This document has been modified by CARD Secretariat, deleting personal information that the original version contained, as indicated below, for the purpose of making it publicly available on CARD website.

Modified sections	Pages in the original document	Modifications made
Appendix 5: Key Informants	47-51	Removed

Baseline Survey for the Zambian Third National Rice Development Strategy

Baseline Report

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Additionally, we thank the Task Force (TF) consisting of MoA, Agricultural Consultative Forum (ACF), National Association for Smallholder Farmers (NASFA) and Market Oriented Rice Development Project (MoReDeP) for their participation in the feedback sessions which helped in contextualizing to suit the Zambian conditions thereby aiding in the development of this report.

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Further, with utmost importance to this project, we thank the farmers for their attendance and input into the process that aided in the development of this report that is expected to well inform stakeholders of the current situation with regards to the rice sector.

Lastly, acknowledgment goes towards the AnChiCon staff for their efforts during the execution of this assignment namely; Mr Mwenda Silumesii, Mr Stephen Tembo, Ms Nellie Simuchoba and Ms Melody Kunda.

In conclusion, we hope this report will provide the needed knowledge on the current situation of the rice sector and aid in the strategic planning and implementation of the Third National Rice Development Strategy.

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List of Acronyms

AGRA	Alliance for a Green Revolution in Africa
AnChiCon	AnChiCon Limited
ARO	Agriculture Research Officer
CARD	Coalition for African Rice Development
CDF	Constituency Development Fund
CEO	Chief Executive Officer
CFS	Crop Forecasting Survey
DACO	District Agricultural Coordinating Officer
DMDO	District Marketing Development Officer
EA	Enumeration Area
FAO	Food and Agriculture Organisation
FBS	Food Balance Sheet
FGD	Focus Group Discussion
FISP	Farmer Input Support Programme
FMO	Farmer Management Officer
FSP	Food Security Pack Programme
FTI	Farmer Training Institute
GM8	8th General Meeting
GRZ	Government of the Republic of Zambia
ha	Hectares
HYV	high-yielding varieties
IDE	International Development Enterprises
JICA	Japan International Cooperation Agency
KIIs	Key Informant Interviews
KIs	Key Informants
Log Frame	Logical Framework
M&E	Monitoring and Evaluation
MCDSS	Ministry of Community Development and Social Services

Mha	Million Hectares
MMT	Million Metric Tonnes
MoA	Ministry of Agriculture
MOReDeP	Market Oriented Rice Development Project
MT	Metric Tonnes
NEPAD	New Partnership for Africa's Development
NGOs	Non-Governmental Organisations
NRDS	National Rice Development Strategy
PACO	Provincial Agricultural Coordinating Officer
PAO	Provincial Agricultural Officer
PHS	Post Harvest Survey
PR	Progress Report
PS	Permanent Secretary
RICE	Resilience, Industrialization, Competitiveness and Empowerment
SAO	Senior Agriculture Officer
SCCI	Seed Control and Certification Institute
SSA	Sub-Saharan African
SSR	Self-Sufficiency Rate
TF	Task Force
TICAD IV	Fourth Tokyo International Conference on African Development
T-NRDS	Third National Rice Development Strategy
ToRs	Terms of Reference
TRA	Technical Research Assistant
TSB	Technical Services Branch
ZamStats	Zambia Statistics Agency
ZARI	Zambia Agriculture Research Institute
ZRA	Zambia Revenue Authority

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0 Executive Summary

0.1 Background

According to the Food and Agriculture Organisation (FAO), rice is vital for the nutrition of much of the population of Asia, as well as Latin America and the Caribbean and Africa. It is central to food security of over half of the world's population, thus is considered a 'strategic' commodity in many countries (Food and Agriculture Organisation, 2002). Specifically in Zambia, the Government recognises rice as one of priority crops on the crop diversification agenda, aimed at contributing to increased production of diverse range of agricultural commodities and products that can support households' income and food and nutrition security in a changing climate (Ministry of Agriculture and Livestock, 2014).

Zambia is a member of the Coalition for African Rice Development (CARD) which supports the development of the rice sector in thirty-two (32) Sub-Saharan African (SSA) countries. The first phase of the CARD initiative aimed at doubling the rice production in SSA from fourteen (14) million metric tonnes (MMT) in 2008 to twenty-eight (28) MMT in 2018, while the second phase has a new target of further doubling rice production to fifty-six (56) MMT by 2030. The CARD is mainly implemented using National Rice Development Strategies (NRDS) and Zambia, through the Ministry of Agriculture (MoA), is implementing its Third NRDS (T-NRDS) from 2022 to 2026.

In the second phase, CARD focuses more on Monitoring and Evaluation (M&E) of NRDS implementation. Thus, the CARD has developed an M&E framework, applying the "RICE Approach" (Resilience, Industrialization, Competitiveness and Empowerment). To ascertain the current figures of the aforementioned indicators, the Japan International Cooperation Agency (JICA) Zambia office engaged AnChiCon Limited (AnChiCon) to undertake the baseline study under the guidance of CARD Secretariat and the NRDS Task Force (TF). The full terms of reference (ToRs) are attached as Appendix 1.

0.2 Overview of CARD M&E Indicators

The first four (4) indicators are the overall indicators measuring the OUTPUT and OUTCOME level results. These indicators are; "Quantity of Paddy Production", "Total Area Harvested", "Yield per Unit Area" and "Self-Sufficiency Rate". Under the RICE approach, each of the four (4) components has two (2) indicators. These indicators are mainly at the INPUT and ACTIVITY levels. The additional eight (8) indicators are listed below;

1) **Resilience** ("Area under irrigation" and "Quantity of resilient variety seeds");
2) **Industrialisation** ("Level of milling sector upgrading" and "Level of mechanization in production");
3) **Competitiveness** ("Share of local rice in the market" and "Quantity of high-yielding variety seeds"); and,
4) **Empowerment** ("Smallholder farmers' accessibility to financial services" and "Smallholder farmers' accessibility to technical training or services")

It is these twelve (12) indicators that the baseline report measured to ascertain the starting point of the Third NRDS (T-NRDS). Further to these, the Baseline also collected the price of rice segregated by local and imported rice.

0.3 Methodology

AnChiCon used a consultative and reiterative approach to ascertain the necessary outputs of the baseline which would be fully owned by the stakeholders. This meant consultation with various stakeholders along the rice value chain from the research and seed certification institutes who look into the farming methodologies and inputs such as seeds, through the farmers and millers, to the traders and retail stores. This approach is built on the understanding that stakeholders, especially intervention target groups, have insights into their conditions which greatly inform actions aimed at addressing the underlying conditions. This approach ensures stakeholder involvement throughout the process.

Our approach also informs our methodology in which we use a general, mixed methodology approach to collect, collate and develop concepts for stakeholder validation and a specific methodology, within the activities of the general methodology, in which we focus on addressing the specific items in the assignment's scope of work to assure absolute compliance to the requirements of the ToRs.

This assignment consists of two (2) main methodology approaches; desk studies and field studies.

0.4 Findings – CARD Indicators

The summary of the CARD indicator findings based is tabulated as below;

Table 0-1: NRDS M&E Indicators – Definitions and Baseline Values

CARD M&E Framework	Indicator (Baseline Year)	Definition (Unit)	Baseline Value (Source Data)
Overall	1. Quantity of paddy production (2022)	Paddy rice produced in a year (metric tonnes - MT)	62,918MT (PHS)
	2. Total area harvested (2022)	Rice-harvested area (hectares - ha)	59,601 ha (PHS)
	3. Yield per unit area (2022)	Paddy rice harvested per hectare of land (MT/ha)	1.06 MT/ha (PHS)
	4. Self-sufficiency rate	The percentage of rice consumed that is locally produced (%)	83.16% (PHS and ZRA)
Resilience	1. Area under irrigation (2022)	Area under rice cultivation with supplementary irrigation that could mitigate the negative impacts of weather fluctuations on rice production (ha)	Zero (Survey)
	2. Quantity of resilient variety seeds (2022)	Quantity of seeds of locally preferred varieties with resilient characteristics, locally produced and/or imported annually (MT)	301.5 MT (SCCI)
Industrialization	1. Level of Industrial Milling Capacity (2022)	Ratio of installed capacity of medium and large mills among all functional mills (%)	66.7% (Survey, Technical Services Branch (TSB) and MoA Extension)

CARD M&E Framework	Indicator (Baseline Year)	Definition (Unit)	Baseline Value (Source Data)
	2. Level of mechanization in production (2022)	Number of machines available for ploughing and harvesting in rice producing areas (Number)	23 Tractors, 3 Planters, 1 Combined Harvester, 3 Boom Sprayers and 1 Spreader (Survey, TSB and MoA Extension)
Competitiveness	1. Share of local rice in the market (2022)	Share of locally produced rice in the total quantity of rice procured by major retail stores (%)	41.29% (Retail Stores)
	2. Quantity of high-yielding variety seeds (2022)	Quantity of seeds of locally preferred varieties with high-yielding attributes, locally produced and/or imported (MT)	648.0 MT (SCCI)
Empowerment	1. Smallholder farmers' accessibility to financial services (2022)	Ratio of smallholder farmers having access to financial services (%)	10.9% (Survey)
	2. Smallholder farmers' accessibility to technical training or services (2022)	Ratio of farmers accessing necessary technical training and services in rice production areas (%)	100% (Survey)

0.5 Findings – Rice Prices

Further to the CARD indicators, the assignment was to find the prices of the various rice varieties and this was ascertained by collecting the data from the retail stores. An average of the local and the imported brands based on package sizes was tabulated below with prices both the Zambian Kwacha (ZMW) and in the United States Dollar (US $)[1];

Table 0-2: Average Prices of Rice Per Package Size

Weight (kg)	Imported (ZMW)	Local (ZMW)	Imported (US $)	Local (US $)
0.5	ZMW 38.28	ZMW 16.00	$1.91	$0.80
1	ZMW 56.66	ZMW 28.42	$2.83	$1.42
2	ZMW 70.67	ZMW 58.49	$3.53	$2.92
2.5	ZMW 88.03	ZMW 72.60	$4.40	$3.63
5	ZMW 136.48	ZMW 132.77	$6.82	$6.63
10	ZMW 303.32	ZMW 241.99	$15.15	$12.09

Appendix 4 is the full list of various rice brands, package sizes and prices.

0.6 Challenges and Recommendations

The baseline had challenges in collecting the rice sales data required to calculate the share of locally produced rice in the retail stores. It is recommended that for follow-up surveys, the MoA and the NRDS TF, engage the retail stores to explain the need for this data for the development of the rice sector in the country.

The second challenge was the seemingly inadequate sample size. It was recommended by the TF that should there be follow up surveys as regards the NRDS, the sample size should be more than the two (2) towns selected under the baseline. The number of areas and selection of areas should be more representative of the rice sector in Zambia.

[1] The conversion rate was US $ 1 = ZMW 20.0229 as indicated by the Bank of Zambia average mid-rate on Friday, 03rd March 2023. (Bank of Zambia, 2023)

0.7 T-NRDS Baseline Figures and Targets for 2026 and 2030

Despite the challenges indicated, the baseline established baseline figures for all the indicators and set targets for the T-NRDS (2026) and the end of the CARD Phase 2 (2030) as follows;

Table 0-3: Indicator Baseline Figures and Targets for 2026 and 2030

Indicator	2022 T-NRDS Baseline	2026 T-NRDS Target	2030 CARD Target[2]
Paddy Rice Production (MT)	62,918	93,420	125,836
Area Harvested (ha)	59,601	56,365	80,266
Yield Rate (MT/ha)	1.06	1.66	2.07
Self Sufficiency Rate	83.16%	91.58%	100.00%
R1. Area under irrigation	0 ha	80 ha	160 ha
R2. Quantity of resilient variety seeds	301.50 MT	452.25 MT	603.00 MT
I1. Level of Industrial Milling Capacity	66.70%	70.85%	75.00%
I2. Level of mechanization in production	23 Tractors, 3 Planters, 1 Combined Harvester, 3 Boom Sprayers and 1 Spreader	23 Tractors, 3 Planters, 1 Combined Harvester, 3 Boom Sprayers and 1 Spreader	30 Tractors, 5 Planters, 2 Combined Harvesters, 5 Boom Sprayers and 2 Spreaders
C1. Share of local rice in the market	41.29%	45.47%	49.65%
C2. Quantity of high-yielding variety seeds	648.0 MT	972.0 MT	1,296.0 MT
E1. Smallholder farmers' accessibility to financial services	10.9%	30.0%	50.0%
E2. Smallholder farmers' accessibility to technical training or services	100.0%	100.0%	100.0%

The methodology of setting the targets is outlined in sub-section 4.15.2

0.8 Conclusion

The Baseline Report has reported the results of the primary data collection and the secondary data collection using methods that can be replicated by the MoA for the following years.

[2] These are the tentative targets for Zambia to achieve under the CARD initiative as set by the Zambian NRDS TF. It should be noted that pending the performance of the T-NRDS, the 2030 targets can be revised.

1 Background

1.1 Role of Rice

According to the Food and Agriculture Organisation (FAO), rice is vital for the nutrition of much of the population of Asia, as well as Latin America and the Caribbean and Africa. It is central to the food security of over half of the world's population, not to mention the culture of many communities. Rice is, therefore, considered a 'strategic' commodity in many countries and is, consequently, subject to a wide range of government controls and interventions. (Food and Agriculture Organisation, 2002)

Specifically in Zambia, the Government recognises rice as one of the priority crops on the crop diversification agenda, aimed at contributing to increased production of a diverse range of agricultural commodities and products that can support households' income and food and nutrition security in a changing climate (Ministry of Agriculture and Livestock, 2014). It is anticipated that rice production will offer various cropping alternatives to farmers as opposed to relying on a single crop, namely maize (ibid). It is the third most important crop from maize and wheat and as such it is increasingly becoming an important food and cash crop in Zambia (Moono, 2015). This is evidenced by its inclusion in the National Food Balance Sheet (FBS). At producer level, it is a major source of income in four major producing provinces Northern, Muchinga, Western and Eastern. (Ministry of Agriculture, 2013 - 2022) Farmers consume 30 % to 35% of the rice, they produce, while the balance is traded through different channels though most of it is sold to private traders at the farm. (Salman, et al., 2022)

1.2 The CARD Initiative

Zambia is a member of the Coalition for African Rice Development (CARD), which is a consultative group of various donors (both bilateral and multilateral) and African/international institutions, supporting the development of the rice sector in thirty-two (32) Sub-Saharan African (SSA) countries. CARD was launched by the Alliance for a Green Revolution in Africa (AGRA), the New Partnership for Africa's Development (NEPAD, current AUDA-NEPAD) and the Japan International Cooperation Agency (JICA) at the Fourth Tokyo International Conference on African Development (TICAD IV) in May 2008.

