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Modified sections	Pages in the original document	Modifications made
Annex 2: List of Key Informants met during the survey	67-70	Removed
Annex 3: List of contacts (Respondents)	71-72	Removed

REPUBLIC OF RWANDA

Ministry of Agriculture and Animal Resources

SETTING BASELINES FOR MONITORING INDICATORS OF IMPLEMENTATION OF RWANDA'S SECOND NATIONAL RICE DEVELOPMENT STRATEGY (NRDS2)

Prepared by:
Dr. Emmanuel NZEYIMANA
Globalmax & Development Ltd
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Sponsored by:

CARD
COALITION for African Rice Development

AGRA
Growing Africa's Agriculture

JICA

Setting Baselines for Monitoring Indicators of Implementation of Rwanda's Second National

Rice Development Strategy (NRDS2)

Final Report

By

Dr. Emmanuel NZEYIMANA

(Globalmax and Development Ltd)

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EXECUTIVE SUMMARY

This report summarizes the baseline status for the second National Rice Development Strategy (NRDS2), the baseline survey was commissioned by the Japanese International Cooperation Agency (JICA) Rwanda Office. The assignment had two-fold objectives; one to set baseline figures for the NRDS M&E indicators, including the 12 indicators adopted at GM8 in October 2021, and the other is to identify the data sources, specify data collection methods and prepare a procedural manual for the ministry in charge of agriculture or the NRDS taskforce members to conduct M&E on the progress of NRDS implementation throughout the second phase of CARD.

With the following specific objectives, Globalmax and Development Ltd carried out the NRDS2 Baseline:

More specifically, the following elements were carried out:

1) Collection of data necessary for each indicator, identified in the country's NRDS M&E framework, including the 12 common and additional indicators.
2) Analysis of the data and compilation of a report to be submitted to Ministry of Agriculture and Animal Resources
3) Preparation of technical manual on data collection methods.

A total of **21** NRDS2 indicators; 4 under the overall Indicators remained: (1) Total production quantity, (2) total area harvested, (3) average yield, and (4) self-sufficiency rate, plus 17 under RICE Indicators (Resilience, Industrialization, Competitiveness and Empowerment) were measured.

A total of **237 interviews** were conducted with Smallholder Farmers, Millers and Market Actors/rice sellers across the country, the research used both qualitative and quantitative approaches to come up with relevant information on Baseline for the National Rice Development Strategy2 (NRDS2), Desk review, Key Informant Interviews (KIIs) and the survey questionnaire were used.

As it was the core of the assignment for Setting Baselines for Monitoring Indicators of Implementation of Rwanda's Second National Rice Development Strategy (NRDS2) against which the progress will be measured, in summary the following are the key findings identified to serve as NRDS2 Baseline Indicators (2019).

For the Overall Indicators, the survey traced the 2019 baselines and revealed that; (1) Total production quantity is at ***131,577 (Ton)***, (2) Total area harvested is at ***32,846 (Ha)***, (3) Average yield is at ***4.004t/ha***, and (4) Self-sufficiency rate is at ***57 %***.

The survey further established for RICE (Resilience, Industrialization, Competitiveness and Empowerment) indicators, that 2019 baseline for:

Resilience: (5) Area under irrigation is at ***28,932 (Ha)***, (6) Quantity of resilient variety seeds is at ***370 MT***, (7) New varieties released were ***7 New Varieties Released***, (8) Use of fertilizer is at ***83.5 %*** and application IPM is at ***20.2 %***.

Industrialization: (9) Level of industrial milling capacity is at ***0,*** (10) New value-added products is ***1*** (Briquettes), (11) Level of mechanization in production (unit) is at ***8 Tractors***, (12) Availability and accessibility of machinery and services to farmers is at ***1***, (13) Adoption of appropriate harvesting and postharvest equipment is at ***1 Combine Harvester***.

Competitiveness: (14) Share of local rice in the market is at ***38,9 %,*** (15) Quality of locally produced rice is at: Grade 1 (0%), Grade 2 (20%), Mixture (80%), (16) Availability varieties with marketable traits is at ***89 Tons***, (17) Quantity of high-yielding variety seeds is at ***207.1Tons***, (18) Seed supply through contract farming is at ***6.5%***.

Empowerment: (19) Smallholder farmers' accessibility to financial services is at ***80.6 %***, (20) Smallholder farmers' accessibility to technical training and services is at ***75.8 %*** and (21) Smallholder farmers' accessibility to private Extension Services in Rice Sector is at ***85 %***.

Furthermore, the assessment captured voices and recommendations of small holder farmers, rice traders and rice millers on two major questions: Question on what farmers think can be done to increase the quality and quantity of rice production and what rice traders think can be the strategies for increasing the consumption of the local rice products at market.

Farmers' voices "recommendations to increase the quality and quantity of rice production", through the survey with smallholder farmers, we captured their recommendations in regard to increase quantity and quality of rice. Majority of farmers (26%) see the mechanization in production as one of the strategies to increase rice production, (26%) recommends also access to quality seeds, (25%) recommends timely access to inputs, fertilizers and pesticides, while 15% recommends access to enough water, rehabilitation of canals and marshlands and 7% increased provision of extension and training services.

Rice Traders' Voices "recommendations increase the consumption of the local rice products", the survey with rice traders in 10 selected district markets in Kigali City and secondary cities; Nyabugogo, Nyarugenge, Kimironko, Kicukiro, Huye, Rusizi,

Muhanga, Musanze, Rubavu and Nyagatare, captured their recommendations for increasing the consumption of local rice at the market, 18 % recommends for setting competitive prices and increasing quality as key factors that may lead to increase the consumption of local rice, 28 % recommended increased quantity & quality produced, while 29 % stressed on increasing hygiene; purity and whitening of local rice and 24 % recommended for introducing high yielding varieties and 1% recommend for cutting down cost of production of local rice as a strategy.

Rice Millers' Voices "recommendations to increase the consumption of local rice products", the survey with rice 5 rice milling plants, Nyagatare mill (Nyagatare District), Mayange Mill (Bugesera District), Mukunguli Mill (Kamonyi District), Minoterie de Huye (Huye district) and COTICORI (Rusizi District) captured their recommendations for increasing the consumption of local rice at the market, the majority 40% recommend to increase the production of local rice, while 20% recommended to introduce new high yielding varieties of rice, and 20% recommended also to increase inspection of the quality of imported rice, and 20% recommended as well to the waiver of VAT for local rice.

ACRONYMS

7YGP	Seven Years Government Program
BNR	National Bank of Rwanda
CARD	Coalition for Africa Rice Development
CIP	Crop Intensification Program
COMESA	Common Market for Eastern and Southern Africa
COVID-19	Coronavirus disease 2019
ECAPAPA	Eastern and Central Africa Programme for Agricultural Policy Analysis
FAO	Food and Agriculture Organization of United Nations
FGDs	Focus Groups Discussions
FUCORIRWA	Fédération des Unions des Coopératives de Riz au Rwanda
GoR	Government of Rwanda
IFAD	International Fund for Agricultural Development
IPM	Integrated Pest Management
IRRI	International Rice Research Institute
ISAR	Rwanda Institute of Agriculture Research/Institut des Sciences Agronomiques au Rwanda
JICA	Japan International Cooperation Agency
KIIS	Key Informants Interviewed
LSF	Large-Scale Farmers
MFS	Multiple Frame Sampling
MINAGRI	Ministry of Agriculture and Animal Resources
MINICOM	Ministry of Trade and Industry
MRGC	Muvumba Rice Growers Cooperative
NGOs	Non-Government Organizations
NISR	National Institute for Statistics of Rwanda
NRDS	National Rice Development Strategy
NRP	National Rice Policy
NSAR	National Seed Association of Rwanda
NSC	National Seed Council
NSP	National Seed Policy
NST	National Strategy for Transformation
PSTA	Strategic Plan for the Transformation of Agriculture
RAB	Rwanda Agriculture and Animal Resources Development Board
RCA	Rwanda Cooperative Agency
RFRM	Rwanda Forum of Rice Mill
RICA	Rwanda Inspection and Certification Agency
RICE	Resilience, Industrialization, Competitiveness, Empowerment
RRA	Rwanda Revenue Authority
RSB	Rwanda Standard Board
SAS	Seasonal Agriculture Survey

SSS	Selected Seed Service/ Service des Semences Selectionnees
TICAD	Tokyo International Conference on African Development
TNT	The New Times
WFP	World Food Program
WUA	Water User Association

INTRODUCTION

1.1 Overview of the Rice Sector in Rwanda

As Rwanda modernizes into a knowledge-based economy, agriculture remains the backbone for sustained economic growth, providing high-quality livelihoods, and living standards for the population. Rwanda's agriculture is central to creating growth, jobs, exports, and livelihoods necessary to transform the economy that increased on average 5.3 percent annually a couple of years ago. Food crops are the dominant sub-sector accounting for 58 percent of the sector in terms of GDP contribution[1].

In 2004, the government prioritized the development of a select group of crops under Crop Intensification Program (CIP). These crops were chosen based on the degree of their contribution to import substitution, export revenues, food security, sector growth potential, and profitability. Rice has been identified as one of the potential priority crops which can improve farmers' incomes and livelihoods in Rwanda. It is regarded as a strategic crop for food security and income generation in line with the poverty eradication strategy. Rice can also absorb some of the increasing pressure on hillside land for food production[2].

Rwanda is endowed with marshlands and inland valley swamps that are highly suitable for rice cultivation. The climatic condition in Rwanda is ideal for rice production where the wet and dry seasons provide sufficient rains (800-1000mm) to feed rivers for irrigation. Suitable ecosystems of 46,000 ha of marshland and inland valley swamps can be put under production[3].

Rice is widely grown as an irrigated crop in Rwanda. Water becomes scarce, especially during the dry season in most of the marshlands where rice is grown. This scarcity is due to either (i) water availability and/or (ii) inequitable distribution of available water. In old marshlands, water availability is felt as a common problem. Due to poor maintenance, weeds and soils clog the irrigation canals. In new marshlands, the water equity, especially for rice fields in the tail ends of the water channels, is perceived as a major concern by rice growers.

Rice growers are grouped into farming cooperatives which are seen as an institutional engine to improve smallholder agricultural performance and they have increased very rapidly in terms of organization and production.

Agricultural cooperatives play a great role, mainly in rural areas, in distributing subsidized inputs (especially mineral fertilizers and improved seeds), in joint production

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[1]MINAGRI. (2018). National Agriculture Policy.

[2]MINAGRI. (2011). National Rice Development Strategy (NRDS1).

[3]MINAGRI. (2017). Strategic Plan for Agricultural Transformation 2018-24

and marketing. Cooperative effectiveness depends on the natural potential of districts and the level of external technical and financial assistance. According to Strategic Plan for the Transformation of Agriculture (PSTA4), based on data from 2014-2017, paddy rice has been the best-performing crop in terms of revenue per hectare (e-soko consumer prices)[4].

Cooperatives help farmers to access inputs (fertilizers and seeds). Rice farmers in most parts of Rwanda access good quality rice seeds through cooperatives/associations. For fertilizers, they register in the smart NKUNGANIRE system where they specify their districts, cooperatives, type and amount of fertilizers needed. After being registered, fertilizers are distributed to farmers through agro-dealers.

During the harvesting period, cooperatives drying grounds and stores are used for post-harvest activities of rice paddy which is transferred to rice millers' facilities after the setup of rice minimum price by the technical team. Government institutions and ministries support the process of paddy pricing as mediators between sellers and buyers. Before COVID-19 pandemic, the market of the locally produced rice was huge, and dominated by the local rice. According to MINICOM (2019), the total produced rice satisfied 53% of local market and the remaining was mainly filled by imports from Thailand, Pakistan, Vietnam and Tanzania. This was disrupted by the COVID-19 pandemic disease mainly during the lockdowns whereby Government of Rwanda provided food support to most vulnerable families, and this increased rice demand. To fill the gap, the imports of rice increased and therefore imported rice, mainly from Tanzania dominated the local market.

1.2 National Rice Development Strategies in Rwanda

The Coalition for African Rice Development (CARD), a consultative group of development partners and research institutions, has set out to double rice production in Sub-Saharan Africa. Spearheaded by the Alliance for a Green Revolution in Africa (AGRA) and the Japan International Cooperation Agency (JICA), the CARD has taken the initiative of drawing National Rice Development Strategies (NRDS) for Rwanda.

The first NRDS (2010-2018) aimed to achieve self-sufficiency in rice production by 2018 and to substantially raise the competitiveness of Rwanda rice in local and regional markets. It was envisaged that the approaches would raise the productivity level from 5.8 t/ Ha to 7.0 t/ Ha and expand the area under cultivation from 6,838 ha to 28,500 ha by 2018. It was emphasized that an integrated approach to interventions in the key sub-sectors along the rice value chain could provide sustainability to the targeted increases in productivity and area under cultivation. The proposed strategies were aligned with the overarching national, regional, and global perspectives on economic development and poverty reduction (MINAGRI, 2011).

The establishment of NRDS secretariat was proposed to help attain coherence amongst rice-related projects and programs, and provide a forum for consultations on policies and implementation of projects by the various stakeholders along the rice value chain in

[4] MINAGRI. (2017). Strategic Plan for Agricultural Transformation 2018-24

Rwanda. To continue supporting the process of rice sector development in Rwanda, NRDS2 was developed by setting new objectives, projections and targets.

1.2.1 NRDS2 Indicators Definition

The NRDS2 defined a number of indicators; among which 21 were selected for monitoring of its implementation. Below, are the 21 indicators classified under overall Indicators (4) plus 17 under RICE Indicators (Resilience, Industrialization, Competitiveness and Empowerment).

Table 1: NRDS Indicators Definition

Approach	Category	Indicator	Definition
Overall	Production	Quantity of paddy produced (ton)	Sum of paddy produced in a given year in different ecologies
	Area	Total area harvested (ha)	Sum of rice-harvested area from all rice-growing ecologies
	Productivity	Yield per unit area (t/ha)	Average quantity of paddy grains harvested per hectare of land (obtained by dividing the quantity of paddy produced by the area harvested)
	Self-sufficiency	Self-sufficiency (%)	Coverage rate of rice needed by local production
Resilience	Resilient production system – Irrigation	Area under irrigation (ha)	Area under rice cultivation with supplementary irrigation that could mitigate the negative impacts of weather fluctuations on rice production
	Availability of resilient variety	Quantity of resilient variety seeds (ton)	Quantity of seeds of varieties with resilient characteristics, locally produced and/or imported annually
	New resilient varieties released*	Number of resilient varieties released.	Number of varieties released to farmers with appealing traits of diseases resistance and cold tolerance
	Use of fertilizer and application of IPM*	Percentage of farmers using fertilizers and applying IPM	The share of farmers using fertilizers and other good agriculture practices
Industrialization	Modernization of processing	Level of industrial milling capacity	The number of millers who operate at more than 70% of their milling capacity
	New value-added products*	Number of new products/ byproducts developed	The number of new value-added products or byproduct delivered from rice grains or biomass.
	Modernization of production	Level of mechanization in production (unit)	The number of machines available for ploughing in rice producing areas
	Modernization	Number of Service	Availability and accessibility of

	of production*	Providers for machinery services	machineries and services to farmers
	Adoption of appropriate harvesting and post harvesting equipment*	Number and type of harvesting and post harvesting tools	Adoption of appropriate harvesting and post harvesting tools with engine or motors.
Competitiveness	Market penetration	Share of local rice in the market (%)	Share of locally produced rice in the total quantity of rice procured by major retail stores (in urban areas) and major sales points in rural areas for a year
	Quality of locally produced rice improved*	Percentage of each grade of locally produced rice	The grading of rice locally produced is observed.
	Availability of seeds of varieties with marketable traits*	Quantity of seeds of varieties with marketable traits available	Quantity of seeds of locally preferred varieties with marketable attributes (long size and aroma), locally produced
	High yielding varieties seeds	Quantity of high yielding variety seeds (ton)	The number of tonnes of quality seeds of high yielding varieties
	Seed supply through contract farming*	Number of cooperatives accessing quality seeds through contract farming	Use of contract farming for Seed supply through contract farming between cooperatives and millers
Empowerment	Access to finance	Smallholder farmers' accessibility to financial services (%)	Percentage of smallholders in pre-selected farmers' groups/associations accessing necessary financial services (in rice producing areas)
	Access to extension	Smallholder farmers' accessibility to technical training and/or services (%)	Percentage of smallholder in pre-selected farmers' groups/associations regularly accessing necessary technical training and services (in rice producing areas)
	Access to extension*	Smallholder farmers 'accessibility to private Extension Services in Rice Sector (%)*	Penetration of private extension companies in delivering extension services in rice production.

*: Added Indicators

1.2.2 Alignment of CARD and NRDS2 Indicators

For the second National Rice Development Strategy (NRDS2) 21 Indicators are considered for the baseline survey, our discussion with the NRDS Task Force suggested to add 9 Indicators that are country specific: The overall NRDS Indicators remained 4: (1) production quantity, (2) area harvested, (3) yield, and (4) self-sufficiency rate, while under RICE Approach (Resilience, Industrialization, Competitiveness and Empowerment), number of Indicators increased as follows:

Resilience: (5) Area under irrigation (ha), (6) Quantity of resilient variety seeds (ton), (7) New resilient varieties released, (8) Percentage of farmers using fertilizer and applying IPM.

Industrialization: (9) Level of industrial milling capacity (%), (10) New value-added products/ byproducts, (11) Level of mechanization in production (unit), (12) Number of service providers for machinery services, (13) The number and type of harvesting and post harvesting tools.

Competitiveness: (14) Share of local rice in the market (%), (15) Percentage of each grade of locally produced rice, 16) Quantity of seeds of varieties with marketable traits available, (17) Quantity of high-yielding variety seeds (ton), (18) The number of cooperatives accessing quality seeds through contract farming.

Empowerment: (19) Smallholder farmers' accessibility to financial services (%), (20) Smallholder farmers' accessibility to technical training and/or services (%), and (21) Smallholder farmers' accessibility to private Extension Services in Rice Sector (%).

