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: Persons conducted during field visits	56-57	Removed
Appendix 6: Names and Contacts of Private Irrigation Schemes	58	Removed
Appendix 7: Milling Capacity of 44 Rice Mills surveyed	58-59	GPS Coordinates removed

BASELINE REPORT FOR GHANA NATIONAL RICE DEVELOPMENT STRATEGY (GHA-NRDS-II)

FINAL REPORT

PART- 1

PREPARED BY:

SCHOOL OF ECONOMICS,
UNIVERSITY FOR DEVELOPMENT STUDIES,
TAMALE, GHANA
Contact: aawuni@uds.edu.gh

JANUARY, 2024

EXECUTIVE SUMMARY

The main objective of this study was to set baseline figures for the Ghana National Rice Development Strategy (NRDS-II) M&E indicators against which implementation progress can be measured; and to prepare an M&E procedural manual which contains details of data sources and data collection methods for each indicator (including 12 indicators that are common across all 32 CARD countries). The process involved the collection and analysis of secondary and primary data. To ensure replicability of the data collection process during M&E, this report is focused on the methodology that was used in setting the baseline figures. This report together with the M&E procedural manual are expected to serve as a guide for the Ghana NRDS Taskforce members and focal person to carry out M&E data collection throughout the second phase of CARD activities in Ghana.

Identification and Assessment of Sources of Secondary Data

Five secondary sources of data for setting the baseline figures as well as for monitoring and evaluation (M&E) of the indicators of NRDS-II; were identified. These are:

i) Agricultural Engineering Services Directorate (AESD)
ii) Ghana Irrigation Development Authority (GIDA)
iii) Ghana Seed Inspection Division (GSID) of the Plant Protection and Regulatory Services Directorate (PPRSD)
iv) Statistics, Research, and Information Directorate (SRID) of MoFA
v) Research and Nutrition Unit of the Food & Drugs Authority (FDA)

Assessment and extraction of secondary data and information, was done through:

a. Meetings and consultations with the officers in charge of each of the database.
b. Desk reviews and Key Informants Interviews (KIIs), including (i) collectors of primary data at zonal levels; (ii) district and regional departments of agriculture, and (iii) relevant directors/heads at national level.
c. Review of the reports emanating from each database, in relation to the process of capturing the data required for the baseline as well as the M&E of NRDS-II indicators.
d. Based on the literature, a criterion was used to judge the adequacy and /or appropriateness of secondary data for inclusion in setting the baseline figures

Collection and Processing of Primary Data

a. After an extensive search for secondary data, indicators which required primary data collection were identified for field surveys to collect the needed data.
b. Field visits to selected sites and market surveys in the key rice growing regions (Upper East, Northern, Volta, Eastern, Greater Accra and Ashanti regions) spanned a period of six weeks (24th August to 6th October, 2023**).** This phase was dedicated to meetings and interviewing all relevant stakeholders to obtain the needed primary data.
c. Among others, consultations were held with key directorates of the Ministry of Food and

Agriculture (at the national level and selected regional/district departments of agriculture), the Ghana Irrigation Development Authority, Irrigation Company of Upper Region (ICOUR), key Rice Processing Plants and Private Irrigators.

d. The selected districts were drawn from the four major rice producing regions in Ghana (Upper East, Northern, Volta and Eastern regions). These included the leading district for production of rice each region.

To find out proportions of local and imported rice that are sold in the retail stores (Indicator 9: *Share of local rice in the market %*). Interviews were conducted with managers, and/or supervisors of 49 retail stores in the following cities/towns: Accra (21), Kumasi (9), Tamale (6), Koforidua (5), Bolgatanga (3), Vakpo -Hohoe (4) and Navrongo (1). Routine collection of such data by the NRDS taskforce could be done through the existing SRID's agriculture commodity market price data collection system.

With respect to indicator 7 (*Level of industrial milling capacity %)* the focus was to validate the results of a nationally representative sample survey (unpublished) of 44 rice mills in Ghana, which was undertaken by MoFA (DCS, SRID, PPMED &AESD). The report contains accurate and useful information on the ratio of medium-large scale mill (≥1.6 Tons/Hour)/ small scale mills (≤ 1.5 Tons/Hour). The survey methodology was well described and the NRDS taskforce could periodically replicate data collection for M&E purposes.

The district directors of agriculture and district MIS Officers who are the custodians of key information on rice farmer groups were also contacted in 36 districts in the four selected regions to collect data for

(i) Indicator 11 (Smallholder farmers 'access to financial services (%)) and
(ii) indicator 12 (Smallholder farmers' accessibility to technical training and services (%)

Data quality assessment was done on the main data sources with respect to the adequacy and /or appropriateness of the data for inclusion as a baseline figure using the following criteria:

(i) Highly satisfactory- *Secondary data* can be accessed in a practical fashion; the data source provides quality data; and the data source can be accessed on a regular and timely basis to support M&E during implementation.

(ii) Moderately satisfactory-*The Secondary data* can be accessed in a practical fashion; the data source provides quality data, but the data source cannot be accessed on a regular and timely basis to support M&E during implementation.

(iii) Moderately unsatisfactory-*The Secondary data* can be accessed in a practical fashion. However, the quality and regularity of the data, as well as the timeliness of the data to support M&E during implementation cannot be guaranteed.

(iv) Unsatisfactory- *No secondary data is readily available or* can be accessed in a practical fashion to support M&E during implementation. Consider primary data collection from information sources that are feasible and cost effective.

Conclusions

The following conclusions can be drawn from the M&E baseline process:

Twelve (12) out of the fifteen (16) baseline indicators are accounted for by four routinely collected national level databases. Whereas another, two (2) indicators: (i) Smallholder rice farmers' accessibility to financial services (*Indicator 11*), and (ii) Smallholder farmers' accessibility to technical training or services (*Indicator 12*) are accounted for by secondary data regularly updated in databases of the district departments of agriculture (36 key rice growing districts were sampled).

Indicator 7 – (*Level of industrial milling capacity %)* -was covered by the results of research survey that was undertaken by MoFA.

It is only one of the indicators (*indicator number 9-share of local rice in markets -%),* that there is absolutely no routine data generated at any level and no reliable survey report could be found. In this case, the baseline was established solely from primary data collection (Interviews of managers of selected retail stores in six selected cities and towns).

It is important to emphasize that no single data source could be used for setting the baseline for all the 16 indicators of NRDS-II, but there are four main consistent national databases that jointly account for 12 of the 16 indicators.

Members of NRDS Task Force have strongly suggested that paddy production under private irrigation should be included in the measurements of area of paddy produced under irrigated rice ecology because measuring area under public irrigation alone will not give a complete picture of the situation (leading to underestimation of the indicator under resilience).

Recommendations

For Indicator 9 (*Share of local rice in the market %*) which requires primary data, SRID should lead the NRDS Taskforce in conducting regular market surveys through its well-established market price data collection systems. To reduce cost, it is recommended that the collection of data on the share of locally produced rice should feature permanently in the regular price data monitoring undertaken by SRID.

In order to incorporate the suggestion of members of Ghana NRDS Task Force, it is recommended that for Indicator 5, both Area (Ha) under public irrigation schemes and Area (Ha) under private, schemes planted with paddy, shall be monitored and reported; and double cropping (growing a second rice crop after harvesting a first crop in the same growing season), which has been consistently estimated at 10% of area under irrigation should be accounted for.

Table 1: The recommended baseline figure proposed for the 16 NRDS-II indicators as per the findings

Category	Indicators/ Code	Baseline (2019)	2020	2021	Target (2030)	Data Source	Data Needs
Overall	1.Quantity of paddy produced /O1	925,000 MT	937000 MT	1,143,000 MT	3,312,282 MT	SRID-MoFA	Secondary
	2. Area harvested /O2	282,000 Ha	291,000 Ha	357000 Ha	690,0 Ha	SRID-MoFA	Secondary
	3. Yield/O3	3.28 MT/Ha	3.21 MT/Ha	3.20 MT/Ha	4.80 MT/Ha	SRID-MoFA	Secondary
	4.Self-sufficiency rate (SSR)/O4	37.0%	51.4%	45.80 %	106%	SRID-MoFA	Secondary
Resilience	5. Area under irrigation /R1	11,601.98 (Ha)	13,163.1	13,492.3	69,005.9 Ha	GIDA, Head Office, Accra Private Irrigators	Secondary
	6. Quantity of resilient variety seeds/R2	**8,353.80 MT:** AGRA-7518.42 Amankwatia-417.69 Gbewa-250.61 Exbaika-167**.**	**7,746.91 MT:** AGRA-6,972.21 Amankwatia-387.35 Gbewa-232.41 Exbaika-154.94**.**	**12,979,90MT:** AGRA-11,626.1 Amankwatia-645.81 Gbewa-387.54 Exbaika-258.36	32,550 MT	GSID-PPRSD, Head Office, Accra	Secondary
Industrialization	7. Level of industrial milling capacity (%)/I1	-	-	**i). Milling Capacity:** Small-Scale Mills ≤ 1.5 31.3Tons per		Field Survey in 2021	Primary

Category	Indicators/ Code	Baseline (2019)	2020	2021	Target (2030)	Data Source	Data Needs
				hour/56. 1Tons per hour = 0.56 (56.0%) Medium -Large Mills ≥1.6 Tons/Ho ur 24.8Ton s per hour/56. 1 Tons per hour = 0.44 (44.0%) **ii). Number ratio:** Small-Scale Village Mills ≤ 1.5 Tons/Ho ur = 33/44 (77.3%) - Medium -Large Mills ≥1.6 Tons/Ho ur = 10/44 (22.7%)			

Category	Indicators/ Code	Baseline (2019)	2020	2021	Target (2030)	Data Source	Data Needs
	8. Level of mechanization in production/I 2	-	-	**2023** Tractors =2,859 Harvesters= 268 Rice Threshers= 90 Power Tillers= 1,292		AESD, Head Office Accra & SRID (MoFA-Facts &Figures Annual Series)	Secondary
Competitiveness	9. Share of local rice in the market/C1	-	-	**(2023)** Share of local rice in the market for 2023= **2.04**% (estimated total quantity of rice procured by the 49 shops surveyed = 7,920.44 MT per annum, out of which local rice amounts to 161.24 MT/annum		Survey in selected markets in 2023	Primary

Category	Indicators/ Code	Baseline (2019)	2020	2021	Target (2030)	Data Source	Data Needs
	10. Quantity of high-yielding variety seeds/C2	**8,354.13tons** AGRA-7518.42 Amankwatia-417.69 Gbewa-250.61 Exbaika-167.08 Others= 0.3286	**7,746.91 tons:** AGRA-6,972.21 Amankwatia-387.35 Gbewa-232.41 Exbaika -154.94	**12,979,90MT:** AGRA-11,626.1 Amankwatia-645.81 Gbewa-387.54 Exbaika -258.36	32,550.0 MT	GSID-PPRSD Head Office, Accra	Secondary
Empowerment	11. Smallholder rice farmers' accessibility to financial services/E1	-	-	**2023** 38.02 % (6,728 farmers out of 17,721 farmers surveyed in 2023		Established from databases of 36 District Departments of Agriculture	Secondary data at selected districts
Empowerment	12. Smallholder farmers' accessibility to technical training or services/E2	-	-	92.93% (16,468 farmers out of 17,721 farmers surveyed in 2023)		Established from databases of 36 District Departments of Agriculture	Secondary data at selected districts
Price	13. Retail prices per Kg for representative rice brands/varieties for local and imported rice	Local rice (average retail price-Jan-Dec. 2019) = GHS 4.76 (0.86 USD) Per KG -Imported rice (average	Local rice (average retail price-Jan-Dec. 2020) = 4.98 GHS(0.89USD) Per KG	Local rice (average retail price-Jan-Dec. 2021) = 5.69 GHS(0.97USD) Per KG		Secondary data SRID-MoFA and Forex Data from BoG https://www.bog.gov.gh/treasury-and-the-markets/historical-	Secondary