The CARD initiative aimed at doubling the rice production in SSA in ten years from fourteen (14) million metric tonnes (MMT) in 2008 to twenty-eight (28) MMT in 2018, thereby closing the demand-supply gap and contributing to food security as well as poverty reduction in the continent. To achieve this goal, the CARD Initiative tried to promote increased dialogue among partners interested in promoting rice sector development in SSA, leading to improved interventions, both in quantity (resources allocated) and quality (more coordination). While the initiative achieved its goal of doubling rice production by 2018, the demand-supply gap remained significant, due to continuing increase in demand for rice. Therefore, the CARD entered its second phase in 2019, with a new target of further doubling rice production to fifty-six (56) MMT by 2030.

As a member of the CARD, the Government of the Republic of Zambia (GRZ) through the Ministry of Agriculture (MoA) has so far developed three (3) National Rice Development Strategies (NRDS), which are the implementation strategies of the CARD, namely; the First NRDS 2011 -2015, Second NRDS 2016-2020 and the Third NRDS 2022-2026 (T-NRDS). While the First and Second NRDS were developed to enhance the rice value chain, due to challenges that were identified in the sub-sector, production and productivity of rice remain low. Therefore, the T-NRDS, aims to accelerate the development of the sub-sector by driving the achievement of the objectives of increasing rice production and productivity to improve the share of locally produced rice on the market (Ministry of Agriculture, 2022a).

In the second phase, CARD focuses more on the Monitoring and Evaluation (M&E) of NRDS implementation. Thus, the CARD has developed an M&E framework (approved in the 8th General Meeting (GM8) of CARD in October 2021), applying the "RICE Approach" (Resilience, Industrialization, Competitiveness and Empowerment), a new strategic approach. The M&E framework has four (4) overall indicators, namely; production quantity, area harvested, yield, and self-sufficiency rate. Further, there are two (2) indicators for each of RICE components, totalling twelve (12) indicators.

While each CARD member country has its own NRDS M&E framework, all the member countries are requested to incorporate those twelve (12) common indicators in their M&E framework, so that CARD can monitor the progress of NRDS implementation in its member countries, using the same measures. In addition to the twelve (12) indicators, CARD also advises its members to monitor the price of rice segregated by the source; that is, imported rice or locally produced rice. Consequently, each CARD member country is to collect data and set the baseline figure for each indicator. At the same time, it is required to establish a simple methodology of data collection that makes it possible for NRDS Taskforce (TF) team to conduct M&E of their NRDS throughout the second phase of CARD up to 2030, using their own human and financial resources.

1.3 Key Objectives

It is for this reason that JICA Zambia office engaged AnChiCon Limited (AnChiCon) a local consultancy firm to conduct the baseline study of the T-NRDS under the guidance of CARD Secretariat and the NRDS T. The key objectives of the study were two-fold. The first was to set baseline figures in Zambia against the NRDS M&E indicators and the second was to prepare a procedural manual which detailed the data sources and data collection methods for each indicator, in order for the MoA or the NRDS TF team members to conduct the same data collection throughout the second phase of CARD. The assignment also collected retail prices of various rice varieties and/or brands making a comparison of locally produced rice versus imported rice. The full terms of reference (ToRs) are attached as Appendix 1.

The T-NRDS states that, the MoA recognizes rice as one of the priority crops with potential to transform the agriculture sector into a viable driver towards poverty reduction through wealth creation. It is envisaged that increased rice production can not only contribute tremendously in enhancing the livelihood of households but also work as a viable alternative crop for the farmers (Ministry of Agriculture, 2022a). Therefore, the baseline study will be of utmost importance for the implementation of the T-NRDS.

1.4 Outline of the Report

The outline of this report on chapter basis is as follows;

1) Chapter 1 gives the context and the objectives of the assignment,
2) Chapter 2 is the overview of the CARD M&E Indicators,
3) Chapter 3 outlines the methodology used to achieve the objectives of the assignment,
4) Chapter 4 is the findings of the baseline survey as according to the CARD M&E framework. There are also the findings of the baseline survey in relation to retail prices of various rice brands from the major retail stores in Zambia,
5) Chapter 5 is a short conclusion of the Baseline, and,
6) Chapter 6 are the various published works that the report cited.

All chapters after Chapter 6 are appendices that support various aspects of the report giving more detail.

2 Overview of the CARD M&E Indicators

This Chapter gives an overview of the indicators that are used to measure NRDS progress under the CARD M&E framework.

The first four (4) indicators are the overall indicators measuring the OUTPUT and OUTCOME level results. These indicators are; "Quantity of Paddy Production", "Total Area Harvested", "Yield per Unit Area" and "Self-Sufficiency Rate". The CARD M&E framework has applied the "Resilience, Industrialization, Competitiveness and Empowerment" (RICE) approach and under each of these four (4) components are two (2) indicators. These indicators are mainly at the INPUT and ACTIVITY levels. The additional eight (8) indicators are listed below;

1) **Resilience** ("Area under irrigation" and "Quantity of resilient variety seeds");
2) **Industrialisation** ("Level of milling sector upgrading" and "Level of mechanization in production");
3) **Competitiveness** ("Share of local rice in the market" and "Quantity of high-yielding variety seeds"); and,
4) **Empowerment** ("Smallholder farmers' accessibility to financial services" and "Smallholder farmers' accessibility to technical training or services")

Table 2-1 below is a summary of the CARD M&E framework indicators for the NRDS.

Table 2-1: NRDS M&E Indicators

CARD M&E Framework	Indicator	Definition (Unit)	Indicator Level
Overall	1. Quantity of paddy production	Paddy rice produced in a year (metric tonnes - MT)	Output Level
	2. Total area harvested	Rice-harvested area (hectares - ha)	Output Level
	3. Yield per unit area	Paddy rice harvested per hectare of land (MT/ha)	Output Level
	4. Self-sufficiency rate	The percentage of rice consumed that is locally produced (%)	Outcome Level
Resilience	1. Area under irrigation	Area under rice cultivation with supplementary irrigation that could mitigate the negative impacts of weather fluctuations on rice production (ha)	Activity Level
	2. Quantity of resilient variety seeds	Quantity of seeds of locally preferred varieties with resilient characteristics, locally produced and/or imported annually (MT)	Input Level
Industrialization	1. Level of industrial milling capacity	Ratio of installed capacity of medium and large mills among all functional mills (%)	Input Level

CARD M&E Framework	Indicator	Definition (Unit)	Indicator Level
	2. Level of mechanization in production	Number of machines available for ploughing and harvesting in rice producing areas (Number)	Input Level
Competitiveness	1. Share of local rice in the market	Share of locally produced rice in the total quantity of rice procured by major retail stores (%)	Output Level
	2. Quantity of high-yielding variety seeds	Quantity of seeds of locally preferred varieties with high-yielding attributes, locally produced and/or imported (MT)	Input Level
Empowerment	1. Smallholder farmers' accessibility to financial services	Ratio of smallholder farmers having access to financial services (%)	Input Level
	2. Smallholder farmers' accessibility to technical training or services	Ratio of farmers accessing necessary technical training and services in rice production areas (%)	Input Level

It is these twelve (12) indicators that this baseline report was measuring to ascertain the starting point of the Third NRDS (T-NRDS). Appendix 2 gives the description of these indicators in full.

In addition to the twelve (12) CARD indicators, this Baseline Survey also collected the prices of rice differentiating between locally produced rice and imported rice.

3 Methodology

This chapter details the methodology that was used to conduct the T-NRDS baseline survey.

3.1 Overall Methodology

AnChiCon used a consultative and reiterative approach to ascertain the necessary outputs of the baseline which would be fully owned by the stakeholders. This meant consultation with various stakeholders along the rice value chain from the research and seed certification institutes who look into the farming methodologies and inputs such as seeds, through the farmers and millers, to the traders and retail stores including policy makers such the MoA and NRDS TF. This approach is built on the understanding that stakeholders have insights which greatly inform actions aimed at addressing the underlying conditions.

Our approach also informed our methodology in which we used a general, mixed methodology approach to collect, collate and develop concepts for stakeholder validation and a specific methodology, within the activities of the general methodology, in which we focussed on addressing the specific items in the assignment's scope of work to assure absolute compliance to the requirements of the ToRs. This assignment consisted of two (2) main methodology approaches; desk studies and field studies.

3.1.1 Desk Studies

AnChiCon undertook to understand the context of the project and establish the levels of achievement of the CARD indicators as at agreed baseline year of 2022. The studies were important as they informed the development of data collection tools and fine-tune the data collection methods following the identification of secondary data gaps.

3.1.2 Field Studies

In Zambia, rice is mainly grown by small-scale farmers under rain-fed conditions in Northern, Muchinga, Western, Eastern and Luapula Provinces. The abundance of water in these areas creates favourable conditions for rice cultivation especially in the dambos and wetlands (Salman, et al., 2022, p. 15).

The baseline survey visited the towns of Mansa (Luapula Province) and Mongu (Western Province) for primary data collection which was used to fill in the data gaps from secondary data collection under the desk studies.

Pictorial evidence of the various interactions during the baseline survey is attached as Appendix 3.

The location of towns/cities visited in Zambia are illustrated in the map below;

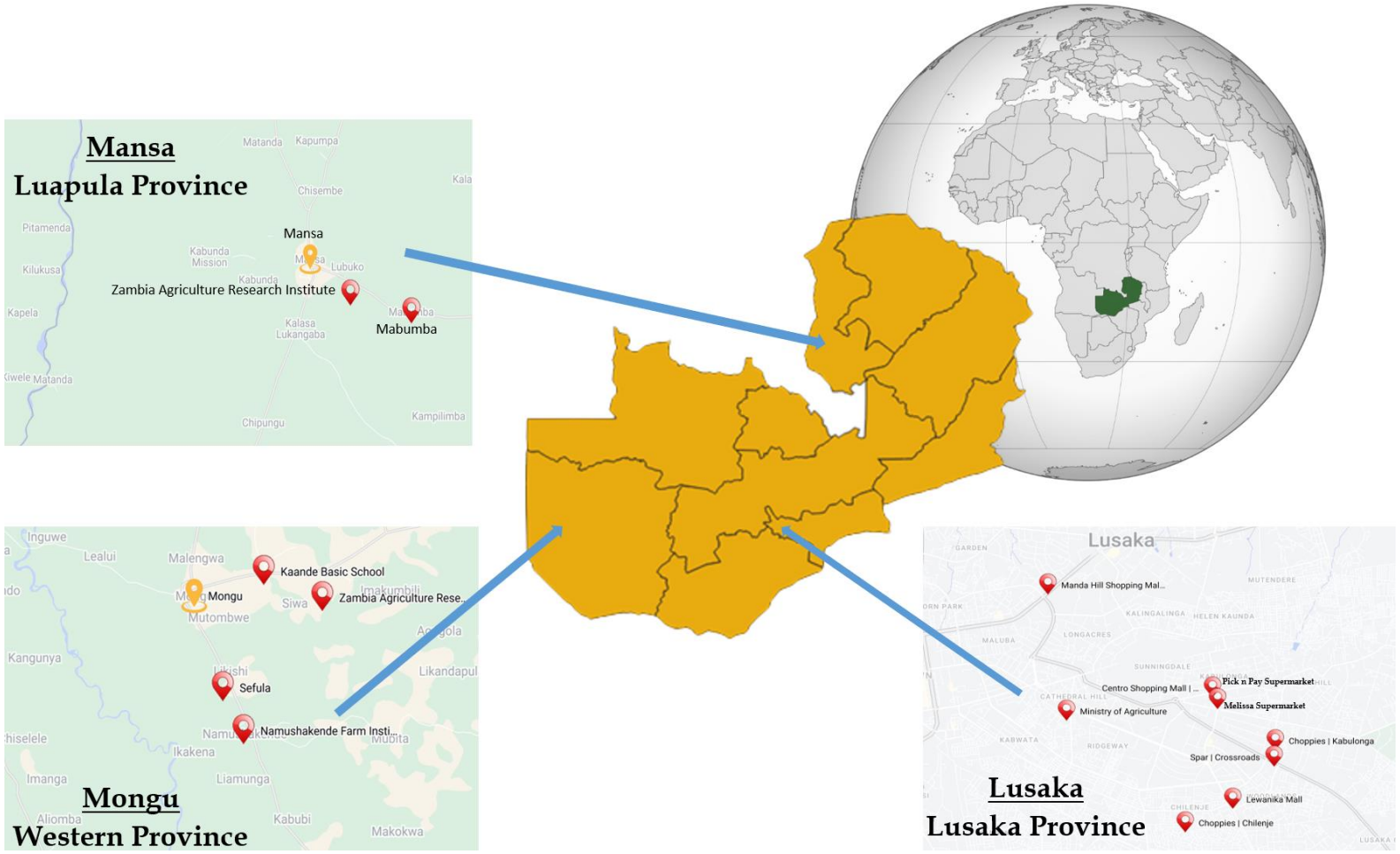

Figure 3-1: Locations Visited Under The T-NRDS Baseline

Source of City/Town Maps: (Google Maps, 2023) and Source of World Atlas showing Africa: (Embassy of Zambia, 2023)

The actual list of places visited is attached as Appendix 4.

3.1.3 *Data Collection Tools and Formats*

AnChiCon having travelled to the agreed destinations, interacted with key stakeholders along the rice value chain. This was mainly done through physical interactions on an individual basis and/or in focus group discussions (FGDs), where necessary, having established the relationship with the people, follow-up interactions such as phone calls and emails were used.

AnChiCon developed data collection tools for the key informant interviews (KIIs), farmers, milling companies and the agricultural research institutes; which had combined elements of quantitative and qualitative queries. The tools incorporated feasible research questions which put into consideration the various demographic parameters so as to ascertain overall performance for a particular indicator. In addition, KIIs helped formulate recommendations that can improve the data collection, collation and recording of the indicators.