NB: Definitions to explain the 12 CARD indicators remain valid for the local context, NRDS2 has defined the 9 additional indicators as follows:

1) New resilient varieties released: Number of varieties released to farmers with appealing traits of diseases resistance and cold tolerance.
2) The percentage of farmers using fertilizer and applying IPM: Farmers are using fertilizers and practicing IPM.
3) New value-added products/ byproducts: Value addition for new product or by product delivered from rice grains or biomass.
4) Level of mechanization in production (unit): Improved adoption of farm machineries in rice growing marshlands (The number of marshlands mechanized).
5) The number and types of appropriate harvesting and post-harvesting tools: Adoption of appropriate harvesting and post harvesting tools with engines or motors.
6) The percentage of each grade of locally produced rice: The grading of rice locally produced is observed.
7) The quantity of seeds of varieties with marketable traits available: Quantity of seeds of locally preferred varieties with marketable attributes (Long size and aroma), locally produced.

8) The number of cooperatives accessing quality seeds through contract farming: Use of contract farming for Seed supply through contract farming between cooperatives and millers.
9) Smallholder farmers 'accessibility to private Extension Services in Rice Sector (%): Penetration of private extension companies in delivering extension services in rice production.

BASELINE FOR NATIONAL RICE DEVELOPMENT STRATEGY 2

In Rwanda, rice demand has increased sharply, thus amplifying the volume of rice imports. During the TICAD meeting (2018), the Coalition for African Rice Development (CARD) was tasked to support Sub-Saharan African countries to double rice production from 28 million to 56 million tonnes by 2030. To achieve this target, CARD supported countries to develop their national rice strategies including Rwanda, and it produced the document guiding rice sub-sector from 2020 to 2030 (NRDS2). For NRDS2, CARD adopts RICE approach (Resilience, Industrialization, Competitiveness, and Empowerment) to facilitate monitoring the implementation of NRDS2 up to 2030.

2.1 Objectives of the assignment

2.1.1 Overall objective

The primary purposes of the study were two-fold. One was to set baseline figures against the NRDS M&E indicators, including the 12 indicators adopted at GM8 in October 2021, and the other was to identify the data sources, specify data collection methods and prepare a procedural manual for the ministry in charge of agriculture or the NRDS task force team members to conduct M&E on NRDS progress throughout the second phase of CARD.

2.1.2 Specific objectives

More specifically, the following elements were carried out:

1) Collection of data necessary for each indicator, identified in the country's NRDS2 M&E framework, including the 12 common and additional indicators.
2) Analysis of the data and compilation of a report to be submitted to Ministry of Agriculture and Animal Resources
3) Preparation of technical manual on data collection methods.

2.2 Proposed approaches and methodology

Both qualitative and quantitative approaches were used to come up with relevant information on Baseline Study of the National Rice Development Strategy2 (NRDS2). The study utilized such techniques, desk review, Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs), and the survey questionnaire.

2.2.1 Desk Review

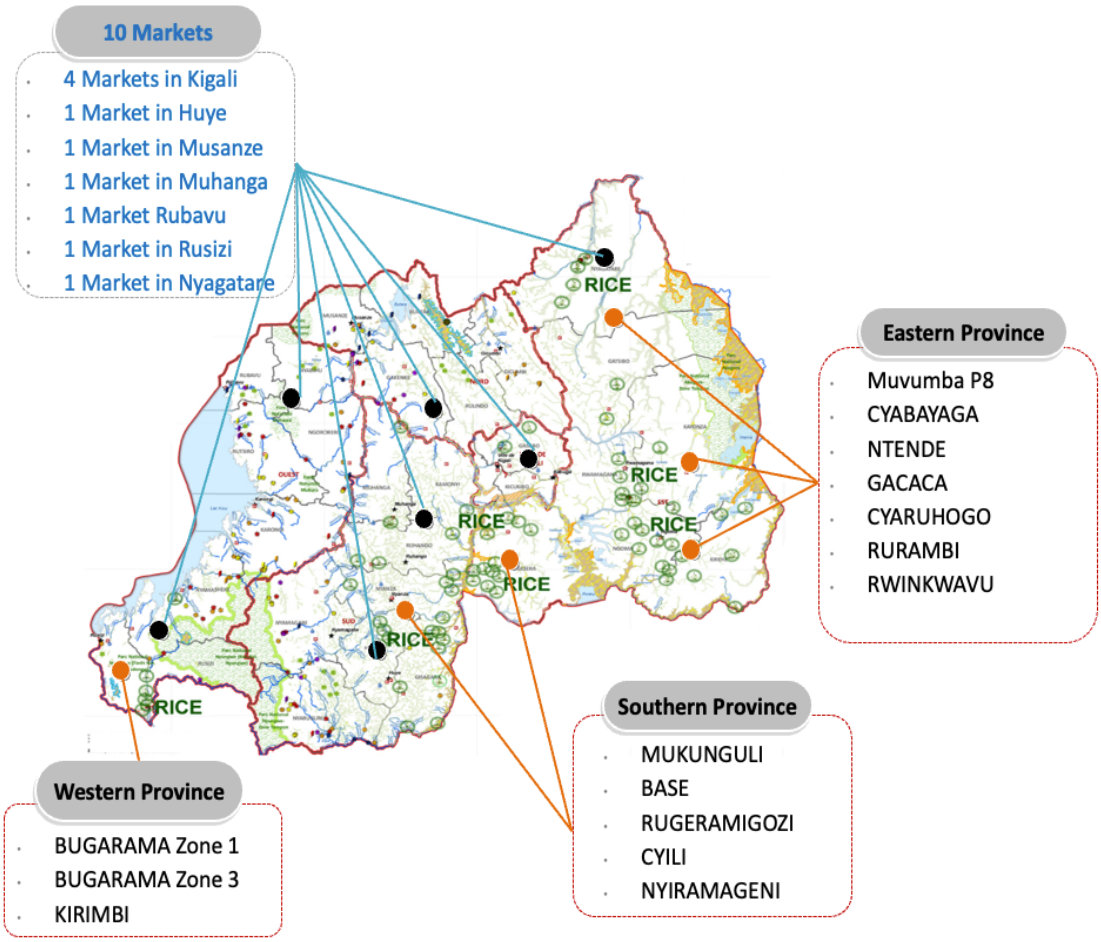
Desk review technique was used to build relevant databases, publications and reports (from NISR, MINAGRI, MINICOM, RAB, RRA, GoR's Development Partners World Bank, FAO, JICA, the private sectors etc) which provided knowledge about rice sector in Rwanda. Associated with primary information, secondary information contributed to developing of policy options and their strategies for project implementation. Relevant policy documents, such as NST1 and PSTA IV, were used.

2.2.2 Stakeholder analysis and consultations

The rice value chain is composed of various stakeholders with multiple horizontal and vertical links from producers to consumers. Those involved in the chain include primary producers, farmer's cooperatives, government institutions, financial institutions, insurance companies, inputs traders, processors, importers, wholesalers, retailers and consumers. Considering the indicators stipulated in the ToRs, some of the value chain actors were consulted and a questionnaire administered to collect data during the survey. It was composed of both closed and open-ended questions and was mainly administered to sample targeted groups in different regions to collect baseline information about rice production, milling and marketing. It was used mainly for collecting quantitative and qualitative information only for the data for some indicators of which information were not available and there was a need to collect primary data.

2.2.3 Data collection methods and analysis

The methods used for data collection was the fields survey and interviews for primary data gathering where the survey covered in total 15 rice marshlands: Muvumba P8, Cyabayaga, Ntende, Gacaca, Rwinkwavu, Cyaruhogo, Rurambi, Mukunguli, Base II, Rugeramigozi, Cyili, Nyiramageni, Kirimbi, Bugarama Zone 1, Bugarama Zone 3 where smallholder farmers were interviewed. In the selected 10 district markets in Kigali city (Nyabugogo, Nyarugenge, Kimironko, Kicukiro) and secondary cities (Huye, Rusizi, Muhanga, Musanze, Rubavu and Nyagatare) where rice sellers selected randomly were interviewed. Five (5) rice processors were visited namely Nyagatare Mill (Nyagatare District), Mayange Mill (Bugesera District), Mukunguli Mill (Kamonyi District), Minoterie de Huye (Huye district) and COTICORI (Rusizi District); secondary data were obtained using different approaches such as desk review of documents and reports related to rice crop, NRDS 2, rice policy document, PSTA 4 document, scientific publications on rice in Rwanda, online publications of different institutions. We organized interviews with key informants in Ministry of trade, Ministry of Agriculture, Rwanda Agriculture and Animal Resources Development Board (RAB), National Institute for Statistics of Rwanda (NISR), Rwanda Revenue Authority (RRA), federation of rice cooperatives (FUCORIRWA) and federation of rice millers, etc.



Legend:

- Surveyed Markets
- Surveyed Marshlands

Figure 1: NRDS2 ME Baseline Survey Map

Section I: State of NRDS2 Baseline Indicators

Section I: State of NRDS2 Baseline Indicators

I.1. Demographic Characteristics

Table 2: Respondents per region

Regions	Small Holder Farmers	Rice Sellers/Markets
	Interviews (%)	Interviews (%)
CoK	-	32.4
North	-	11.1
East	45.2	11.1
South	32.3	22.2
West	22.6	23.1
Total	**100**	**100**

NRDS2, survey 2022.

As per the table above, for the category of markets respondents; the majority of respondents were from the City of Kigali (32.4%), this is because the study plan considered the City of Kigali to host a big number of rice consumers and out of 10 District markets surveyed, four were identified from the city of Kigali. South and Western Provinces come in the second place with 22.2% and 23.1% respectively while North and Eastern Provinces come in the third place each with 11.1% respondents.

For the category of smallholder farmers, majority of respondents 45.2% operates in the Eastern Province, followed by the Southern province in the second place with 32.3% of total respondents while Western Province occupies the third place with 22.6% of respondents, City of Kigali and Northern Provinces were not part of the sample element.

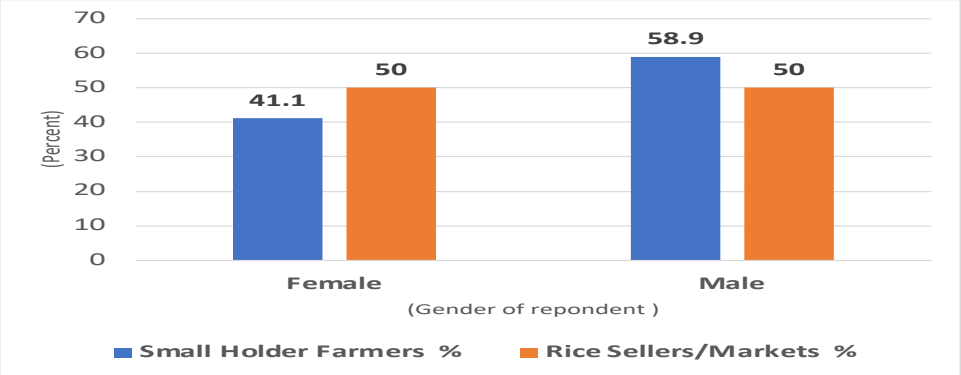


Figure 2: Gender of Respondents

NRDS2, survey 2022.

As per the figure above, it can be observed that the survey took into consideration gender representation; the team did it deliberately to reach out equally to both males and females in both categories to avoid any potential biases or leave untouched any insights due to gender of respondents. The survey perfectly reached out at 50% of male and female for the category of rice sellers and 41.1% female and 58.9% male for the category of small holder farmers.

Table 3: Number of respondents, per category and per district

	Small Holder farmers		Rice Sellers/Markets	
District	**Respondents**	**%**	**Respondents**	**%**
Gasabo	-	-	11	10.2
Huye	-	-	12	11.1
Kicukiro	-	-	14	13
Musanze	-	-	12	11.1
Nyarugenge	-	-	10	9.3
Huye	-	-	12	11.1
Muhanga	8	6.5	12	11.1
Nyagatare	16	12.9	12	11.1
Rusizi	13	10.5	13	12
Bugesera	8	6.5	-	-
Gatsibo	8	6.5	-	-
Gisagara	16	12.9	-	-
Kamonyi	8	6.5	-	-
Kayonza	16	12.9	-	-
Nyamasheke	15	12.1	-	-
Ruhango	8	6.5	-	-
Rwamagana	8	6.5	-	-
Total	**124**	**100**	**108**	**100**

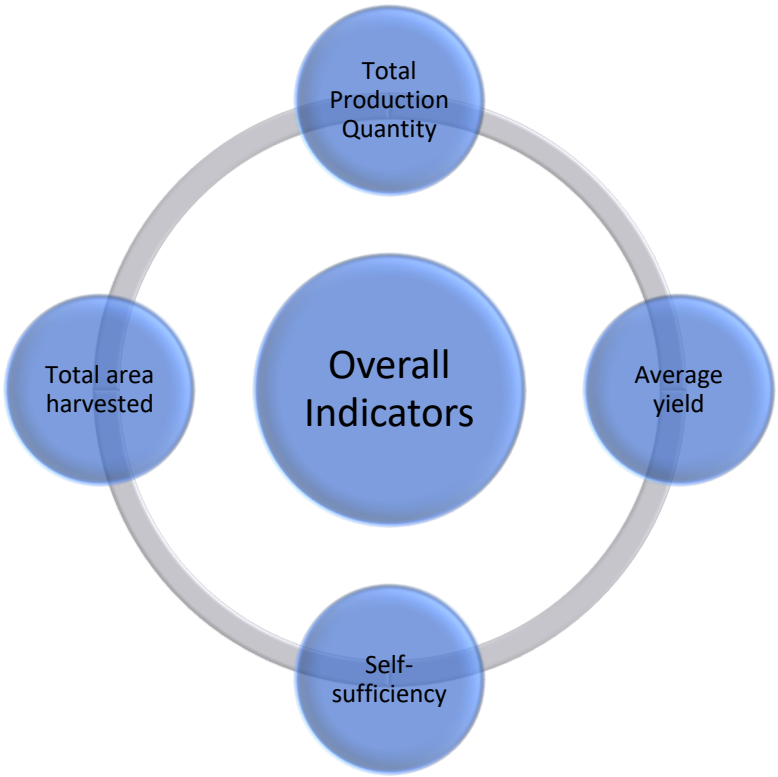
NRDS2, survey 2022.

In total the survey covered 17 Districts and reached out to 237 respondents; 124 under the category of "smallholder farmers", 108 under the category of "Rice Sellers/Markets" and 5 under the category of "Rice Millers". As the implementation period for the second National Rice Development Strategy (NRDS2) is ten years from 2020-2030, while the first NRDS its duration was from 2010-2018[5]; therefore, the baseline for the second

[5] MINAGRI, National Rice Development Strategy (2020-2030)

strategy is determined the state of indicators in 2019 season B for all the identified 21 Indicators: 4 Overall indicators and 17 RICE Indicators.

I.1 Overall NRDS Indicators



<u>Indicator 1</u>: Quantity of paddy production

Paddy production is the sum of paddy produced in a given year in different ecologies. Meaning that the data from indicators 2 and 3 are prerequisites to obtain the paddy production. The source of data is NISR "SAS".

The second National Rice Development Strategy defines the indicator of Quantity of paddy produced (ton) as the *"Sum of paddy produced in a given year in different ecologies"*

In the last 30 years, rice production in Rwanda has increased tremendously, according to FAO Statistics, in 1991 the rice gross production value was 3,276,000 USD which doubled in 10 years (2000) to 6,848,000USD and hiked (Twenty times) in twenty years up to 65,840,000USD in 2010 and almost doubled between 2010 and 2019, as the gross production value was 106,471,000 USD in 2019.

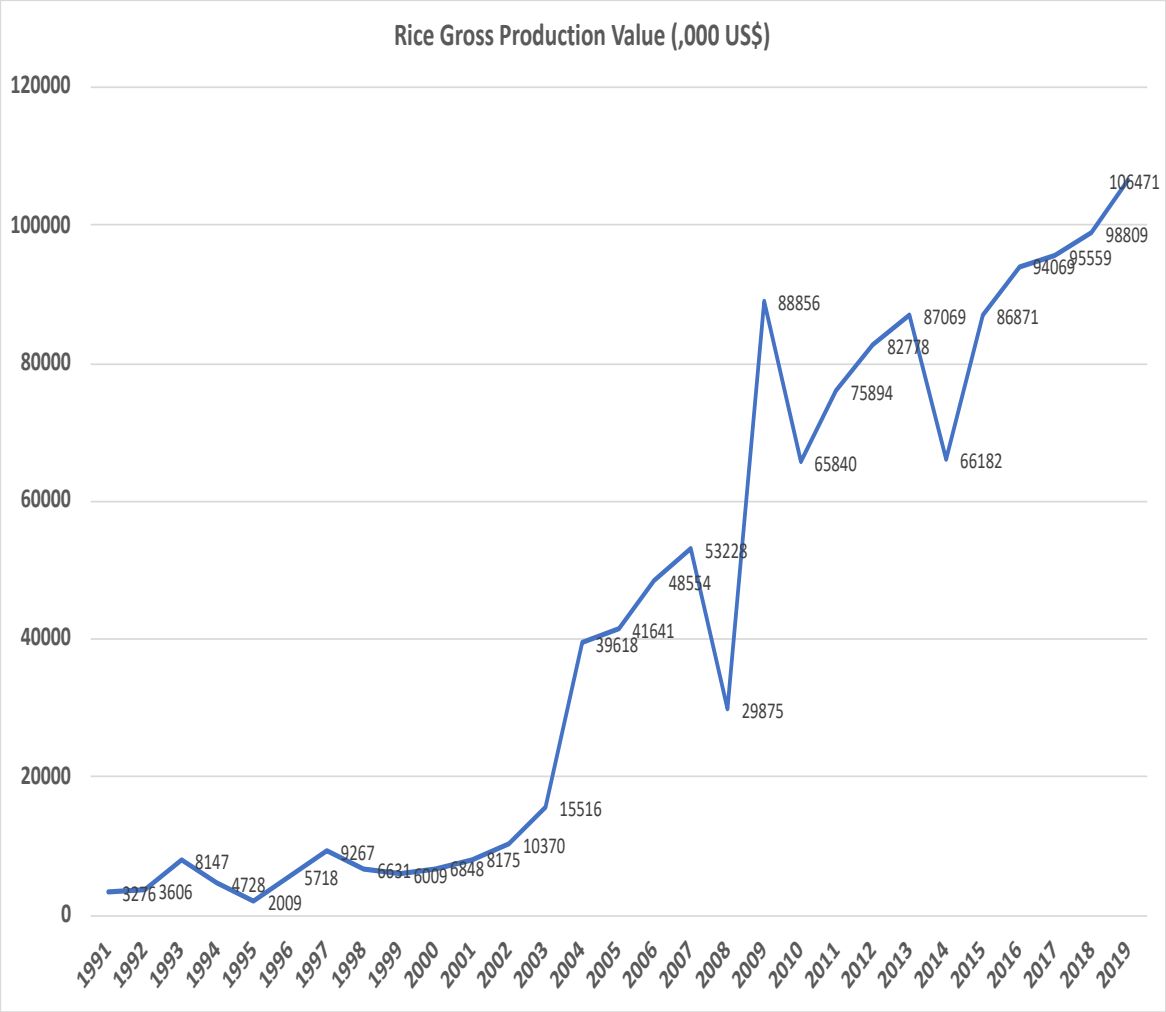


Figure 3: Rice Gross Production Value (.000 US$), last 30 Years

Source: FAO STAT[6]

This explains how much efforts GoR invested in development of Rice production in Rwanda, as per NISR's Seasonal Agricultural Survey/SAS (2019), the national rice production was 131,577 MT. The biggest rice production regions are; Gisagara, Rusizi, Nyagatare, Gatsibo, Ngoma and Bugesera which contribute each to more than 5,000 MT annually.