Category	Indicators/ Code	Baseline (2019)	2020	2021	Target (2030)	Data Source	Data Needs
		retail price-Jan-Dec. 2019) = 6.03 GHS (1.09 USD) GHS per KG	- Imported rice (average retail price-Jan-Dec2020) = 7.38GHS(1.31USD) per KG	- Imported rice (average retail price-Jan-Dec. 2021) = 7.38 GHS (1.26USD) per KG		interbank-fx-rates/	
Area under Certified Seed production	14. Area under Certified Seed production	3,294.20 Ha	2,776.51 Ha	5,287.40 Ha		GSID-PPRSD Head Office, Accra	Secondary
Seed System	15. Percentage area of land at irrigation site allocated for rice seed production	1.22%	0.36%	1.18		Secondary data from GIDA/Private Irrigators	Secondary
Post Harvest and Marketing	16.Number of locally produced rice brands introduced by the regulatory authorities		-	-72 (2023)		Research & Nutrition Unit of FDA	Secondary

Table of Contents

List of Tables

Abbreviations and Acronyms

AESD:	Agricultural Engineering Services Directorate
AGRA:	Alliance for a Green Revolution in Africa
AMSECs:	Agricultural Mechanization Services Enterprise Centres
CARD:	Coalition for African Rice Development
CRI:	Crop Research Institute
CSIR:	Council for Scientific and Industrial Research
DAES:	Directorate of Agricultural Extension Services
DCS:	Directorate of Crop Services
DPs:	Development Partners
FDA	Food and Drugs Authority
FP:	Focal Person
FIs:	Financial Institutions
GAPS	Ghana Agriculture Production Survey
GIDA:	Ghana Irrigation Development Authority
GIRSAL:	Ghana-Incentive-Based Risk-Sharing System for Agricultural Lending
GRIB:	Ghana Rice Inter-professional body
GSID:	Ghana Seed Inspection Division
GSS:	Ghana Statistical Services
JICA:	Japan International Cooperation Agency
MRACLS:	Multi-Round Annual Crop and Livestock Survey
MoFA:	Ministry of Food and Agriculture
M&E:	Monitoring and Evaluation
NASTAG	National Seed Trade Association of Ghana
NRDS:	National Rice Development Strategy
NRDS-TF	National Rice Development Strategy-Taskforce
PFJ	Planting for Food and Jobs
PPMED:	Policy, Planning, Monitoring and Evaluation Directorate
PPRSD:	Plant Protection and Regulatory Services Directorate

SARI:	Savannah Agricultural Research Institute
SRID:	Statistics, Research, and Information Directorate
SIGA:	State Interest and Governance Authority
TASAI:	African Seed Access Index
TICAD:	Tokyo International Conference on African Development
ToR:	Terms of Reference
UDS	University for Development Studies

1. Background

In Ghana, rice has become the second most consumed cereal after maize, and net imports continue to be the main solution to narrowing the gap between low domestic production and increasing consumption. In 2021, domestic rice production provided only 45.80% of consumption needs, which was estimated at 1,297,309 MT (MoFA, 2022). The rice sector is largely characterized by traditional farming practices such as dependance on rainfall and the use of basic farming tools such as cutlass, hoe, and sickle. Infrastructure deficit and poor access to appropriate agricultural machinery and equipment are key constraints in the rice value chain. In the past decade, interventions in the sector had been mainly guided by the National Rice Development Strategy (NRDS), which was formulated in 2009 and revised in 2021 in collaboration with the Coalition for African Rice Development (CARD).

The president of the Republic of Ghana, on Monday, August 28th, 2023, launched Phase Two of Government's flagship programme on agriculture, dubbed: "Planting for Food and Jobs" (PFJ 2.0), at the Dungu Campus of the University for Development Studies in Tamale. The PFJ 2.0 Programme is touted as an innovative and comprehensive approach, building on the successes of the first PFJ campaign. It takes a holistic view of the value chain approach by focusing on strengthening linkages among actors along selected agricultural commodity value chains and improving service delivery to maximize impact. Rice is one of the strategic food crops targeted for support under the PFJ 2.0. This gives a huge boost to the National Rice Development Strategy II (NRDS-II) since the PFJ 2.0, if fully implemented could propel Ghana to attaining self-sufficiency in rice production by 2027.

The Coalition for African Rice Development (CARD) is a consultative group of 32 African countries and development partners that aims at doubling rice production in Sub-Saharan Africa by 2030. The CARD initiative was first launched at the Fourth Tokyo International Conference on African Development (TICAD IV) in 2008, to improve African rice production, which should help to improve food security and income on the continent. After ten years (2008-2018) of implementation, the initiative achieved its initial aim of doubling sub-Saharan African rice production from 14 million tons to 28 million tons. That achievement notwithstanding, African rice production has not kept pace with the rising demand. Therefore, CARD rolled out a second phase in 2019, with a new target of further doubling rice production to 56 million tons by 2030. In the second phase, CARD is expected to focus more of its assistance on implementation, monitoring and evaluation of each country's National Rice Development Strategy (NRDS). The support of the Coalition for African Rice Development (CARD) should therefore, aim to effectively respond and use these ambitious intentions of the Government's flagship agriculture programme (PFJ 2.0), to ensure the goals set are achieved.

To establish baseline figures and provide a methodology for data collection for the M&E indicators in Ghana's NRDSII (2019-2030), a contract for a consulting service to conduct an M&E baseline

survey was awarded to the School of Economics, University for Development Studies (UDS) Tamale, by JICA Ghana. The contract is scheduled to run from 2nd May, 2023 to 12th January, 2024.

This report is about how progress of implementation, results and outcomes will be measured, and evaluated during NRDS-II (2019-2030).

1.1 Objectives of the Survey

The main objective of the baseline study is to provide the NRDS FP & TF members with a methodology for M&E data collection for each indicator. The specific objectives of the survey are: (1) set baseline figures for the National Rice Development Strategy (NRDSII) M&E indicators against which implementation progress can be measured; and (2) prepare an M&E procedural manual that contains details of data sources and data collection methods for each indicator (including 12 indicators that are common across all 32 CARD countries) to serve as a guide for the National Taskforce Team members to carry out data collection throughout the second phase of CARD in Ghana.

1.2 Setting the Base-Line and M&E Manual for NRDS-II

On 2nd May, 2023, the Japan International Cooperation Agency (JICA) Ghana Office, signed a contract with the School of Economics, University for development Studies, Tamale (Consultant) under which the Consultant agreed to develop a baseline and prepare an M&E procedural manual for Ghana's NRDS -II.

In line with the ToR and further clarifications provided by the CARD M&E consultant, the baseline survey process was guided by the following:

i 12 CARD M&E indicators were carefully and purposefully selected to be as simple as possible and uniform across all 32 CARD countries so that the M&E could be carried out in a sustainable manner using each country's own resources.
ii Secondary data and primary data collection should not proceed concurrently. In this regard, the consultant would first conduct extensive secondary data collection on each indicator and identify indicators that may require primary data collection.
iii After completion of secondary data collection, the consultant would submit a Progress Report 1 (which contains an analysis and judgement of the secondary data) and suggest a methodology to collect primary data for those indicators that good secondary data could not be found.
iv Progress Report 2, as outlined in the ToR, would essentially contain the results of the primary data collection.
v A final report would contain the contents of Progress 1 and 2, which should be submitted together with an M&E manual. The M&E manual should contain a detail methodology to guide the M&E data collection by the NRDS TF & FP. The procedural manual should

therefore, provide detailed information on the data sources and how data would be collected for each indicator.

vi The involvement of the NRDS FP and TF members throughout the survey process is very crucial and therefore, the consultant must work closely with the NRDS FP and TF

vii The CARD secretariat will give technical clearance to JICA Ghana Office throughout the survey.

1.2.1 Synchronizing the CARD M&E Indicators with Ghana Specific NRDS-II Indicators

During the kick-off meetings and the first progress report of this assignment (progress report 1), it was concluded that all the 12 CARD common indicators are well aligned with indicators set by the NRDS-II. It was observed that the NRDS-II document was still at a draft stage and there was a need for it to be validated and approved. The Consultant observed that the indicators contained in the draft NRDS-II document were too many and most of them were too generic and would not permit a cost-effective M&E system. It was agreed that the Consultant should undertake a review of the draft NRDS-II indicators and suggest to the NRDS TF and FP, which Ghana specific indicators should be added to the 12 common CARD indicators. At the end of the review process of the progress reports, an additional three Ghana specific indicators were adopted giving a set of 16 indicators for the Ghana NRDS-II. The baseline setting for each indicator was guided by the definitions as presented in Table1.

Field visits to selected sites and market surveys in the key rice growing regions (Upper East, Northern, Volta Eastern, Greater Accra and Ashanti regions) spanned a period of six weeks (24th August to 6th October, 2023**).** This phase was dedicated to meetings and interviews with all relevant stakeholders to obtain the needed data. Among others, consultations were held with the Ministry of Food and Agriculture (at the national and selected regions/districts offices), the Ghana Irrigation Development Authority, Irrigation Company of Upper Region (ICOUR), key Rice Processing Plants and private irrigators.

1.2.2 Overview of the Indicators

In CARD phase 2, a new approach called R.I.C.E. (Resilience, Industrialization, Competitiveness and Empowerment) has been adopted by all 32 countries with a focus on twelve M&E indicators. The indicators include quantity of paddy production, total area harvested, yield per unit area, self-sufficiency rate, area under irrigation, quantity of resilient variety seeds, Level of industrial milling capacity (%), level of mechanization in production, share of local rice in the market, quantity of high-yielding variety seeds, smallholder farmers' accessibility to financial services and Smallholder farmers' accessibility to technical training or services. The M&E baseline survey seeks to collect the necessary baseline figures for each of the twelve indicators, as well as the Ghana specific indicators identified in the Ghana NRDS 2 M&E framework.

Given the strategic importance of rice in attaining food security and import substitution, Ghana's national taskforce, identified 3 additional M&E indicators (See Table 1) to be included in the baseline survey to collect baseline information for measuring progress during the NRDS-II implementation.

Table 2: Overview of Ghana's NRDS-II Indicators

Indicator Category	Indicator Level	Indicator Name	Indicator Code	Indicator Definition
CARD Common Indicators	Overall	1.Quantity of paddy production	O1	Quantity (Tons) of paddy produced locally from all the different rice ecologies
		2. Area harvested	O2	Sum of area (Ha) harvested from all rice-growing ecologies
		3. Yield	O3	Average quantity of paddy grains harvested per hectare of land (Tons/Ha)
		4.Self-sufficiency rate (SSR)	O4	Coverage rate (%) of rice needs by local production
	Resilience	5. Area under irrigation	R1	Area (Ha) under rice cultivation with supplementary irrigation that could mitigate the negative impacts of weather fluctuations on rice production
		6. Quantity of resilient variety seeds	R2	Quantity of seeds of locally preferred varieties with resilient characteristics, locally produced and/or imported annually
	Industrialization	7. Level of industrial milling capacity (%)	I1	Ratio (%) of installed capacity of medium and large mills among all functional mills
		8. Level of mechanization in production	I2	Number (Count) of machines available for ploughing and harvesting (in rice producing areas)
	Competitiveness	9. Share of local rice in the market	C1	Share (%) of locally produced rice in the total quantity of rice procured by major retail stores for a year
		10. Quantity of high-yielding variety seeds	C2	Quantity (Tons) of seeds of locally preferred varieties with high-yielding attributes, locally produced and/or imported annually
	Empowerment	11. Smallholder rice farmers' accessibility to financial services	E1	Percentage (%) of smallholder farmers having access to financial services (in rice producing areas)
	Empowerment	12. Smallholder farmers' accessibility to technical	E2	Percentage (%) of smallholder in pre-selected farmers' groups/associations regularly accessing necessary technical training and services (in rice producing areas)

Indicator Category	Indicator Level	Indicator Name	Indicator Code	Indicator Definition
		training or services		
	Price	13 Retail Prices	-	Average retail prices of both representative local (white rice) and imported rice brands
GHA-Specific	Seed System	14-Area under certified Seed production	-	Sum of area (Ha) under certified production from all rice-growing ecologies
	Seed System	15-Percentage area of land at irrigation site allocated for rice seed production	-	Irrigated land area (Ha) under rice seed production as a proportion of total irrigated land area (Ha) under rice cultivation
	Post Harvest and Marketing	16-Number of locally produced rice brands introduced by the regulatory authorities	-	Count of Ghana rice brands at marketing outlets (mini and supermarkets)

1.3 Organization of the Report

The report is presented in two parts:

PART- 1 (Main report)- Setting the baseline, this part contains four (4) chapters. Chapter 1 presents an overview of the background and objectives of the assignment and describes the process and outcomes of the activities implemented to collect secondary data as well as primary data for setting the baseline of the 16 indicators of the Ghana NRDS-II. Chapter 2 presents the methodologies used for secondary data collection from the existing databases. Primary data collection through field visits to four key regions of rice production in Ghana is also presented. Chapter 3 presents the findings of respective data sources that is adequate to set the baseline for the indicators. The report presents the assessments used to guide selection of values to be used for the baseline and finally Chapter 4 presents the conclusions, recommendations and summary of the baseline figures proposed.