3.1.4 *Baseline Respondents*

Purposive sampling was used to select respondents and each engagement was guided by using semi-structured data collection tools. The survey interacted with two hundred and eighty (280) respondents broken down by mode of engagement and gender as follows;

Table 3-1: Baseline Total Respondents

Mode of Engagement	Female	Male	Grand Total
Key Informant (KI)	16	34	50
Farmer	24	36	60
Focus Group Discussion (FGD)	82	88	170
Total	**122**	**158**	**280**
Percentage	**43.6%**	**56.4%**	**100.0%**

The survey interaction was 43.6% with female and 56.4% male. The location breakdown per mode of engagement is as in the tables below;

3.1.4.1 Key Informants

The survey engaged fifty (50) KIs including research and seed certification institutes, MoA staff, JICA staff, millers, lead farmers, traders and retail shop managers distributed as below;

Table 3-2: KIs Composition

Town/City	Female	Male	Grand Total
Lusaka	1	7	8
Mansa	5	11	16
Mongu	10	16	26
Grand Total	**16**	**34**	**50**
Percentage	**32.0%**	**68.0%**	**100.0%**

The list of KIs that the baseline interacted with is attached as Appendix 5.

3.1.4.2 Farmers

The survey engaged a total of sixty (60) farmers using a structured individual survey tool. The location and gender are as broken down below;

Table 3-3: Farmers Composition

Row Labels	Female	Male	Grand Total
Mansa	14	16	30
Mongu	10	20	30
Grand Total	**24**	**36**	**60**
Percentage	40.0%	60.0%	100.0%

The survey attempted to get equal gender representation during the data collection phase with the individual farmer ratio being 40% female and 60% male.

3.1.4.3 Focus Group Discussions

The survey carried out a total of four (4) FGDs as tabulated below;

Table 3-4: FGD Composition

Location	Female	Male	Sub-Total
Mabumba (Mansa)	48	52	100
Kaande (Mongu)	1	11	12
Sefula (Mongu)	8	11	19
Namushakende (Mongu)	25	14	39
Total	**82**	**88**	**170**
Percentage	**48.2%**	**51.8%**	**100%**

3.1.5 Data Collection Limitation

The baseline incurred limitations in giving a national overview for some of the indicators as the primary data collection was limited to two (2) districts only; Mansa and Mongu. Therefore, the data collected during field studies might not be a representation of the national rice sector. Further, despite several efforts by both the Consultants and the MoA was not able to obtain the sales data from the retail stores.

3.1.6 Data Collation, Analysis, Synthesis and Report Writing

Data collected in the desk and field studies was collated, analysed and synthesised with the consultant's experiential data in order to ascertain the values of the baseline.

3.2 Specific Methodology

AnChiCon having grasped the purpose of this assignment and indicated the general methodology of achieving the assignment objectives, developed a specific methodology based on the tasks in the ToRs indicating how each task will be achieved, this was tabulated as below;

Table 3-5: Baseline Specific Methodology

Task	Specific Methodology (Activities)
1. Review NRDS	1.1 Desk study of the 1st, 2nd and the Draft 3rd NRDS 1.2 Desk study of NRDS report (previous baselines, mid-term and end line evaluations)
2. Identify data sources and agree on them with NRDS TF	2.1 Desk study to assess both existing and proposed M&E framework 2.2 Identify data sources based on required data inputs into the M&E framework
3. Collect secondary data/information	3.1 Desk study to collect various secondary data
4. Suggest methods for primary data collection	4.1 Ascertain data gaps from secondary data collection to be filled by primary data collection 4.2 Combine 2.2 and 4.1 to formulate methods of primary data collection
5. Prepare Progress Report 1 and organize a meeting with NRDS TF to obtain approval	5.1 Compile Tasks 1 to 4 into Progress Report 1 (PR-1) 5.2 Organise the feedback meeting 5.3 Present PR-1 to NRDS TF for feedback and approval 5.4 Submit Progress Report 1 to JICA Zambia office
6. Collect primary data/information	6.1 Interviews with Lusaka based stakeholders 6.2 Field study for primary data collection in Mongu 6.3 Field study for primary data collection in Mansa 6.4 Application of methods formulated in 4.2

Task	Specific Methodology (Activities)
7. Prepare and submit Progress Report 2	7.1 Update PR-1 into Progress Report 2 (PR-2) 7.2 Present PR-2 to NRDS TF for feedback 7.3 Submit Progress Report 2 to JICA Zambia office
8. Prepare & submit draft Final Report	8.1 Update PR-2 into the Draft Baseline Report with feedback from the NRDS TF 8.2 Submit Draft Baseline Report to the NRDS TF
9. Obtain feedback on draft Final Report, organizing a meeting with NRDS TF	9.1 Organise the feedback meeting 9.2 Present Draft Baseline Report to NRDS TF for feedback and approval
10. Incorporate comments and submit Final Report	10.1 Incorporate feedback NRDS TF to update Draft Baseline to Final Baseline Report 10.2 Submit Final Baseline Report to JICA and the NRDS TF

4 Findings

This chapter is a depiction of the results generated from the desk and field data collection activities. The baseline survey findings are aligned to each of the CARD M&E indicators as discussed in Chapter 2 in addition to collecting the prices of rice.

4.1 Main Secondary Data Sources

Below are short write-ups to describe the main secondary data sources of this Baseline Survey.

4.1.1 The Crop Forecasting Survey

The Ministry of Agriculture (MoA) in collaboration with the Zambia Statistics Agency (ZamStats) conducts the Crop Forecasting Survey (CFS) every year covering the Small and Medium Scale farming households and large-scale farms. Crop forecasting is an estimate of the most likely production and yields of the crop based on crop conditions and weather forecast.

For an example of the methodology used, the 2021/2022 CFS captured the large-scale farms on a 100 percent enumeration basis while small and medium scale farmers were covered on a sample basis in 680 Enumeration Areas (EAs) drawn from an estimated 16,000 EAs which make up the agricultural sampling frame. At household level, 20 households are covered out of an average of 100-150 households per EA. (Ministry of Agriculture, 2022b)

For confidence in the survey, it should be noted that the Zambia Statistics Agency (ZamStats) was established in 2018 under the Statistics Act, 2018 as the sole designated entity responsible for the publication of official statistics. The Agency is also responsible for the development and coordination of an Integrated National Statistical System. The website is www.zamstats.gov.zm.

The CFS estimates the most likely production and yields of the crop based on crop conditions and weather forecast. It also provides information on farmland and use, crop production, fertiliser acquisition and application, seed type and source, expected crop sales, and the food security position. Therefore, in relation to this baseline survey, and the subsequent data collection by the NRDS, the CFS is a vital report.

4.1.2 The Post-Harvest Survey

The Post-Harvest Survey (PHS) is an assessment of the actual performance of the agricultural sector. The PHS gives definite data against the CFS which is more of a projection. However, the challenge with the PHS is that its frequency is not guaranteed. The infrequency is exhibited by the fact prior to the current compilation, the last PHS was for the season 2014/2015. Nonetheless, the 2021/2022 PHS results were published by ZamStats in their February 2023 monthly bulletin (Zambia Statistics Agency, 2023), and the baseline survey was able to use those figures in lieu of the CFS. The Baseline Survey was guided that for years where the PHS was available, it would supersede the CFS as was the case for the baseline year of 2022.

4.1.3 Other Data Sources

Other data can be sourced from the; Technical Services Branch (TSB) under the MoA, the MoA Extension Services, SCCI and ZRA as indicated in Appendix 6.

4.2 Overall 1. Quantity of Paddy Production

4.2.1 *Indicator Findings*

Analysis of the 2018 to 2022 Crop Forecasting Survey (CFS) reports by the MoA indicate that Zambia produced an average of 47,087 MT of paddy rice per year. The annual production levels are illustrated below;

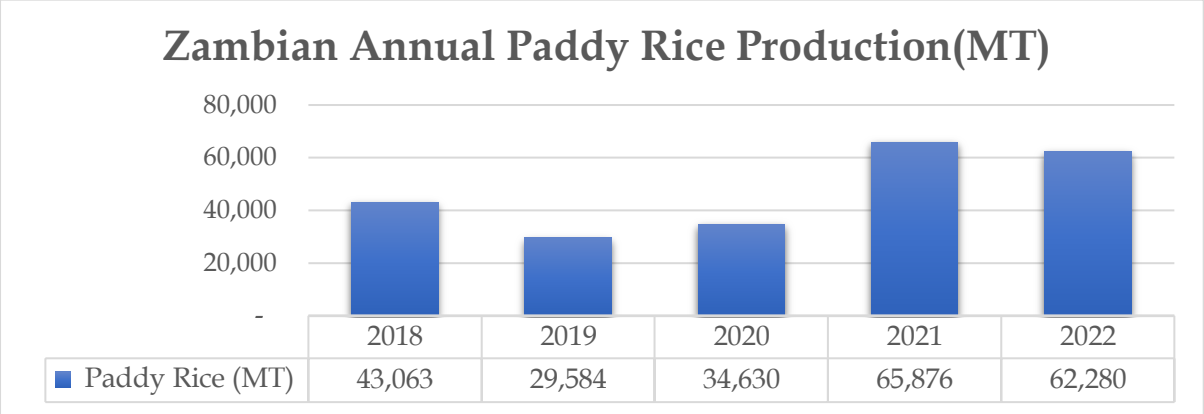

Figure 4-1: Zambian Annual Paddy Rice Production

Despite the above, the PHS indicated that the actual production was 62,918 MT, an increase of 1.0% over the CFS. Thus, the baseline figure was set as 62,918 MT.

4.2.2 *Indicator Data Source*

In conclusion, the identified data source for this indicator being either the PHS or CFS is very reliable as it is a survey conducted by the MoA in conjunction with ZamStats and with the CFS being conducted annually allowing for the NRDS to have annual updated data.

4.3 Overall 2. Total Area Harvested

4.3.1 *Indicator Findings*

According to the MoA CFS reports, the average harvested area over the period from 2018 to 2022 was 32,689.

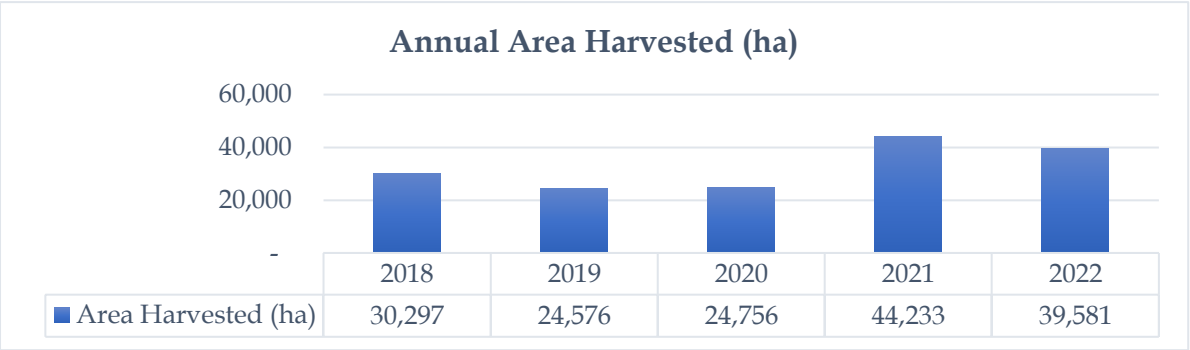

Figure 4-2: Annual Harvested Area

As the baseline year of 2022 had PHS data, the PHS record of 59,601 ha was recorded as the baseline figure which was a 50.6% increase from the CFS estimation.

4.3.2 *Indicator Data Source*

For follow-up reporting by the NRDS TF, the CFS is a reliable source of data for the total area harvested as it is released annually.

4.4 Overall 3. Yield Per Unit Area

4.4.1 *Indicator Findings*

For analysis of this indicator, it was established that the CARD formula being used was;

$$Yield\ (MT/ha) = \frac{\text{Paddy Rice Harvested (MT)}}{\text{Area Harvested (ha)}}$$

Equation 4-1: Yield Rate

Analysis of the CFS reports for the period of 2018 to 2022 results in the graph below;

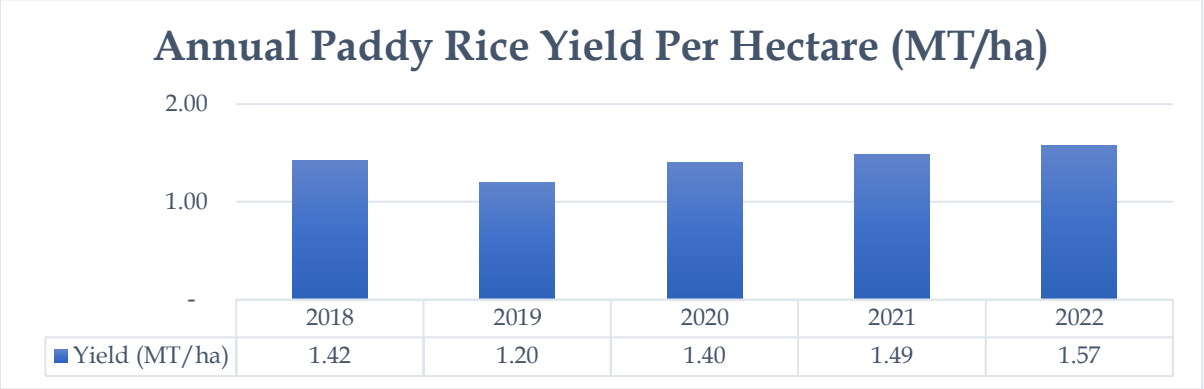

Figure 4-3: Annual Paddy Rice Yield Per Hectare

The result for the year 2020 is in conformity with the reports indicated for Zambia on the CARD website (CARD, 2022b) indicating that the MoA was already using the CFS data for reporting to the CARD. However, with the PHS data available (reference is made to Section 4.2 and 4.3 which indicated that production was 62,918 MT and the area harvested as 59,601 ha) the baseline value was recorded as 1.06 MT/ha, a decrease of 32.8%. This was because, despite increasing both the production and the area harvested, the 50.6% increase in area harvested only led to a 1.0% increase in production

4.4.2 *Indicator Data Source*

Therefore, the annually updated CFS data which provides information on the paddy rice harvested and the area harvested will suffice as a means for calculating the yield per unit area in the years that the PHS is not available.

4.5 Overall 4. Self-Sufficiency Rate

4.5.1 *Indicator Findings*

According to the CARD, the self-sufficiency rate (SSR) at the initiative level will be calculated using the following formula;

$$Self\ Suffciency\ Rate\ (\%) = \frac{\text{Milled Rice Produced (MT)}}{(\text{Milled Rice Produced (MT)} + \text{Milled Rice Imported (MT)} - \text{Milled Rice Exported (MT)})}$$

Equation 4-2: Self Sufficiency Rate (Full Equation)

The baseline through the NRDS TF obtained the IMPORT/EXPORT data of rice from the Zambia Revenue Authority (ZRA). The analysed raw data was in the following three (3) categories with their national codes; Rice in the husk, paddy or rough (10061000), Husked (brown) rice (10062000) and Semi-milled or wholly milled rice (10063000). This analysis did not include broken rice (10064000).

