree of erosion per district

District	Degree of erosion			
	Severe (Rill erosion, Gully erosion, Mass movement/Landslides)	Moderate (Diffuse overland flow erosion, overland flow erosion)	Low (Wind erosion)	Very Low (Splash erosion)
Nyarugenge	5.2	14.5	16.8	63.5
Gasabo	0.8	2.1	47.7	49.4
Kicukiro	0.0	3.9	22.1	74.0
Nyanza	3.3	14.0	63.2	19.6
Gisagara	0.1	9.1	24.4	66.4
Nyaruguru	1.7	14.2	50.4	33.7
Huye	0.0	3.4	23.0	73.6
Nyamagabe	9.7	12.5	44.3	33.5
Ruhango	4.2	13.6	48.6	33.5
Muhanga	0.4	10.9	47.8	41.0
Kamonyi	3.2	5.9	14.1	76.8
Karongi	2.2	26.8	7.0	63.9
Rutsiro	7.3	25.8	25.5	41.5
Rubavu	1.4	3.7	22.2	72.7
Nyabihu	1.4	6.4	53.0	39.2
Ngororero	6.5	26.6	26.2	40.7
Rusizi	0.9	14.0	15.0	70.1
Nyamasheke	3.3	10.2	13.1	73.4
Rulindo	1.6	35.3	18.5	44.7
Gakenke	4.3	21.4	47.7	26.5
Musanze	2.0	7.0	31.7	59.3
Burera	3.5	9.3	55.9	31.3
Gicumbi	0.9	9.1	41.8	48.2
Rwamagana	0.1	0.0	83.4	16.4
Nyagatare	0.7	15.7	30.5	53.1
Gatsibo	1.1	4.3	10.2	84.5
Kayonza	0.0	12.1	43.0	44.8
Kirehe	0.2	15.9	9.4	74.6
Ngoma	0.1	0.9	4.4	94.6
Bugesera	0.0	2.9	31.6	65.5
National	2.5	12.5	32.5	52.6

Source: NISR, SAS 2024

ANNEXES

1. Concepts, definitions, and estimation methods

1. Total land area

Total land area at district level is the district area excluding area under inland water bodies. The definition of inland water bodies generally includes major rivers and lakes.

2. Agricultural area

The agricultural area includes arable land, land under permanent[3] crops and permanent pasture.

3. Arable land

Arable land includes land defined by the FAO as land under temporary crops (double-cropped areas are counted only once), temporary meadows for mowing or pasture, land under market and kitchen gardens and land temporarily fallow (less than five years). The abandoned land resulting from shifting cultivation is not included in this category. Data for arable land are not meant to indicate the amount of land that is potentially cultivable.

4. Permanent crop land

Permanent crops are sown or planted once and occupy the land for some years and do not need to be replanted after each annual harvest, such as cocoa, coffee and rubber. This category includes flowering shrubs, fruit trees, nut trees and vines, but excludes trees grown for wood or timber. The following crops are considered as permanent crops in SAS: Cooking banana, Dessert banana, Banana for beer, Avocado, Coffee, Sugar cane, Macadamia, Olive, Mango, Apple, Papaya, Orange, Lemon, Guava, Mulberry, Stevia, Jatropha, Palm, and Tea.

5. Permanent pasture land

Land used permanently (five years or more) for herbaceous forage crops, either cultivated or growing wild (wild prairie or grazing land).

6. Irrigated agricultural land

Area equipped for irrigation, which is actually irrigated, (sometimes expressed as a percentage of the total land area). Part of the area equipped for irrigation refers to area equipped to provide water to crops and includes areas equipped for full/partial control irrigation, equipped lowland areas, and areas equipped for spate irrigation. Part of the area equipped for irrigation which is irrigated refers to physical areas. Irrigated land that is cultivated more than once a year is counted only once.

3 For some plots, permanent crops are mixed with temporary crops which mean that same area is counted in both arable land area and area under permanent crop.

7. Physical area

Physical area refers to the total area of the plot as physically measured. The physical agricultural area in a district is estimated by aggregating all weighted individual agricultural plots area for that district.