PART-2- Procedural Manual, presents a manual that provides guidance for the process of monitoring and evaluating (M&E) of the implementation, outputs, outcomes and impact of NRDS-II.

2. Description of Methodology Used in Collection of Data

The study was based on two main approaches: first, an extensive search for secondary data on each indicator and afterwards, primary data collection for indicators that secondary data could not be found. This section therefore seeks to provide insights on the process of data collection and analysis. The main analytical process of the survey borders on Data Quality Assessment to select the data source and value for each indicator to be used in setting the baseline. A desk review of documents and databases, key informants' interviews (KIIs), and focus group discussions were conducted to collect both secondary and primary data. List of persons consulted is attached in appendix 6

2.1 Collection of Secondary Data

This begun with a review of the draft Ghana NRDS-II (2019 – 2030) and the CARD M&E Framework (ver. 20 January, 2022). Various documents pertaining to statistics in the Ghanaian agricultural sector were reviewed, including similar studies conducted in the past (sector policy documents, baseline reports, and other technical reports). The review involved checking the documents for data and information sources, synthesis of information to respond to the ToR.
Overall, the review and analysis took keen interest in how regularly data is generated by the various sources and the practicality of accessing the data for M&E. The existing agriculture statistics databases or information systems in the sector, were explored on whether they were relevant or responsive to the information needs of the baseline. In particular, the review sought to understand the operational mechanisms or how data could be accessed from the databases. The review also sought to understand whether the databases kept up-to-date information on the NRDS-II indicators.

The following data systems were identified and used as key sources for the data required for both the baseline as well as the M&E manual of Ghana NRDS-II:

2.1.1 Statistics, Research, and Information Directorate (SRID) of MoFA

The Statistics Research and Information Directorate (SRID) was created in 1999 in response to Civil Service Law (PNDC Law 135 of 1985) that requires for a statistics and information Directorate within the Ministry of Food and Agriculture (MoFA). A flagship publication of SRID which is titled: "Agriculture in Ghana: Facts and Figures", is an annual series, which was commenced in 1991. It is prepared and issued by SRID, and the most recent one was compiled for 2021, and the report was issued in September, 2022. SRID takes inputs for the preparation of the document from two sources;

(i) primary data-through the Ghana Agricultural Production Survey (GAPS)
(ii) and (ii) secondary data- obtained largely from public and private institutions and published documents/reports).

The GAPS questionnaire, which is administered by trained Agricultural Extension Agents (AEAs), consists of forms such as: (1) household and holder listing, (2) field area measurement, and (3) crop yield measurement.

Through review of the documents and data received, it was found out that data available in databases/publications of SRID could account for the following indicators:

- Indicator 1: Quantity of paddy production (MT);
- Indicator 2: Area Harvested (Ha);
- Indicator 3: Paddy yield (MT/ha);
- Indicator 4: Self-sufficiency rate (SSR)
- Indicator 13 Retail prices per Kg for representative rice brands/varieties for local and imported rice
- Indicator 8: Level of mechanization in production (to fully establish a figure for this indicator, data obtained from SRID should synchronized with data at the AESD)

The process of evaluating data available at the Statistics Research and Information Directorate (SRID), begins by establishing a formal contact with the Director of SRID, at the MoFA, Head Office Accra to obtain copies of the various editions of Agriculture in Ghana: Facts and Figures". Monthly/annual price data for various agriculture commodities. A brief description of how the various statistics is generated by SRID is presented in Table3. Further details on the methodology can be obtained at the SRID Head Office in Accra, Ghana.

Table 3: SRID data collection methods for baseline figures

Indicator	**SRID's data collection process for the baseline figures**
Indicator 1: Quantity of paddy production (MT);	SRID adopted the Ghana Agricultural Production Survey (GAPS) a stratified multi-stage sampling design in response to the Government of Ghana's requirement for reliable agricultural statistics at the national, regional and district levels: • First Stage Sampling – Selection of 40 Enumeration Areas (EAs) from each of the 260 Districts using the systematic sampling technique to select EAs from rural, peri-urban/urban EAs. • Second Stage Sampling – Selection of 5 farmers from each of the 40 EAs per district using the simple random sampling technique giving a sample size of 200 holders (farmers) per district. • Third stage – selection of 5 fields per crop grown in the district for the establishment of yield plot to determine yield for each study crop. Thus, the quantity of paddy produced is determined as a product of the crop harvested area and the yield. That is, Crop production (MT.) = Crop harvested Area (Ha) × Yield (MT/Ha). Total production of paddy is determined taking into account only districts producing rice paddy.
Indicator 2: Area Harvested (Ha)	Total Area harvested is determined by an extrapolation procedure which involves the multiplication of the inverses of the various sampling fractions by the total area of sampled fields for each crop. The estimation is done for all districts producing rice paddy and is further aggregated to the regional and national levels.
Indicator 3: Paddy yield (MT/Ha);	Yield at the district level is determined by the output per hectare. To obtain the output per hectare, the weight obtained from the sample plot is multiplied by

	the inverse of the fraction made by the sample plot to a hectare. Area of a hectare (equivalent to 10,000 square meter)/Area of plot, multiplied by Weight of harvested plot (in kilogram)/1,000. Average yield at the regional level is determined by dividing the total (aggregated) production by the total harvested crop area of the various districts within the region. Average yield at the national level is determined by dividing the total (aggregated) production by the total harvested crop area of the various regions in the country.
Indicator 4: Self-Sufficiency Rate (SSR)	The Self-Sufficiency Rate (SSR) which is expressed as a percentage, is calculated by dividing the domestic production of milled rice over the total consumption or demand for rice within the country in a given year. In other words, SSR = domestic production of milled rice available for human consumption ÷ Estimated Net Consumption X 100. These figures can be obtained from the annual series: "Agriculture in Ghana -Facts & Figures" In the case of Ghana, the surplus/deficit which is estimated as net deficit/surplus of rice production is calculated in the food balance sheet by subtracting the estimated net consumption of food commodities from the total supply of food commodities as assessed during the year in review. This calculation is done for milled rice production at the national level.
Indicator 13: Retail prices per Kg for representative rice brands/varieties for local and imported rice	Retail price data is collected from pre-assigned (pre-designated) market/s using specially designed forms or questionnaires, on market day/s. Depending on the market, data collection may be done in the early hours of the day or in the afternoon (around noon). For each selected commodity, three (3) to five (5) traders are randomly selected in each of the designated markets. Each commodity is weighed and their corresponding prices and weight, based on local unit of measurement (LUoM), are recorded for each of the traders interviewed. An average price per kilogram of each commodity is then used to represent the weekly average retail price, which is aggregated at the end of the month to generate the monthly average price per commodity per market and ultimately per region. The average monthly prices from all the regions are then put together to estimate the average retail price per kilogram per commodity, per month

There have been significant improvements in the quality and quantity of statistics generated by SRID over the years. We therefore, rate as highly satisfactory the quality of data from SRID to be included in setting the baseline for NRDS-II.

2.1.2 Data System of Agricultural Engineering Services Directorate (AESD)- MoFA

The baseline figure for indicator 8: Level of mechanization in production was obtained from the data system of the Agricultural Engineering Services Directorate (AESD) of Ghana's Ministry of Food and Agriculture (MoFA), Head Office, Accra. AESD receives and collates import data on all publicly procured agriculture equipment in the country. The directorate, compiles and updates its database on equipment imports in to the country on a yearly basis. We approached the Director

of AESD at MoFA Head Office in Accra, who referred the Team of Consultants to the Schedule Officer. The data on agriculture equipment imported since the year 1990 was made available on request. After careful review of the literature on the operational life span of most agriculture equipment in Ghana, we set a cut of date of 2008. Thus, equipment imported from 2008 to 2023 were included in the count to set the baseline. A key limitation of database is the lack of accurate and up to date data on privately imported equipment. It is important that measures are put in place to adequately capture and update the database with private machinery/equipment imports.
We adjudge the quality of the baseline figure on level mechanization (equipment count) to be **Moderately Satisfactory** for NRDS- II

2.1.3 Database of Ghana Irrigation Development Authority (GIDA) and Private Irrigation Farms

As the agency responsible for irrigation development in the Republic of Ghana, it is mandatory for all irrigation infrastructure/equipment to be checked and certified by GIDA before it is implemented. GIDA receives and collates monitoring reports from all public irrigation schemes across the country on quarterly basis. GIDA is the custodian of data in relation to public irrigation schemes in Ghana. The data on area (Ha) under irrigation with respect to public irrigation is regularly collated from all public schemes and it is readily available at the GIDA Head Office in Accra. However, as at the time of data collection for this baseline survey, there were about 10 private companies cultivating rice under their own purposely constructed irrigation schemes. These companies keep their own records regarding the area (Ha) under irrigation for rice grain and seed production.

Thus, secondary data of the baseline figure regarding area under irrigation was obtained by contacting and receiving the data from the officer in-charge of the database at the Ghana Irrigation Development Authority (GIDA), Head Office in Accra and the designated persons at the various private irrigations schemes. The baseline figure for the indicator is then generated by adding the data obtained from GIDA to data obtained from the Private Schemes. The baseline data for indicator 5: Area under irrigation and the Ghana specific indicator 14: Percentage area of land at irrigation site allocated for rice seed production are available and can be obtained from the Head Office of GIDA in Accra and the officers at the various private schemes (see list and contact numbers attached). Therefore, we adjudge the quality of the baseline figure on area (Ha) under irrigation to be **Highly Satisfactory** for NRDS- II.

2.1.4 Ghana Seed Inspection Division (GSID) of the Plant Protection and Regulatory Services Directorate (PPRSD)

The database of the Ghana Seed Inspection Division (GSID) of the Plant Protection and Regulatory Services Directorate (PPRSD) accounts for Indicator 6: Quantity of resilient seed varieties, Indicator 10: Quantity of high-yielding seed varieties and Ghana specific Indicator 13: Area under certified seed production. However, to confirm the resilient and yielding properties of the seed varieties as required in Indicators 6 and 10, it is important to reference any seed varieties obtained from GSID to the Catalogue of Crop Varieties Released & Registered in Ghana.

The custodian of the baseline figures on seed variety and the quantities of certified seed produced locally or imported in to the country is the Head of Seed Inspection Division of PPRSD Accra.

The responsibilities of GSID include:

- Register seed growers and dealers for the production and marketing of seeds.
- Inspect seed fields, processing and storage facilities.
- Sample, test and evaluate seeds produced by seed growers
- Sample and test imported seeds
- Certify seed produced by growers.
- Conduct pre and post control verifications.
- Monitor sales outlets to ensure suitability of storage premises and seed viability and
- Enforce seed laws and regulations

The Head office of the GSID in Accra receives and collates reports on all certified rice seed produced by certified seed producers across the country on annual basis. The collated data stored at the national database. The baseline figure represents locally produced certified rice seed (There is no imported rice seed in the market. Imported rice seed is mostly for research purposes only)

Other document reviewed to aid in determining resilience included –(i)the African Seed Access Index report (version April 2023)

(iii) National Seed Trade Association of Ghana (NASTAG) and (iii) University of Ghana Research Magazine.