The quantities of paddy rice (both from the ZRA data and Section 4.2) were converted to milled rice using the following formula;

$$Milled\ Rice\ (MT) = Paddy\ Rice\ (MT) * 0.667$$

Equation 4-3: Conversion of Paddy Rice to Milled Rice

This is as guided by CARD on their website; https://riceforafrica.net (CARD, 2023)

The input data based on the CFS and the ZRA with the resultant SSR are tabulated below;

Year	2018	2019	2020	2021	2022
Import (MT)	12,242.18	22,976.34	28,739.31	16,037.58	13,513.90
Export (MT)	4,194.20	6,505.00	4,382.09	272.40	5,014.81
Production (MT)[3]	28,723.10	19,732.53	23,098.21	43,939.18	41,540.76
SSR (%)	**78.11%**	**54.50%**	**48.67%**	**73.59%**	**83.02%**

As for the year 2022, which is our baseline year, the PHS was available, the substitution of the PHS data as relates to production to the year 2022 (62,918 MT), the SSR calculation then results in 83.16% which is thus taken as the baseline figure.

4.5.2 *Indicator Data Source*

Based on the above recommendation the suggested data sources for this indicator are PHS and CFS as reliable sources for rice produced and the import/export data from the ZRA.

4.6 Resilience 1. Area Under Irrigation

4.6.1 *Indicator Findings*

Definition: Area under rice cultivation with supplementary irrigation that could mitigate the negative impacts of weather fluctuations on rice production (ha)

According to the T-NRDS, the 2022 status is that there are no irrigated rice fields but has set the target for the mid-term, the year 2024, as forty (40) ha and the end-term, the year 2026, as eighty (80) ha. During the primary data collection, the baseline survey visited the irrigation scheme in Sefula, a two hundred (200) hectare irrigation scheme originally built for the growing of rice.

While the scheme was developed for rice irrigation, there is negligible utilisation of the scheme for the growing of rice. As explained to the baseline survey team, one of the main issues is the preferred variety of rice in Mongu is Supa MG. This variety of rice does not blossom outside of the rainy season therefore is not profitable to plant in the scheme and utilise the irrigation during non-rainy seasons.

While most of the canal system was still functional at the Sefula Irrigation Scheme, the baseline established that area allocated to rice was negligible and thus agreed with the starting point set under the T-NRDS, that there was zero (0) area under irrigation for rice.

4.6.2 *Indicator Data Source*

The baseline used both primary data collection (the survey) and secondary data (the T-NRDS) collection to establish the finding.

[3] For avoidance of doubt, this is the milled rice equivalent

4.7 Resilience 2. Quantity of Resilient Variety Seeds

4.7.1 Indicator Findings

Definition: Quantity of seeds of locally preferred varieties with resilient characteristics, locally produced and/or imported annually (ton)

The primary data collection exercise established that while there were a number of climate resilient varieties of rice seed, they were all fallible to pests such as the black beetle. Farmers in Mongu also complained about attacks from earth worms.

The baseline was informed that the Zambia Agricultural Research Institute (ZARI) was currently undertaking research into improving the resilience of the preferred seed varieties to the aforementioned pest infections.

In relationship to climate resilience, there are varieties such as Nerica 1 and Nerica 4 as they can grow in low water feed areas. Analysis of the data of seed growers from the SCCI indicate that the two (2) varieties have been grown over the years in the quantities as tabulated below;

Table 4-1: Varieties of Climate Resilient Rice Seeds Reproduced (MT)

Year	2018	2019	2020	2021	2022
Nerica 1	1.20				
Nerica 4	212.50	0.50		125.00	301.50

The above table was calculated based on the area planted taking into consideration the yield rates of 1,200 kgs per hectare for Nerica 1 and 5,000 kgs per hectare for Nerica 4. According to the SCCI data, Nerica 1 was last grown in 2019 thus the 2022 baseline figure for climate resilient seeds are those of Nerica 4 only, totalling 301.5 MT.

4.7.2 Indicator Data Source

The current data source are the certified seed growers from the SCCI and their quantities are recorded annually.

4.8 Industrialization 1. Level of Industrial Milling Capacity

4.8.1 Indicator Findings

Definition: Ratio of installed capacity of medium and large mills among all functional mills (%)

The measurement is the number of millers above two (2) MT per hour versus the total milling capacity. The baseline visited the only two (2) millers in Mansa; Silaupa Milling and DoChris Milling companies, while in Mongu, the bassline physically visited three (3) of the milling companies; APG Milling, Agriline Milling and the Diocese of Mongu Development Centre (DMDC). Further to these, data was collected from another six (6) milling companies in Mongu. The location of the milling companies and their hourly milling rates are as below;

Table 4-2: Millers Production Rate

District	Company	Milling Rate (MT/hr)
Mansa	Silaupa Milling	3.13
Mansa	DOCHRIS Enterprises	0.25
Mongu	Diocese of Mongu Development Centre	1.13
Mongu	Agriline (Z) Limited	0.63
Mongu	APG Milling	2.5
Mongu	Country Millers	3.13
Mongu	Mbuywana	0.42

District	Company	Milling Rate (MT/hr)
Mongu	Kashumba	0.63
Mongu	Station Rice Mills	0.63
Mongu	Mandanga Rice Mills	0.38
Mongu	Suffering Gives Knowledge Milling	0.31

Equation 4-4 below was applied to data in Table 4-2 above to ascertain the current indicator.

$$Level\ of\ Industrial\ Milling\ Capacity\ (\%) = \frac{\text{Capcaity of Millers Milling Above 2 MT/hr}}{\text{Total Capacity of Millers Sampled}}$$

Equation 4-4: Level of Industrial Milling Capacity Formula

Analysis of Table 4-2 and Equation 4-4 turns out a capacity ratio of

$$Level\ of\ Industrial\ Milling\ Capacity\ (\%) = \frac{3.13 + 2.5 + 3.13}{3.13 + 0.25 + 1.13 + 0.63 + 2.5 + 3.13 + 0.42 + 0.63 + 0.63 + 0.38 + 0.31}$$

Equation 4-5: Level of Industrial Milling Capacity Calculated

This gives a ratio of 8.76 :13.14 resulting in a percentage of 66.7%.

4.8.2 Indicator Data Source

The baseline used primary data collected during the survey with the MoA extension services and data collected from the TSB.

4.9 Industrialization 2. Level of Mechanisation in Production

4.9.1 Indicator Findings

Definition: Number of machines available for ploughing and harvesting (in rice producing areas) (unit)

In Luapula province, it was established that there are low levels of mechanisation. Farmers in rural communities rely on traditional hand tools for land preparation, cultivation, harvesting and processing methods. This limits hectarage of rice under production. This is attributed to none availability or high cost of mechanised tools. (Ministry of Agriculture, 2016, p. 11). In Western province, about a third of the respondents planted rice in rows or lines instead of broadcasting. For cultivation, some farmers were using hoe-technology and others used hired oxen since majority of the respondents (70%) did not own any cattle. (Musaba & Mukwalikuli, 2019).

Interaction with farmers and the MoA extension staff in both Mansa and Mongu indicated there was little to no mechanisation in the process of farming rice. This was ranged from planting to weeding to harvesting and the subsequent threshing. All the aforementioned works were driven by mostly human effort and in some cases, where farmers had some disposable income, ox-driven technologies. The survey did find a crop planter at the Sefula Irrigation Scheme but it was not in use as there was not tractor to aid in its use.

In some instances, farmers informed the baseline that there was equipment available for hire but the financial rates for hiring were too high to the small-scale farmers ranging from ZMW 800 (US $ 39.95) to ZMW 1,200 (US $ 59.93) per hour.

Table 4-3: Equipment Available to Farmers (Selected Areas)

Area	Tractor	Planter	Combine Harvester	Boom Sprayer	Spreader	Data Source
Mansa	3					Survey
Mongu	8	1				Survey
Chitambo	5		1	1	1	TSB
Isoka	5					TSB
Mungwi	2	2		2		TSB
Total	**23**	**3**	**1**	**3**	**1**	

The above table is the breakdown of the equipment that the baseline was able to collect. That is a total of thirty-one (31) pieces of equipment.

4.9.2 *Indicator Data Source*

Based on the above collected data, the data can be obtained from; MoA extension (as exhibited during the survey) and the TSB.

4.10 Competitiveness 1. Share of Local Rice in the Market

4.10.1 *Indicator Findings*

Definition: Share of locally produced rice in the total quantity of rice procured by major retail stores (%)

According to the CARD indicators, the share of local rice in the market should be established by the sales data obtained from the major retail stores in Zambia using the equation as below;

$$Share\ of\ Local\ Rice\ in\ the\ Market\ (\%) = \frac{\text{Locally Produced Rice Sold in the Retail Stores (MT)}}{\text{All Rice Sold in Retail Stores (MT)}}$$

Equation 4-6: Share of Local Rice in the Market

The baseline and the MoA attempted to obtain sales data from the retail stores, however, by the time of the conclusion of the baseline, this data was not available. With approval from the CARD, the baseline calculated this indicator by assessing the samples found in the stores visited and calculating the percentage of local rice brands compared the total rice brands in the stores.

With reference to the column "Source" in Table 13-1 which is a result of observational data compiled to tabulate the different rice brands and packages on the shelves in the sampled stores, the following formula was applied;

$$Share\ of\ Local\ Rice\ in\ the\ Market\ (\%) = \frac{\text{Unique Number of Locally Produced Rice Brands and Package Sizes on the Shelves}}{\text{Total Unique Number of All Rice Brands and Package Sizes on the Shelves}}$$

Equation 4-7: Share of Local Rice in the Market (Baseline Alternative)

Using Equation 4-7 the share of local rice was established as 41.29% as there were 64 local brands and sizes of the 155 sampled rice brands and packages.

4.10.2 *Indicator Data Source*

The affirmed data source(s) of this indicator are the retail stores in conformity with the CARD initiative. This is the case for both the data based on sales data or the observational data used to segregate the brands and packages on the shelves.

4.11 Competitiveness 2. Quantity of High-Yielding Variety Seeds

4.11.1 Indicator Findings

Definition: Quantity of seeds of locally preferred varieties with high-yielding attributes, locally produced and/or imported (ton)

The high yielding seed varieties are;

Table 4-4: Rice Varieties Released in Zambia

Variety	Year of Release	Title Holder/Agent	Potential Yield (Ton/Ha)
Lowland Rice Varieties			
Var. 1329	1969	Zambia Seed Company Ltd	3 - 6
Var. 1345	1969	Zambia Seed Company Ltd	
Var. 1632	1969	Zambia Seed Company Ltd	
Var. 7601	1970s	Zambia Seed Company Ltd	
Angola Crystal	-	Zambia Seed Company Ltd	
Malawi Faya	1960s	Zambia Seed Company Ltd	
Burma	1947	Zambia Seed Company Ltd	
Kalembwe	1975	Zambia Seed Company Ltd	
Sindano	1972	Zambia Seed Company Ltd	
IR 36	-	Zambia Seed Company Ltd	
Mulonga	1995	Zambia Seed Company Ltd	
ITA 230	2009	ZARI	
Kilombero	2009	ZARI	
PAC 801R	2012	Advanta	
PAC 807R	2012	Advanta	
Supa-Mg	2015	ZARI	
Misamfu–2	2018	ZARI	
Misamfu–3	2018	ZARI	
Upland Rice Varieties			
Nerica 1	2009	ZARI	2 - 3.5
Nerica 4	2009	ZARI	
Longe 1	2014	ZARI	
Longe 2	2014	ZARI	
Longe 3	2014	ZARI	
Mansa–2	2019	ZARI	

The consideration of what are high yielding seeds is related to the CARD target for the Zambian yield rate which is 2.07 by the year 2030.

Using the SCCI data, the only high yielding seeds and their reproduction was tabulated below;

Table 4-5: Quantity of High Yielding Seeds Under Reproduction

Year	2018	2019	2020	2021	2022
Kilombero	650	143,000	65,000	65,000	344,500
Nerica 1	1,200	-	-	-	-
Nerica 4	212,500	500	-	125,000	301,500
Total	216,368	145,519	67,020	192,021	648,022

The above varieties were selected for their ability to produce above the 2.07 MT /ha suggested as a threshold. This indicates that the baseline figures for this indicator is 648,022 kgs which is 648.0 MT.

4.11.2 Indicator Data Source

The SCCI data can be used as a proxy based on the approved seed growers but the limitation of this method lays in the use of probable yield rates and not the actual quantities.

4.12 Empowerment 1. Smallholder Farmers' Accessibility to Financial Services

4.12.1 Indicator Findings

Definition: Ratio of smallholder farmers having access to financial services (%)

It was established that rice farmers, traders, processors and agribusiness operators in the country have limited access to affordable loans. Most banks are not willing to give loans to small scale farmers thereby affecting agribusiness development, (Ministry of Agriculture, 2016, p. 11).

The Crop Diversification Programme under the Ministry of Agriculture also recognizes rice as one of the strategic commodities that contributes to food security, and with potential to significantly increase incomes and employment among rural producers. Hence the government's decision to include rice as one of the nine crops supported by the Farmer Input Support Programme (FISP). Rice is also one of the crops that is included in the Statutory Instrument of 2015 as a designated crop. (Salman, et al., 2022).

Nonetheless, the baseline did establish that where the small-scale farmers are banded together to form cooperatives, they were able to obtain funding from the Constituency Development Fund (CDF) as was the case in Sefula, Mongu. This was a cooperative of twenty-five (25) farmers out of a total of two hundred and thirty (230) farmers that were interviewed during the baseline, a representation of only 10.9%.

4.12.2 Indicator Data Source

This data was collected during the survey and was calculated based on the number of farmers interacted with.

4.13 Empowerment 2. Smallholder Farmers' Accessibility to Technical Training and Services

4.13.1 Indicator Findings

Definition: Ratio of farmers accessing necessary technical training and services in rice production areas (%)

There is use of poor farming practices (broadcasting seeds, no weeding) used by farmers who fall short of recommended management practices and thus contributes to low production, productivity and quality. Limited human resources and institutional capacities with regard to research, extension and marketing, has affected rice production, productivity and consequently marketing of rice (Ministry of Agriculture, 2016, p. 12).

Climate change has negatively affected farmers in that it brings in the increased variations in precipitation resulting in frequent occurrence of floods and droughts and other extreme weather conditions. This means that farmers are finding it difficult to manage water and

therefore affecting production and productivity (Salman, et al., 2022). Such training will ensure the farmers are well prepared for diverse climate effects through training and the selection of appropriate farming techniques and seed varieties.