[6] FAO STAT: https://www.fao.org/faostat/en/#data/QV

Table 4: Quantity of paddy production

	Season A 2019_Crop production by crop type per district (MT)	Season B 2019_Crop production by crop type per district (MT)	Total Production of Season A & B
District	Paddy rice	Paddy rice	Paddy rice
Gasabo	541	1,019	1,560
Nyanza	1,129	2,923	4,052
Gisagara	7,886	12,878	20,764
Huye	2,891	3,776	6,667
Ruhango	3,822	6,348	10,170
Muhanga	596	612	1,208
Kamonyi	649	544	1,193
Rusizi	7,605	7,952	15,557
Nyamasheke	1,465	1,855	3,320
Rulindo	37	77	114
Rwamagana	1,449	1,097	2,546
Nyagatare	9,971	8,567	18,538
Gatsibo	6,123	5,853	11,976
Kayonza	3,221	3,537	6,758
Kirehe	3,887	3,718	7,605
Ngoma	3,982	5,469	9,451
Bugesera	4,033	6,066	10,099
National	**59,286**	**72,291**	**131,577**

Source: NISR, SAS 2019

Indicator State at Baseline

Table 5: Quantity of Paddy Production (ton)

Secondary data [**Yes/No**]	**Source of Data**
Yes	NISR "SAS"[7]
State at Baseline	***131,577(Ton)***

Data for this indicator is available from the secondary data and the source of data is NISR "SAS" which is a reliable source of the data for this indicator because of their mandate as a national institute for statistics. They possessed resources to do regular

[7] NISR, SAS (2019): https://www.statistics.gov.rw/publication/seasonal-agricultural-survey-2019-annual-report

surveys on agricultural sector which they do twice a year/season, you can get most of updated and published data.

<u>Indicator 2</u>: Total Area Harvested

Area harvested is defined as the Sum of rice-harvested areas from all rice-growing ecologies per year. The data will be sourced in National institute of statistics where the national institute of statistics in Rwanda in collaboration with ministry of agriculture and animal resources (MINAGRI), NISR conducts a regularly seasonal agriculture survey (SAS) to gather information related to crops and livestock.

For crops, Rice is one of the surveyed commodities and data are collected in rice growing districts, SAS use Multiple-Frame Sampling (MFS) methodology by which, area frame is constructed and a survey sample is drawn from it. In addition, a list frame of large-scale farmers (LSF), with at least 10 hectares of agricultural holdings is done to complement the area frame to cover crops mostly grown by large-scale farmers which are not easily covered in the area frame. To construct an area frame, the process involves the following two steps: land cover classification, land stratification, and sampling of a segment. For rice commodity, land cover classification shows that Rwanda has 13 land cover classes with paddy land wetland among them. With this paddy land class, rice crop is grown twice a year with a certain percentage of occupation reduced in the dry season due to shortage of water. Data Supplements from Rwanda Agriculture and animal resources development board and districts staffs are availed for a complete survey. NISR can estimate the land under rice crops seasonally; NISR/SAS should be the reliable source of the data for this indicator because of the possessed resources to do regular surveys on agricultural sector which they do twice a year/season, most updated data and published.

The second National Rice Development Strategy defines the indicator of total area harvested (ha) as *"The Sum of rice-harvested area from all rice-growing ecologies"*.

Table 6: Total Area Harvested

	Season A 2019_Harvested area per district (ha)	Season B 2019_Harvested area per district (ha)	Total harvested Area [Season A &B]
District	**Paddy rice**	**Paddy rice**	**Paddy rice**
Gasabo	164	243	407
Nyanza	359	812	1171
Gisagara	2,085	3,528	5613
Huye	895	1,401	2296
Ruhango	887	1,823	2710
Muhanga	151	148	299
Kamonyi	205	180	385
Rusizi	1,472	1,539	3011
Nyamasheke	327	523	850
Rulindo	16	17	33
Rwamagana	339	368	707
Nyagatare	2,373	2,052	4425
Gatsibo	1,410	1,365	2775
Kayonza	872	953	1825
Kirehe	839	821	1660
Ngoma	956	1,136	2092
Bugesera	1,271	1,316	2587
National	**14,671**	**18,225**	**32,846**

Source: NISR, SAS 2019

Indicator State at Baseline

Table 7: Total area harvested (ha)

Secondary data [**Yes/No**]	**Source**
Yes	NISR "SAS"[8]
State at Baseline	***32,846 (Ha)***

Data for this indicator is available from the secondary data and the source of data is NISR "SAS" which is a reliable source of the data for this indicator because of their mandate as a national institute for statistics. They possessed resources to do regular surveys on agricultural sector which they do twice a year/season, you can get most of updated and published data.

[8] Ibid

Indicator 3: Yield per Unit Area

Rice yield is defined as the average quantity of paddy grains harvested per hectare of land (obtained by dividing the quantity of paddy produced by the area harvested). This method is estimating the yield using a two-step method involving sampling the crop and calculating the yield. Data will be sourced from NISR "SAS".

As per methodology used by NISR, the sampling is conducted in selected rice marshlands of targeted districts where a rice crop yield means measuring the yield of a small fraction of total harvested area. The sample is representing the crop as a whole. The sample is accurate generally per site. For ease of measurement, harvest and cut all the panicles within the "mini samples" and collect them in one place. Thresh the grains, being careful not to lose any (a small error in sampling may lead to a large error in calculating the yield). According to NISR, Seasonal Agricultural Survey/SAS (2019), the average yield of paddy rice was estimated at **4,004** kilograms per hectare[9].

Table 8: Yield per Unit Area (T/Ha)

	Season A 2019_Average yield by crop type per district (Kg/Ha)	**Season B 2019_Average yield by crop type per district (Kg/Ha)**	**Average yield for year 2019 (Kg/Ha)**
District	Paddy rice	Paddy rice	Paddy rice
Gasabo	3,305	4,193	3,749
Nyanza	3,142	3,599	3,371
Gisagara	3,781	3,650	3,716
Huye	3,232	2,695	2,964
Ruhango	4,310	3,482	3,896
Muhanga	3,938	4,133	4,036
Kamonyi	3,175	3,031	3,103
Rusizi	5,167	5,167	5,167
Nyamasheke	4,480	3,547	4,014
Rulindo	2,243	4,500	3,372
Rwamagana	4,277	2,984	3,631
Nyagatare	4,202	4,175	4,189
Gatsibo	4,341	4,287	4,314
Kayonza	3,694	3,713	3,704
Kirehe	4,634	4,529	4,582
Ngoma	4,165	4,813	4,489
Bugesera	3,173	4,609	3,891
National	**4,041**	**3,967**	**4,004**

Source: NISR, SAS 2019

[9] Ibid

Indicator State at Baseline

Table 9: Yield per Unit Area (t/ha)

Secondary data [**Yes/No**]	**Source**
Yes	NISR "SAS"[10]
State at Baseline	***4.004t/ha***

Data for this indicator is available from the secondary data and the source of data is NISR "SAS" which is a reliable source of the data for this indicator because of their mandate as a national institute for statistics. They possessed resources to do regular surveys on agricultural sector which they do twice a year/season, you can get most of updated and published data.

Indicator 4: Self-sufficiency rate

The self-sufficiency rate is the national rice demand covered by locally produced rice. The self-sufficiency ratio is measured as a percentage obtained from the total local milled rice times 100 over the total national demand of milled rice. The total demand for milled rice at country level is the imports milled rice plus the local milled rice minus exports. Data related to imports and exports can be obtained from Rwanda Revenue Authority which is represented in taskforce on rice commodity. In order to obtain the local milled rice, the data available from indicator 1 will be converted into milled rice by multiplying the total paddy produced at country level with 0.65 (This conversion rate from paddy rice to milled rice was set by the National Technical Team: MINICOM, MINAGRI, RAB, Millers and FUCORIRWA).

Data from Rwanda Revenue Authority (2019) have shown that the total quantity of rice imports and the total rice exports in 2019 were 63,803 and 53 Tones respectively[11] while the total local production in the same year; according to NISR, SAS (2019) was 131,577 Tones, meaning that after milling the amount of local milled rice was 85,525 Tones. The self-sufficiency rate was at 57 %.

[10] Ibid

[11] RRA, Imports and exports of Rice 2019

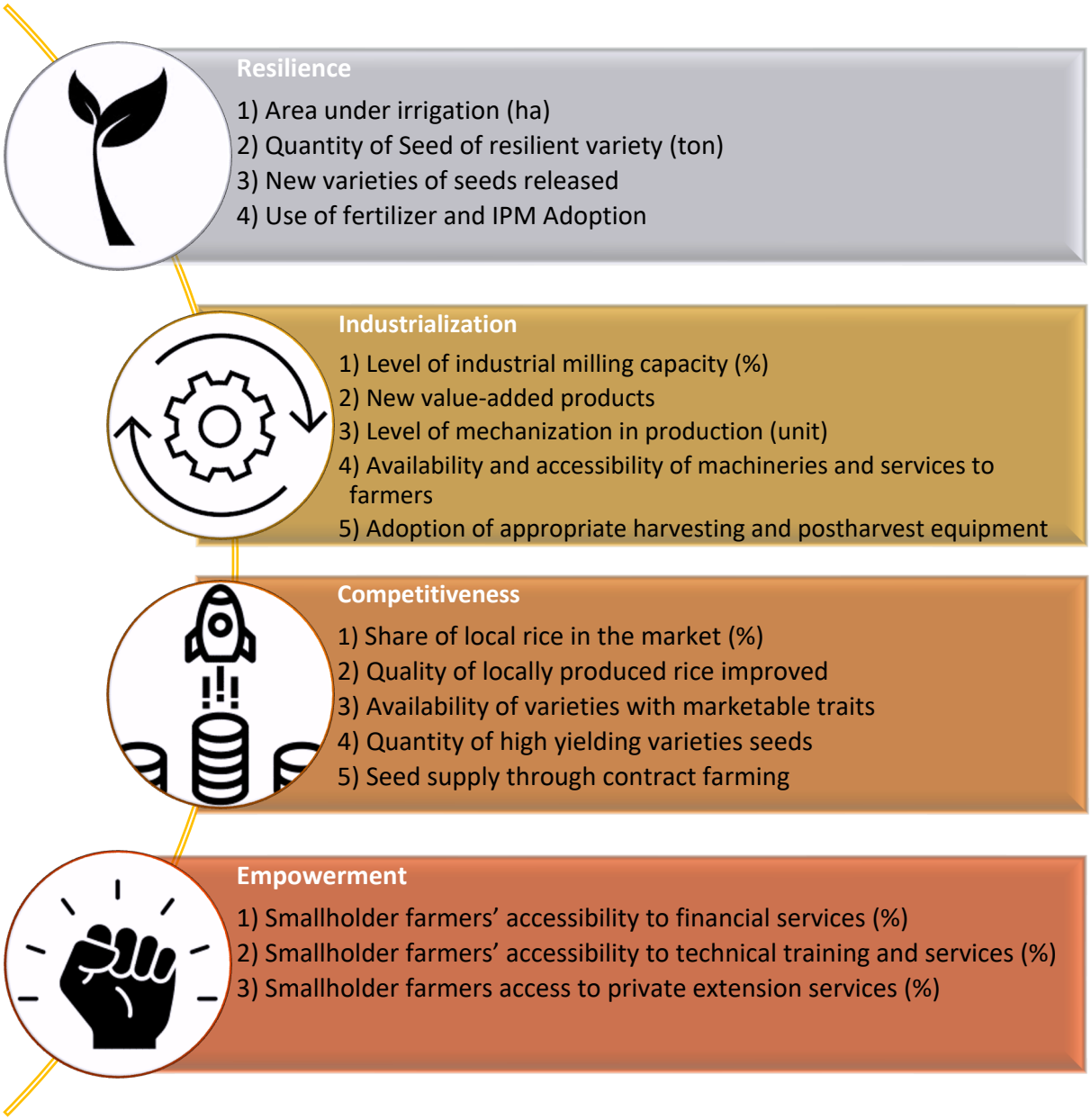
Indicator State at Baseline

Table 10: Self-sufficiency Rate (%)

Secondary data [**Yes/No**]	**Source**
Yes	RRA, NISR
State at Baseline	***57%***

In order to obtain data for this indicator; for local milled rice data available from NISR/SAS which is for paddy production will be converted into milled rice by multiplying the total paddy produced at country level by 0.65 (This is conversion rate used by the rice technical team to convert paddy rice to milled rice). Data on rice Imports & Exports will come from RRA, then do the calculations for the ratio: Percentage of the total local milled rice times 100 over the total national demand of milled rice. NISR/SAS and RRA should be the reliable sources of the data for this indicator because of their mandates and possessed resources to do regular data collection.

I.2 R.I.C.E Indicators



I.2.1 Resilience

<u>Indicator 5</u>: Area under Irrigation

The climatic condition in Rwanda is ideal for rice production where the wet and dry seasons provide sufficient rains (800-1,000mm) to feed rivers for irrigation, there is great potential and highly suitable ecosystem for rice cultivation with 46,000ha of marshland and inland valley swamps which can be put under production.

Water resources management policy of Rwanda of 2011 and irrigation policy of 2014, highlight the role of public participation and private sector in management of the water

resources and irrigation infrastructures[12]. Water Users Associations were established in different rice irrigation schemes as single entities for implementing irrigation management.

According to NISR, Seasonal Agricultural Survey/SAS (2019), the percentage of irrigated rice plots (flood irrigation) was 86.9% in Season A and 88.8% in season B, while the total area cultivated was 14,671 ha in Season A and 18,225 ha in Season B, therefore area under irrigation was **12,749 ha** in season **A** and **16,183 ha** in Season **B,** the total area under irrigation was ***28,932 (ha)*** for the year 2019.

Indicator State at Baseline

Table 11: Area under irrigation (ha)

Secondary data [**Yes/No**]	**Source**
Yes	NISR "SAS"[13]
State at Baseline	***28,932 (ha)***

Data for this indicator is available from the secondary data sources; NISR SAS is the reliable source of data because of their mandate as a National Institute for statistics and possessed resources to do regular data collection. To get the total area under irrigation; both area under irrigation in season A and Season B should be added up to get data for this indicator.

Indicator 6: Quantity of Seed of Resilient variety

The quantity of seeds of resilient variety is defined as the quantity of seeds of locally preferred varieties with resilient characteristics (disease resistant and cold tolerant), locally produced annually. Seeds are very important in farming because they are one of the most critical determining factors of production and productivity. Therefore, it is very important to meet the seed demand ensuring required standards for various schemes and regions.

Various government institutions were visited, including Rwanda Agriculture and Animal Resources development board (RAB) and Rwanda Inspection and Certification Agency (RICA) to collect secondary data related to the seed production of resilient varieties and MINAGRI Annually reports were consulted as well.

[12]T. Bizuhoraho, et al. (2019).Water Users Association and Irrigation Performance in Eastern Province of Rwanda

[13] Ibid

Table 12: Use of Seed of Resilient variety by farmers

Cold tolerant		Disease resistant Varieties	
Seed Variety	**%**	**Seed Variety**	**%**
Fashingabo	2	Basmati	10.6
Imbaturabukungu	1.6	Yun yin 4	77.9
Jyambere	9	Nemeye ubutaka	2.7
Yun yin 8	12.7	Fashingabo	6.8
Buryohe	0.5	WAT1395-B-24-2	2
Nemeye ubutaka	1.2	**Total**	**100**
Umutebo	6.6		
Yun er tian	0.8		
YUN-Yin 4	65.6		
Total	**100**		

NRDS2, survey 2022.

Table 13: Use of Seed of Resilient variety by farmers

Year	Pre basic seeds produced	Basic seeds produced	Certified seeds
2019-2020	2.35 MT	34.5 MT	370 MT

MINAGRI, Annual Report 2019.

Indicator State at Baseline

Table 14: Quantity of Seeds of Resilient Variety (Tones)

Secondary data [Yes/No]	Source
Yes	MINAGRI
State at Baseline	***370 Tones***[14]

Data for this indicator is available from the secondary data sources; MINAGRI's Annual Reports are the reliable source of data as they are published annually and the reports contain data on rice seeds production.

[14]MINAGRI, Annual Report 2019

Indicator 7: New resilient varieties released

This indicator "New resilient varieties released" is defined as the number of varieties released to farmers with appealing traits of disease resistance and cold tolerance.

RAB Seed Division was visited to collect data related to new varieties released. Complementary Primary Data were collected from Rice Cooperatives. In total, seven new varieties have been released since the year 2003. There are also some other varieties with traits of cold tolerance (Short grain varieties called Kigoli) which are currently used.

Table 15: New varieties released with cold tolerance traits

Variety	Year of release
(1) Ramba	2003
(2) Muturage	2003
(3) Rumbuka	2010
(4) V30	2013
(5) Br	2013
(6) Mpembuke	2010
(7) Umutebo	2021

Indicator State at Baseline

Table 16: New Resilient Varieties Released

Primary Data [Needed/Not Needed]	Source
Needed	RAB Seed Division
State at Baseline	***7 New Resilient Varieties Released***

Data for this indicator, is available from secondary data from RAB Seed Division as they are in charge of breeding and evaluation of new varieties. The RAB Seed Division should be visited to collect data related to new varieties released and their descriptions, complementary primary data can be collected from Rice Cooperatives.