The Ghana Seed Inspection Division, PPRSD, is endowed with experienced staff that collates data on seed produced locally or imported on yearly basis.

2.2. Sampling and primary data collection

Field visits to selected sites and market surveys in the key rice growing regions (Upper East, Northern, Volta Greater Accra, Eastern and Ashanti regions) spanned a period of six weeks (24th August to 6th October, 2023). This phase was and dedicated to meetings and interviewing all relevant stakeholders to obtain and validate the needed data. Among others, consultations were held with the Ministry of Food and Agriculture (at the national and selected regions/districts offices), the Ghana Irrigation Development Authority, Irrigation Company of Upper Region (ICOUR), key Rice Processing Plants and Private Irrigators. 36 districts were purposively selected in the four major rice producing regions in Ghana (Upper East, Northern, Volta and Eastern regions). The districts included were the leading districts for production of rice in the selected regions. Details of the names of the districts surveyed are attached in appendix 1.

With respect to indicator 9 (share of local rice in the market). Seven (7) cities and/or municipalities were purposively selected for primary data collection The selected cities and/or municipalities were:

i) Metropolitan City of Accra- selected because it is the largest and capital city of Ghana with large urban rice consuming population
ii) Metropolitan City of Kumasi- selected because it is the largest city in the middle belt and second largest city of Ghana, it is also a cultural hub with large tourist attractions
iii) Metropolitan City of Tamale- selected because it is fastest growing and only metropolitan

city in the north of Ghana

iv) Koforidua (Municipality)- selected to represent urban areas near leading rice producing districts in the south of the country

v) Bolgatanga (Municipality)- also selected to represent urban areas near leading rice producing areas in north east of the country

vi) Vakpo -Hohoe Municipality - also selected to represent urban areas near leading rice producing areas in the south east of the country

vii) Navrongo Municipality - selected to represent urban areas near leading rice producing areas and close to a major international border- Akey point for rice imports/exports

The main aim of the market survey was to collect data from preselected key retail shops in the target cities. The approach included the following steps:

i) Requesting the directorate of SRID for the contact information of the Regional MIS officers who have supervisory responsibility over the trained market enumerators of SRID-MoFA

ii) Planning meetings with the Regional MIS officers and/or District MIS Officers prior to the surveys

iii) A market enumerator from the regional offices of SRID was assigned the responsibility of accompanying the Consultant in conducting the market survey using the questionnaire attached in Appendix 5.

A total of 49 retail stores were surveyed in Accra (21), Kumasi (9), Tamale (6), Koforidua (5), Bolgatanga (3), Vakpo -Hohoe (4) and Navrongo (1).

With respect Indicator 11: Smallholder farmers' accessibility to financial services (%) and Indicator 12: Smallholder farmers' accessibility to technical training and extension services (%). The 36 district departments of agriculture have records on the characteristics of rice producing groups (on whether they have access to financial services or technical services). The consultant collected primary data from the record books of 36 district departments of agriculture in the key rice producing regions (The structured questionnaire used is presented see Appendix1).

With regards to primary data for setting the baseline for indicator 7 (*Level of industrial milling capacity (%)*). The Consultant recommends adoption of the approach used in the nationally representative sample survey (unpublished) of 44 rice mills in Ghana, which was undertaken by MoFA (DCS, SRID, PPMED &AESD). It contains useful information on the ratio of medium-large scale mill (≥1.6 Tons/Hour)/ small scale mills (≤ 1.5 Tons/Hour). The survey methodology was well described such that the national NRDSTF could periodically replicate data collection for M&E purposes).

3.Setting M&E Baseline figures from Review and Analysis of Collected Data

According to Kusek, J. Z., & Rist, R. C. (2004), a number of issues need to be considered when identifying data sources: (i) Can the data source be accessed in a practical fashion? (ii) Can the data source provide quality data? (iii) Can the data source be accessed on a regular and timely basis? and (iv) Is primary data collection from the information source feasible and cost effective? Mindful of the above criteria, the consultant started with a thorough desk study and research, compiling and analyzing all relevant secondary data sources, documents and reports on NRDS and previous intervention in the rice sector in Ghana and other CARD member countries. The literature from both published and unpublished sources were examined. Various documents related to the indicators were reviewed, including Agriculture Sector Working Group (ASWG) and Joint Sector Review (JSR) reports, sector policy documents, research reports, and other technical reports. The review involved checking related documents and information sources, analysis of information collected, and synthesis of information to respond to the ToR (especially the data needs of the indicators). Key Informant Interviews with key persons that have knowledge of and access to the relevant data were undertaken through face-to-face (SRID-MoFA, DCS, GIDA) and virtual interactions (TASAI, CSIR-SARI)).

The consultant then used available, reliable and appropriate sources of information to establish the M&E baseline figures for the indicators. Judgement of the adequacy and /or appropriateness of the secondary data for inclusion as a baseline figure for the indicators was undertaken according to the following criteria:

(i) Highly satisfactory-*The Secondary data* can be accessed in a practical fashion; the data source provides quality data; and the data source can be accessed on a regular and timely basis to support M&E during implementation.

(ii) Moderately satisfactory-*The Secondary data* can be accessed in a practical fashion; the data source provides quality data, but the data source cannot be accessed on a regular and timely basis to support M&E during implementation.

(iii) Moderately unsatisfactory-*The Secondary data* can be accessed in a practical fashion. However, the quality and regularity of the data, as well as the timeliness of the data to support M&E during implementation cannot be guaranteed.

(iv) Unsatisfactory- *No secondary data is readily available or* can be accessed in a practical fashion to support M&E during implementation. Consider primary data collection from information sources that are feasible and cost effective.

3-b. Setting the 2030 Targets

The M&E targets for the indicators were set by NRDS Taskforce (TF) team using their own internal procedures. The NRDS TF is therefore required to review and update the indicator targets to reflect changes in national policies and strategies such as Planting for Food and Jobs Phase II (PFJ II) during implementation.

3.1 Indicator 1: Quantity of Paddy Production (MT)

The quantity of paddy production has been reported in several edition of a publication titled: "Agriculture in Ghana: Facts and Figures". The annual series, which was commenced in 1991, is prepared and issued by the Statistics, Research, and Information Directorate (SRID) of Ghana's Ministry of Food and Agriculture (MoFA). SRID takes inputs for the preparation of the document from two sources:
(i) primary data-through the Ghana Agricultural Production Survey (GAPS) and (ii) secondary data- obtained largely from public and private institutions and published documents/reports). The Agriculture in Ghana: Facts and Figures annual series is available at SRID-MoFA, Head Office, Accra (see table3 for more details on SRID's data collection methods for this indicator). We rate the quality of this baseline figure for the purpose of CARD/NRDSII M&E as Highly Satisfactory.

It is therefore recommended to adopt the 2019 figure 925, 000 metric tons (MT) which can be obtained directly from the "Agriculture in Ghana: Facts and Figures" annual series as the baseline for this indicator**. (The figure is produced annually by SRID, so no further computation would be required during M&E).**

Indicators	Code	Baseline (2019)	2020	2021	Target (2030)	Data Source
1.Quantity of paddy production	O1	925,000 MT	987,000 MT	1,143,000 MT	3,312,282 MT	SRID-MoFA

3.2 Indicator 2: Total Area (Ha) Harvested

Again, total area (Ha) harvested has been reported in several edition of a publication titled: "Agriculture in Ghana: Facts and Figures". The annual series, which was commenced in 1991, is prepared and issued by the Statistics, Research, and Information Directorate (SRID) of Ghana's Ministry of Food and Agriculture (MoFA). Given the pedigree of SRID as the main custodian of agriculture statistics in Ghana (see table3 for more details on SRID's data collection methods for this indicator), **it is recommended that the 2019 figure 282,000 hectares (Ha) should be adopted as the baseline for this indicator. (The figure is produced annually by SRID so no further computation would be required during M&E)**

Indicators	Code	Baseline (2019)	2020	2021	Target (2030)	Data Source
2. Area harvested	O2	282,000 Ha	311,000 Ha	357,000 Ha	690,059Ha	SRID-MoFA

3.3 Indicator 3: Yield per Unit Area Harvested (MT/Ha)

Since Indicator-2 is measured by total Area (Ha) harvested. Therefore, the figure for indicator 3, is simply obtained by a division of the proposed baseline figure for indicator-1 (925,000 MT) by the proposed figure for indicator-2 (282,000 hectares), which gives yield of 3.28 MT/Ha. Thus, **it is recommended baseline for Indicator-3 be set at 3.28 MT/Ha (The figure is produced annually by SRID, so no further harmonization of data would be required during M&E)**

Indicators	Code	Baseline (2019)	2020	2021	Target 2030	Data Source
3. Yield	O3	3.28 MT/Ha	3.17MT/Ha	3.20 MT/Ha	4.80 MT/Ha	SRID-MoFA

4.4 Indicator 4: Self Sufficiency Rate (%)

The Self-Sufficiency Rate (SSR) which is expressed as a percentage, is calculated by dividing the domestic production of milled rice over the total consumption or demand for rice within the country in a given year. In other words, SSR = domestic production of milled rice available for human consumption ÷ Estimated Net Consumption X 100. Since 2021, SRID stopped reporting SSR as percentage in the annual food balance sheets. Therefore, SSR is obtained as a ratio of domestic production of milled rice available for human consumption ÷ Estimated Net Consumption X 100. The figures for domestic production of milled rice available for human consumption and estimated net consumption are produced annually by SRID and reported in the "Agriculture in Ghana -Facts & Figures" series. Based on the track record of SRID in the production of agriculture statistics, **it is recommended that the baseline for -Indicator 3(O4) (Self Sufficiency Rate (%) should be set at 37.0% as of 2019.**

Indicators	Code	Baseline (2019)	2020	2021	Target (2030)	Data Source
4.Self-sufficiency rate (SSR)	O4	37.0	51.4%	43.7%	106%	SRID-MoFA

3.5 Indicator 5: Area under Irrigation (Ha) for Paddy Production

GIDA is the custodian of data in relation to public irrigation schemes in Ghana. The data on area (Ha) under irrigation with respect to public irrigation is regularly collated from all public schemes and it is readily available at the GIDA Head Office in Accra. However, as at the time of data collection for this baseline survey, there were about 10 private companies cultivating rice under their own purposely constructed irrigation schemes. These companies keep their own records regarding the area (Ha) under irrigation for rice grain and seed production. The baseline data for indicator 5: Area under irrigation and the Ghana specific indicator 14: Percentage area of land at irrigation site allocated for rice seed production are available and can be obtained from the Head Office of GIDA in Accra and the designated officers at the various private schemes (see list and

contact numbers attached in appendix). Thus, the baseline figure for this indicator is generated by adding the data obtained from GIDA to the data received from the Private Schemes. Therefore, **it is recommended to adopt the figure of 11, 601.98 (Ha) in 2019 as the baseline for Indicator** The baseline figure is generated by a simple addition of data obtained from the government agency (GIDA) and the private irrigation companies.

Indicators	Code	Baseline (2019)	2020	2021	Target (2030)	Data Source
5. Area under irrigation	R1	11,601.98 (Ha)	13,163.1Ha	13,492.3 Ha	69,005.90Ha	GIDA and Private Irrigators

6.6 Indicator 6 – Quantity (MT) of Resilient Seeds Varieties

As stated in the previous section, besides the Ghana Seed Inspection Division (GSID) of PPRSD, two other groups or organization compile data on quantities of certified seeds available in Ghana: (i) the African Seed Access Index (TASAI) and (ii) National Seed Trade Association of Ghana (NASTAG). However, it was decided that the seed data compiled by GISD be used because the staff of GSID collects data directly from the source and no seed can be considered to be certified in Ghana without production supervision and approval by GSID. Therefore, only the figures provided by GSID are official by Law. The current most dominant rice varieties in Ghana are AGRA rice, Amankwatia, Gbewaa and Ex Baika varieties. According to the Catalogue of Crop Varieties Released & Registered in Ghana (CSIR, 2019), these rice varieties have resilient characteristics. Therefore, **it is recommended to adopt the GSID's figure of 8,353.80 MT in 2019 as the baseline for Indicator 6.** The baseline figure for this indicator is computed by a simple addition of the quantities of seed produced for each variety. Thus, Quantity (MT) of Resilient Seeds Varieties for base year = sum (AGRA rice+ Amankwatia+ Gbewaa +Ex Baika).