The baseline visited the Farmer Training Institute (FTI) in Namushakende where farmers are trained production and productivity techniques in various crops including rice. All the farmers interacted with during the primary data collection phase of the baseline attested to technical training primarily from the MoA extension services but in addition to that was support from various projects implemented by cooperating partners and NGOs.

4.13.2 Indicator Data Source

This data was collected during the survey.

4.14 Findings - Retail Prices of Rice in Zambia

4.14.1 Findings

The primary data collection phase established the average prices of the local and international rice by size of the package as tabulated below;

Table 4-6: Average Prices of Rice Per Package Size

Weight (kg)	Imported (ZMW)	Local (ZMW)	Imported (US $)[4]	Local (US $)
0.5	ZMW 38.28	ZMW 16.00	$1.91	$0.80
1	ZMW 56.66	ZMW 28.42	$2.83	$1.42
2	ZMW 70.67	ZMW 58.49	$3.53	$2.92
2.5	ZMW 88.03	ZMW 72.60	$4.40	$3.63
5	ZMW 136.48	ZMW 132.77	$6.82	$6.63
10	ZMW 303.32	ZMW 241.99	$15.15	$12.09

The full list of various rice brands, package sizes and prices is attached as Appendix 7.

4.14.2 Data Source

The source of data for the prices was primary data collection from the retail stores using observational methods.

4.15 Summary Findings and the Targets of the CARD Indicators

4.15.1 Findings

The CARD has indicated that for the current phase, targets have been set for the year 2030. Since the target setting has not yet been finalized, the targets for 2030 are tentatively set against 2018 figures, as follows: Production, 100% increase; Area, 37% increase; and Yield, 46% increase (CARD, 2022b). These percentages are the same as the rates of increase for the respective indicators set as targets at the CARD initiative level. Therefore, the Zambia targets for the CARD overall indicators are as below;

1) Paddy Rice Production - 86,126 MT;
2) Area Harvested - 41,507 MT; and
3) Yield Rate - 2.07 MT/ha

However, each country is encouraged to set up its own targets based on the strategies, projects and programmes put in place.

[4] The conversion rate was US $ 1 = ZMW 20.0229 as indicated by the Bank of Zambia average mid-rate on Friday, 03rd March 2023. (Bank of Zambia, 2023)

4.15.2 Setting of the 2026 and 2030 Targets

The Baseline Survey took into consideration the growth rates assumed by the CARD (Production, 100% increase; Area, 37% increase; and Yield, 46%), together with the 2026 targets set by the T-NRDS, to set the CARD 2030 targets based on the 2022 baseline figures as briefly discussed below. Further, all the RICE indicators' performance were related to the overall indicators' performance as the RICE indicators at input/activity level are all related to the overall indicators at output/outcome levels.

4.15.2.1 Paddy Rice Production

Paddy rice production has the baseline value of 62,918 MT and the T-NRDS has set its 2026 target as 93,420 MT. This is an increase of 30,502 MT in four (4) years. Going with this logic, it would mean a similar increase from 2026 to 2030 therefore setting the 2030 target as 123,922 MT.

4.15.2.2 Area Harvested

The area harvested baseline figure for 2022 was established as 59,601 ha (based on the PHS) which already exceeded the T-NRDS 2026 target of 56,365 ha. It is understood that this was set with the CFS figures which for 2022 was 39,581 ha. This would indicate a 42% increase in the four (4) years to 2026. Based on this logic the T-NRDS target was then increased by 42% to give the 2030 target of 80,266 ha.

While the 2022 actuals were already over the 2026 target, the fluctuational nature on hectarage was considered and targets set that would be permanent in nature.

4.15.2.3 Yield Rate

The baseline yield rate was established at 1.06 MT/ha and the baseline agreed with the 2026 T-NRDS target of 1.66 MT/ha. With this trajectory, the baseline set the CARD suggestion of 2.07 MT/ha for Zambia as the 2030 target.

4.15.2.4 Self Sufficiency Rate

The baseline established the SSR for 2022 as 83.16% and set the goal of self-sufficiency by the end of the CARD phase 2, meaning a target of 100% by 2030. Based on a linear analysis, this entails that the 2026 target would be 91.58%.

It should be noted that in the particular case of Zambia, there is a lot of informal domestic and international trade in rice which currently may not be measurable, therefore, the "real" SSR might actually be different from the calculated one.

4.15.2.5 R1: Area Under Irrigation

The baseline set the 2022 area under irrigation at zero (0), the same as the T-NRDS, then agreed with the 2026 T-NRDS target of 80 ha. With the 2026 target being half way through the remaining period of the CARD phase 2, the 2030 target was thus set to 160 ha.

Currently, in Zambia, this would be mostly supplementary irrigation as most of the rice varieties grown in Zambia do not flower outside of the rainy season due to their photoperiodism traits, making it unproductive to plant outside of the rainy season.

4.15.2.6 R2: Quantity of Resilient Variety Seeds

The baseline figure of 301.5 MT was used to set the 2030 target by doubling the quantity as would be required to double the production numbers, giving a 2030 target of 603.0 with a linear analysis setting the 2026 target as 452.25 MT.

4.15.2.7 I1: Level of Industrial Milling Capacity

The 2022 baseline performance was established to be 66.7%. The baseline suggests a 2030 target of 75% allowing for the existence of mills below 2 MT/hr which are common in the rural areas but enough for mass milling for national production and potential exports. Taking a linear approach, this would set the 2026 target at 70.85%.

4.15.2.8 I2: Level of Mechanisation in Production

The baseline established the following number of machines from the sampled areas; 23 Tractors, 3 Planters, 1 Combined Harvester, 3 Boom Sprayers and 1 Spreader.

Taking into consideration the current level of mechanisation and the projected investment in this area coupled with the maintenance costs, it was agreed with the NRDS TF that the 2026 targets be set as equal to the baseline levels. This is compounded with the assumption that the machines that would have broken down by 2026 would have been replaced. Therefore, the 2026 and 2030 targets were set as;

1) 2026 - 23 Tractors, 3 Planters, 1 Combined Harvester, 3 Boom Sprayers and 1 Spreader; and,
2) 2030 - 30 Tractors, 5 Planters, 2 Combined Harvesters, 5 Boom Sprayers and 2 Spreaders.

These targets take into account the affordability of the equipment whether for outright purchase or on a hire basis.

4.15.2.9 C1: Share of Local Rice in the Market

Though the baseline had challenges in establishing this figure based on the CARD methodology, the baseline analysed the sources of the various rice brands in the visited retail stores. Analysis of Table 13-1 indicates that of the 155 samples of rice in the stores, 91 (58.71%) are imported brands and only 64 (41.29%) are locally produced rice brands. Without the actual sales data to indicate preference, the 41.29% was taken as the baseline figure for 2022.

As this indicator is related to the overall SSR indicator, the growth rate of the SSR was adopted and applied to this indicator resulting in the following targets; 45.47% for 2026 and 49.65% for 2030.

4.15.2.10 C2: Quantity of High-Yielding Variety Seeds

The baseline established the 2022 value as 648.0 MT. Based on the goal of doubling the production, the 2030 target was then set as 1,296 MT with a linear analysis determining the 2026 target as 972 MT.

4.15.2.11 E1: Smallholder Farmers' Accessibility to Financial Services

Based on the sample size, the baseline established that accessibility to financial services was only 10.9%. taking into consideration the increased number of farmers expected for the increased hectarage of farming, but expected increased performance, the baseline set the 2026 target at 30% and the 2030 target as 50%. This is an approximate 20% increase for each four (4) year period.

4.15.2.12 E2: Smallholder Farmers' Accessibility to Technical Training or Services

The baseline established that 100% of the rice farmers had access to technical training or services. Therefore, the targets for 2026 and 2030 were both set for 100%. It is important for

this to be maintained to lead to increased adoption of the methodologies impressed upon the farmers during the training.

4.15.2.13 Summary of Indicators and Targets

The summary of indicators with their baseline values and corresponding 2026 and 2030 targets is as tabulated below;

Table 4-7: Indicator Baseline Figures and Targets for 2026 and 2030

Indicator	2022 T-NRDS Baseline	2026 T-NRDS Target	2030 CARD Target[5]
Paddy Rice Production (MT)	62,918	93,420	125,836
Area Harvested (ha)	59,601	56,365	80,266
Yield Rate (MT/ha)	1.06	1.66	2.07
Self Sufficiency Rate	83.16%	91.58%	100.00%
R1. Area under irrigation	0 ha	80 ha	160 ha
R2. Quantity of resilient variety seeds	301.50 MT	452.25 MT	603.00 MT
I1. Level of Industrial Milling Capacity	66.70%	70.85%	75.00%
I2. Level of mechanization in production	23 Tractors, 3 Planters, 1 Combined Harvester, 3 Boom Sprayers and 1 Spreader	23 Tractors, 3 Planters, 1 Combined Harvester, 3 Boom Sprayers and 1 Spreader	30 Tractors, 5 Planters, 2 Combined Harvesters, 5 Boom Sprayers and 2 Spreaders
C1. Share of local rice in the market	41.29%	45.47%	49.65%
C2. Quantity of high-yielding variety seeds	648.0 MT	972.0 MT	1,296.0 MT
E1. Smallholder farmers' accessibility to financial services	10.9%	30.0%	50.0%
E2. Smallholder farmers' accessibility to technical training or services	100.0%	100.0%	100.0%

4.15.3 Data Source

The PHS and CFS were the main data sources used to determine the 2022 T-NRDS baseline figures together with the import/export data from the ZRA, while the T -NRDS was used as a data source for the 2026 T-NRDS targets of the overall indicators. Data for the indicators related to seed varieties was obtained from the SCCI.

The RICE indicator targets were set as described in Sub-Section 4.15.2 for each indicator.

[5] These are the tentative targets for Zambia to achieve under the CARD initiative as set by the Zambian NRDS TF. It should be noted that pending the performance of the T-NRDS, the 2030 targets can be revised.

5 Conclusion

At the conclusion of the assignment which complied both primary and secondary data, the status of the various baseline indicators is as follows;

Table 5-1: NRDS M&E Indicators – Definitions and Baseline Values

CARD M&E Framework	Indicator	Definition (Unit)	2022 Baseline
Overall	1. Quantity of paddy production (2022)	Paddy rice produced in a year (metric tonnes - MT)	62,918MT (PHS)
	2. Total area harvested (2022)	Rice-harvested area (hectares - ha)	59,601 ha (PHS)
	3. Yield per unit area (2022)	Paddy rice harvested per hectare of land (MT/ha)	1.06 MT/ha (PHS)
	4. Self-sufficiency rate	The percentage of rice consumed that is locally produced (%)	83.16% (PHS and ZRA)
Resilience	1. Area under irrigation (2022)	Area under rice cultivation with supplementary irrigation that could mitigate the negative impacts of weather fluctuations on rice production (ha)	Zero (Survey)
	2. Quantity of resilient variety seeds (2022)	Quantity of seeds of locally preferred varieties with resilient characteristics, locally produced and/or imported annually (MT)	301.5 MT (SCCI)
Industrialization	1. Level of Industrial Milling Capacity (2022)	Ratio of installed capacity of medium and large mills among all functional mills (%)	66.7% (Survey, TSB and MoA Extension)
	2. Level of mechanization in production (2022)	Number of machines available for ploughing and harvesting in rice producing areas (Number)	31 machines which are; 23 Tractors, 3 Planters, 1 Combined Harvester, 3 Boom Sprayers and 1 Spreader (Survey, TSB and MoA Extension)
Competitiveness	1. Share of local rice in the market (2022)	Share of locally produced rice in the total quantity of rice procured by major retail stores (%)	41.29% (PHS/CFS and Retail Stores)
	2. Quantity of high-yielding variety seeds (2022)	Quantity of seeds of locally preferred varieties with high-yielding attributes, locally produced and/or imported (MT)	648.0 MT (SCCI)
Empowerment	1. Smallholder farmers' accessibility to financial services (2022)	Ratio of smallholder farmers having access to financial services (%)	10.9% (Survey)
	2. Smallholder farmers' accessibility to technical training or services (2022)	Ratio of farmers accessing necessary technical training and services in rice production areas (%)	100% (Survey)

A breakdown of the aforementioned baseline figures, based on the CFS only for the overall indicators into provinces is as below;

Table 5-2: Provincial Breakdown of the Baseline Figures

Province	Hectares Planted (ha)	Hectares Harvested (ha)	Production (MT)	Yield on Area Planted (MT/ha)	Yield on Area Harvested (MT/ha)
Central	1,528	1,528	2,729	1.79	1.79
Copperbelt	6	2	13	2.17	6.50
Eastern	3,378	3,236	4,617	1.37	1.43
Luapula	2,588	2,530	5,049	1.95	2.00
Muchinga	9,820	8,404	9,737	0.99	1.16
Northern	18,849	16,024	7,337	0.39	0.46
North-Western	1,909	1,889	3,369	1.76	1.78
Western	29,522	25,989	30,066	1.02	1.16
National	**67,601**	**59,601**	**62,918**	0.93	1.06

Indications from both the CFS and the PHS are that there was no contribution of rice production from the Lusaka and Southern Provinces of Zambia.

For the full data collection matrix and process of collection and analysis, please refer to the "Third National Rice Development Strategy - Data Collection and Analysis Procedural Manual".

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7 Appendix 1: Assignment ToRs

Monitoring Baseline Survey for the National Rice Development Strategy (NRDS)

<Background>

The Coalition for African Rice Development (CARD) is 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[6]. CARD was launched by the Alliance for a Green Revolution in Africa (AGRA), the New Partnership for Africa's Development (NEPAD, current AUDA-NEPAD) and the Japan International Cooperation Agency (JICA) at the Fourth Tokyo International Conference on African Development (TICAD IV) in May 2008.

The CARD initiative aimed at doubling the rice production in SSA in ten years from 14 million tons in 2008 to 28 million tons in 2018, thereby closing the demand-supply gap and contributing to food security as well as poverty reduction in the continent. To achieve this goal, the CARD Initiative tried to promote increased dialogue among partners interested in promoting rice sector development in SSA, leading to improve interventions, both in quantity (resources allocated) and quality (more coordination). While the initiative achieved its goal of doubling rice production by 2018, the demand-supply gap remained significant, due to continuing increase in demand for rice. Therefore, the CARD entered its second phase in 2019, with a new target of further doubling rice production to 56 million tons by 2030.

One of the main activities of CARD at the country level is the provision of assistance in formulating and implementing National Rice Development Strategy (NRDS). Currently, CARD is supporting its original member countries for revising their NRDS and the new member countries for formulating their NRDS. NRDS charts out pathways for developing the rice sector in the respective country, based on their strengths and needs.