Indicator 8: The percentage of farmers using fertilizer and applying IPM

There are over 800 agro dealers working with private sector input suppliers to supply fertilizer, seeds, and micronutrients. However, farmers continue to face difficulties in accessing and/or affording seeds, PSTA 4 supports the increase in organic fertilizer production and utilization as part of integrated soil fertility management practices in conjunction with the gradual liberalization of fertilizer supply. Organic fertilizers are

more sensitive to conserving soil quality. Support and training are provided to farm level production and application of organic fertilizer[15].

The fourth Rwanda Strategy for Agriculture Transformation (PSTA4) through the research and innovation development, envisages to develop and disseminate improved varieties and breeds as well as new approaches and technologies plays a key role in improving crop and land productivity, promoting sustainable land use and intensification, and mitigating and adapting to environmental degradation and current and future climate risk. Research emphasis under PSTA 4 is placed on areas such as soil health and fertility, pest, and diseases (including IPM), development of resistant varieties and animal genetic improvement, integrated farming systems- including climate smart agriculture and crop/livestock integration, and on previously under-exploited areas - specifically fisheries and aquaculture.

The secondary data were collected from Cooperatives on the use of IPM using a questionnaire administered to the selected rice cooperatives [Muvumba P8, Cyabayaga, Ntende, Gacaca, Rwinkwavu, Cyaruhogo, Rurambi, Mukunguli, Rugeramigozi, Base2, Cyili, Nyiramageni, Bugarama 1, Bugarama 3 and Kirimbi] and data on use of fertilizers were collected from FUCORIRWA.

Table 17: Use of inputs/Fertilizers by farmers

	NPK 17-17-17			UREA		
Union	**Planned (Ton)**	**Used (Ton)**	**Application (%)**	**Planned (Ton)**	**Used (Ton)**	**Application (%)**
UCORIBU	344	344	100	172	172	100
UCORIGI	160	160	100	80	80	100
UCORINYA	57	46	81	28	26	90
TWIBUMBE	112	112	100	56	56	100
UCORIVAM	312	205	66	156	96	62
UCORIVABU	278	260	93	139	152	109
UCORIHU	121	112	92	61	56	92
UCORIKA	173	165	95	87	83	96
CORIKA	42	20	48	21	10	48
CORIMAK	52	52	100	26	26	100
CORIMI	35	35	100	18	18	100
C.NTENDE	103	103	100	52	52	100
Average/Input			**82.70**			**84.36**
General Av.						
83.53 %						

Source: FUCORIRWA, 2019

[15] MINAGRI. (2018). National Agriculture Policy.

The survey conducted with smallholder farmers has revealed that only 20.2 % apply IPM techniques in rice farming (see figure 4), which is an indicator that more capacity building and training on IPM is needed for rice farmers.

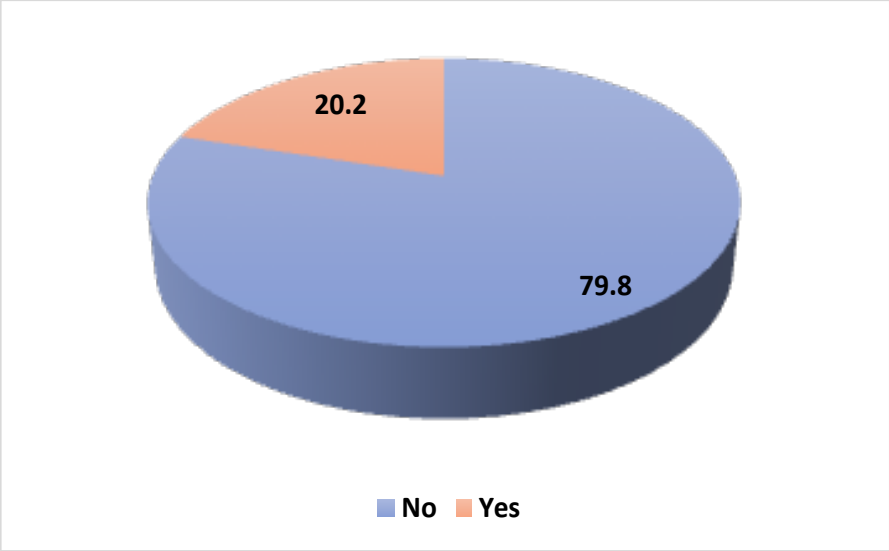


Figure 4: Adoption of integrated pest management (IPM) by farmers (%)

NRDS2, survey 2022.

Indicator State at Baseline

Table 18: The percentage of farmers using fertilizers and applying IPM

Secondary data [**Yes/No**]	Primary Data [**N or NN**]	**Source**
Yes	NN	FUCORIRWA, COOPERATIVES
No	Needed	
State at Baseline (Use of Fertilizers)		***83.5 %***
State at Baseline (IPM Adoption)		***20.2 %***

N*: Needed, NN*: Not Needed

Data on IPM use and adoption were collected (Primary Data) from 15 pre-selected Cooperatives: Muvumba P8, Cyabayaga, Ntende, Gacaca, Rwinkwavu, Cyaruhogo, Rurambi, Mukunguli, Rugeramigozi, Base2, Cyili, Nyiramageni, Bugarama 1, Bugarama 3 and Kirimbi. Data on use of fertilizers can be obtained (Secondary Data) from FUCORIRWA as it ensures the coordination for most of rice cooperatives and collect different data including those on the use fertilizers, FUCORIRWA remains the reliable source of data for this indicator in future.

I.2.2 Industrialization

Indicator 9: Level of industrial milling capacity

Since 2009, it is important to note that the small hullers have been banned by the GoR through MINICOM due to their poor milling efficiency and that the numbers of milling plants increased, however, their milling capacity remains challenged and the situation has to continuously be monitored.

The following mills were visited and a questionnaire was used to interview key staff of Nyagatare, Mayange, MRPIC Mukunguli, Minoterie de Huye and COTICORI mills. Rice Mills are the reliable sources of data for this indicator.

Table 19: Milling Capacity for selected local rice milling plants

Milling Plants	Milling Capacity for processing Paddy Rice/Hr	Milling Capacity for processing Paddy Rice/Year	Qty of Paddy Rice Processed/Year	Level of milling capacity/Year
Minoterie de Huye	3t/Hr	6240	1200	19%
Mayange Mill	3t/Hr	6240	1800	29%
COTICORI	3t/Hr	6240	2600	42%
MRPIC Mukunguli	3t/Hr	6240	3400	54%
Nyagatare Mill	5t/Hr	10400	5140	49%
Average		**35,360**	**14,140**	**39%**

Annual: 8Hrs/Day- 5 Days/Week, 52 Weeks/year: 260 Days

The Information collected from the survey in 5 rice processing plants is summarized in the above table. The survey revealed that 4 plants [Minoterie de Huye, Mayange Mill, COTICORI, MRPIC Mukunguli] have the processing capacity of 3Tons/Hour while one plant [Nyagatare Mill] has the capacity of 5Tons/Hour, with data received from the 5 plants compared with their milling capacities, Minoterie de Huye runs at 19% of its annual capacity, Mayange mill at 29%, COTICORI at 42%, MRPIC Mukunguli at 54% and Nyagatare Mill at 49% and the average is **39%** for the 5 milling Plants, therefore, there is **no** (0) any plant mills that operates at 70%.

Indicator State at Baseline

Table 20: Level of industrial milling capacity

Primary Data **[Needed/Not Needed]**	**Source**
Needed	Millers
State at Baseline	***0***

Data for the indicator requires primary data collection using a questionnaire to collect data from the 5 pre-selected rice mill plants namely Nyagatare mill (Nyagatare District), Mayange Mill (Bugesera District), Mukunguli Mill (Kamonyi District), Minoterie de Huye (Huye district) and COTICORI (Rusizi District). The questionnaire to be used can be found in annexes. Rice Mills are the reliable sources of data for this indicator.

<u>Indicator 10</u>: New value-added products/ byproducts

Before 2009, due to the low capacity of the milling plants that was generally done by small hullers and/or hand pounding by farm families, there were no new products introduced; the small hullers with installed capacity of up to 200 kg/ hour often lacked the capability of valuing the by-products received from rice cleaning, whitening, polishing and grading. Investments made to increase the number of milling plants and to upgrade their processing capacity came with innovations to transform by-products into economical and commercial products.

The following milling plants were visited to capture the new value-added products available at each plant, a questionnaire was used to interview key staff: Nyagatare, Mayange, Mukunguli, Minoterie de Huye and COTICORI.

According to the survey results, three out of five Milling plants consulted are involved in the businesses of producing "Briquettes" from rice husks. Meaning that only one **(1)** rice byproduct is produced.

Photo: Production of briquettes in Nyagatare

Indicator State at Baseline

Table 21: New value-added products/ byproducts

Primary Data **[Needed/Not Needed]**	**Source**
Needed	Millers
State at Baseline	***1***

Data for the indicator requires primary data collection using a questionnaire to collect data from the 5 pre-selected rice mill plants namely Nyagatare mill (Nyagatare District), Mayange Mill (Bugesera District), Mukunguli Mill (Kamonyi District), Minoterie de Huye (Huye district) and COTICORI (Rusizi District). The questionnaire to be used can be found in annexes, Rice Mills are the reliable sources of data for this indicator.

<u>Indicator 11</u>: Level of mechanization in production

Mechanization is crucial for increasing labor and land productivity. With just a hand-hoe, a farmer can manage not more than one hectare whereas with mechanization a farmer can go up to 200 hectares. The mechanization can be supported by the consolidation of small rice plots into large rice farming plots which can allow easy mechanization process from land preparation, planting, input application and harvesting and post harvesting activities.

Through primary data collection in the field at Cooperatives' level, a questionnaire was used to capture the number of machines available for ploughing in rice producing areas. Data for this indicator will require primary data collection from cooperatives as reliable sources of data.

The survey conducted with farmers revealed that only in one cooperative "Muvumba P8 Rice Growers Cooperative" farmers use mechanization in their farms. Farmers rent machines/tractors from the cooperative; Muvumba P8 Rice Growers Cooperative owns **8 Machines** (Tractors) that they use in rice production activities for ploughing.

Photo (TNT): Tractors in Muvumba/Nyagatare (MRGC)

Indicator State at Baseline

Table 22: Level of mechanization in production {%}

Primary Data **[Needed/Not Needed]**	**Source**
Needed	Cooperatives.
State at Baseline	***8 Tractors***

Data for this indicator, require primary data collection from fifteen marshlands/ cooperatives: Muvumba P8, Cyabayaga, Ntende, Gacaca, Rwinkwavu, Rurambi, Mukunguli, Rugeramigozi, Base 2, Cyili, Nyiramageni, Bugarama Zone 1, Bugarama Zone 3 and Kirimbi to assess the number of machines available for ploughing in rice producing areas, a questionnaire to be used can be found in the annexes.

Indicator 12: Number of Service Providers for machinery services

The Government of Rwanda aims to enhance the accessibility of agricultural machinery and equipment through facilitating local manufacturing and assembling of simple implements and even machineries as appropriate as well through promoting private mechanization service provision.

Currently there are initiatives to support private investments to supply farm machinery implements through cooperatives or purchasing machineries for field activities. Moreover, some cooperatives have introduced tractors which can reduce the burden of farmers while maximizing their utility.

Through primary data collection in the field at Cooperatives' level, a questionnaire was used to assess the level of participation of the private sector or individual entrepreneurs to establish and manage service centers for machines at the village/ cell/ sector/ district level and in manufacturing/ assembling and/or selling of agricultural machineries, spare parts, accessories and implements for farmers in marshlands. Only **one** service provider, Muvumba rice growers in Nyagatare (P8) possesses tractors for land preparation and they provide service to their farmers/neighbors who need it.

Indicator State at Baseline

Table 23: Number of Service Providers for machinery services

Primary Data **[Needed/Not Needed]**	**Source**
Needed	Farmers
State at Baseline	***1***

Data for this indicator, require primary data collection from fifteen marshlands/ cooperatives: Muvumba P8, Cyabayaga, Ntende, Gacaca, Rwinkwavu, Rurambi, Mukunguli, Rugeramigozi, Base 2, Cyili, Nyiramageni, Bugarama Zone 1, Bugarama Zone 3 and Kirimbi to assess the provision of services by private service providers, a questionnaire to be used can be found in the annexes.

Indicator 13: Number and type of harvesting and post harvesting tools

The government policies among other things seek to transform agriculture into a productive, high value, market-oriented sector, with forward linkages to other sectors, with major emphasis on promoting private sector involvement and agribusiness. This can be achieved through development and promotion of improved rice technologies including harvesting and post-harvesting technologies.

Under NRDS2, harvesting and post harvesting indicator is defined as "Adoption of appropriate harvesting and post harvesting tools including, threshing, winnowing and drying using machineries with engines/ motors"

Fifteen marshlands were visited: Muvumba P8, Cyabayaga, Ntende, Gacaca, Rwinkwavu, Rurambi, Mukunguli, Rugeramigozi, Base 2, Cyili, Nyiramageni, Bugarama Zone 1, Bugarama Zone 3 and Kirimbi with the aim to assess the use of machinery and equipment by farmers in harvesting and postharvest handling. It was found that only in Muvumba P8 Rice Growers Cooperative, they use appropriate harvesting and postharvest equipment and they have **1** Combine Harvester Machine.

Photo: Combine Harvester in Muvumba/Nyagatare (MRGC)

Indicator State at Baseline

Table 24: The number and type of harvesting and post harvesting equipment and tools adopted

Primary Data [**Needed/Not Needed**]	**Source**
Needed	Farmers
State at Baseline	***1 Harvester***

Data for this indicator, require primary data collection from fifteen marshlands/cooperatives: Muvumba P8, Cyabayaga, Ntende, Gacaca, Rwinkwavu, Rurambi, Mukunguli, Rugeramigozi, Base 2, Cyili, Nyiramageni, Bugarama Zone 1, Bugarama Zone 3 and Kirimbi to assess the adoption of appropriate harvesting and post harvesting tools including, threshing, winnowing and drying using machineries, questionnaire to be used can be found in the annexes.

I.2.3 Competitiveness

Indicator 14: Share of local rice in the market (%)

In order to achieve the aspirations of economic development and poverty reduction, Rwanda's rice sector needs to attain self-sufficiency in rice production and improve the quality and competitiveness of locally produced rice. The government envisages that after the initial wave of investments, the private sector will fully take over the operations of rice value chain. The government intends participation of private sector in all sub sectors and expects it to be driven by the spirits of competitiveness and entrepreneurship[16].

Under the NRDS2; share of local rice is defined as share of locally produced rice in the total quantity of rice procured by major retail stores (in urban areas) and major sales points in rural areas for a year.

Four districts' markets in City of Kigali (Nyabugogo, Nyarugenge, Kimironko, Kicukiro) and six district markets in secondary cities (Huye, Rusizi, Muhanga, Musanze, Rubavu and Nyagatare) were visited and a questionnaire was used to interview 108 rice sellers through in order to capture the share of locally produced rice in total rice sales on local markets.

According to figure 5 the results from the survey revealed that majority in 2019, the 108 rice sellers sold in total 2,595 Tons among which 1,010 Tons were the locally produced rice while 1,585 Tons were the imported rice. As per NRDS2 definition for this indicator "Share of Local Rice" which is defined as share of locally produced rice in the total quantity of rice procured by major retail stores (in urban areas) and major sales points in rural areas for a year, therefore the share of local rice is 38,9%. Data for this indicator will require primary data collection from rice sellers/markets as reliable sources of data.

[16]MINAGRI. (2011). National Rice Development Strategy (2011-2018)

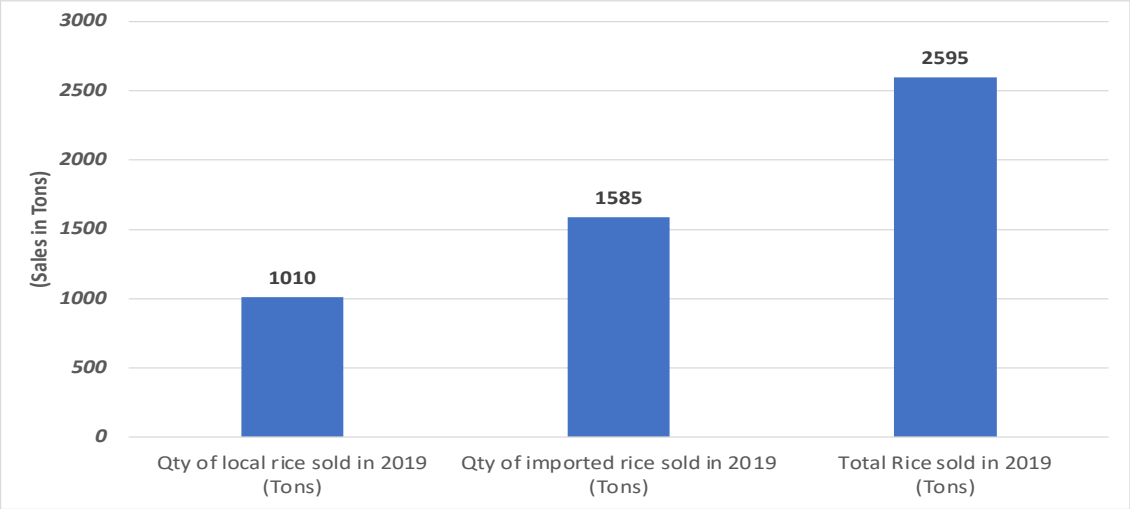


Figure 5: Sales of Local Rice versus Imported Rice in 2019 (Tons)

Source: NRDS2 Survey, 2022.

In ten District Markets visited, an assessment was made to identify factors that consumers consider for their preference while buying imported rice versus the local rice.