Indicators	Code	Baseline (2019)	2020	2021	Target (2030)	Data Source
6. Quantity of resilient variety seeds	**R2**	**8,353.80 MT:** AGRA-7518.42 Amankwatia-417.69 Gbewa-250.61 Exbaika-167**.**	**7,746.91MT:** AGRA-6,972.21 Amankwatia-387.35 Gbewa-232.41 Exbaika-154.94**.**	**12,979,90MT:** AGRA-11,626.1 Amankwatia-645.81 Gbewa-387.54 Exbaika-258.36	32,550MT	GSID and Catalogue of Crop Varieties Released & Registered in Ghana

3.7 Indicator 7 - Level of Industrial Milling Capacity (%)

It was found that the well-publicized Ghana rice mechanization report-2020 (Opportunity to Influence and Impact Policy on Mechanization, did provide a detail methodology on how the data was collected. Hence, it was decided to adopt data contained in a nationally representative sample survey (unpublished) of 44 rice mills which was jointly conducted by several key directorates of

MoFA. It contains useful information on the ratio of medium-large scale mill (≥1.6 MT/Hour)/ small scale mills (≤ 1.5 MT/Hour). More importantly, the survey methodology is described in more detail such that NRDS taskforce (some members of NRDS task were involved in surveying the 44 rice mills) could periodically replicate data collection for M&E purposes. A multi-stage sampling technique was used to sample the mills. In the first stage of sampling, milling sites were purposively selected based on the list of milling sites established within the various regions and districts. In the second stage, functional mills were also randomly selected to determine whether they were undertaking any milling operation. This sampling was done using a list of milling sites across the country. In all, a total of forty-four (44) milling centres were visited.

The baseline figure for indicator 7 is computed as follows:
Step1- Compute the total milling capacity (TMC) for all sampled mills (a total of 44 mills were surveyed) -See Appendix 7 for details on Rice Mills surveyed
Step 2- compute Milling Capacity Small-Scale Mills- SSM (≤ 1.5 Tons/Hour) and
Step3- compute Milling Capacity for Medium-Large Mills- MLM (≥1.6 Tons/Hour)
Step4- Level (%) of Milling Capacity (Small-Scale Mills ≤ 1.5Tons/Hour) = SSM/TMC*100
Step5- Level (%) of Milling Capacity (Medium-Large Mills ≥1.6 Tons/Hour) =MLM/TMC*100

Applying the above methods, it is recommended that the baseline for Indicator 7 - Level of industrial milling capacity (%) of Small-Scale Mills ≤ 1.5 MT be set at 56%**, while the** Medium-Large Mills with capacity ≥1.6 MT/Hour be set at **44%/.**

Indicators	Code	**Baseline /Current (2021)**	**Data Source**
7. Level of industrial milling capacity (%)	I1	**Number ratio:** -Small-Scale Mills ≤ 1.5 Tons/Hour = 33/44 (77.3%) - Medium-Large Mills ≥1.6 Tons/Hour = 10/44 (22.7%) **Milling Capacity:** -Small-Scale Mills ≤ 1.5Tons/Hour**:** **31.3/56.1 = 0.56 (56.0%)** -Medium-Large Mills ≥1.6 Tons/Hour: **24.8/56.1 = 0.44 (44.0%)**	Field Survey, conducted in 2021

3.8 Indicator 8: Level of Mechanization in Production (number of machines)

Data for indicator 8 is available at the Agricultural Engineering Services Directorate (AESD) of Ghana's Ministry of Food and Agriculture (MoFA). AESD receives and collates import data on all publicly procured agriculture equipment into the country. A review of the literature on the operational life span of most agriculture equipment in Ghana, shows that agricultural equipment

imported in to country from 2008 to 2023 (about 10-15 years old) can reasonably be considered functional.

Therefore, it is recommended to use the AESD figures to set the baseline for Indicator 8 (Level of mechanization in production (number of machines)) as follows:
Tractors=2,859
Harvesters= 268
Rice Threshers= 90
Power Tillers= 1,292

Indicators	Code	Baseline /Current (2023)	Data Source
8. Level of mechanization in production	I2	Tractors=2,859 Harvesters= 268 Rice Threshers= 90 Power Tillers= 1,292	AESD/SRID

3.9 Indicator 9: Share of local rice in the market (%)

Seven (7) cities and/or municipalities were purposively selected for primary data collection from supermarkets in the cities of: Accra (21), Kumasi (9), Tamale (6), Koforidua (5), Bolgatanga (3), Vakpo -Hohoe (4) and Navrongo (1). See appendix 2 for details. It was found that, on average only paltry 2.04% of rice in the key retail stores were locally produced.

The baseline figure for indicator 9 was computed as follows:

Step1-Calculate the average number of bags of rice sold per annum by multiplying the average bags of rice sold per week by 52 for both local and imported rice for each enterprise

Step2-Obtain the total quantity of rice sold per annum in kilograms by multiplying the values obtain in step1 with the average weight of a bag of rice (5kg, 50kg, etc) for both local and imported rice for each enterprise

Step3-Convert the values obtained in step 2 (total quantity of rice sold per annum in Kg) to metric tons by dividing the values by 1000 to obtain the total quantity of rice sold for each enterprise.

Step4-Calculate rice procured by adding the total quantity of local rice sold in Metric tons (obtained from step 3) + total quantity of imported rice sold in metric tons (Obtained from Step 4) for each enterprise

Step5-Obtain the percentage of local rice in the market for each enterprise using this formula:

$$\frac{Total\ Quantity\ of\ Local\ Rice\ in\ MT per\ annum}{Rice\ procured\ \ per\ annum\ in\ MT} * 100\%$$

Calculate the overall percentage for local rice in the market using the formula below:

$$\frac{sum\ of\ total\ Quantity\ of\ Local\ Rice\ in\ MT\ per\ annum\ for\ all\ enterprises}{sum\ of\ Rice\ procured\ for\ all\ enterprises\ per\ annum\ in\ MT} * 100\%$$

After applying the above formula to market survey data, it is recommended **that the baseline for Indicator 9 [Share of local rice in the market (%)] should be set at 2.04%.**

Indicators	Code	Baseline (2023)	Data Source
9. Share of local rice in the market	C1	(**2023)** Share of local rice in the market for 2023= **2.04%** (estimated total quantity of rice procured by the 49 shops surveyed = 7,920.44 MT per annum, out of which local rice amounts to 161.24 MT/annum	Primary data through Survey in selected markets (See Appendix)

3.10 Indicator 10: Quantity (MT) of High-yielding Varieties

The dominant rice varieties cultivated in Ghana as at the time of the baseline were: AGRA rice, CRI-Amankwatia, Gbewaa and Ex Baika rice. A review of the Catalogue of Crop Varieties Released & Registered in Ghana (CSIR,2019), shows that these varieties have proven high yield potentials as follows:

Name of Variety	Yield Potential
Gbewaa Rice	Yield potential of 5-6 MT/ha. Milling rate is 62%. Excellent cooking quality. Very high consumer acceptability and good resistance to common pests and diseases
CRI-Amankwatia	Potential yield: 8.0 t/ha; Resistant to blast: tolerant; Resistant to lodging: good; White rice % (Milling yield): 70.4%; Cooking quality: Good; Aromatic; Amylose content: 22.5%; Alkaline spreading value: 3.7; Resistance to blast:
AGRA Rice	Yield potential: 8 t/ha; Resistant to blast: tolerant to iron toxicity: moderate; White rice % (Milling yield): 70.4; Cooking quality: Good; Amylose content: 16-18%; Alkaline spreading value: 7; Aroma: Strong aroma
Ex Baika Rice (Legon rice-1)	Yield potential of 10 tons per hectare with milling yield of 72.8 %. Its aromatic and long slender grain, with an amylose content of 18.3% makes it fluffy rather than sticky.

It was decided that the seed data compiled by GISD be used since staff of GSID collect data directly from the source and no seed can be considered to be certified in Ghana without production supervision and approval by GSID. The baseline figure for Indicator-10 (**Quantity (MT) of High-yielding Varieties)** is computed by a simple addition of the quantities of seed produced for each high yielding variety. Thus, Quantity (MT) of High Yielding Varieties for base year of 2019 = sum (AGRA rice+ Amankwatia+ Gbewa +Ex baika).

Therefore, **it is recommended that the baseline for indicator 10- Quantity (MT) of High-yielding Varieties should be set at 8,353.80 MT in 2019.**

Indicators	Code	Baseline (2019)	2020	2021	Target (2030)	Data Source
10. Quantity of high-yielding variety seeds	**C2**	**8,354.13tons** AGRA-7518.42 Amankwatia-417.69 Gbewaa-250.61 Exbaika-167.08 Others= 0.3286	**7,746.91tons:** AGRA-6,972.21 Amankwatia-387.35 Gbewa-232.41 Exbaika-154.94	**12,979,90MT:** AGRA-11,626.1 Amankwatia-645.81 Gbewa-387.54 Exbaika-258.36	32,550 MT	GSID-PPRSD, Head Office, Accra

3.11 Indicator 11: Smallholder farmers' Accessibility to Financial Services (%)

As at the time of the baseline survey there was no nationally collated database on smallholder rice farmers accessibility to financial services. Therefore, the Consultant undertook field visits to 36 districts located across 4 key rice growing regions within September to October, 2023 to collect the needed data from the record books of districts departments of agriculture. Analysis (divide number of farmers accessing financial services/over the total number of farmers in the groups) of the consolidated results shows that only 38.02% of (6,728 farmers out of 17,721 farmers in the record books of the districts departments of agriculture have access to financial services such as:

- Introductory letter to Financial Institutions
- Business plan preparation
- Proposal preparation
- Formation of Village Savings & Loans Association (VLSA)
- Land preparation on credit and
- Input credit

It is recommended that **the baseline for indicator 11 should be set at 38.02 %, as estimated from the record books of** the 36-district department of agriculture in 2023.

Indicators	Code	Baseline (2023)	Data Source
11. Smallholder rice farmers' accessibility to financial services	E1	38.02 % (6,728 farmers out of 17,721 farmers surveyed in 2023	Derived from the Databases of District (36) Departments of Agriculture in 2023

3.12 Indicator 12: Smallholder Farmers' Accessibility to Technical Training and Services

As at the time of the baseline survey there was no nationally collated database on smallholder rice farmers accessibility to financial services. Therefore, the Consultant undertook field visits to 36

districts located across 4 key rice growing regions within September to October, 2023 to collect the needed data from the record books of districts departments of agriculture. Analysis (divide number of farmers accessing technical services/over the total number of farmers in the groups) of the consolidated results shows that as high as 92.93% (16,468 farmers out of 17,721 farmers in the record books of the districts departments of agriculture have access to technical services such as training in:

- Row planting
- Seed selection
- Proper land preparation
- Bund construction/embankments
- Transplanting (irrigated rice)
- Water management
- Nutrient management
- Harvesting techniques
- Postharvest management
- Market linkages
- bird scaring techniques
- packaging and branding of their produce
- identification and knowing the right time to harvest rice
- water harvesting technology
- Adoption of new varieties of rice

It is recommended that the baseline for indicator 12 should be set at 92.93 %, as estimated from the record books of 36 district departments of agriculture in 2023.