In the second phase, CARD focuses more on Monitoring and Evaluation (M&E) of NRDS implementation. Recently, CARD has developed a M&E framework, applying the "RICE Approach" (Resilience, Industrialization, Competitiveness and Empowerment), a new strategic approach that CARD adopted for the second phase. The M&E framework involves four overall indicators, namely (1) production quantity, (2) area harvested, (3) yield, and (4) self-sufficiency rate, as well as two indicators for each of R, I, C, and E (2 x 4 = 8), totaling 12

[6] During the first phase (2008-2018), CARD had 23 member countries: Benin, Burkina Faso, Cameroon, Central African Republic, Côte d'Ivoire, Democratic Republic of the Congo, Ethiopia, The Gambia, Ghana, Guinea, Kenya, Liberia, Madagascar, Mali, Mozambique, Nigeria, Rwanda, Senegal, Sierra Leone, Tanzania, Togo, Uganda, and Zambia. For the second phase (2019-2030), nine countries joined the initiative: Angola, Burundi, Chad, Congo Republic, Gabon, Guinea-Bissau, Malawi, Niger, and Sudan.

indicators (see Table 1 below). This M&E framework was approved in the 8th General Meeting (GM8) of CARD in October 2021. While each CARD member country has its own NRDS M&E framework, all the member countries are requested to incorporate those 12 common indicators in their M&E framework, so that CARD can monitor the progress of NRDS implementation in its member countries, using the same measures.

Table 1: CARD's common set of M&E indicators[7] are as follows:

Overall	1. Quantity of paddy production 2. Total area harvested 3. Yield per unit area 4. Self-sufficiency rate
Resilience	1. Area under irrigation 2. Quantity of resilient variety seeds
Industrialization	1. Level of milling sector upgrading 2. Level of mechanization in production
Competitiveness	1. Share of local rice in the market 2. Quantity of high-yielding variety seeds
Empowerment	1. Smallholder farmers' accessibility to financial services 2. Smallholder farmers' accessibility to technical training or services

The next step for each CARD member country is to collect data and set the baseline figure for each indicator. At the same time, it is required to establish a simple methodology of data collection that makes it possible for NRDS Taskforce (TF) team to conduct M&E of their NRDS throughout the second phase of CARD up to 2030, using their own human and financial resources. For this purpose and responding to the request from the Ministry in charge of NRDS implementation, JICA Zambia office wishes to seek a local consultant team (hereinafter referred to as the "Consultant"). The Consultant will conduct the study under guidance of CARD Secretariat and the NRDS TF team led by NRDS Focal Point person (FP), who is an official in charge of rice promotion from Ministry of Agriculture (hereafter

[7] Detailed explanation of each indicator can be found in Attachment 1 "CARD Monitoring and Evaluation Framework."

referred to as "MoA"). The present Terms of Reference provide a general framework and guidance for this monitoring baseline study.

<Purpose and scope>

The primary purposes of the study are two-fold. One is to set baseline figures in Zambia against the NRDS M&E indicators (See Attachment 2). And the other is to prepare a procedural manual which details the data sources and data collection methods for each indicator, in order for Ministry of Agriculture or the NRDS TF team members to conduct the same data collection throughout the second phase of CARD. It should be noted that the 12 M&E indicators were carefully and purposefully selected to be as simple as possible, so that all 32 CARD member countries could carry out the M&E in a sustainable manner up to 2030, with their own resources. Therefore, the data collection methodology to be developed for the indicators and retail rice price data must be simple as well, using as much secondary data available in various authorities as possible, limiting the necessity of conducting a survey to collect primary data. While the indicators are common across CARD member countries, the methodology for data collection is expected to be tailor-made, according to the situations in each country, in terms of existing agricultural statistics and resources available to collect necessary data.

<Expected workload>

To conduct this study, the Consultant is expected to consist of a leader and a data collection assistant, with a period of person-days suggested below.

Team Leader: 60 person-days

Data collection assistant: 15 person-days

Total: 75 person-days

<Consultant's task>

The Consultant is expected to carry out the following tasks under the close guidance of the NRDS FP, NRDS TF members, CARD secretariat and JICA office.

Review the latest NRDS of the country and discuss with the NRDS TF team how each of the indicators mean in the context of Zambia's rice sector development. There are several indicators whose details should be agreed upon with the NRDS TF team, such as geographical coverage of data to be collected and definition of terms (e.g., For the indicator "quantity of resilient variety seeds," it is necessary to first define and identify "resilient varieties.") (See Attachment 2 "CARD ME Indicators.")

Identify various sources where the Consultant can collect data for the indicators and retail price data, and agree on them with NRDS TF members through NRDS FP. Under this study,

it is important to make full use of secondary data/information from available information sources (e.g., bureau of statistics, relevant Ministry Departments). The collection of primary data/information by the Consultant should be limited to those indicators for which secondary data are not available or, even available, not comprehensive/trustworthy. (See Attachment 2 "CARD ME Indicators," Sheet "Indicator" for a reference.)

Collect secondary data/information through telephone calls, e-mails, visits, and other appropriate measures from the various sources identified in Task 2. Examine the quality of collected data/information, from different perspectives such as how they are originally collected, whether they are official, reliable, easy to obtain, and regularly updated. If the quality can be judged adequate, calculate baseline figures for indicators based on the collected data/information (i.e., the value of indicators for the year 2018).

For those indicators identified to require primary data collection, suggest the methods of data collection (e.g., survey, field visit). The most important aspect is that the method of data collection should be reproducible considering that the TF team will be responsible for collection of the updated data annually, up to 2030.

Prepare a Progress Report 1, describing the results of Tasks 1 to 4, and obtain pre-approval of NRDS FP, TF members and CARD Secretariat. To do so, the Consultant needs to organize a meeting with NRDS TF team and present the report. After the pre-approval from them, the Consultant is required to submit the report to JICA Zambia office by 1 February 2023

Collect primary data/information based on the methods and approaches agreed with TF in Task 5.

*Actual movement of the Consultant in the country for the purpose of primary data collection can be decided through discussions with NRDS FP and TF members. However, the expectation is that the Consultant spends a total of approximately 30 person-days to visit Mongu and Mansa.

Prepare a Progress Report 2, which contains all collected data/information, both secondary and primary, with the details of methods that the Consultant used to collect them. Suggestion of baseline figures needs to be made for each indicator. A pre-approval from NRDS FP, TF members and CARD Secretariat should be obtained prior to submission of the report to JICA Zambia office by 6 March 2023.

Draft a Final Report that includes, in addition to the contents of the Progress Report 2, the methodology of data collection, keeping in mind that the readers are the NRDS TF team who are supposed to carry out the same exercise from the following year, either by themselves or through hiring a consultant depending on the country's situation. This methodology must be organized in a manual format, with step-by-step instructions, including information such as whom to contact, when updated data become available, and how to process data to calculate the figure for the indicator.

Share the draft Final Report with the NRDS FP, TF members and CARD secretariat to obtain their comments by 7 April 2023. To do so, the Consultant needs to organize a meeting with NRDS TF team and present the report. At this timing, discuss with NRDS FP and TF team to set 2030 targets for each of the indicators for including them in the Final Report.

Incorporate comments collected through Task 9 and finalize the report (Final Report). After confirming with the NRDS TF and CARD Secretariat that incorporation of comments is duly made, submit the report to JICA Zambia office by 21 April 2023.

<Approach and management of the survey>

The Consultant shall work under the direct guidance of the NRDS TF through NRDS FP and shall also work in close collaboration/consultation with the CARD Secretariat, especially with the CARD M&E officer as well as the CARD Regional Consultant who is responsible for assisting the NRDS-related activities in the country. In the technical proposal, the applicant shall suggest how to collect data for each M&E indicator (including availability of secondary data, potential sources, etc.), specified in the Attachment 1 "CARD Monitoring and Evaluation Framework."

<Deliverables>

Only Soft-copies (MS-Word and PDF) are required.

Progress Report 1

Progress Report 2

Final Report

<Duration and timeframe of assignment >

The period of contract is expected from 21 December 2022 to 30 April 2023. It can start as early as possible after the contract is signed if both parties (JICA and the Consultant) agree.

The Final Report shall be completed and submitted within 120 days after the contract is signed. Each deliverable is required to be checked and approved by NRDS FP and CARD Secretariat, prior to the submission to JICA office.

	Task	December			January			February			March			April		
1	Review NRDS			■												
2	Identify data sources and agree on them with NRDS TF			■												
3	Collect secondary data/information			■	■	■										
4	Suggest methods for primary data collection				■	■										
5	Prepare Progress Report 1 and organize a meeting with NRDS TF to obtain approval						△									
6	Collect primary data/information							■	■	■						

7	Prepare and submit Progress Report 2										■					
8	Prepare & submit draft Final Report											■	■	△		
9	Obtain feedback on draft Final Report, organizing a meeting with NRDS TF													■	■	
10	Incorporate comments and submit Final Report													■	■	△

<Payment Schedule>

Payments for the consultancy services will be made as follows:

Upon successful submission of the Progress Report 1, the Consultant shall be paid 25% of the Contract amount. Expected submission date is 1 February 2023.

Upon successful submission of the Progress Report 2, the Consultant shall be paid 35% of the Contract amount. Expected submission date is 6 March 2023.

The remaining 40% shall be paid to the Consultant upon successful submission of Final Report. Expected submission date is 21 April 2023.

<Qualification and Experience>

Team leader:

A minimum of a Master's degree in relevant fields of expertise (e.g., agriculture, agricultural and development economics, international development, public administration, business administration, management sciences)

Experiences in monitoring and evaluation of government policies, strategy, programs and institution

Good knowledge of the agriculture sector (rice sector in particular) of the country

Logical thinking

Skills in writing and presentation

Fluency in English in both writing and speaking

Data collection assistant:

Experience in data collection in the area of agriculture and rural/social development

Skills in communicating with local people in their languages

<Notes>

It is ideal to find out a single source of secondary data that is official, reliable, easy to obtain and regularly updated, for each indicator. Once such a data source is identified, the Consultant no longer needs to look at different data sources. In many countries, it is expected to be the case for the overall indicators (i.e., quantity of paddy production, total area harvested, yield per unit area, and self-sufficiency rate), for which the MoA is most likely to have developed a methodology to obtain and process data to report to FAOSTAT every year.

FAOSTAT can be consulted but cannot be a source of data for any indicators in itself. The Consultant is required to explore how the data available in FAOSTAT are collected and reported by the MoA, and examine whether the methodology currently applied is appropriate. If judged appropriate, the Consultant is expected to propose in the Progress Report 1 to use the same data as the indicator, describing the methodology of data collection applied by MoA in detail and the way to obtain it from MoA for the purpose of NRDS M&E. If judged inappropriate, the Consultant is expected to propose a countermeasure.

In the same manner, NRDS TF can be consulted for the data they have with them, but cannot be reported as a source of data for any indicators. It is important to identify original data sources.

Furthermore, literature review of published reports and articles might be useful at the initial stage of the study, to identify potential data sources and crosscheck the quality of collected data. However, such reports and articles themselves cannot be reported as a source of data for any indicators, unless they are periodical and it is expected that annually updated data will be available up to 2030.

When the Consultant finds multiple data sources for the same indicator, they are supposed to analyze them to identify which one is the best for the purpose of NRDS M&E (exercise often called "triangulation"). The Consultant may also has to suggest the way to combine the data from several sources, if a single source cannot provide enough data to obtain adequate figures for an indicator. The results of such analyses, related to the quality of data, have to be fully described in Progress Reports 1 and 2. On the other hand, the Consultant is NOT expected to analyze data quantitatively (e.g., showing the trend in a graph, examining causes of upward/downward trends, and making comparison with data from neighboring countries). It is not within the scope of this study. The Consultant is expected to focus on finding out and report where and how the best data for each indicator can be obtained.

8 Appendix 2: CARD Indicators

8.1 Overall Indicators and Targets

The CARD M&E framework as four (4) overall indicators and they are each briefly explained below.

8.1.1 Overall 1. Quantity of paddy production

Quantity of paddy production is the sum of paddy produced in a given year in different ecologies. The CARD has set the target of fifty-six (56) million metric tonnes (MMT) produced by the year 2030 by all Sub-Saharan African (SSA) countries. This will be measured from the twenty-eight (28) MMT from 2018. According to the CARD;

> *CARD Phase2 just started in 2019, with a renewed target of further doubling of rice production in SSA, from 28 million to 56 million MT for the next 12 years (by 2030).* (CARD, 2022a)

In the case of Zambia, according to the CARD, the Phase 2 baseline figure was 43,063 MT and this meant to be doubled to 86,126 MT by the year 2030. (CARD, 2022b).

According to the T-NRDS, the target is to increase the rice production in Zambia up to 44,376 MT (paddy rice) by 2026. (Ministry of Agriculture, 2022a, p. 12). This is against the backdrop of the production figures falling to 34,630 MT in 2020. (CARD, 2022b)

8.1.2 *Overall 2. Total Area Harvested*

Total area harvested is the sum of rice-harvested area from all rice-growing ecologies. According to the CARD M&E framework, the 2030 target for the SSA countries is 18.7 million hectares (Mha), this is from a 2020 achievement of 16.6 Mha.

For Zambia, the 2020 area was 24,756 hectares (ha), a drop from the Phase 2 baseline figure of 30,297 ha. The CARD 2030 target has been set at 41,507 ha. The MoA has a 2026 target of increasing this to 38,375 ha under the -NRDS.

8.1.3 Overall 3. Yield Per Unit Area

This indicator is basically the average quantity (in weight) of paddy grains harvested per hectare of land. For the SSA, from the 2020 value of 1.98 metric tonnes per hectare (MT/ha), the 2030 target is set for 3.00 MT/ha.

The Zambian case is that in 2020, this was measured to be 1.40 MT/ha with the CARD 2030 target being 2.07 MT/ha. Through the T-NRDS, the MoA aims for this to be 1.35 MT/ha by the year 2026.

8.1.4 Overall 4. Self-Sufficiency Rate

This indicator measures the; quantity of milled rice produced / (quantity of milled rice produced + quantity of milled rice imported– quantity of milled rice exported). This is;

$$x = \frac{\text{a}}{(a + b - c)}$$

Where;

x = Self-Sufficiency Rate (in percentage)

a = milled rice

b = imported rice

c = exported rice

The CARD M&E framework does not set a target for the SSA countries but encourages member countries to set their own targets.