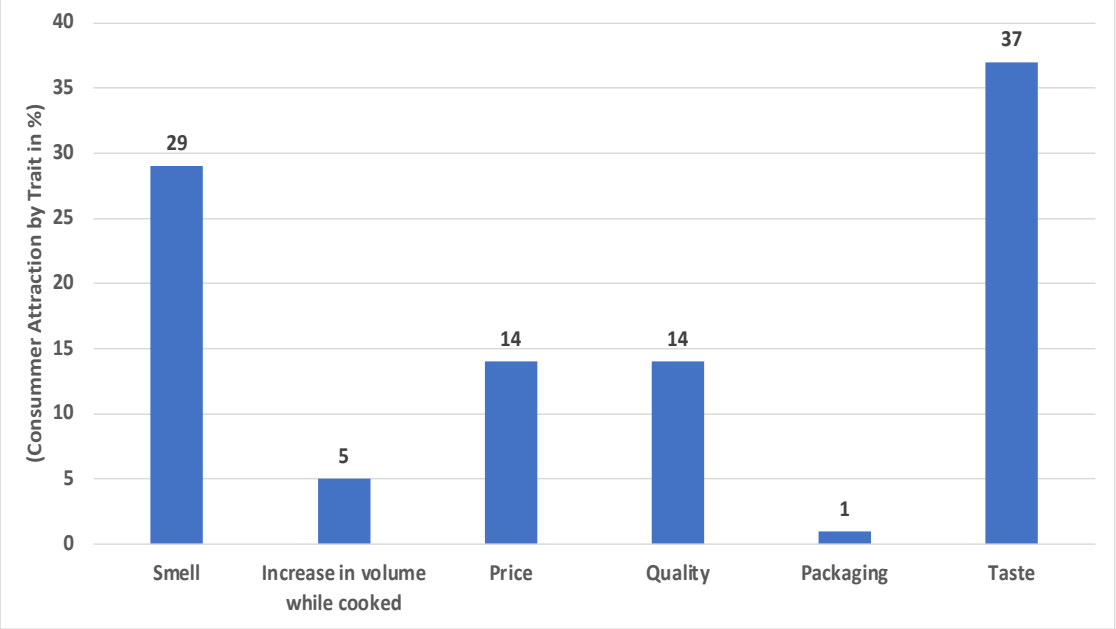


Figure 6: Attributes that attract consumers for imported rice (%)

NRDS2, survey 2022.

As per the figure 6 above, it can be observed that consumers make mostly their choices looking at mainly four attributes, i) Taste (37%), ii) Smell (29%) iii) The quality of rice in general (14%) and iv) Price (14%).

Indicator State at Baseline

Table 25: Share of local rice in the market (%)

Primary Data **[Needed/Not Needed]**	**Source**
Needed	10 Districts Markets
State at Baseline	**38.9 %**

Data for this indicator require primary data collection from 10 District markets: in City of Kigali (Nyabugogo, Nyarugenge, Kimironko, Kicukiro) and six district markets in secondary cities (Huye, Rusizi, Muhanga, Musanze, Rubavu and Nyagatare). A questionnaire is used to collect data from rice sellers of major selected sales points in urban and rural areas through interviews to capture the share of locally produced rice in total rice sales on local markets. The questionnaire to be used is found in annexes.

<u>Indicator 15</u>: Percentage of each grade of locally produced rice

The milled rice is graded as Grade 1, Grade 2 and Grade 3 or otherwise be regarded unfit for human consumption. Consumers have different preferences on grades, with the majority preferring grades 1 and 2. Rice markets in Rwanda are generally more responsive to price than quality. Millers and traders take advantage of this demand and blend grades 1and 2 or aromatic and non-aromatic rice to lower the price of purely grades 1 or aromatic varieties.

To assess the quality of locally produced rice, five (5) rice processors were visited namely Nyagatare mill (Nyagatare District), Mayange Mill (Bugesera District), Mukunguli Mill (Kamonyi District), Minoterie de Huye (Huye district) and COTICORI (Rusizi District) and a questionnaire was used to interview the key respondents to capture the level of grading of locally produced rice. Data for this indicator will require primary data collection from plant mills as reliable sources of data.

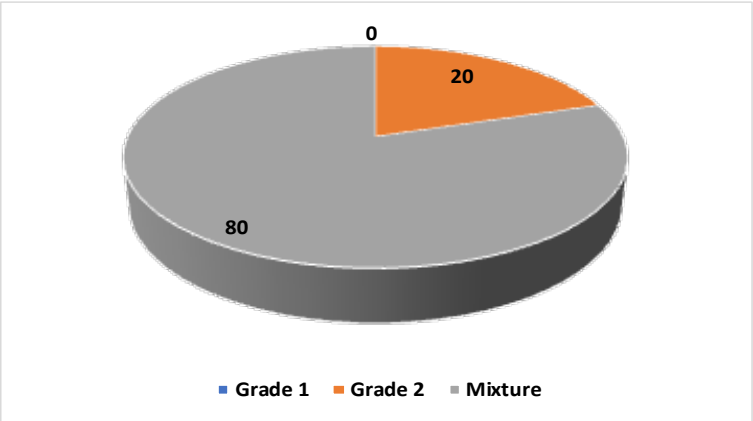


Figure 7: Rice grades produced by local mills

NRDS2, survey 2022.

The survey revealed that local rice milling plants produce only 0% of rice grade 1, 20% of rice grade 2 and 80% of mixture, this shows how much is needed to increase the quality of locally produced rice by our local milling plants.

Indicator State at Baseline

Table 26: Percentage of each grade of locally produced rice

Primary Data **[Needed/Not Needed]**	**Source**
Needed	Mills
State at Baseline	Percent
Grade 1	***0%***
Grade 2	***20%***
Mixture	***80%***

Data for the indicator requires primary data collection using a questionnaire to collect data from the 5 pre-selected rice mill plants namely Nyagatare mill (Nyagatare District), Mayange Mill (Bugesera District), Mukunguli Mill (Kamonyi District), Minoterie de Huye (Huye district) and COTICORI (Rusizi District). The questionnaire to be used can be found in annexes. Rice Mills are the reliable sources of data for this indicator.

<u>Indicator 16</u>: Quantity of seeds of varieties with marketable traits available

Quantity of seeds of varieties with marketable traits is defined as the quantity of seeds of locally preferred varieties with long or aroma attributes, locally produced annually.

The seed division of the Rwanda Agriculture and Animal Resources Development Board (RAB) was visited for the collection of secondary data related to seeds of

varieties with marketable traits. An interview was organized to collect the information on seed production of varieties with aromatic and long grains size traits.

Table 27: Quantity of Seeds with marketable traits (tons)

Variety	Traits	Quantity of Seeds (ton)/2019
Fashingabo	Long	15.2 T
Rumbuka	Long	7.5 T
Muturage	Long	1 T
Nemeyubutaka	Long	15.7 T
Mpembuke	Long	1 T
Ndamirabahinzi	Long	7.7 T
Basmati	Aroma	4.5 T
Buryohe	Aroma	36.4 T
Total Production		**89 T**

Source: RAB Seed Division

Indicator State at Baseline

Table 28: Quantity of seeds of varieties with marketable traits (Tons)

Secondary data **[Yes/No]**	**Source**
Yes	RAB, Seed division
State at Baseline	***89 Tons***

Data for this indicator is available from secondary data from RAB seed division; data can be obtained through interviews with researchers in charge of seed production and evaluation of new varieties. RAB seed division remains the reliable source of data related to new varieties released and their descriptions.

Indicator 17: Quantity of high-yielding variety seeds (ton)

High yielding variety seeds is defined as the quantity of seeds of varieties with yield superior to 5T/ha, locally produced annually.

Various government institutions were visited such as Rwanda Agriculture and Animal Resources development board (RAB) and Rwanda inspection and certification agency (RICA) for the collection of secondary data. Individual and interviews were organized to collect the information on the seed production of high yielding varieties, only RAB seed division technical team were able to share data for this indicator as long RICA is more oriented in inspection and certification not in production.

Table 29: Used high yielding rice varieties

High yielding Varieties	
Seed Variety	**%**
Fashingabo	13.7
Imbaturabukungu	1.6
Nemeye ubutaka	0.8
Twigire	8.9
Umutebo	6.5
Watt	2.4
Buryohe	1.6
Yun yin 4	64.5
Total	**100**

NRDS2, survey 2022.

The table 29, describes the high yielding varieties cultivated across the country and shows the share of seed quantity of each variety. As per the table above, the survey revealed that the majority of farmers (64.5%) cultivate Yun yin4 which is a short grain type as high yielding variety, on the second place comes the variety of Fashingabo cultivated by 12.9% of farmers which is a long grain variety. The two varieties are major varieties and are grown in different ecologies. The remain percentage is shared by various varieties specific to marshlands

Table 30: Quantity of High Yielding Seeds (Ton)

Nr	High yielding variety (>5t/ha) at farmer gate	Quantity of Seeds (ton)/2019
1	Yun yin 4	42 T
2	Yun Yin 8	45.1 T
3	Mbakungahaze	31.2 T
4	Instindagirabigega	32.4 T
5	Gakire	10.4 T
6	Fashingabo	15.2 T
7	Imbaturabukungu	18.1 T
8	V30	12.7 T
Total Production		**207.1 T**

Source: RAB Seed Division

Indicator at Baseline

Table 31: Quantity of high yielding variety seeds

Secondary data **[Yes/No]**	**Source**
Yes	RAB, Seed division
State at Baseline	***207.1 Tons***

Data for this indicator is available from secondary data from RAB Seed Division as they are in charge of seed production and evaluation of new varieties. RAB seed division remains the reliable source of data related to the production/quantity of high yielding variety seeds.

<u>Indicator 18</u>: Number of cooperatives accessing quality seeds through contract farming

The seed system in Rwanda is governed by national seed legislation, the legislation advocates that new rice varieties are made available to the farmer cooperatives each season by RAB where the institution in charge of foundation seed production.

RAB contracts out the secondary bulking stage to the private sector, as either individual rice and/or rice producers' cooperatives for production of certified/commercial seed. Currently, guidance associated with some technical support is provided for the development of private and cooperative seeds production, and this needs to be scaled up[17]. In order to facilitate the access of seeds to the ender users/ farmers on time, managers of milling plants may be involved in contract farming for seeds supply with end users/ Cooperatives/ farmers

Data related to the seed supply chain were collected from selected rice cooperatives in Muvumba P8, Cyabayaga, Ntende, Gacaca, Rwinkwavu, Cyaruhogo, Rurambi, Mukunguli, Rugeramigozi, Base2, Cyili, Nyiramageni, Bugarama 1, Bugarama 3 and Kirimbi marshlands, milling plants (Nyagatare mill (Nyagatare District), Mayange Mill (Bugesera District), Mukunguli Mill (Kamonyi District), Minoterie de Huye (Huye district) and COTICORI (Rusizi District) using an individual interview to assess the involvement of rice mills and other stakeholders, end users/farmers in seed provision through formal contracts. Cooperatives are the reliable sources of data for this indicator.

[17] A.kathiresan. (2018). Job creation and competitiveness of Rice value chains in Rwanda

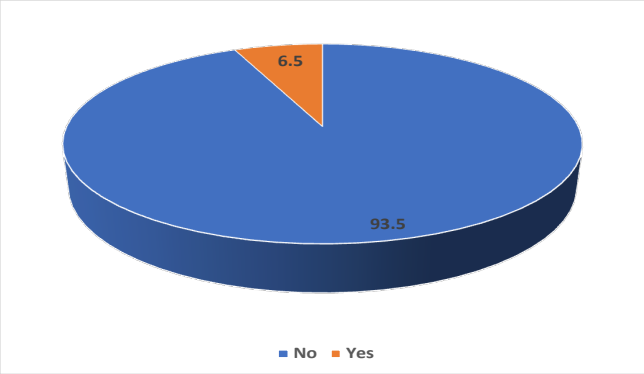


Figure 8: Number of cooperatives accessing quality seeds through contract farming

NRDS2, survey 2022.

The survey has revealed that only 6.5% of farmers have access to seeds through contract farming with rice milling plants as shown by the figure above.

Indicator at Baseline

Table 32: Number of cooperatives accessing quality seeds through contract farming

Primary Data [**Needed/Not Needed**]	**Source**
Needed	Cooperatives
State at Baseline	***6.5%***

Data for this indicator, require primary data collection from fifteen marshlands/ cooperatives: Muvumba P8, Cyabayaga, Ntende, Gacaca, Rwinkwavu, Rurambi, Mukunguli, Rugeramigozi, Base 2, Cyili, Nyiramageni, Bugarama Zone 1, Bugarama Zone 3 and Kirimbi to assess the provision of rice seeds to farmers through contract farming arrangements with milling plants, a questionnaire to be used can be found in the annexes.

I.2.4 Empowerment

<u>Indicator 19</u>: Smallholder farmers' accessibility to financial services (%)

In order to improve access to finance for smallholder farmers, it is important to determine their financial needs, and how best to provide matching financing support. Appropriate financial products should be developed responding to identified needs and repayment capacities of smallholder farmers.

NRDS2 defines smallholder farmers' accessibility to financial services (%) as the *"percentage of smallholders in pre-selected farmers' groups/associations accessing necessary financial services (in rice producing areas)"*.

In order to assess linkage of smallholder farmers to financial services providers, data were collected from cooperatives and small holder farmers using a questionnaire to capture the percentage of smallholder farmers accessing financial services: Financing and Insurance of the rice sector activities.

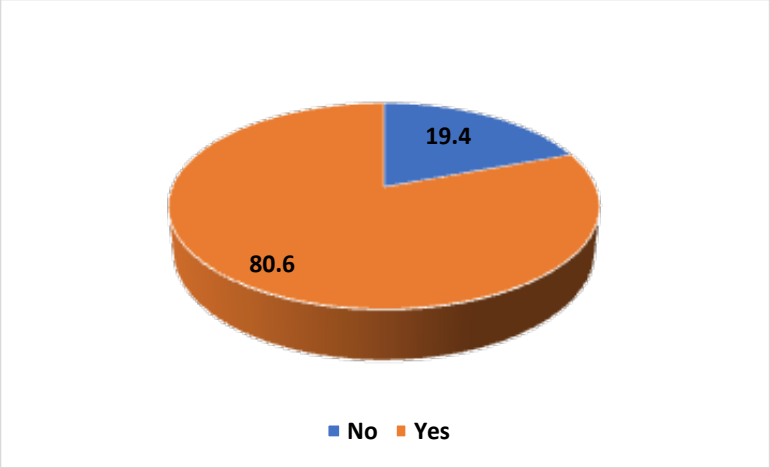


Figure 9: Small holder farmers accessing finance (%)

NRDS2, survey 2022.

According to results from the survey (Figure 7) the majority of farmers (**80.6%**) have confirmed to access the following financial services; financing of production activities 64%, access to inputs 28% personal loans 8% (Table 33). And 19.3% they have confirmed to use insurance. Cooperatives are the reliable sources of data for this indicator.

Table 33: Types of financial services

Type of accessed service	Percent (%)
Financing	64
Financing (Inputs)	28
Personal loan	8
Total	**100**

NRDS2, survey 2022.

Indicator at Baseline

Table 34: Smallholder farmers' accessibility to financial services

Primary Data [**Needed/Not Needed**]	**Source**
Needed	Cooperatives
State at Baseline	***80.6 %***

Data for this indicator, require primary data collection from fifteen marshlands/cooperatives: Muvumba P8, Cyabayaga, Ntende, Gacaca, Rwinkwavu, Rurambi, Mukunguli, Rugeramigozi, Base 2, Cyili, Nyiramageni, Bugarama Zone 1, Bugarama Zone 3 and Kirimbi to assess farmers' access to financial services, a questionnaire to be used can be found in the annexes.

Indicator 20: Smallholder farmers' access to technical training and/or services (%)

Rice farming require specific skills and knowledge for the smallholder farmers to apply right techniques, hence the adoption of good agricultural practices and innovations along the rice value chain is very crucial. Access to technical training and extension services are of huge impact at rice production.

NRDS2 defines the indicator: *Smallholder farmers' accessibility to technical training and services (%)* as the percentage of smallholder in pre-selected farmers' groups/associations regularly accessing necessary technical training and services (in rice producing areas).

Farmer's cooperatives were visited to collect data on the number/percentage of smallholder farmers who have received training and extension services, and assess the availability of extension services in the proximity. Cooperatives are the reliable sources of data for this indicator.

Indicator at Baseline

Table 35: Smallholder farmers' accessibility to technical training and/or services

Primary Data [**Needed/Not Needed**]	**Source**
Needed	Cooperatives
State at Baseline	***75.8%***

Data for this indicator, require primary data collection from fifteen marshlands/cooperatives: Muvumba P8, Cyabayaga, Ntende, Gacaca, Rwinkwavu, Rurambi, Mukunguli, Rugeramigozi, Base 2, Cyili, Nyiramageni, Bugarama Zone 1,

Bugarama Zone 3 and Kirimbi to assess farmers' access to technical trainings or services, a questionnaire to be used can be found in the annexes.

<u>Indicator 21</u>: Smallholder farmers' accessibility to private extension services (%)

Sustainable provision of extension services requires active involvement of private stakeholders; youth individuals/ groups, input supplying companies, millers, investors to complement government's extension services systems.

The NRDS2 defines the indicator: Smallholder farmers' accessibility to private technical training and extension services (%) as the percentage of smallholder in pre-selected farmers' groups/associations regularly accessing necessary private technical training services in rice production. Farmer's cooperatives were contacted, a questionnaire was used to collect the data on smallholder farmers accessing technical training and extension services from private services providers.

The survey was conducted with 124 farmers interviewed; 75.8 % accepted to have received technical assistance & training while 24.2 % they said they have not received any support. The 75.8 % who received the support, they mentioned that majority (53%) they were supported by cooperatives' agronomists, 15% by MINAGRI/RAB team, 9% by Kilimo Trust, 8% by Sector, RDO, 6% by JICA, 1% by HoReCo and 1% by Cooperative.

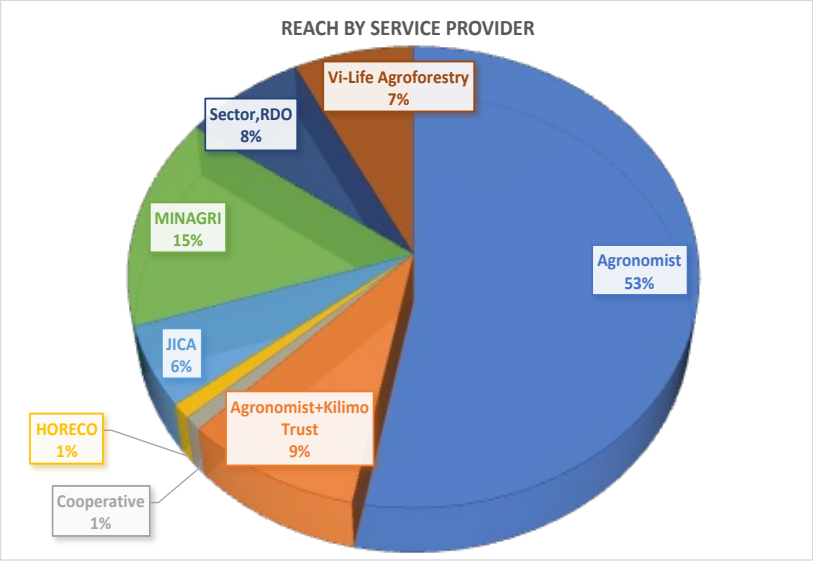


Figure 1: Service Providers

NRDS2, survey 2022.