Indicators	Code	Baseline/ Current (2023)	Data Source
12Smallholder farmers' accessibility to technical training or services	E2	92.93% (16,468 farmers out of 17,721 farmers surveyed in 2023	Derived from the Databases of District (36) Departments of Agriculture in 2023

3.13 Indicator 13.: Retail prices for representative rice brands/varieties for both domestic and imported rice

In Ghana, the data on retail prices for representative rice brands/varieties for both domestic and imported rice is routinely collected and published by two main sources. The Statistics, Research, and Information Directorate (SRID) of Ghana's Ministry of Food and Agriculture (MoFA) and ESOKO Countrywide analysis of food prices in Ghana. However, ESOKO's countrywide analysis

of food prices in Ghana is focused on wholesale prices, whilst SRID collects and reports on both whole sale and retail price data.
The average annual price per KGs is already computed by SRID in the local currency (GHS). There is therefore, the need to convert the price from local currency to USD to facilitate international comparison. Regarding the Forex conversion, it is recommended that the Bank of Ghana's (BoG) Historical Interbank Forex database should be adopted for the appropriate exchange rate to be used for the conversion of the Ghana cedis (GHS) denominated prices to their $ USD equivalent. The BoG database is available at: https://www.bog.gov.gh/treasury-and-the-markets/historical-interbank-fx-rates/.

After applying the processes above, **it is recommended that the baseline for Indicator 13 Retail prices for representative rice brands/varieties for both domestic and imported rice should be set at price of = 4.76GHS (0.86USD) Per KG *for Local rice and* 6.03 GHS(1.09USD) per KG for imported rice in 2019.**

Indicators	Baseline (2019)	2020	2021	Data Source
13Retail prices per Kg for representative rice brands/varieties for local and imported rice	Local rice (average retail price-Jan-Dec. 2019) = GHS 4.76 (0.86 USD) Per KG -Imported rice (average retail price-Jan-Dec. 2019) = 6.03 GHS (1.09 USD) GHS per KG	Local rice (average retail price-Jan-Dec. 2020) = 4.98 GHS(0.89USD) Per KG -Imported rice (average retail price-Jan-Dec2020) = 7.38GHS(1.31 USD) per KG	Local rice (average retail price-Jan-Dec. 2021) = 5.69 GHS(0.97USD) Per KG -Imported rice (average retail price-Jan-Dec. 2021) = 7.38 GHS (1.26USD) per KG	Secondary data SRID-MoFA Forex Data from BoG https://www.bog.gov.gh/treasury-and-the-markets/historical-interbank-fx-rates/

3.14 Indicator 14: Area under Certified Seed production

As stated earlier, the responsibilities of the Ghana Seed Inspection Division (GSID) of PPRSD, include:
- Registration of seed growers and dealers for the production and marketing of seeds.
- Inspection of seed fields, processing and storage facilities.
- Sampling, testing and evaluation seeds produced by seed growers
- Sampling and testing of imported seeds
- Certification of seed produced by growers.
- Conduct pre and post control verifications.
- Monitoring sales outlets to ensure suitability of storage premises and seed viability and
- Enforcement of seed laws and regulations

GSID of PPRSD, compiles and maintains a database on area (Ha) under certified seed production for each year. Because the GSID staff collects data directly from the source and no seed can be considered to be certified in Ghana without production supervision and approval by GSID, it is **recommended to adopt the GSID's figure of 3,294.20 Ha in 2019 as the baseline for Indicator 14 for Area under Certified Seed production.** The data on area under certified production is already compiled annually by GSID, so no further computation would be required during M&E.

Indicators	Baseline (2019)	(2020)	2021	Target	Data Source
14. Area under Certified Seed production	3,294.20 Ha	2,776.51 Ha	5,287.40 Ha	-	GSID-PPRSD. Head Office, Accra

3.15 Indicator 15: Percentage area of land at irrigation site allocated for rice seed production

As stated earlier, GIDA is the custodian of data in relation to public irrigation schemes in Ghana. The data on area on area (Ha) under irrigation with respect to public irrigation is regularly collated from all public schemes and it is readily available at the GIDA Head Office in Accra. However, as at the time of data collection for this baseline survey, there were about 10 private companies cultivating rice under their irrigation own purposely constructed irrigation schemes. These companies keep their own records regarding the area (Ha) under irrigation for rice grain and seed production. The baseline data for Ghana specific indicator 14: Percentage area of land at irrigation site allocated for rice seed production are available and can be obtained from the Head Office of GIDA in Accra and the designated officers at the various private schemes (see list and contact numbers attached in appendix). Thus, the baseline figure for this indicator is generated by adding the data obtained from GIDA to the data received from the Private Schemes.
Since the value for Indicator 5 (Area under irrigation) is already known, the baseline figure for indicator 14 (**Percentage area of land at irrigation site allocated for rice seed production)** computed as follows:
Step 1- compute total area (hectares) dedicated to seed production = Area (Ha) dedicated to seed production under public schemes + area (Ha) dedicated to seed production under private schemes.

Step2 - **Percentage area of land at irrigation site allocated for rice seed production =**

$$\frac{Total\ Area\ for\ seed\ Under\ irrigation}{Value\ for\ Indicaor\ 5} * 100\%$$

Following the steps above, it **recommended that the baseline figure for Indicator 15. should be set at 1.22% in 2019.**

Indicators	Baseline (2019)	2020	2021	Target (2030)	Data Source
15. Percentage area of land at irrigation site allocated for rice seed production	1.22%	0.36%	1.18	-	Secondary data from GIDA and Private Schemes

3.16 Indicator 16: Number of locally produced rice brands introduced by the regulatory authorities

The Ghana Food And Drugs Authority (FDA -Act, Act 851, 2012) **is responsible for the inspection and certification of food products and prescription drugs** . The FDA also collaborates with some of the country's institutions including: DCS-MoFA, the Food Research institute, Pharmacy Council of Ghana, Ghana Standards Authority, Environmental Protection Agency, Ghana Revenue Authority, Centre for Plant Medicine Research, amongst others. The Mandate of the Food Evaluation and Registration Department of the FDA is defined by the following Sections of part 7 of the Public Health Act, 2012, Act 851. The FDA has a register of all locally produced rice brands that it has licensed for the Ghanaian market. This register is updated regularly and can be obtained from the Research & Nutrition Unit of FDA. **It was decided to adopt the FDA's figure of 72 in 2023 as the baseline for Indicator 16.** The figure is compiled by the FDA and no further computation would be required.

Indicators	Baseline (2023)	Target (2030)	Data Source
16.Number of locally produced rice brands introduced by the regulatory authorities	72	-	Research & Nutrition Unit of FDA

4.0 Summary and Conclusions

4.1 Summary

The recommended baseline figures proposed for the 16 NRDS-II indicators as per the findings are presented in Table 3.

Table 4: Summary of the recommended Baseline Values for Ghana NRDS-II as per the findings

Category	Indicators/ Code	Baseline (2019)	2020	2021	Target (2030)	Data Source	Data Needs
Overall	1.Quantity of paddy produced /O1	925,000 MT	937000 MT	1,143,000 MT	3,312,282 MT	SRID-MoFA	Secondary
	2. Area harvested /O2	282,000 Ha	291,000 Ha	357000 Ha	690,0 Ha	SRID-MoFA	Secondary
	3. Yield/O3	3.28 MT/Ha	3.21 MT/Ha	3.20 MT/Ha	4.80 MT/Ha	SRID-MoFA	Secondary
	4.Self-sufficiency rate (SSR)/O4	37.0%	51.4%	45.80 %	106%	SRID-MoFA	Secondary
Resilience	5. Area under irrigation /R1	11,601.98 (Ha)	13,163.1	13,492.3	69,005.9 Ha	GIDA, Head Office, Accra Private Irrigators	Secondary
	6. Quantity of resilient variety seeds/R2	**8,353.80 MT:** AGRA-7518.42 Amankwatia-417.69 Gbewa-250.61 Exbaika-167**.**	**7,746.91 MT:** AGRA-6,972.21 Amankwatia-387.35 Gbewa-232.41 Exbaika-154.94**.**	**12,979,90 MT:** AGRA-11,626.1 Amankwatia-645.81 Gbewa-387.54 Exbaika-258.36	32,550 MT	GSID-PPRSD, Head Office, Accra	Secondary
Industrialization	7. Level of industrial milling	-	-	**i). Milling Capacity:** Small-Scale Mills		Field Survey in 2021	Primary

Category	Indicators/ Code	Baseline (2019)	2020	2021	Target (2030)	Data Source	Data Needs
	capacity (%)/I1			≤ 1.5 31.3Tons per hour/56.1Tons per hour = 0.56 (56.0%) Medium-Large Mills ≥1.6 Tons/Hour 24.8Tons per hour/56.1 Tons per hour = 0.44 (44.0%) **ii). Number ratio:** Small-Scale Village Mills ≤ 1.5 Tons/Hour = 33/44 (77.3%) - Medium-Large Mills ≥1.6 Tons/Hour = 10/44 (22.7%)			
	8. Level of mechanization in production/I2	-	-	**2023** Tractors=2,859 Harvesters = 268		AESD, Head Office Accra & SRID (MoFA-Facts &Figures	Secondary

Category	Indicators/ Code	Baseline (2019)	2020	2021	Target (2030)	Data Source	Data Needs
				Rice Threshers= 90 Power Tillers= 1,292		Annual Series)	
Competitiveness	9. Share of local rice in the market/C1	-	-	**(2023)** Share of local rice in the market for 2023= **2.04**% (estimated total quantity of rice procured by the 49 shops surveyed = 7,920.44 MT per annum, out of which local rice amounts to 161.24 MT/annum		Survey in selected markets in 2023	Primary
	10. Quantity of high-yielding variety seeds/C2	**8,354.13tons** AGRA-7518.42 Amankwatia-417.69 Gbewa-250.61 Exbaika-167.08 Others= 0.3286	**7,746.91 tons:** AGRA-6,972.21 Amankwatia-387.35 Gbewa-232.41 Exbaika -154.94	**12,979,90 MT:** AGRA-11,626.1 Amankwatia-645.81 Gbewa-387.54 Exbaika-258.36	32,550.0 MT	GSID-PPRSD Head Office, Accra	Secondary

Category	Indicators/ Code	Baseline (2019)	2020	2021	Target (2030)	Data Source	Data Needs
Empowerment	11. Smallholder rice farmers' accessibility to financial services/E1	-	-	**2023** 38.02 % (6,728 farmers out of 17,721 farmers surveyed in 2023		Established from databases of 36 District Departments of Agriculture	Secondary data at selected districts
Empowerment	12. Smallholder farmers' accessibility to technical training or services/E2	-	-	92.93% (16,468 farmers out of 17,721 farmers surveyed in 2023)		Established from databases of 36 District Departments of Agriculture	Secondary data at selected districts
Price	13. Retail prices per Kg for representative rice brands/varieties for local and imported rice	Local rice (average retail price-Jan-Dec. 2019) = GHS 4.76 (0.86 USD) Per KG -Imported rice (average retail price-Jan-Dec. 2019) = 6.03 GHS (1.09 USD) GHS per KG	Local rice (average retail price-Jan-Dec. 2020) = 4.98 GHS(0.89USD) Per KG - Imported rice (average retail price-Jan-Dec2020) = 7.38GHS(1.31USD) per KG	Local rice (average retail price-Jan-Dec. 2021) = 5.69 GHS(0.97 USD) Per KG -Imported rice (average retail price-Jan-Dec. 2021) = 7.38 GHS (1.26USD) per KG		Secondary data SRID-MoFA and Forex Data from BoG https://www.bog.gov.gh/treasury-and-the-markets/historical-interbank-fx-rates/	Secondary
Area under Certified Seed production	14. Area under Certified	3,294.20 Ha	2,776.51 Ha	5,287.40 Ha		GSID-PPRSD	Secondary

Category	Indicators/ Code	Baseline (2019)	2020	2021	Target (2030)	Data Source	Data Needs
	Seed production					Head Office, Accra	
Seed System	15. Percentage area of land at irrigation site allocated for rice seed production	1.22%	0.36%	1.18		Secondary data from GIDA/Private Irrigators	Secondary
Post Harvest and Marketing	16.Number of locally produced rice brands introduced by the regulatory authorities		-	-72 (2023)		Research & Nutrition Unit of FDA	Secondary

4.2 Conclusions

There are five main consistent databases that jointly account for 12 of the 16 indicators. There is only one indicator that there was no routine data being generated: Indicator 9 (*Share of local rice in the market %*) which requires primary data. It is recommended that SRID should lead the NRDS Taskforce in conducting regular market surveys through its well-established market price data collection systems.