8.2 R.I.C.E. Indicators

In Phase 2 of the CARD, the new approach called R.I.C.E. is adopted and hence measuring progress on the four aspects of; Resilience, Industrialization, Competitiveness and Empowerment, becomes imperative. Therefore, the following indicators, two for each component, are considered as important indicators for the rice sector development in each member country under the CARD initiative. These indicators make it possible to follow the changes in the entire rice value chain in the process of NRDS implementation, while the overall indicators mentioned in the previous section follow the changes in the OUTPUT and/or OUTCOME. With the RICE indicators, we can understand how we are approaching the set targets, that is the required INPUTS and/or ACTIVITIES.

The target figures for RICE indicators are to be set by each country. For each RICE indicator, the figures at the regional and initiative levels are derived by totalling the figures of corresponding member countries, as shown in the table above.

8.2.1 Resilience 1. Area under irrigation

Definition: Area under rice cultivation with supplementary irrigation that could mitigate the negative impacts of weather fluctuations on rice production (ha)

The area of rice field under irrigation is the sum of rice fields with water control. This data can be obtained in reports from agricultural statistics departments at the national level. Data can be collected at the end of rice production season(s). Where double cropping is practiced under irrigation, areas for both seasons should be counted.

8.2.2 Resilience 2. Quantity of resilient variety seeds

Definition: Quantity of seeds of locally preferred varieties with resilient characteristics, locally produced and/or imported annually (ton)

This indicator is a proxy to the area under cultivation of resilient varieties. It aims to assess the preparedness of rice farmers on climate resilience and pest outbreaks through the evolution of the quantity of resilient varieties adopted from year to year.

8.2.3 Industrialization 1. Level of industrial milling capacity

Definition: Ratio of installed capacity of medium and large mills among all functional mills (%)

This indicator is to assess the level of industrialization by following the level of upgrading the milling sector. It is to be measured by the ratio of installed capacity of medium- and large-scale mills (2 tons/hour or larger) to the total installed capacity of all functional mills in the country. This indicator is selected based on the expectation that larger share of rice milled by medium- to large-scale modern mills, rather than small-scale artisanal mills, can be considered as a major drive for industrialization of the whole rice value chain.

8.2.4 Industrialization 2. Level of mechanization in production

Definition: Number of machines available for ploughing and harvesting (in rice producing areas) (unit)

This indicator is to assess the level of industrialization through the improvement in the modernization of production systems. To measure it, we use the change in number of tractors and harvesters in representative rice producing areas. Tractors can be used for other crops as well. Therefore, we limit the areas to be questioned to what the country regards rice producing areas. By doing so, we can more accurately count tractors meant for rice, not for other crops.

8.2.5 Competitiveness 1. Share of local rice in the market

Definition: Share of locally produced rice in the total quantity of rice procured by major retail stores (%)

This indicator is to assess the competitiveness of local rice compared to imported rice. It will be measured using the share of local rice in the total quantity of rice procured by pre-selected major retail stores. The assumption is that a supermarket store captures the best the value of both the local and imported rice to consumers. The data will be obtained through a survey at the major retail stores (especially pre-selected supermarkets).

8.2.6 Competitiveness 2. Quantity of high-yielding variety seeds

Definition: Quantity of seeds of locally preferred varieties with high-yielding attributes, locally produced and/or imported (ton)

The previous indicator "Competitiveness 1" which measures the ratio of local rice and imported rice to roughly see local rice's competitiveness, covers multiple aspects of consumer preference over rice such as taste, aroma, colour, price and so forth. On the other hand, this "Competitiveness 2" indicator is to measure production capacity to make local rice available in the market because if local rice is not available constantly then it cannot be competitive and also it entails increase in importation which might have an effect on self-sufficiency.

We therefore follow the level of availability of seeds of high-yielding varieties (HYV). Higher yield lowers the unit costs of production, which in turn can increase local supply and market share of local rice. This may also hold the potential to reduce retail prices and thereby increase the market competitiveness of the local rice. The more high-yielding varieties are adopted, the greater the competitiveness of local rice over the imported rice.

8.2.7 Empowerment 1. Smallholder farmers' accessibility to financial services

Definition: Ratio of smallholder farmers having access to financial services (%)

This indicator is to measure the capacity of smallholder rice farmers over investing in their farming operations, evaluated by the degree of their access to financial services that can support and upgrade their rice production system.

8.2.8 Empowerment 2. Smallholder farmers' accessibility to technical training and services

Definition: Ratio of farmers accessing necessary technical training and services in rice production areas (%)

This indicator is to assess the level of extension service accessible to rice farmers. Availability of irrigated fields and better inputs like seeds can help produce more paddy if they are guided by appropriate technological backstopping which is normally provided by the public

extension system. This indicator should try to capture not only the extension services by the public but also by private sectors. The data is to be collected from rice producing areas.

9 Appendix 3: Baseline Survey Interactions

This appendix gives pictorial evidence of the various interactions during the baseline survey. The pictures are broken down into sections to give context to evidence.

9.1 Key Informants

Figure 9-1: The Third Consultative Meeting with the NRDS TF

Figure 9-2: AnChiCon Team (on the left) Interaction with the Western Province MoA Staff

Figure 9-2 was the meeting between the AnChiCon team (the three on the left) and the Western Province MoA staff (the three on the right), from right to left; the Provincial Agricultural Coordinating Officer (PACO), the Provincial Agricultural Officer (PAO) and the Senior Agricultural Officer (SAO).

Figure 9-3: AnChiCon Team Interaction with the Mansa District MoA Staff

From left to right, Figure 9-3 shows, the Assistant District Marketing Development Officer (As. DMDO) for Mansa, AnChiCon Staff, the District Marketing Development Officer (DMDO), who was at the time of the survey also the Acting District Agricultural Coordinating Officer (Ag. DACO), AnChiCon Staff, the Crops Husbandry Officer (CHO) and anther AnChiCon Staff.

9.2 Individual Farmers

Figure 9-4: Interaction with Individual Farmers in Mabumba, Mansa

9.3 Focus Group Discussions

Below are pictures of some of the FGDs that were held;

Figure 9-5: FGD at Mabumba in Mansa

Figure 9-6: FGD at Kaande in Mongu

9.4 Transient Walks and Observational Data Collection

Figure 9-7: Black Beetle Infesting Rice Plantations In Mansa

The outline of the Sefula Irrigation scheme is as in the model below;

Figure 9-8: Sefula Irrigation Scheme Model

Below are some of the findings at the Sefula Irrigation Scheme;

Figure 9-9: Planting and Growing of Various Crops in the Sefula Irrigation Scheme

Figure 9-10: Inspection of the Sefula Irrigation Scheme Water Canals

Illustrations of some of the milling companies visited are as below;

Figure 9-11: Rice Milling at APG Milling in Mongu

Figure 9-12: Destoned Paddy (left) and Polished Rice (right) At Silaupa Milling (Mansa)

Figure 9-13: Crop Planter at Sefula Irrigation Scheme

Figure 9-14: A Farmer Learning to Transplant Rice

Figure 9-14 is an illustration of the farmer transplanting rice from the nursery to the main rice fields at Namushakende FTI, which has about five (5) hectares of rice growing.

9.5 Retail Stores

Figure 9-15: Various Rice Brands and Weights In Choppies Store in Mansa

Figure 9-16: Various Rice Brands and Weights In ShopRite Store in Mansa

Figure 9-17: Rice Brands and Weights Found in Retail Stores in Lusaka

10 Appendix 4: Baseline Visited Area

The list of places visited during the baseline and the mode of engagement is as tabulated below;

Table 10-1: Baseline Location and Mode of Engagement

Location	Activities
Lusaka	
-Choppies Chilenje	KII and Observational Data Collection
-Choppies Crossroads	KII and Observational Data Collection
-Japan International Cooperation Agency (JICA)	KII
-Melissa Supermarket Kabulonga	KII and Observational Data Collection
-Ministry of Agriculture (MoA)	KII (CAO, TF)
-Pick N Pay Kabulonga	KII and Observational Data Collection
-ShopRite Lewanika Mall	KII and Observational Data Collection
-ShopRite Manda Hill	KII and Observational Data Collection
-Spar Crossroads	KII and Observational Data Collection
Mansa	
Mansa Town	
-Choppies	KII and Observational Data Collection
-DOCHRIS Enterprise	KII and Transect Walks
-Ministry of Agriculture (MoA)	KII (PACO, PAO, DACO, DMDO, CHO)
-Seed Control and Certification Institute (SCCI)	KII and Transect Walks
-ShopRite	KII and Observational Data Collection
-Silaupa Milling	KII and Transect Walks
Mabumba	
-Residential	KII and FGD
Mongu	
Mongu Town	
-Agriline (Z) Limited	KII and Transect Walks
-APG Milling	KII and Transect Walks
-Diocese of Mongu Development Centre (DMDC)	KII and Transect Walks
-Ministry of Agriculture (MoA)	KII (PACO, PAO, DACO, SAO, FMO)
-ShopRite	KII and Observational Data Collection
-Zambia Agriculture Research Institute (ZARI)	KII and FGD
Kaande	
-Kaande Basic School	KII and FGD
Namushakende	
-Farmers Training Institute	KII, FGD and Transect Walks
Sefula	
-Sefula Irrigation Scheme	KII, FGD and Transect Walks
-Suffering Give Knowledge Milling	KII and Transect Walks
Simulumbe	
-Zambia Agriculture Research Institute (ZARI)	KII, FGD and Transect Walks

12Appendix 5: Baseline Data Collection Matrix

The main data sources of the baseline survey are tabulated below indicating which indicator information is available in the data source and the organisation to obtain the data from. As per Zambian communication norm, request for this data will have to be made to the controlling officer of each of the organisations.

Table 12-1: Data Collection Matrix

CARD M&E Framework	Indicator	Main Data Source	Organisation (Officer)
Overall	1. Quantity of paddy production	CFS / PHS	MoA (Permanent Secretary)
	2. Total area harvested	CFS / PHS	MoA (Permanent Secretary)
	3. Yield per unit area	CFS / PHS	MoA (Permanent Secretary)
	4. Self-sufficiency rate	CFS / PHS Rice Import/Export Data	MoA (Permanent Secretary) Zambia Revenue Authority (Commissioner General)
Resilience	1. Area under irrigation	CFS / PHS	MoA (Permanent Secretary)
	2. Quantity of resilient variety seeds	SCCI Database	SCCI (Director)
Industrialization	1. Level of Industrial Milling Capacity	MoA Extension Services MoA Technical Services Branch	MoA (Permanent Secretary)
	2. Level of mechanization in production	MoA Extension Services MoA Technical Services Branch	MoA (Permanent Secretary)
Competitiveness	1. Share of local rice in the market	Retails Stores	Store Managers
	2. Quantity of high-yielding variety seeds	SCCI Database	SCCI (Director)
Empowerment	1. Smallholder farmers' accessibility to financial services	MoA Extension Services	MoA (Permanent Secretary)
	2. Smallholder farmers' accessibility to technical training or services	MoA Extension Services	MoA (Permanent Secretary)

For the collection of rice prices from the retail stores, these can be obtained from the stores as per Indicator C1, from the store managers.

13Appendix 6: Rice Brands, Package Sizes and Prices

Table 13-1: Rice Brands, Package Sizes and Prices

Location	Shop	Brand	Weight	Price	Unit Price	Source
Lusaka	ShopRite	People's Pride (Mongu)	5	ZMW 94.99	ZMW 19.00	Local
Lusaka	ShopRite	People's Pride (Aromatic Mongu)	2.5	ZMW 54.99	ZMW 22.00	Local
Lusaka	ShopRite	Mother's Pride (Natural)	2.5	ZMW 69.99	ZMW 28.00	Local
Lusaka	ShopRite	Mother's Pride (Super Rice)	5	ZMW 129.99	ZMW 26.00	Local
Lusaka	ShopRite	Mother's Pride (Super Rice)	10	ZMW 249.99	ZMW 25.00	Local
Lusaka	ShopRite	Mother's Pride (Jasmine)	2.5	ZMW 104.99	ZMW 42.00	International
Lusaka	ShopRite	Mother's Pride (Golden)	2.5	ZMW 64.99	ZMW 26.00	International
Lusaka	ShopRite	Mother's Pride (Parboiled)	10	ZMW 349.99	ZMW 35.00	International
Lusaka	ShopRite	Mother's Pride (Health)	2.5	ZMW 93.99	ZMW 37.60	Local
Lusaka	ShopRite	Tastic (Bonnet)	1	ZMW 37.99	ZMW 37.99	International
Lusaka	ShopRite	Tastic (Bonnet)	2	ZMW 69.99	ZMW 35.00	International
Lusaka	ShopRite	Tastic (Sushi Rice)	1	ZMW 89.99	ZMW 89.99	International
Lusaka	ShopRite	Tastic (Nature's Brown Rice)	2	ZMW 69.99	ZMW 35.00	International
Lusaka	ShopRite	Tastic (Wholegrain)	2	ZMW 69.99	ZMW 35.00	International
Lusaka	ShopRite	Tastic (Parboiled)	0.5	ZMW 12.99	ZMW 25.98	International
Lusaka	ShopRite	Tastic (Parboiled)	1	ZMW 24.99	ZMW 24.99	International
Lusaka	ShopRite	Tastic (Parboiled)	2	ZMW 47.99	ZMW 24.00	International
Lusaka	ShopRite	Tastic (Soft &Absorbing)	2	ZMW 49.99	ZMW 25.00	International
Lusaka	ShopRite	Its wild (Chama)	2	ZMW 46.99	ZMW 23.50	Local
Lusaka	ShopRite	Premuni	1	ZMW 42.99	ZMW 42.99	International
Lusaka	ShopRite	Premuni	2	ZMW 89.99	ZMW 45.00	International
Lusaka	ShopRite	Premuni	5	ZMW 179.99	ZMW 36.00	International
Lusaka	ShopRite	Daawat (Deli Basmati)	1	ZMW 49.99	ZMW 49.99	International
Lusaka	ShopRite	Daawat (Deli Basmati)	2	ZMW 99.99	ZMW 50.00	International