Indicator at Baseline

Table 36: Smallholder farmers' accessibility to private extension services

Primary Data **[Needed/Not Needed]**	**Source**
Needed	Cooperatives
State at Baseline	***85 %***

Data for this indicator, require primary data collection from fifteen marshlands/ cooperatives: Muvumba P8, Cyabayaga, Ntende, Gacaca, Rwinkwavu, Rurambi, Mukunguli, Rugeramigozi, Base 2, Cyili, Nyiramageni, Bugarama Zone 1, Bugarama Zone 3 and Kirimbi to assess farmers' access to private extension services, a questionnaire to be used can be found in the annexes.

1.3 General Conclusion and Recommendations

1.3.1 General Conclusion

The assignment for setting the Baselines for Monitoring Indicators of Implementation of Rwanda's Second National Rice Development Strategy (NRDS2), was done in course of five Months from August to December 2022. As indicated in the Terms of Reference and discussed during the kick off meeting held on 2nd Aug 2022, the purpose for this assignment was clearly explained to be two-fold; firstly, to set baseline figures against the twenty-one NRDS2 indicators and secondary to identify the data sources, specify data collection methods and prepare a procedural manual. The following table 37 captures baseline data for all the 21 indicators for NRDS2.

Table 37: NRDS2 Indicators State at Baseline (2019)

Indicators	Source data	Custodian	State at Baseline
Indicator: Overall NRDS Indicators			
1.Quantity of paddy produced (ton)	Secondary data	NISR "SAS"	***131,577 (Ton)***
2.Total area harvested (ha)	Secondary data	NISR "SAS"	***32,846 (Ha)***
3.Yield per unit area (t/ha)	Secondary data	NISR "SAS"	***4.004 t/ha***
4.Self-sufficiency (%)	Secondary data	NISR "SAS", RRA	***57%.***
Indicator: R.I.C.E Indicators			
Resilience:			
5.Area under irrigation (ha)	Secondary data	NISR "SAS",	***28,932 (Ha)***
6.Quantity of Seed of resilient variety (ton)	Secondary data	MINAGRI (Annual Report)	***370 MT***
7.New resilient varieties of seeds released	Primary Data	RAB Seed Division	***7 New Varieties***
8. Percentage of farmers using fertilizer and applying IPM	Primary Data [Use of Fertilizers]	FUCORIRWA, Cooperatives	***83.5 %***
	Primary Data [Adoption of IPM]	FUCORIRWA, Cooperatives	***20.2 %***
Industrialization:			
9.Level of industrial milling capacity	Primary Data	Millers	***0***
10.Number of New value-added products/ byproducts developed	Primary Data	Millers	***1***
11.Level of mechanization in production (unit)	Primary Data	Cooperatives	***8 Tractors***
12.Number of service providers for machinery services	Primary Data	Cooperatives	***1***

13. Number and types of appropriate harvesting and post-harvesting tools	Primary Data	Cooperatives	***1 Harvester***
Competitiveness:			
14.Share of local rice in the market (%)	Primary Data	Markets	***38.9 %***
15.Percentage of each grade of locally produced rice	Primary Data	Mills	- ***Grade 1 (0%)*** - ***Grade 2 (20%)*** - ***Mixture (80%)***
16. Quantity of seeds of varieties with marketable traits available	Secondary data	RAB Seed division	***89 Tons***
17. Quantity of high yielding variety seeds(ton)	Secondary data	RAB Seed division	***207.1 Tons***
18.Number of cooperatives accessing quality seeds through contract farming	Primary Data	Cooperatives	***6.5%***
Empowerment:			
19.Smallholder farmers' accessibility to financial services (%)	Primary Data	Cooperatives	***80.6 %***
20.Smallholder farmers' accessibility to technical training and/or services (%)	Primary Data	Cooperatives	***75.8%***
21. Smallholder farmers access to private extension services (%)	Primary Data	Cooperatives	***85 %***

All the deliverables expected under this assignment are met; the baseline data for the 21 NRDS2 indicators are presented in the above table, while the manual is presented under section two of the report. The consulting firm acknowledges the invaluable support and clear guidance provided by JICA Rwanda, NRDS TF and MINAGRI teams. In the course of this assignment, consultants interacted in different occasions with the above-mentioned teams which ensures high level of involvement, hence high level of understanding of the report and ownership. We are sure that the monitoring for NRDS2 indicators will be done as indicated in the manual and we reiterate that NRDS2 partners' involvements remain paramount and determinant factor for the success of NRDS2 M&E data collection process.

1.3.2 Insights from respondents

Farmers' voices "recommendations to increase the quality and quantity of rice production", through the survey with smallholder farmers, we captured their recommendations in regards to increase quantity and quality of rice. Majority of farmers (26%) sees the mechanization in production as one of the strategies to increase rice

production, (26%) recommends also access to quality seeds, (25%) recommends timely access to inputs, fertilizers and pesticides, while 15% recommends access to enough water, rehabilitation of canals and marshlands and 7% increased provision of extension and training services.

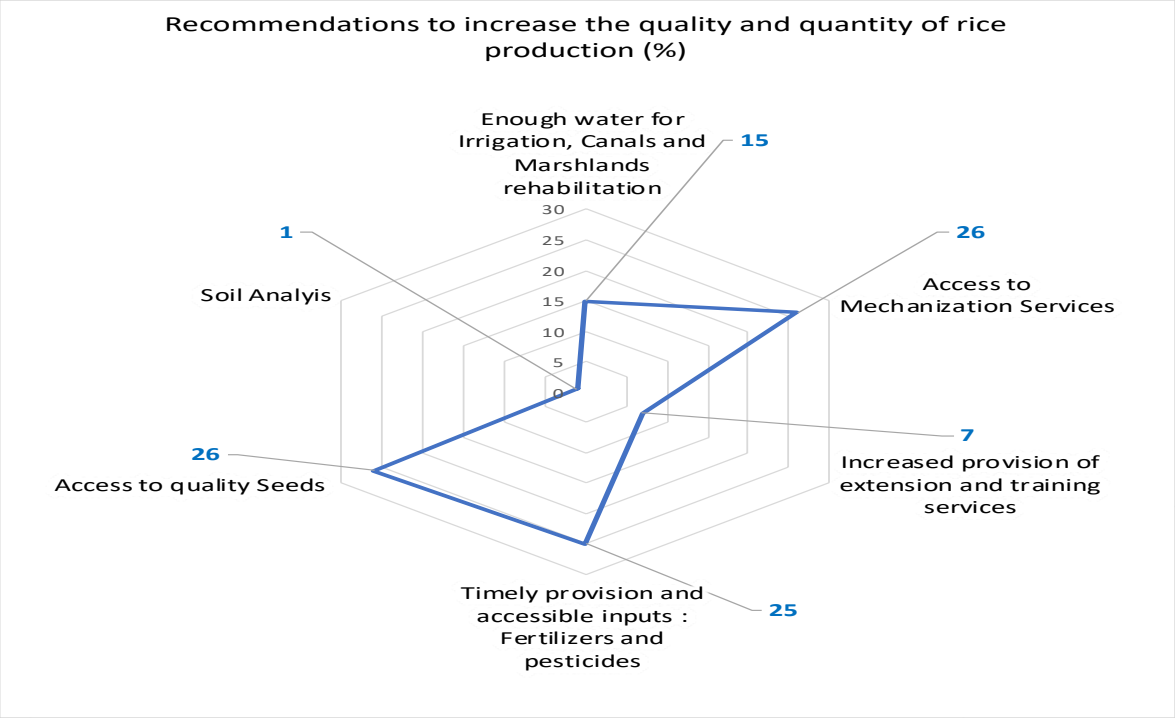


Figure 2: Recommendations by Small holder farmers

NRDS2 survey, 2022

Rice Traders' Voices "recommendations increase the consumption of the local rice products", the survey with rice traders in 10 selected district markets in Kigali City and secondary cities; Nyabugogo, Nyarugenge, Kimironko, Kicukiro, Huye, Rusizi, Muhanga, Musanze, Rubavu and Nyagatare, captured their recommendations for increasing the consumption of local rice at the market, 18 % recommends for setting competitive prices and increasing quality as key factors that may lead to increase the consumption of local rice, 28 % recommended increased quantity & quality produced, while 29 % stressed on increasing hygiene; purity and whitening of local rice and 24 % recommended for introducing high yielding varieties and 1% recommend for cutting down cost of production of local rice as a strategy.

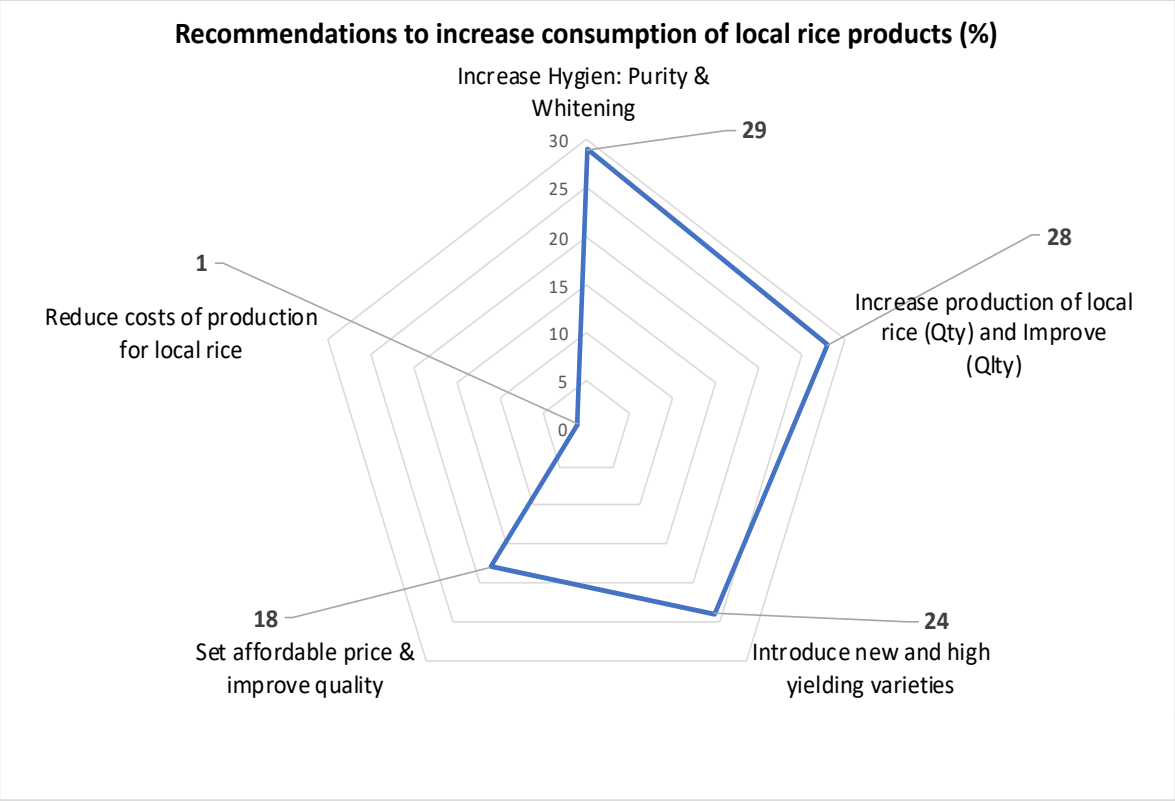


Figure 3: Recommendations by Rice Traders

NRDS2 survey, 2022

Rice Millers' Voices "recommendations to increase the consumption of local rice products", the survey with rice 5 rice milling plants, Nyagatare mill (Nyagatare District), Mayange Mill (Bugesera District), Mukunguli Mill (Kamonyi District), Minoterie de Huye (Huye district) and COTICORI (Rusizi District) captured their recommendations for increasing the consumption of local rice at the market, the majority 40% recommend to increase the production of local rice, while 20% recommended to introduce new high yielding varieties of rice, and 20% recommended also to increase inspection of the quality of imported rice, and 20% recommended as well to the waiver of VAT for local rice.

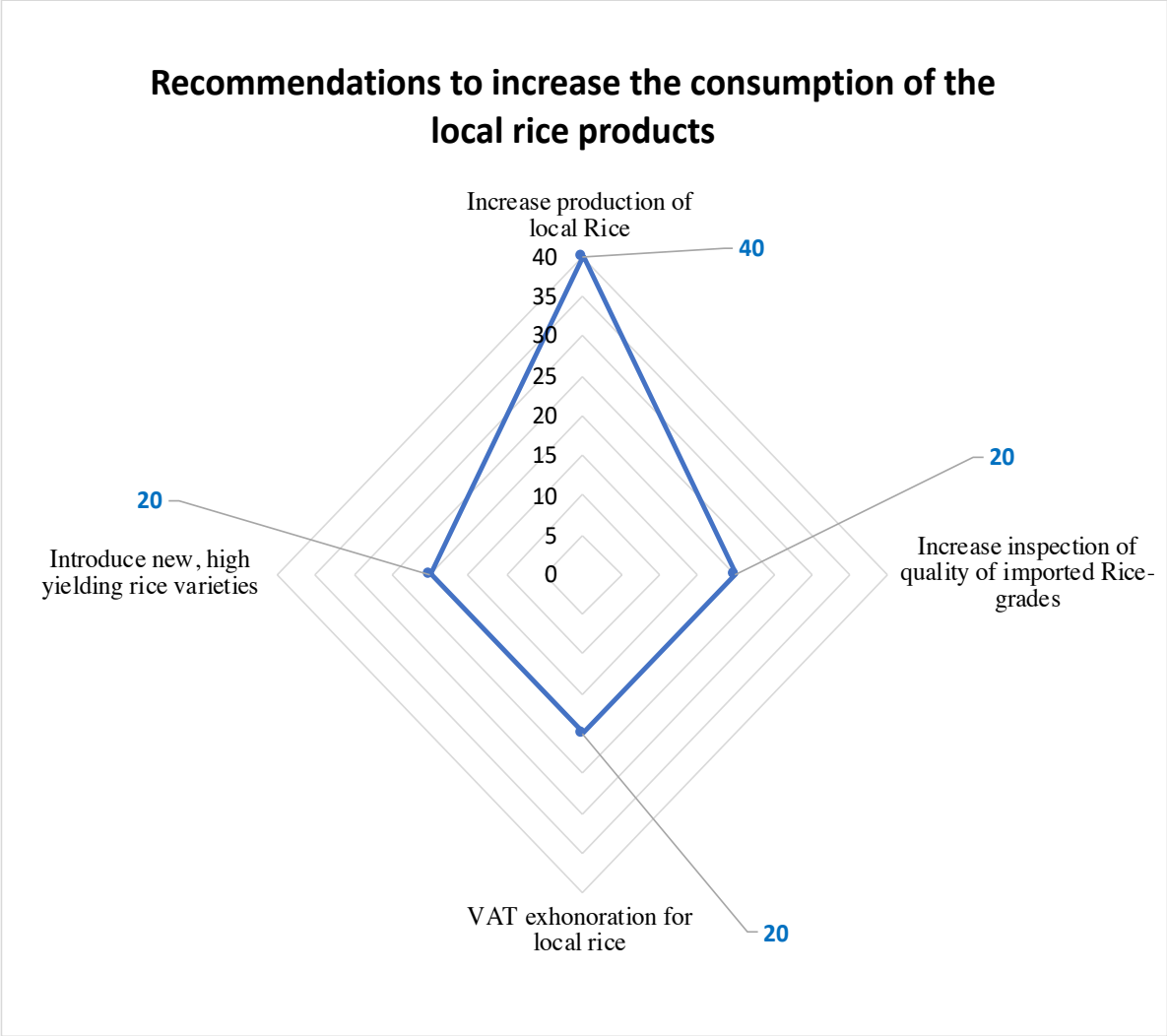


Figure 13: Recommendations by Small holder farmers

NRDS2 survey, 2022

Section II: NRDS2 M&E Baseline and Manual

Section II: NRDS2 M&E Data Collection Manual

1.1 Introduction

This manual is a reference document which provides detailed information about NRDS2 Indicators and is intended to provide guideline on NRDS2 Data collection methods. The purpose of the manual is to promote a good understanding and reliable practices of NRDS2 indicators data collection procedures. It covers the key planning steps and processes needed to set up and implement a system for NRDS2 data **collection planning**, **implementation and evaluation**. It has been designed to be used by NRDs2 monitoring team; Task Force, RAB and the Ministry of Agriculture.

The manual focuses on the key components of a system for data collection that allows the TF to develop and strengthen NRDS2 indicators data collection. The manual contains information that cover the understanding of NRDS2 Indicators, NRDS2 Data collection Principles, Understanding of Partners and Partners Coordination and practical experience in collecting data in the process of setting the baseline for NRDS2 indicators and proposed approach for replication, and finally proposed timeline for NRDS2 data collection.

There first sections of the manual provide the foundation understanding of NRDS2 Indicators and data collection, the narrative is designed to help readers develop an understanding of essential concepts and logics around NRDS2 M&E data collection as expressed by the key partners [JICA Rwanda and MINAGRI]. The manual highlights also the importance of a systematic that collection for NRDS2 Indicators through the coordination mechanism of partners, it identifies options and alternative for data collection from an analysis, selective and eliminative progressive process for “Secondary Data” and “Primary Data” collection processes.

The manual provides also the structure for the practical application of the manual in order to have in place a systematic data collection through a well-coordinated ecosystem of partners. Reference is made to experience and best practices during the process of setting baseline for NRDS2 indicators. The manual indicates for all the 21 indicators through a matrix; categorization of NRDS2 indicators, the type of approach to use for data collection, secondary data or primary data, provide a list of identified sources of data and addresses/link to the data.