With respect to Indicator 11: Smallholder farmers' accessibility to financial services (%) and Indicator 12: Smallholder farmers' accessibility to technical training and extension services (%). The district departments of agriculture in the key rice growing regions have records on the characteristics of the membership of rice producing groups (whether the members have access to financial services or technical services). There would be the need to regularly collect such data from the record books of 36 district departments of agriculture to aid M&E, during implementation.

In order to incorporate the suggestion of members of Ghana of NRDS Task Force, it is recommended that for Indicator 5, both Area (Ha) under public irrigation schemes and Area (Ha) under private, schemes planted with paddy, shall be monitored and reported; and double cropping (growing a second rice crop after harvesting a first crop in the same growing season), which has been consistently estimated at 10% of area under irrigation should be accounted for.

5. References

Alliance for a Green Revolution in Africa. (2020). Opportunity to Influence and Impact Policy on Mechanization, and Infrastructure Delivery for Rice Production–Ghana.

CSIR. (2019). Catalogue of crop varieties released and registered in Ghana. Available at: https://nastag.org/docx/resources/2019%20NATIONAL%20CROP%20VARIETY%20CATALOGUE.pdf

International Food Policy Research Institute (IFPRI). 2020. Ghana's rice market. MoFA-IFPRI Market Brief 2. Washington, DC: International Food Policy Research Institute (IFPRI). https://doi.org/10.2499/p15738coll2.133697

Invest in Ghana - Agribusiness Rice Strategic Brief (2020). Available at: https://mofa.gov.gh/site/images/pdf/Strategic_Brief_Business_Model_rice.pdf

Kusek, J. Z., & Rist, R. C. (2004). *Ten steps to a results-based monitoring and evaluation system: a handbook for development practitioners*. World Bank Publications.

Mabaya, E., Adzivor, S. Y., Wobil, J. Waithaka, M., Mugoya, M., Damba, B., Camara, M., Tihanyi, K. 2022. Ghana Country Report 2022 - The African Seed Access Index (version April 2023).

Muñoz, J. (2011). *A long-term census and household survey programme for Ghana*. GSSP Working Paper No. 026. International Food Policy Research Institute Ghana Strategy Support Program. Available at: https://ebrary.ifpri.org/utils/getfile/collection/p15738coll2/id/124867/filename/124868.pdf. Accessed on 29th June, 2023

Ngeleza, G. and Asante, F.A. July 2010. *Multi-Round Crop and Livestock Survey Questionnaire: A Review*. Draft report prepared for the International Food Policy Research Institute Ghana Strategy Support Program.

Owusu, P. A., Nyantakyi, E. K., & Borkloe, J. K. (2013). Assessing Performance of Irrigation of Rice in Ghana.

Quiñones, E. J., Muñoz, J., & Ngeleza, N. (2011). A strategy for agricultural Statistics in Ghana. Ghana Strategy Support Program (GSSP). GSSP Working Paper No. 025.

Sector Industry Analysis – Commodities Report (Rice & Sugar) Imports (2022), by GCB Strategy & Research. Available at: https://www.gcbbank.com.gh/research-reports/sector-industry-reports/121-commodities-industry-in-ghana-2022-rice-sugar/file

APPENDICES- CARD- M&E BASELINE SURVEY- PRIMARY DATA COLLECTION INSTRUMENTS

Appendix1: Level of Access to Technical/ Financial Services by smallholder farmers in key rice growing districts

Districts	Name of Association/ Famer Group	Name of Rice producing Area/District	Total Membership	Number Accessing Technical Services	Number Accessing Financial Services
Volta Region					
Adaklu	Elete Rice Farmers Association	SOFA	17	17	0
Afadzato South	Setorsusu Women Rice Farmers	Ve-Golokuati	20	20	0
	GRIB	Ve-Golokuati	51	51	0
	Nenyo Rice Farmers	Ve-Wudome	18	18	0
	Young Milliennium	Ve-Koloenu	24	24	3
	Dzidefo Farming Group	Ando Kofe	26	26	0
	Peaceful Farmers Association	Tafi Atome	37	37	37
	Great Achievers	Ve-Gbodome	20	20	0
	Nuakpewornu Lorlornyo Women Group	Liati Soba	38	38	0
	Young farmers and Marketing league	Ve-Dafor	50	50	0
	Mawuko cooperative	Nyive	32	32	0
	Norvisi Farmers Group	Ve-Golokuati	31	31	0
	District Total		**364**	**364**	**40**
Ho Municipal	Elikem Rice Farmers Association	Akrofu Xeviwofe	17	15	0
	Agbeyeye Rice Farmers Association	Akrofu Xeviwofe	24	24	0
	Sokode United Farmers Association	Sokode Bagble	20	20	0
	Norvisi Rice farmers Association	Akrofu Agorve	23	23	0
	Miawoe Rice Farmers Association	Akrofu Xeviwofe	22	22	0

Districts	Name of Association/ Famer Group	Name of Rice producing Area/District	Total Membership	Number Accessing Technical Services	Number Accessing Financial Services
	Agortome Rice Farmers Group	Agortome	15	15	0
	Unity Rice Farmers Group	Atiyinu	18	18	0
	Achiase Tice Farmers Group	Hodzo Achiase	21	21	0
	Shia Norvisi Rice Farmers	Shia	20	20	0
	Novinyo Farmers	Matse	20	20	0
	Morkpokpor Farmers Group	Adukorpe	30	30	0
	Akoefe Akpenamawu Farmers Group	Akoefe	22	22	0
	District Total		**252**	**250**	**0**
Akatsi North	Lorlornyo Rice Farmers	Ave Afiadenyigba	38	38	0
	Lorlonyo Rice Farmers Ass.	Agormor	63	63	0
	Enyonyoge Rice Farmers	Ave Dakpa	38	38	0
	Agblenyo Processing Group	Ave Afiadenyigba	27	27	0
	Dornenyo Farmers Group	Zemu	52	52	0
	Katamanikofe Farmers Group	Agormor	36	36	0
	Mawuta Farmers Group	Kpohe-Kpete	42	42	0
	District Total		**296**	**296**	**0**
South Dayi	Hope For The Future	Wegbe	32	32	0
	Adom Rice Farmers	Todome	36	36	0
	Norvisi Rice Farmers	Todome	27	27	0
	Jemeric Farmers Association	Peki Awudome	45	45	0
	District Total		**140**	**140**	**0**
Ketu North Municipal	Kekeli Farmers Association	Dekpor Yia	38	38	38
	Awalavi Women Rice Processing Assoc.	Avalavi	40	40	40

Districts	Name of Association/ Famer Group	Name of Rice producing Area/District	Total Membership	Number Accessing Technical Services	Number Accessing Financial Services
	Adzortsi / Dekpor Rice Growers Assoc.	Adzortsi	67	41	41
	Dekaworwor Rice Farmers Assoc.	Gadorkope-Tadzewu	42	42	42
	Klenormadi Agbeyeye Rice Farmers Association	Klenormadi	41	41	41
	Capital Exortic Rice Farmers	Tsiyinu	456	456	456
	Nunenyo Rice Farmers And Inter Professional Bodies	Weta	180	180	180
	Amenuveve Farmers Group	Dekpor/Klenormadi	40	40	40
	Volta Cereals Limited	Penyi	19	19	19
	Klenormadi Agbeyeye Rice Farmers Association	Klenormadi	41	41	41
	Wealth In Soil Farmers And Traders Association	Tsiyinu	32	32	32
	District Total		**996**	**970**	**970**
Central Tongu	Mawoefa Farmers Association	Wenu	46	46	6
	Ajasika Rice Farmers Association	Ajasika	37	37	0
	Kpokope Rice Farmers Group	Kpokope	53	53	0
	Adakpo Rice Farmers	Adakpo	18	13	0
	Dzabukpo Rice Farmers Group	Dzabukpo	13	9	0
	Ahlihakpodzi Rice Farmers Group	Ahlihakpodzi	21	18	0
	District Total		**188**	**176**	**6**
Kpando Municipal	Akpini Farmers Association	Tsakpe	25	25	0
	Wotsorme Rice Farmers	Gabi	30	30	0
	Agblenyo Rice Farmers	Konda	27	27	0

Districts	Name of Association/ Famer Group	Name of Rice producing Area/District	Total Membership	Number Accessing Technical Services	Number Accessing Financial Services
	Winners Rice Farmers	Gbefi Hoeme	20	20	0
	Unity Farmers	Tornu	35	35	0
	Amenuveve Dekaworwor	Gadza	15	15	0
	Mawuli Coop	Gbefi Hoeme	15	15	0
	District Total		**167**	**167**	**0**
Ketu South	Aka Rice Farmers Association	Segbe	26	26	12
North Dayi	Vakpo Dunyo Farmers Group (Vadufa)	Vakpo Dunyo	60	60	0
	Anyigbamebleame Farmers Group	Aveme	20	20	0
	Wusuta Farmers Group	Wusuta	36	36	0
	Aveti Farmers Group	Anfoega Aveti	20	20	0
	Denui Farmers Group	Anfoega Denui	16	16	0
	Awate Farmers Group	Awate	32	32	0
	District Total		**184**	**184**	**0**
South Tongu	Integrated Rice Farmers Association	Lakpo	30	30	0
	Aluco Rice Farmers Association	Agbagorme	50	50	0
	Woenenyo Rice Farmers Association	Agbakope	47	47	0
	Lorlornyo Rice Farmers Association	Tordzinu	40	40	0
	Evergreen Rice Farmers Association	Hikpo/Tsavanya	35	35	0
	Fysso Ghana	Besakope	15	15	2
	Dorkplame Rice Farmers Association	Dorkplame	45	45	0
	District Total		**262**	**262**	**2**
Upper East Region					

Districts	Name of Association/ Famer Group	Name of Rice producing Area/District	Total Membership	Number Accessing Technical Services	Number Accessing Financial Services
Builsa South	Builsa South Commercial Farmers Association (BUSCOFA)	Wiesi, Gbedembilisi, Tuedema, Kartegre and Kunkuak valleys	96	96	96
	Builsa South Farmers Association (BSFA)	Wiesi, Gbedembilisi, Tuedema, Yerinsa, Doninga, Kartegre and Kunkuak valleys	147	147	147
	Akalichaab	Wiesi Valleys	30	30	30
	Agositey	Gbedembilisi Valleys	27	27	27
	Nunuing	Gbedembilisi Valleys	30	30	30
	Ayikchaab	Gbedembilisi Valleys	30	30	30
	Ayaachaab	Gbedembilisi Valleys	30	30	30
	Asulichaab	Wiesi Valleys	30	30	30
	Awunitom Farmers	Doninga Valleys	30	30	30
	Amaachaab	Wiesi Valleys	30	30	30
	Achanga	Kanjarga Valleys	30	30	30
	Nayenjaparum	Fumbisi valleys	30	30	30
	Maaka	Fumbisi valleys	30	30	30
	Asiatechaab	Kanjarga valleys	30	30	30
	Anoayeng ale Ayiakjangsa	Wiesi Valleys	30	30	30
	Awonlemaami	Kangarga valleys	30	30	30
	Asagchaab	Kasiesa Valleys	30	30	30
	Wenkari Kpaariba	Kasiesa Valleys	30	30	30
	Yimona Ayigchaab group	Kasiesa Valleys	37	37	37
	Anyenboka	Kasiesa Valleys	30	30	30
	Agisikanalim	Fumbisi valleys	30	30	30
	Akanlugchaab	Gbedema Valleys	30	30	30
	Chompo Naakdeediha	Fumbisi valleys	40	40	40
	Ayikchaab	Doninga Valleys	28	28	28
	Akalichaab	Wiesi Valleys	30	30	30