Location	Shop	Brand	Weight	Price	Unit Price	Source
Lusaka	ShopRite	Daawat (Traditional Basmati)	1	ZMW 52.99	ZMW 52.99	International
Lusaka	ShopRite	Allsome (Parboiled)	0.5	ZMW 15.49	ZMW 30.98	International
Lusaka	ShopRite	Allsome (Parboiled)	1	ZMW 29.99	ZMW 29.99	International
Lusaka	ShopRite	Allsome (Parboiled)	2	ZMW 45.99	ZMW 23.00	International
Lusaka	ShopRite	Allsome (Parboiled)	5	ZMW 164.99	ZMW 33.00	International
Lusaka	ShopRite	Allsome (Parboiled)	10	ZMW 349.99	ZMW 35.00	International
Lusaka	ShopRite	D'lite	1	ZMW 31.99	ZMW 31.99	International
Lusaka	ShopRite	D'lite	5	ZMW 154.99	ZMW 31.00	International
Lusaka	ShopRite	Ritebrand	2	ZMW 59.99	ZMW 30.00	International
Lusaka	Choppies	Mother's Pride (Jasmine)	2.5	ZMW 99.99	ZMW 40.00	International
Lusaka	Choppies	Mother's Pride (Golden)	2.5	ZMW 69.99	ZMW 28.00	International
Lusaka	Choppies	Mother's Pride (Parboiled)	5	ZMW 139.99	ZMW 28.00	Local
Lusaka	Choppies	People's Pride (Mongu Rice)	5	ZMW 94.99	ZMW 19.00	Local
Lusaka	Choppies	IBC Grade A Nakonde	5	ZMW 159.99	ZMW 32.00	Local
Lusaka	Choppies	D'lite	5	ZMW 149.99	ZMW 30.00	International
Lusaka	Choppies	Golden Pride	2	ZMW 44.99	ZMW 22.50	International
Lusaka	Choppies	Golden Pride	5	ZMW 109.99	ZMW 22.00	International
Lusaka	Choppies	Mother's Pride (Healthy)	2.5	ZMW 79.99	ZMW 32.00	Local
Lusaka	Spar	Richmond Nakonde Rice	0.5	ZMW 16.00	ZMW 32.00	Local
Lusaka	Spar	Richmond Nakonde Rice	1	ZMW 34.00	ZMW 34.00	Local
Lusaka	Spar	Richmond Nakonde Rice	2	ZMW 64.00	ZMW 32.00	Local
Lusaka	Spar	Richmond Nakonde Rice	5	ZMW 158.00	ZMW 31.60	Local
Lusaka	Spar	Riech Nakonde Rice	1	ZMW 42.00	ZMW 42.00	Local
Lusaka	Spar	Riech Nakonde Rice	2	ZMW 79.00	ZMW 39.50	Local
Lusaka	Spar	Riech Nakonde Rice	5	ZMW 189.00	ZMW 37.80	Local
Lusaka	Spar	IBC Grade A Nakonde	1	ZMW 28.00	ZMW 28.00	Local
Lusaka	Melissa	Mother's Pride (Healthy)	2.5	ZMW 115.50	ZMW 46.20	Local
Lusaka	Melissa	Mother's Pride (Golden)	2.5	ZMW 73.50	ZMW 29.40	International
Lusaka	Melissa	Mother's Pride (Natural)	2.5	ZMW 66.00	ZMW 26.40	Local
Lusaka	Melissa	D'lite	0.5	ZMW 12.50	ZMW 25.00	International

Location	Shop	Brand	Weight	Price	Unit Price	Source
Lusaka	Melissa	D'lite	1	ZMW 25.00	ZMW 25.00	International
Lusaka	Melissa	D'lite	2	ZMW 50.00	ZMW 25.00	International
Lusaka	Melissa	Melisa Supermarket (Mongu)	1	ZMW 22.50	ZMW 22.50	Local
Lusaka	Melissa	Melisa Supermarket (Mongu)	2	ZMW 57.50	ZMW 28.75	Local
Lusaka	Melissa	Nakonde Rice	1	ZMW 25.00	ZMW 25.00	Local
Lusaka	Melissa	Super Nakonde Rice	1	ZMW 25.00	ZMW 25.00	Local
Lusaka	Melissa	Mongu Rice	1	ZMW 22.00	ZMW 22.00	Local
Lusaka	Melissa	Richmond Nakonde Rice	1	ZMW 29.50	ZMW 29.50	Local
Lusaka	Melissa	Taste of Basmati	1	ZMW 80.00	ZMW 80.00	International
Lusaka	Melissa	Everday Essentials	1	ZMW 65.50	ZMW 65.50	International
Lusaka	Melissa	Daawat (Deli Basmati)	1	ZMW 57.50	ZMW 57.50	International
Lusaka	Melissa	Daawat (Traditional Basmati)	1	ZMW 50.00	ZMW 50.00	International
Lusaka	Melissa	Daawat (Traditional Basmati)	2	ZMW 167.00	ZMW 83.50	International
Lusaka	Melissa	Taste of Long Grain Rice	1	ZMW 65.50	ZMW 65.50	International
Lusaka	Melissa	Taste of Long Grain Easy Cook Rice)	1	ZMW 65.50	ZMW 65.50	International
Lusaka	Melissa	Wasanie Suppliers (Nakonde)	1	ZMW 25.00	ZMW 25.00	Local
Lusaka	Melissa	Wasanie Suppliers (Nakonde)	2	ZMW 62.50	ZMW 31.25	Local
Lusaka	Melissa	Sachonge Suppliers (Nakonde)	1	ZMW 25.00	ZMW 25.00	Local
Lusaka	PnP	Tastic (Sushi Rice)	1	ZMW 72.99	ZMW 72.99	International
Lusaka	PnP	Tastic (Risotto)	1	ZMW 72.99	ZMW 72.99	International
Lusaka	PnP	Tastic	2	ZMW 99.99	ZMW 50.00	International
Lusaka	PnP	Tastic (Parboiled)	5	ZMW 169.90	ZMW 33.98	International
Lusaka	PnP	Its wild (Chama)	5	ZMW 104.99	ZMW 21.00	Local
Lusaka	PnP	Mother's Pride (Golden)	2.5	ZMW 79.99	ZMW 32.00	International
Lusaka	PnP	Mother's Pride (Jasmine)	2.5	ZMW 104.99	ZMW 42.00	International
Lusaka	PnP	Mother's Pride (Aromatic Mongu)	2.5	ZMW 57.99	ZMW 23.20	Local
Lusaka	PnP	People's Pride (Mongu)	5	ZMW 109.99	ZMW 22.00	Local
Lusaka	PnP	D'lite	5	ZMW 128.99	ZMW 25.80	International
Lusaka	PnP	D'lite (Parboiled)	1	ZMW 27.99	ZMW 27.99	International
Lusaka	PnP	D'lite (Parboiled)	2	ZMW 56.99	ZMW 28.50	International

Location	Shop	Brand	Weight	Price	Unit Price	Source
Lusaka	PnP	D'lite (Parboiled)	5	ZMW 139.99	ZMW 28.00	International
Lusaka	PnP	D'lite (Parboiled)	10	ZMW 269.99	ZMW 27.00	International
Lusaka	PnP	Tastic (Nature's Brown Rice)	2	ZMW 102.99	ZMW 51.50	International
Lusaka	PnP	Riso Arborio	1	ZMW 104.99	ZMW 104.99	International
Lusaka	PnP	Happy Family (Parboiled)	5	ZMW 109.99	ZMW 22.00	International
Lusaka	PnP	Pick n Pay (Long Grain Black Rice)	0.5	ZMW 89.99	ZMW 179.98	International
Lusaka	PnP	Pick n Pay (Long Grain Red Rice)	0.5	ZMW 94.99	ZMW 189.98	International
Lusaka	Choppies	Golden Pride	2	ZMW 44.99	ZMW 22.50	International
Lusaka	Choppies	Golden Pride	5	ZMW 109.99	ZMW 22.00	International
Lusaka	Choppies	Golden Pride	10	ZMW 199.99	ZMW 20.00	International
Lusaka	Choppies	D'lite (Parboiled)	0.5	ZMW 16.99	ZMW 33.98	International
Lusaka	Choppies	D'lite (Parboiled)	5	ZMW 154.99	ZMW 31.00	International
Lusaka	Choppies	Mother's Pride (Golden)	2.5	ZMW 69.99	ZMW 28.00	International
Lusaka	Choppies	Mother's Pride (Parboiled)	5	ZMW 139.99	ZMW 28.00	Local
Lusaka	Choppies	Mother's Pride (Jasmine)	2.5	ZMW 99.99	ZMW 40.00	International
Lusaka	Choppies	Mother's Pride (Super Rice)	5	ZMW 126.99	ZMW 25.40	Local
Lusaka	Choppies	Mother's Pride (Healthy)	2.5	ZMW 79.99	ZMW 32.00	Local
Lusaka	Choppies	People's Pride (Aromatic Mongu)	2.5	ZMW 52.99	ZMW 21.20	Local
Lusaka	Choppies	People's Pride (Mongu)	5	ZMW 94.99	ZMW 19.00	Local
Lusaka	Choppies	IBC Grade A Nakonde	5	ZMW 159.99	ZMW 32.00	Local
Lusaka	Choppies	Wasanie Suppliers (Nakonde)	1	ZMW 32.99	ZMW 32.99	Local
Lusaka	Choppies	Wasanie Suppliers (Nakonde)	2	ZMW 64.99	ZMW 32.50	Local
Lusaka	Choppies	Wasanie Suppliers (Nakonde)	5	ZMW 159.99	ZMW 32.00	Local
Lusaka	Choppies	Choppies (Grade A Nakonde)	5	ZMW 139.99	ZMW 28.00	Local
Lusaka	Choppies	Richmond Nakonde Rice	10	ZMW 269.99	ZMW 27.00	Local
Lusaka	Choppies	Richmond Nakonde Rice	5	ZMW 144.99	ZMW 29.00	Local
Lusaka	Choppies	Richmond Nakonde Rice	2	ZMW 59.99	ZMW 30.00	Local
Lusaka	Choppies	Richmond Nakonde Rice	1	ZMW 29.99	ZMW 29.99	Local
Lusaka	Choppies	Richmond Nakonde Rice	0.5	ZMW 15.99	ZMW 31.98	Local
Lusaka	Choppies	Mother's (Jeerakashala Rice)	1	ZMW 64.99	ZMW 64.99	International

Location	Shop	Brand	Weight	Price	Unit Price	Source
Lusaka	Choppies	Mother's (Palakkadan Matta Rice)	5	ZMW 119.99	ZMW 24.00	International
Lusaka	Choppies	Gandhi's Basmatic Rice	0.5	ZMW 24.99	ZMW 49.98	International
Lusaka	Choppies	Gandhi's Basmatic Rice	1	ZMW 44.99	ZMW 44.99	International
Lusaka	Choppies	Gandhi's Basmatic Rice	2	ZMW 89.99	ZMW 45.00	International
Mansa	ShopRite	Mother's Pride (Jasmine)	2.5	ZMW 104.99	ZMW 42.00	International
Mansa	ShopRite	Mother's Pride (Natural)	2.5	ZMW 69.99	ZMW 28.00	Local
Mansa	ShopRite	People's Pride (Mongu)	5	ZMW 94.99	ZMW 19.00	Local
Mansa	ShopRite	People's Pride (Mongu)	10	ZMW 194.99	ZMW 19.50	Local
Mansa	ShopRite	Tastic (Sushi Rice)	1	ZMW 82.99	ZMW 82.99	International
Mansa	ShopRite	Tastic (Nature's Brown Rice)	2	ZMW 69.99	ZMW 35.00	International
Mansa	ShopRite	Tastic (Nature's Brown Rice)	1	ZMW 32.99	ZMW 32.99	International
Mansa	ShopRite	Tastic (Nature's Brown and Wild Rice)	1	ZMW 59.99	ZMW 59.99	International
Mansa	ShopRite	D'lite	10	ZMW 299.99	ZMW 30.00	International
Mansa	ShopRite	D'lite	5	ZMW 154.99	ZMW 31.00	International
Mansa	Choppies	Its wild (Chama)	2	ZMW 49.99	ZMW 25.00	Local
Mansa	Choppies	Golden Pride	5	ZMW 109.99	ZMW 22.00	International
Mansa	Choppies	Mother's Pride (Parboiled)	5	ZMW 139.99	ZMW 28.00	Local
Mansa	Choppies	People's Pride (Aromatic Mongu)	2.5	ZMW 52.99	ZMW 21.20	Local
Mansa	Choppies	Choppies (Grade A Nakonde)	5	ZMW 139.99	ZMW 28.00	Local
Mansa	Choppies	Akshaya (Parboiled)	5	ZMW 74.99	ZMW 15.00	International
Mongu	ShopRite	Tastic (Parboiled)	2	ZMW 47.99	ZMW 24.00	International
Mongu	ShopRite	Mother's Pride (Golden)	2.5	ZMW 77.99	ZMW 31.20	International
Mongu	ShopRite	Mother's Pride (Parboiled)	5	ZMW 149.99	ZMW 30.00	International
Mongu	ShopRite	Mother's Pride (Natural)	2.5	ZMW 69.99	ZMW 28.00	Local
Mongu	ShopRite	Mother's Pride (Super Rice)	5	ZMW 127.99	ZMW 25.60	Local
Mongu	ShopRite	Mother's Pride (Healthy)	2.5	ZMW 93.99	ZMW 37.60	Local
Mongu	ShopRite	Mother's Pride (Jasmine)	2.5	ZMW 104.99	ZMW 42.00	International
Mongu	ShopRite	D'lite	2	ZMW 59.99	ZMW 30.00	International
Mongu	ShopRite	People's Pride (Mongu)	5	ZMW 94.99	ZMW 19.00	Local
Mongu	ShopRite	Peoples Pride (Aromatic Mongu)	2.5	ZMW 57.99	ZMW 23.20	Local

Location	Shop	Brand	Weight	Price	Unit Price	Source
Mongu	ShopRite	Super Mongu Rice (Country Millers)	5	ZMW 199.99	ZMW 40.00	Local
Mongu	ShopRite	Super Mongu Rice (Country Millers)	10	ZMW 252.99	ZMW 25.30	Local
Mongu	ShopRite	Its wild (Chama)	2	ZMW 46.99	ZMW 23.50	Local
Mongu	ShopRite	Its wild (Chama)	5	ZMW 106.99	ZMW 21.40	Local
Mongu	ShopRite	Its wild (Chama Super Brown Rice)	2	ZMW 52.99	ZMW 26.50	Local
Mongu	ShopRite	Tastic (Nature's Brown Rice)	2	ZMW 69.99	ZMW 35.00	International
Mongu	ShopRite	Tastic (Nature's Brown Rice)	1	ZMW 69.99	ZMW 69.99	International
Mongu	ShopRite	Tastic (Bonnet)	1	ZMW 34.99	ZMW 34.99	International
Mongu	ShopRite	Tastic (Sushi Rice)	1	ZMW 89.99	ZMW 89.99	International
Mongu	ShopRite	Allsome (Parboiled)	10	ZMW 349.99	ZMW 35.00	International
Mongu	ShopRite	Ritebrand (Parboiled)	2	ZMW 45.99	ZMW 23.00	International