From experience, the manual also provides an analysis of timelines used by partners in collecting data at their levels which determines the availability of data at partners' level and which also informs on when data can be collected at NRDS2 level, the same section proposes the timeline for NRDS2 Data Collection through 3 TF Meetings; the 1st one in March, the 2nd in July and the 3rd one in October.

1.2 Clearly understand NRDS2 Indicators

The second National Rice Development Strategy (NRDS2) has **21 Indicators** considered for its implementation; these include the overall NRDS2 Indicators 4: (1) production quantity, (2) area harvested, (3) yield, and (4) self-sufficiency rate, while under RICE Approach (Resilience, Industrialization, Competitiveness and Empowerment), number of Indicators increased as follows plus other country specific indicators that were proposed by the TF among other RICE Indicators:

Resilience: (5) Area under irrigation (ha), (6) Quantity of resilient variety seeds (ton), (7) New varieties released, (8) Use of fertilizer and application IPM.

Industrialization: (9) Level of industrial milling capacity (%), (10) New value-added products, (11) Level of mechanization in production (unit), (12) Availability and accessibility of machineries and services to farmers, (13) Adoption of appropriate harvesting and postharvest equipment.

Competitiveness: (14) Share of local rice in the market (%), (15) Quality of locally produced rice improved, 16) Availability of varieties with marketable traits, (17) Quantity of high-yielding variety seeds (ton), (18) Seed supply through contract farming.

Empowerment: (19) Smallholder farmers' accessibility to financial services (%), (20) Smallholder farmers' accessibility to technical training and services (%) and (21) Smallholder farmers' accessibility to private Extension Services in Rice Sector (%).

1.3 Factors to consider in selecting primary data collection methods

Factor	Note and questions
Cost	Key partners; JICA Rwanda, MINAGRI and NRDS TF have agreed to minimize the cost incurred for NRDS2 M&E data collection.
Speed	NRDS TF should consider through consultations with partners and TF members how much time it takes for partners to collect data and adjust timeline for data collection at TF level.
Representation [Regions]	Always consider the aspect of national representation for any

	data collected from partners.
Representation [Farmers]	Always consider the aspect of smallholder farmers [Male and Female] representation for any data collected from partners.
Level of Accuracy	How accurate should the data be? How accurate are the data from partners? How do data respond to NRDS2 indicators we are measuring?
Reliability	How are we sure that the data can be collected using this same method in the future?
Frequency	How often are the data collected by partners? How does this impact data collection at NRDS2/TF level? And what is the costs associated to data collection process?

1.4 Identification of potential sources for secondary data

For each of NRDS2 performance indicator, it is recommended to explore what data sources are available, only for those indicators of which data are not available from the secondary sources, then primary data collection should be used. NRDS2 TF members or any other partners involved in supporting for NRDS2 M&E Indicators data collection, they can explore the possibility to integrate in their existing M&E tools questions that will help to collect some of NRDS2 M&E data.

Determining potential sources of data will require conversations with people knowledgeable/conversant withNRDS2 indicators, NRDS TF Members, who can advise on the identification of various data sources (partners, government officials, statistical experts or service providers, survey organizations, university research centers, etc.). This is in line with Step1 under section II.6 which is the continuous assessment of the availability of the data responding to NRDS2 indicators.

- What data are already being collected
- Whether existing data would be appropriate for NRDS2 indicators
- Whether data are reliable and updated
- What alternatives may work to get the missing data for NRDS2 Indicators

NB: If there are no feasible or reliable sources available for one or more NRDS2 Indicators, then consider a cost-effective primary data collection approach.

1.5 Approach to NRDS2 M&E Data Secondary Collection

During the assignment for setting the baseline for Monitoring Indicators of Implementation of Rwanda's Second National Rice Strategy (NRDS2), through the Terms of Reference and through the instructions by partners; JICA Rwanda Team, MINAGRI and NRDS Taskforce, experience revealed that data collection for NRDS2 can be successfully done through a Systematic Partners' Coordination for secondary data and a cost-effective approach for the primary data.

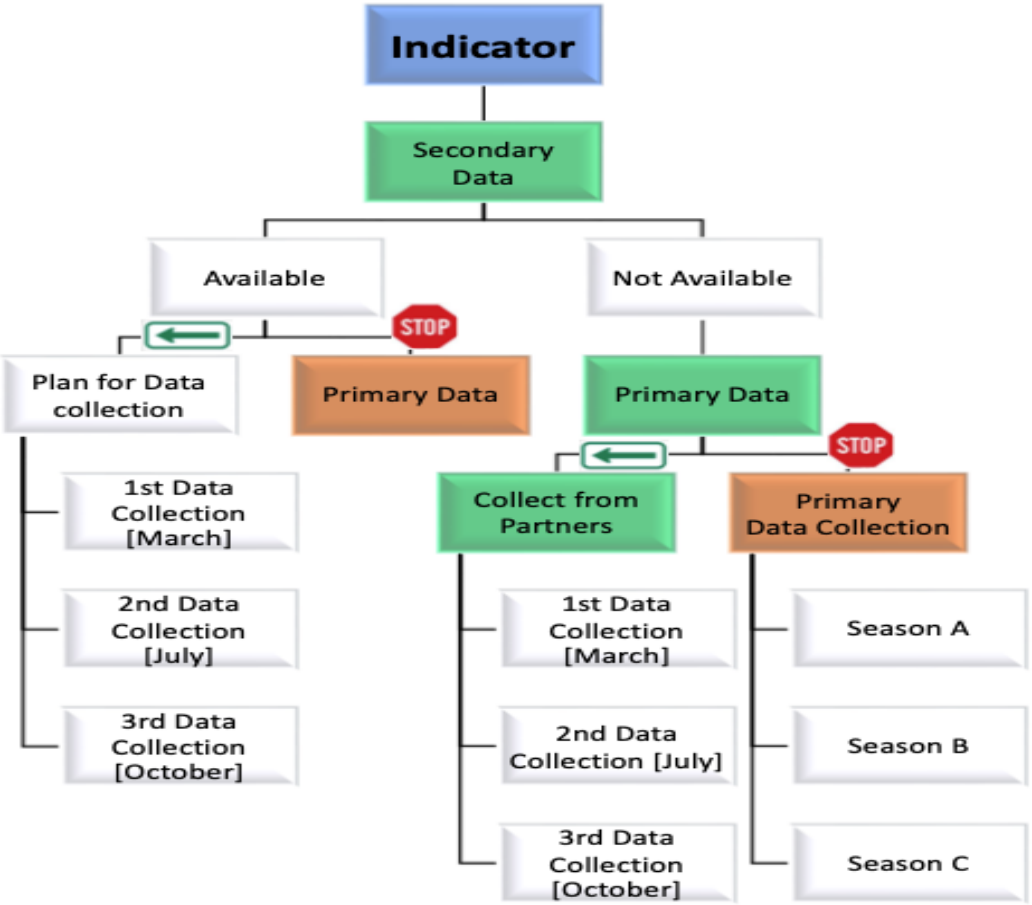


Figure 14: Approach to NRDS2 M&E Data collection

Developed from NRDS2 Indicators Baseline Setting Experience (Oct-Nov 2022)

Step 1: Assess the data availability for each indicator

At the stage of setting of the baseline for NRDS2 Indicators, the assessment was done for all 21 Indicators, however, depending on interests for data collection by current NRDS2 partners or by new partners (Sources of data), there will be always to make this analysis/exercise (TF Members) to identify if no new data sources/secondary data for NRDS2 Indicators can be found for a continued easy and assured NRDS2 M&E data collection.

Step 2: Always privilege data secondary

As introduced already, this exercise will privilege sourcing NRDS2 M&E data from secondary data to respect the second principle set of "Minimum/Low-Cost processes", therefore, this process should avoid as much as possible any processes for "Primary Data Collection" rather encourage/coordinate partners to do so and share the collected data through partners' coordination mechanism and TF.

Step 3: Always plan for data collection

Even if data are expected to be collected through partners, it is very key to plan for data collection at Taskforce level and respect the set calendar, this manual has proposed calendar for NRDS2 M&E data collection after the analysis of individual partners' timeline for data collection.

1.6 NRDS2 Partners' Coordination

1.6.1 Understanding of current NRDS2 Key Partners

About NRDS2 Partners	Roles they should play in NRDS2 M&E data provision
About JICA: JICA is a member of the Coalition for African Rice Development (CARD) a consultative group of bilateral and multilateral donors and African/international institutions, namely COMESA, EAC, ECCAS, ECOWAS, SADC, AfricaRice, AATF, AfDB, AUDA-NEPAD, AGRA, FAO, FARA, IFAD, IRRI, IsDB, JICA, JIRCAS, WB and WFP, supporting the development of rice sector in 32 Sub-Saharan African (SSA) countries including Rwanda.	• Support financially the implementation of NRDS2; • Support coordination of NRDS2 implementation; • Support the NRDS2 TF;

MINAGRI: As the Ministry of Agriculture, MINAGRI leads the implementation of the NRDS2.	• Coordinate the implementation of NRDS2; • Support NRDS TF; • Bring on board other partners who will provide data for NRDS2 M&E.
RAB:With the general mission of developing agriculture and animal resources through research, agricultural and animal resources extension in order to increase agricultural and animal productivity as well as their derived, RAB is a key partner to NRDS2 Implementation and M&E.	• Member of the NRDS TF; • Provide data on NRDS2 indicators that are available at RAB; • Play an important role in coordinating NRDS2 data collection from partners through the TF.
MINICOM: The Ministry of Trade and Industry, is also an equal partner like MINAGRI and JICA Rwanda at the level of ownership and implementation of the NRDS2 and coordination of other partners.	• Member of the NRDS TF; • Provide data on NRDS2 indicators that are available at RAB; • Play an important role in coordinating NRDS2 data collection from partners through the TF.
NISR: The National Institute for Statistics of Rwanda possesses a repository of law data and reports such as "SAS": Seasonal Agriculture Survey" reports containing plenty of data aligned with NRDS2 M&E log frame. [Open data]	• Data from NISR repository; are very important and aligned with key indicators of the NRDS2.
Federation of Millers:As the Federation of all Rice Millers in Rwanda, the federation can play an important role to coordinate the collection of NRDS2 data from the millers.	• If well-coordinated, the federation can be a good partner for Data collection for NRDS2 indicators that require data from millers.
FUCORIRWA: "Fédération des Unions des Coopératives de Riz au Rwanda" As the Federation of Unions that gathers all Rice Cooperatives in Rwanda, FUCORIRWA can be a good partner for Data collection for NRDS2 indicators that require data from Cooperatives & farmers.	• If well-coordinated with FUCORIRWA, it can be a good partner for Data collection for NRDS2 indicators that require data from Cooperatives & farmers, specifically data on use of fertilizers and IPM adoption.
RRA: As revenues collection body, they always have updated data on imports and exports. As a member of the TF, there should be negotiations at TF level to exonerate the TF to access data free of charge.	• Avail data on Rice Imports and Exports which are very important in measuring some NRDS2 Indicators.
NRDS Task Force: Under the implementation of NRDS1, the Minister of Agriculture and Animal Resources (MINAGRI) appointed a Task Force (TF) that was given the responsibility of formulating NRDS in collaboration with the	• As a taskforce that bring together experts from different partners, the TF plays a central role for the implementation of NRDS2; • Put in place strategies to collect NRDS2

Coalition for African Rice Development (CARD) based in Nairobi, Kenya.	data from partners by tasking TF members and focal persons in targeted institutions; • Ensure the coordination of partners for NRDS2 data collection.

1.6.2 Understanding NRDS2 timelines for data collection

During the assignment of setting

A. Data from NISR: SAS Timeline for Data Collection

SAS Calendar for data collection: Data collection is done three times a year, following three agricultural seasons:

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

E.g Data considered for the baseline, SAS 2019, data were collected:

- **Season A** data collection was done from 02nd December 2018 to 09th February 2019.
- **Season B** data was collected from 05th May to 23rd June 2019;
- **Season C**, field work was done from 8th to 27th September 2019.

B. Data from RRA

For indicators that require data on "Import" and "Export" such as "Self-Sufficiency", data can be gotten from RRA, the process involves mainly 3 steps:

i) Presenting the request/email to RRA indicating the type of data you are looking for period et….
ii) You paying for the service, they charge 5,000 Rwf per type of data, e.g Rice Import is one type and Rice Export is another type and you pay per year.
iii) Then you are given access to the data.

Step 1:

Request for Rice Import & Export Data

Emmanuel NZEYIMANA <emmavlady@gmail.com> 12:22 PM (1 hour ago)
to Jerome.Mugemanyi, globalmaxdevelopment, Patrick

Dear Jerome, I am doing a follow up on the conversation you had with one of my colleagues, we are working on a research for MINAGRI and we need the data on Rice Import & Export, yes I am aware that we have to pay 5,000 for each regime/year [Import & Export], can you guide us on the process, how we do the payment & how we access the data?

If you can share with me your phone number so that I can call you that would be great.

Thank you.

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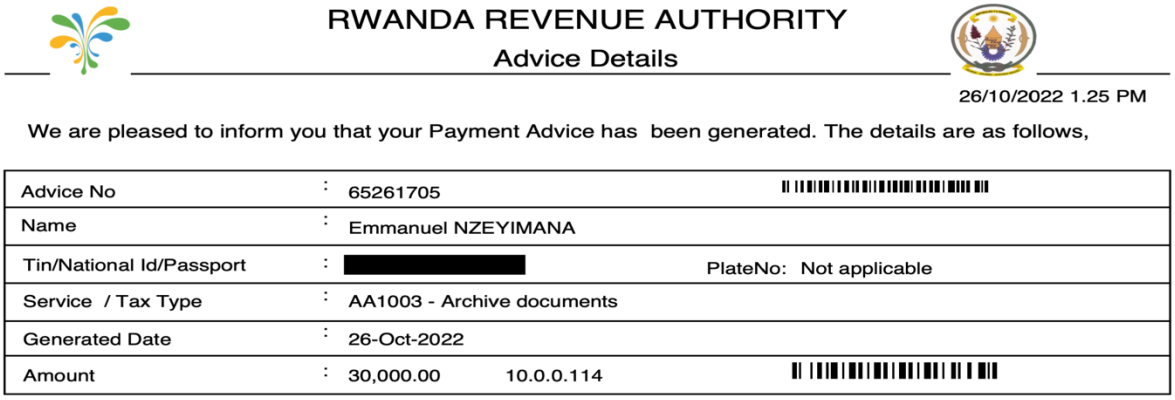
Dr. NZEYIMANA EMMANUEL, Ph.D

Step 2:



RWANDA REVENUE AUTHORITY

Advice Details

26/10/2022 1.25 PM

We are pleased to inform you that your Payment Advice has been generated. The details are as follows,

Advice No	:	65261705	
Name	:	Emmanuel NZEYIMANA	
Tin/National Id/Passport	:	[redacted]	PlateNo: Not applicable
Service / Tax Type	:	AA1003 - Archive documents	
Generated Date	:	26-Oct-2022	
Amount	:	30,000.00 10.0.0.114	

A. Data from FAOSTAT

FAOSTAT provides free access to food and agriculture data for over 245 countries (including Rwanda) and territories from 1961 to the most recent year available. During the assignment for setting baseline for M&E NRDS2, we have consulted FAOSTAT and data on "Trade Indices: Import-Export" were updated. FAOSTAT remains an important source for NRDS2 M&E data collection.

1.6.3. Strategies for partners' Coordination

Coordination is very key, absence of a dedicated/fulltime team to ensure data collection for NRDS2 Indicators, this brings this responsibility at the NRDS2 TF level which has to play an active; technical and administrative role for NRDS2 Data collection. It is the TF to mobilize, educate and coordinate partners for data collection.

However, Capacity Building is always at the backbone for increasing performance for technical teams, depending on the availability of resources, we recommend the NRDS2 TF to organize training workshops for its members to increase their capacity in understanding NRDS2 and M&E techniques. For the effective implementation of this manual, we recommend the NRDS TF to:

- Identify the various tasks and related skills needed, such as adequate data collection systems in the field, research design, and data entry and analysis at TF and Members level;
- Assess the relevant skills of NRDS TF members and partner organizations;
- Specify to what extent partners will or will not participate in the NRDS2 M&E process;
- Assign specific roles and responsibilities to NRDS TF team members and designate an overall M&E focal person among the TF members;
- Recruit consultants to fill in the skill gaps and special skills needs for NRDS TF members;
- Identify the topics for which formal training is needed and hold training sessions.