8. Crop area (cultivated area)

Crop area refers to the area occupied by a given crop in a plot considering its density or occupation. In context of Rwanda as well as many African countries, mixed cropping system is a general practice in agriculture. This practice makes it complex to estimate area under crop cultivation. In case of pure stands (for crop completely covering a plot), crop area is equal or less to physical plot area (if a crop is partially covering the plot, the share is estimated then applied to the plot area). In case of mixed crops, the share of each crop in the plot is estimated by enumerator by eye estimation method and applied to the physical area of the plot to obtain area for each specific crop planted in plot. In this context, the crop share is eye estimation of crop density or occupation in a plot (in %) basing on spacing between plants. Cultivated area at district level is equal to the total weighted crop areas within plots in the whole district.

Examples

- In case of pure stands, crop area will be equal to the physical area if the crop entirely covers the whole plot. Otherwise, the crop area will be less than physical area. For example, a plot of 1 hectare in which maize was grown and completely occupies the whole plot (100 % occupied), it means that cultivated area for maize is 1 hectare. On the other side let us assume that the maize crop occupies 80 % of the total plot area. In that case the area of maize equals 0.8 hectares (1hectare times 0.8).
- In case of mixed cropping system, specifically seasonal crops the crop area is less than physical area. For example, a plot of 1 hectare grown with maize and beans which occupies 60 % and 40 % of total plot area respectively. The maize area will be 0.6 hectare (1hectare times 0.6), and beans area will be 0.4(1hectare times 0.4). It is important to note that sum of shares of seasonal crops do not exceed one hundred percent.
- When seasonal and perennial crops are mixed in same plot, since perennial crops are permanent crops in nature, their shares are treated separately from seasonal crops. The sum of seasonal crops share does not exceed 100 %, while for perennial crops shares are given based on density (spacing between trees) and it may exceed 100 percent. For example, a plot of 1 hectare grown with maize, bean, and cassava with 60 %, 40 % and 50% shares respectively. Maize area will be 0.6 hectare (1hectare times 0.6), beans area will be 0.4(1hectare times 0.4), while cassava area will be 0.5 hectare (1hectare times 0.5).

9. Developed area

Developed area is the land covered by crops. Due to mixed cropping (over exploitation of agriculture land or under exploitation in case pure cropping), developed area can be less or greater than the physical area. Basing on the example provided above of the plot in which maize, beans and cassava have been mixed, maize has 0.6, beans have 0.4 while cassava has 0.5 ha. The developed area equals the sum of the crops area equivalent to 1.5 ha.

10. Harvested area

Area harvested is defined as the total number of hectares for all crops that is harvested in a given agriculture season. In case of crops considered as seasonal, the harvested area is assumed to be equal to the cultivated

area. For perennial crops a farmer can decide to harvest a portion of land and stores the remaining production in the farm or harvest the whole plot for commercial or other purposes. In this case, the proportion of harvested area is estimated and applied to the plot area to obtain actual harvested area. For example, cassava which occupies 0.5 hectare has 5,000 trees of cassava. In agriculture Season B, if the farmer only harvested 1,250 trees. In this case, the farmer harvested only a quarter (0.125hectares) of the cultivated area.

11. Crop yield

Crop yield is defined as total reported quantity of harvested crop over the harvested area of that crop.

12. Crop production

Crop production is the product of crop yield and crop area (harvested). At district level, crop production is estimated by taking crop yield of crop produce times total harvested area in the district.

2. Sampling Errors

Table 33: Sampling Errors for major crops at the national level Season B 2024 data

Crop name	Estimate	SE	CV	95% Confidence Interval		DEFF	No. observations (plots)
				Lower	Upper		
Maize	92,944	3,485	0.037	86,106	99,781	0.249	3,844
Sorghum	120,005	5,297	0.044	109,611	130,399	1.360	2,407
Paddy rice	17,994	124	0.007	17,750	18,238	0.000	2,335
Sweet potato	97,289	2,939	0.030	91,522	103,055	2.454	3,322
Irish potato	41,836	2,994	0.072	35,960	47,711	1.571	1,225
Cassava	172,596	4,757	0.028	163,263	181,929	1.536	5,376
Bush bean	207,112	6,003	0.029	195,334	218,890	0.784	4,898
Climbing bean	122,000	4,529	0.037	113,112	130,887	2.726	3,229
Pea	8,248	761	0.092	6,755	9,741	1.262	340
Groundnut	21,085	1,424	0.068	18,292	23,879	1.567	778
Cooking banana	90,123	3,668	0.041	82,927	97,320	1.363	3,621
Dessert banana	48,809	1,911	0.039	45,059	52,558	1.599	3,547
Banana for beer	119,632	4,166	0.035	111,458	127,806	1.336	3,941

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