1.6.4 NRDS2 Indicators Data Collection Matrix

Indicators	Source data	Custodian/Partner	Data address/Source
Indicator: Overall NRDS Indicators			
1.Quantity of paddy produced (ton)	Secondary data	NISR "SAS": [Production]	SAS Reports:https://www.statistics.gov.rw/publication/seasonal-agricultural-survey-2019-annual-report
2.Total area harvested (ha)	Secondary data	NISR "SAS": [Area Harvested]	SAS Reports:https://www.statistics.gov.rw/publication/seasonal-agricultural-survey-2019-annual-report
3.Yield per unit area (t/ha)	Secondary data	MINAGRI: [Area Harvested]	Annual Reports
4.Self-sufficiency (%)	Secondary data	NISR "SAS": [Production]	SAS Reports:https://www.statistics.gov.rw/publication/seasonal-agricultural-survey-2019-annual-report
		RRA: [Imports]	Write & Make request for Data: customs@rra.gov.rw
Indicator: R.I.C.E Indicators			
Resilience:			
5.Area under irrigation (ha)	Secondary data	NISR "SAS"	SAS Reports:https://www.statistics.gov.rw/publication/seasonal-agricultural-survey-2019-annual-report
6.Quantity of Seed of resilient variety (ton)	Secondary data	RAB seed division	RAB seed division
7.New varieties of seeds released	Primary Data	RAB seed division	Survey [See Questionnaires in annex] or Data from Partners
8.Use of fertilizer and IPM Adoption	Primary Data	FUCORIRWA, Cooperatives	Survey [See Questionnaires in annex] or Data from Partners
Industrialization:			

9.Level of industrial milling capacity (%)	Primary Data	Millers	Survey [See Questionnaires in annex] or Data from Partners
10.New value-added products	Primary Data	Millers	Survey [See Questionnaires in annex] or Data from Partners
11.Level of mechanization in production (unit)	Primary Data	Cooperatives	Survey [See Questionnaires in annex] or Data from Partners
12.Availability and accessibility of machineries and services to farmers	Primary Data	Cooperatives	Survey [See Questionnaires in annex] or Data from Partners
13. Adoption of appropriate harvesting and postharvest equipment	Primary Data	Cooperatives	Survey [See Questionnaires in annex] or Data from Partners
Competitiveness:			
14.Share of local rice in the market (%)	Primary Data	Markets	Survey [See Questionnaires in annex] or Data from Partners
15.Quality of locally produced rice improved	Primary Data	Mills	Survey [See Questionnaires in annex] or Data from Partners
16. Availability of varieties with marketable traits	Secondary data	RAB seed division	RAB seed division
17. Quantity of high yielding varieties seeds	Secondary data	RAB seed division	RAB seed division
18.Seed supply through contract farming	Primary Data	Cooperatives	Survey [See Questionnaires in annex] or Data from Partners
Empowerment:			
19.Smallholder farmers' accessibility to financial services (%)	Primary Data	Cooperatives	Survey [See Questionnaires in annex] or Data from Partners
20.Smallholder farmers' accessibility to technical training and services (%)	Primary Data	Cooperatives	Survey [See Questionnaires in annex] or Data from Partners
21. Smallholder farmers access to private extension services (%)	Primary Data	Cooperatives	Survey [See Questionnaires in annex] or Data from Partners

1.7. Methodology to be used to collect data

Indicator 1. Quantity of paddy produced (ton)

Paddy production is the sum of paddy produced in a given year in different ecologies. It is a secondary data where the source was NISR SAS which published every season. NISR calculates the Quantity of paddy by multiplying the total land under Rice (Ha) and the yield obtain per hectare (t/ha). Data for this indicator is available from the secondary data and source of data is NISR "SAS" which is the reliable source of the data for this indicator because of the possessed resources to do regular surveys on agricultural sector which they do twice a year/season, most updated data and published.

Indicator 2. Total Area Harvested

Area harvested is defined as the Sum of rice-harvested areas from all rice-growing ecologies per year. The data is sourced in National institute of statistics where the national institute of statistics in Rwanda in collaboration with ministry of agriculture and animal resources (MINAGRI), NISR conducts a regularly seasonal agriculture survey (SAS) to gather information related to crops and livestock. Data for this indicator is available from the secondary data and source of data is NISR "SAS" which is the reliable source of the data for this indicator because of the possessed resources to do regular surveys on agricultural sector which they do twice a year/season, most updated data and published.

Indicator 3. Yield per Unit Area

Rice yield is defined as the average quantity of paddy grains harvested per hectare of land (obtained by dividing the quantity of paddy produced by the area harvested). This method is estimating the yield using a two-step method involving sampling the crop and calculating the yield. Data for this indicator is available from the secondary data and source of data is NISR "SAS" which is the reliable source of the data for this indicator because of the possessed resources to do regular surveys on agricultural sector which they do twice a year/season, most updated data and published.

Indicator 4: Self-sufficiency rate

The self-sufficient rate is the coverage rate of rice needed by local production. The self-sufficient ratio is measured as percentage obtained from the total local milled rice times 100 over the total needed milled rice. The total need milled rice at country level is the imports milled rice plus the local milled rice minus exports. Data related to imports and exports can be obtained in Rwanda revenue authority. In order to obtain the local milled rice, the data available from paddy production will be converted into milled rice by multiplying the total

paddy produced at country level 0.65 (This is conversion rate used by the rice technical team to convert paddy rice to milled rice). NISR/SAS and RRA should be the reliable sources of the data for this indicator because of the possessed resources to do regular data collection.

Indicator 5: Area under irrigation

Area under irrigation is defined as area under rice cultivation with supplementary irrigation that could mitigate the negative impacts of weather fluctuations on rice production. The data for this indicator are sourced in NISR SAS where they consider the area under irrigation in season A and Season B. NISR/SAS should be the reliable sources of the data for this indicator because of the possessed resources to do regular data collection.

Indicator 6: Quantity of Seed of Resilient variety

Quantity of seeds of resilient variety is defined as the quantity of seeds of locally preferred varieties with resilient characteristics (disease resistant and cold tolerant), locally produced annually. This information is sourced in Rwanda agriculture and animal resources development board (RAB) by organizing an interview with staff in charge of certified seeds production. MINAGRI publishes annually reports which contain data for this indicator.

Indicator 7: New resilient varieties of seeds released

New resilient varieties released is defined as the Number of varieties released to farmers with appealing traits of disease resistance and cold tolerance. This is data is sourced in RAB Seed Division by interviewing researchers in charge of breeding and evaluation of new varieties. The RAB Seed Division was visited to collect data related to new varieties released and their descriptions. Complementary Primary Data were collected from Rice Cooperatives.

Indicator 8: Percentage of farmers using fertilizer and applying IPM

This indicator is defined as percentage of farmers using fertilizers and other good agriculture practices. The data related to this indicator is gathered at MINAGRI and RAB using the Smart Nkunganire data system and for IPM, the information is collected at cooperative level using a questionnaire administered to the selected rice cooperatives. The questionnaire to be used is found in annexes. As FUCORIRWA ensures the coordination for most of rice cooperatives and collect different data including those on the use fertilizers, it remains the reliable source of data for this indicator in future.

Indicator 9: Level of industrial milling capacity

This indicator is defined as the number of millers who operate at more than 70% of their milling capacity. The data related to the indicator is collected at mill plant level using a questionnaire administered to the selected rice mill plants [Five (5) rice processors were visited namely Nyagatare mill (Nyagatare District), Mayange Mill (Bugesera District), Mukunguli Mill (Kamonyi District), Minoterie de Huye (Huye district) and COTICORI (Rusizi District)]. The questionnaire to be used is found in annexes. Rice Mills are the reliable sources of data for this indicator.

Indicator 10: Number of New value-added products/ byproducts developed

This indicator is defined as the number of new value-added products or byproduct delivered from rice grains or biomass. To gather information related to this indicator, a questionnaire is used to the selected mill plants [Five (5) rice processors were visited namely Nyagatare mill (Nyagatare District), Mayange Mill (Bugesera District), Mukunguli Mill (Kamonyi District), Minoterie de Huye (Huye district) and COTICORI (Rusizi District)]. The questionnaire to be used is found in annexes. Data for this indicator can be obtained from processors of rice products.

Indicator 11: Level of mechanization in production

The indicator is defined as the Number of machines available for ploughing in rice producing areas and a questionnaire is used to capture the status of mechanization preparedness; level of land/plots consolidation to allow the mechanization services such as; roads, introduction of small machinery available. A questionnaire is administered at Cooperatives level. The questionnaire to be used is found in annexes. Data for this indicator will require primary data collection from cooperatives as reliable sources of data.

Indicator 12: Number of Service Providers for machinery services

This indicator is defined as availability and accessibility of machineries and services to farmers. The team visited and interviewed small holder farmers in pre-selected 15 Cooperatives [Muvumba P8, Cyabayaga, Ntende, Gacaca, Rwinkwavu, Cyaruhogo, Rurambi, Mukunguli, Base II, Rugeramigozi, Cyili, Nyiramageni, Kirimbi, Bugarama Zone 1, Bugarama Zone 3]. The questionnaire to be used is found in annexes. Data for this indicator will require primary data collection from cooperatives as reliable sources of data.

Indicator 13: Number and type of harvesting and post harvesting tools

Harvesting and Post Harvesting indicator is defined as adoption of appropriate harvesting and post harvesting tools including, threshing, winnowing and drying using machineries. A questionnaire is administered at targeted cooperatives. The questionnaire to be used is found in annexes. Data for this indicator will require primary data collection from cooperatives as reliable sources of data.

Indicator 14: Share of local rice in the market (%)

Share of local rice is defined as share of locally produced rice in the total quantity of rice procured by major retail stores (in urban areas) and major sales points in rural areas for a year. a questionnaire is administered to rice sellers of major selected sales points in urban and rural areas through interviews to capture the level of Rwandan Rice sold on local markets in percentage. The questionnaire to be used is found in annexes. Data for this indicator will require primary data collection from rice sellers/markets as reliable sources of data.

Indicator 15: Percentage of each grade of locally produced rice

This indicator is defined as grading of rice locally produced is observed to capture the quality status. To collect data related to this indicator, a questionnaire is administered to the key respondents from selected processing plants to capture the level of grading of locally produced rice. The questionnaire to be used is found in annexes. Data for this indicator will require primary data collection from plant mills as reliable sources of data.

Indicator 16: Quantity of seeds of varieties with marketable traits available

Seeds of varieties with marketable traits is defined as the seeds of locally preferred varieties with long or aroma attributes, locally produced. To collect data related with this indicator, an individual/group interview will be organized with staff of Rwanda Agriculture and Animal Resources development board (RAB). The questionnaire to be used is found in annexes. RAB seed division is the reliable source data for this indicator

Indicator 17: Quantity of high-yielding variety seeds (ton)

High yielding variety seeds is defined as the seeds of varieties with expected yield superior to 5T/ha. To collect data related with this indicator, an individual/group interview will be organized with staff of Rwanda Agriculture and Animal Resources development board (RAB). The questionnaire to be used is found in annexes. RAB, seed division is the reliable source data for this indicator.

Indicator 18: Number of cooperatives accessing quality seeds through contract farming

This indicator is defined as use of contract farming for seed supply through contract farming between cooperatives and millers. To capture this information, data related to the seed supply chain is collected from selected rice cooperatives and milling plants using an individual interview. The questionnaire to be used is found in annexes, Cooperatives are the reliable sources of data for this indicator.

Indicator 19: Smallholder farmers' accessibility to financial services

This indicator is defined as the "percentage of smallholders in pre-selected farmers' groups/associations [Muvumba P8, Cyabayaga, Ntende, Gacaca, Rwinkwavu, Cyaruhogo, Rurambi, Mukunguli, Base II, Rugeramigozi, Cyili, Nyiramageni, Kirimbi, Bugarama Zone 1, Bugarama Zone 3] accessing necessary financial services (in rice producing areas). Data is collected Cooperatives level using a questionnaire to capture the percentage of smallholder farmers accessing financial services: Financing and insurance of the rice sector activities. The questionnaire to be used is found in annexes. Cooperatives are the reliable sources of data for this indicator.

Indicator 20: Smallholder farmers' accessibility to technical training and/or services

This indicator is defined as the percentage (%) of smallholder in pre-selected farmers' groups/associations [Muvumba P8, Cyabayaga, Ntende, Gacaca, Rwinkwavu, Cyaruhogo, Rurambi, Mukunguli, Base II, Rugeramigozi, Cyili, Nyiramageni, Kirimbi, Bugarama Zone 1, Bugarama Zone 3] regularly accessing necessary technical training and services (in rice producing areas). To collect data related to this indicator, a questionnaire is used and selected farmers cooperatives are visited and RAB Rice program staff contacted and other key stakeholders in rice subsector. The questionnaire to be used is found in annexes. Cooperatives are the reliable sources of data for this indicator.

Indicator 21: Small farmers access to private extension services

This indicator is defined as the percentage of smallholder in pre-selected farmers' groups/associations [Muvumba P8, Cyabayaga, Ntende, Gacaca, Rwinkwavu, Cyaruhogo, Rurambi, Mukunguli, Base II, Rugeramigozi, Cyili, Nyiramageni, Kirimbi, Bugarama Zone 1, Bugarama Zone 3] regularly accessing necessary private technical training and extension services in rice production. To collect data related to this indicator, a questionnaire is used and selected farmers cooperatives should be visited. The questionnaire to be used is found in annexes. Cooperatives are the reliable sources of data for this indicator.

1.8 Timelines for NRDS2 Data Collection

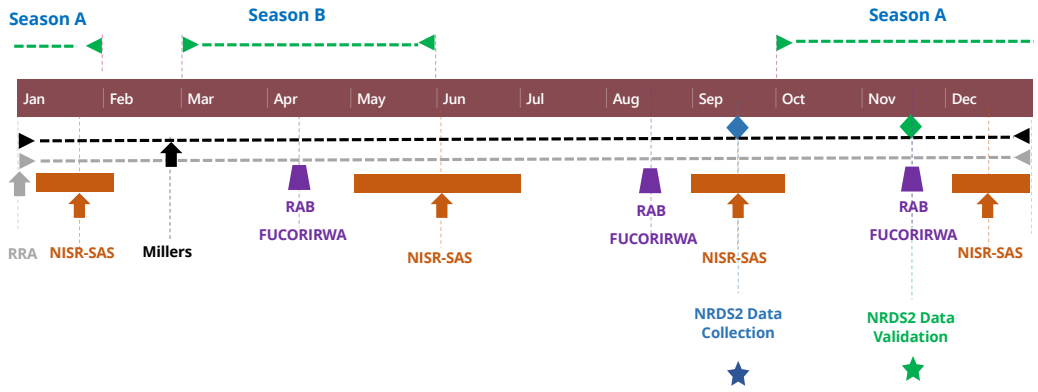


Figure 15: Timeline for NRDS2 Data Collection

Developed from NRDS2 Indicators Baseline Setting Experience (Oct-Nov 2022)

Considering that data for NRDS2 M&E will be collected from partners and that partners collect their data at different time along the three seasons depending on the type of businesses they are involved in along the rice value chain, some they collect data during the agricultural seasons, others after the agricultural seasons, at harvest and others all along the year independently of agricultural seasons (RRA), we are proposing for two TF Events every year; the first in September to gather data and the second in November to validate the collected data.

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ANNEX

Annex 1: Work-plan and implementation timeline

Activity		Aug 22				Sept 22				Oct 22				Nov 22				Dec 22				Jan 23
		Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1	Wk 2	Wk 3	Wk 4	Wk 1
1	Kick-off Meeting																					
2	Review NRDS II and other documents																					
3	Review of data sources																					
4	Prepare and submit Inception Report																					
5	Collect data/information																					
6	Compilation, analysis and preparation of draft report																					
7	**Sharing the Draft Report to obtain comments**																					
8	1-day meeting with NRDS TF for presentation of Draft reports and discussions																					
9	Incorporation of comments and finalization of the report																					
10	**Submission of the Final Report**																					

Annex 2: List of Key Informants met during the survey

REMOVED

Annex 3: List of contacts (Respondents)

REMOVED

Annex 4: NRDS2 Data Collection Tools [Market]

1.Name province			
2.Name District			
3.Name Market			
4.Location			
5. Name Interviewee	Gender: F M	Mobile phone	
6. Do you sell rice products		Yes:……	No:……..
7. From when did you start selling rice product		Year:…….	
8. In 2019, what was the total volume of rice sold in your shop?		……Ton or …….KGs	
9. In 2019, what was the volume of local rice did you sell?	Tons:……	Percentage (%)	
10. What is the grade of local rice did you sell?		1)Grade 1: 2) Grade 2: 3)Mixture	
11. what was the average price of local rice in 2019?		……RFW	
12. what are the major attributes attracting consumers to local rice purchase?			
13.In 2019, what was the volume of imported rice did you sell?	Tons;……	Percentage (…….%)	
14. what was the grade of imported rice did you sell?		1)Grade 1: 2)Grade 2: 3)Mixture	
15. what was the average price for imported rice?			
16. What are the major attributes which attracted the consumers to imported rice purchase.			
17. What are your recommendations to increase the consumption of the local rice products? …… ……			

Annex 5: NRDS2 Data Collection Tools [Milling Plants]

1.Name province			
2.Name District			
3.Name of Mill			
4.Location			
5.Name of interviewee	Gender: M….F….		
6. When was your plant installed/Launched?			
7. How many parts does your plant have?			
8. What is the capacity of your milling plant? (Metric Tons/hour)	……T/Hour		
9.How many tons of paddy do you receive per season?	……T/Season		
10. Do you have any seeds supply contracts with seeds producers or cooperatives?	Yes:.....	No:.....	
11. What are the rice grades do you produce?	1)Grade 1:	2)Grade 2:	3)Mixture
12. What is the proportion for each grade? […%]	1)Grade 1: […%]	2)Grade 2: […%]	3)Mixture: […%]
13.How many tons of milled rice do you obtain per grade?	1)Grade 1: […T]	2)Grade 2: […T]	3)Mixture: […T]
14.What was the average price at mill gate last year 2019			
15. what are the types of by-products do you produce?		1) 2)	
16. Do you have a new product or by-product in coming years? If yes which one?			
17. What are your recommendations to increase the consumption of the local rice products? …… ……			

Annex 6: NRDS2 Data Collection Tools [Smallholder Farmer]

1.Name Province		
2.Name District		
3.Name cooperative		
4.Location		
5.Name interviewee	Mobile Phone	Gender: M…..F……
6. What is the total area do you have (Ares)?	…….Ares	
7. What is the number of rice varieties do you grow?		
8. How many among them are High yielding, resistant to diseases and tolerant to cold and which one?	High Yielding……# Resilient…….#	
9. Which one is high yielding? disease resistant? cold tolerant? Name it	Disease resistant	
	Cold tolerant	
	High yielding	
10. Do you receive good quality seeds?	Yes……No……	
11. How many kilograms of quality seeds are you using in your cultivation/Season?	……Kg/Season	
12. What is the source of your seeds?	……	
13. Do you have any contract farming for seeds supply with any milling plant?	Yes:..... If Yes, which one:.....	No:.....
14. Does your source of seeds have the certification from RICA?	Yes……No……	
15. Are you aware of IPM approach?	-Yes……No……..	-If Yes, which one are you using?.....
16. Are you using any mechanization tools in your farm? If yes which one?	Yes……..Type:…… ……How many/EachType?....	No……
17. At harvest, do you separate paddy from different varieties? Yes or no	Yes……	No….
18.Do the seed producer has the contract farming with your cooperative/farmer?	Yes…….	No….
19. Do you have access to any mechanization tools or access public or private services in mechanization.	Yes….. Type……	No
20. Who was the service provider? ……		
21. Did you receive any financial service in 2019 ? If yes which one?	Yes……If Yes, which one?	No……..
	i) Financing	……
	ii) Insurance	……
22. Did you receive any technical support or training in 2019 season? If yes which one?	Yes……	No……..
23. If Yes, who was the training provider?	……	
24. What are your recommendations to increase the quality and quantity of your rice production?		

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By Dr. Emmanuel NZEYIMANA
Globalmax and Development Ltd

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