Districts	Name of Association/ Famer Group	Name of Rice producing Area/District	Total Membership	Number Accessing Technical Services	Number Accessing Financial Services
	Asiakatichaab	Fumbisi valleys	30	30	30
	Batuisa Ayaachaaba Co-op. Farmers Society	Fumbisi valleys	63	63	63
	AyieKchaab	Bachonsa Valleys	36	36	36
	Awontigsitety	Pintengsa Valleys	40	40	40
	Ayikchaab	Naadema Valleys	42	42	42
	Alumsikawen	Chansa Valleys	25	25	25
	Ayiakjangsa	Buterisa Valleys	54	54	54
	Fumbisi Luisa FBO	Fumbisi valleys	42	42	42
	Ayaakamaaka	Fumbisi valleys	32	32	32
	Awenzantega	Fumbisi valleys	30	30	30
	Ayaanalim	Zamsa Valleys	26	26	26
	Nig Yeg	Gbedema Valleys	33	33	33
	Ayaakanalim	Gbedema Valleys	33	33	33
	Asuiyong	Kasiesa Valleys	28	28	28
	Amaachaab	Kanjarga Valleys	30	30	30
	Atagerim	Chansa Valleys	30	30	30
	Ayaachaab	Uwasi Valleys	38	38	38
	Awenatong	Doninga Valleys	27	27	27
	Anoayeng	Zogsa Valleys	27	27	27
	Ayineika	Naadema Valleys	35	35	35
	Amaachab	Fumbisi Valleys	30	30	30
	Awunimari	Gbedema Valleys	28	28	28
	Ayaachaab	Kanjarga Valleys	30	30	30
	Nawen-namare	Fumbisi valleys	30	30	30
	Ababobere	Fumbisi valleys	23	23	23
	Tinyetinkamagsa	Kanjarga Valleys	30	30	30
	Dabomsa Farmers	Gbedema Valleys	43	43	43

Districts	Name of Association/ Famer Group	Name of Rice producing Area/District	Total Membership	Number Accessing Technical Services	Number Accessing Financial Services
	Amaachaab	Fumbisi valleys	30	30	30
	Awunitom Farmers	Doninga Valleys	26	26	26
	Anuoyeng	Kanjarga Valleys	30	30	30
	Ayaachaab	Kanjarga Valleys	34	34	34
	Ayikchaab	Kanjarga Valleys	28	28	28
	Ayaanalim	Kanjarga Valleys	25	25	25
	Ayaachab	Uwasi Valleys	31	31	31
	Noayenaleyiakjangsa	Uwasi Valleys	28	28	28
	Anuoyeng	Uwasi Valleys	30	30	30
	Singsangsa Co-operative	Fumbisi valleys	43	43	43
	Vigsangsa Farmers	Gbedema Valleys	24	24	24
	Amaachaab	Kanjarga Valleys	30	30	30
	Chosichaab	Kanjarga Valleys	30	30	30
	Zula gan nalim	Kanjarga Valleys	25	25	25
	Anueyeng	Kanjarga Valleys	30	30	30
	Angendogsa yeri	Kanjarga Valleys	18	18	18
	Samsa biisa	Kanjarga Valleys	46	46	46
	Achanga	Kanjarga Valleys	34	34	34
	Ayiichsab	Kanjarga Valleys	30	30	30
	Amaachaab	Kanjarga Valleys	30	30	30
	Awolemai	Kanjarga Valleys	32	32	32
	Anyewiamena	Kanjarga Valleys	35	35	35
	Azulichaab	Kanjarga Valleys	25	25	25
	Amaabore	Kanjarga Valleys	23	23	23
	Anueyeng	Kanjarga Valleys	30	30	30
	Avunchaab	Kanjarga Valleys	43	43	43
	Anoayeng Group	Kanjarga Valleys	30	30	30
	Zula Gaam Nalim	Naadema Valleys	26	26	26

Districts	Name of Association/ Famer Group	Name of Rice producing Area/District	Total Membership	Number Accessing Technical Services	Number Accessing Financial Services
	Anoayeng Group	Kanjarga Valleys	30	30	30
	Nayenjaparum	Fumbisi valleys	34	34	34
	Ayaakanalum	Uwasi Valleys	28	28	28
	Ayichaab	Kanjarga Valleys	25	25	25
	Achumlila	Fumbisi valleys	31	31	31
	Ayichaab	Kanjarga Valleys	28	28	28
	Anoayeng	Zamsa Valleys	30	30	30
	Anuoyeng Farmers' Cooperative	Kanjarga Valleys	43	43	43
	Ayaachaab Farmers	Kanjarga Valleys	24	24	24
	Ayikachaab Farmers	Kanjarga Valleys	30	30	30
	Ayaanalim Farmers	Kanjarga Valleys	30	30	30
	Yadema Ayaachaab Farmers	Uwasi Valleys	25	25	25
	Noayenaleyiakjangsa Farmers	Uwasi Valleys	30	30	30
	Anuoyeng Farmers	Uwasi Valleys	30	30	30
	Abiisawomchaaba Co-op. Farmers Society	Uwasi Valleys	54	54	54
	Ayaachaab Co-op. Farmers	Uwasi Valleys	75	75	75
	Wiesi Co-op. Farmers	Wiesi Valleys	38	38	38
	Atieyeri Co-op. Farmers Society	Wiesi Valleys	35	35	35
	Amaakachaab	Uwasi Valleys	10	10	10
	Amabiri Group	Naadema Valleys	38	38	38
	Amaboka	Kanjarga Valleys	31	31	31
	Anamfede group	Doninga Valleys	27	27	27
	District Total		**3.432**	**3,432**	**3,432**
	1A (Zone A)	ICOUR	393	393	200
	1B (Zone C)	ICOUR	83	83	43

Districts	Name of Association/ Famer Group	Name of Rice producing Area/District	Total Membership	Number Accessing Technical Services	Number Accessing Financial Services
Kassena-Nankana	1C (D and E)	ICOUR	86	86	40
	2 (Zone F)	ICOUR	131	131	70
	3 (H and I)	ICOUR	235	235	100
	4 (Zone J)	ICOUR	262	262	150
	5 (Zone K)	ICOUR	191	191	91
	6 (L, M, N)	ICOUR	239	239	139
	7 (Zone Q)	ICOUR	263	263	260
	8 (S and U)	ICOUR	128	128	150
	9 (Zone V)	ICOUR	187	187	160
	12 (GR1 -GR7)	ICOUR	122	122	66
	13 (GR8-GR11)	ICOUR	59	59	40
	14 (Zone P)	ICOUR	291	291	101
	15 (R, T, W)	ICOUR	163	163	115
	District Total		**2,833**	**2,833**	**1,725**
Northern Region					
Nanton	Suglonboribuni	Dingoni	28	28	6
	Maltiti	Jana	26	26	8
	Wumpini	Batanyili	30	30	0
	Bobgu Nye yaa	Fazihini	26	26	21
	Sugulomalinyori	Guntingli	25	25	0
	Tiyumtaba	Guntingli	24	24	0
	Salpawuni	Jegun	28	28	6
	Suglo mboribuni	Kpachilo	30	30	0
	Kpanmanga	Kpano	24	24	0
	Nyebi Yoo Na	Kpano	31	31	0
	Suhulo Nbori Buni	Looni	21	21	0
	Gubkatimali	Moya	31	31	0
	Bobgu Nyayaa women	Nanton-Kurugu	25	25	0

Districts	Name of Association/ Famer Group	Name of Rice producing Area/District	Total Membership	Number Accessing Technical Services	Number Accessing Financial Services
	Kpanman-kawunsonda	Nyamandu	16	16	0
	Tiyumyataba	Nyeko	23	23	0
	Suglo Nboribuni	Sanvili	30	30	0
	Wunizooya	Sindigu	26	26	0
	Behisun	Tampion	26	26	0
	Zaapayim	Tampion	32	32	0
	Langubivela	Tigu	32	32	0
	Tunteeya	Tigu	30	30	0
	Mangsongsim	Yapalsi	30	30	0
	Albarkasaakuya	Zali	31	31	0
	Kpanmankawunsonda	Zieng	30	30	0
	Tiyumtaba	Zoggu	31	31	0
	Levantis marketing and food cooperative	Sanvili	76	76	0
	Suhuyini	Zoonaayili	36	36	0
	District Total		**798**	**798**	**41**
Savelugu	Tiyumtaba Farmers	Duko	20	20	0
	Maltiti Farmers Association	Kanshegu	26	26	0
	Zisung Nitee Nabli Farmers	Kanshegu	24	24	0
	Kambeng Farmers Association	Diare	22	22	0
	Bobgun Nyeyee Farmers Association	Nakpanzoo	37	37	0
	Zaapayim Rice Farmers Association	Chai Yapalsi	49	49	0
	Bomma Viella Farmers Association	Chai Yapalsi	13	13	0
	Nyabu Yona Rice Farmers Association	Kpalung	30	30	0

Districts	Name of Association/ Famer Group	Name of Rice producing Area/District	Total Membership	Number Accessing Technical Services	Number Accessing Financial Services
	Wonzoya Rice Farmers Association	Koduzegu	80	80	0
	Pigu Rice Farmers Association	Pigu	25	25	0
	Disiga Rice Farmers Association	Disiga	22	22	0
	Saakpuli Rice Farmers Association	Saakpuli	21	21	0
	Kukobila Rice Farmers	Kukobila	85	85	0
	Tamalgu Rice Farmers Association	Tamalgu	106	106	0
	Tiyumtaba Ataayabase Farmers	Duko	25	25	0
	Laamgba gbubi laamgbi	Duko	54	54	0
	Suglo mal'nyori	Kanshegu	34	34	0
	Maltiti women group	Diare	50	50	0
	District Total		**723**	**723**	**0**
Kumbungu	Kpangmang Kawunisong	Jakpahi-Kukuo	20	20	0
	Timtooni Farmers Association	Tonjing	25	25	0
	Zaabuni Farmers Association	Dalun	121	121	0
	Din-nani Rice Farmers	Jaajirigu	32	32	0
	Anamzooya Rice Farmers	Gung	30	30	0
	Binsung Yolidaa	Zangballung-Kukuo	20	20	15
	Tizaabuni Farmers Association	Bontanga	116	116	20
	Wuni Ntira Farmers Association	Bontanga	45	45	0
	Yambitigra Farmers Association	Bontanga	60	60	0
	Yumzaa Farmers Association	Gbugli	30	30	0

Districts	Name of Association/ Famer Group	Name of Rice producing Area/District	Total Membership	Number Accessing Technical Services	Number Accessing Financial Services
	Songtaba Farmers Association	Bontanga	60	60	0
	Suglo Kongbo	Bontanga	50	50	0
	Berisung Farmers Association	Kpaliga	50	50	0
	Ziekunya Farmers Association	Nwagu	36	36	0
	Mandeeya Farmers Association	Bontanga	35	35	0
	Tim-tooni Rice Farmers Group	Kpegu	15	15	0
	District Total		**745**	**745**	**35**
Gushegu	Kpagmag Nookumya	Sampebga	40	40	0
	Suglo Nbori Boni	Kpatili	45	45	0
	Sugbei Rice farmer Ass.	Sugbei	30	30	0
	Damdabol Rice Farmers group	Damdaboli	40	40	0
	Jibga Farmers Group	Gushegu	37	37	0
	Banama Farmers Group	Bulugu	45	45	0
	Tung Farmers Group	Nawuni	40	40	0
	Jagbo Farmers Group	Nakunga	43	43	0
	Nyabiyoona Group	Gbambu	42	42	0
	Tiri yipolo Group	Nayilifong	41	41	0
	Nangbanyini Rice Group	Jung	42	42	0
	Limo rice farmers association	Limo	43	43	0
	Behasumg rice farmers	Bilsinga	42	42	0
	Tiyumtaba Rice farmers	Kpala	40	40	0
	Solombombine rice farmers	Zinindo	41	41	0
	Bialannabra rice farmers	Zinindo	42	42	0
	Zaabuni rice farmers	Digbila	40	40	0

Districts	Name of Association/ Famer Group	Name of Rice producing Area/District	Total Membership	Number Accessing Technical Services	Number Accessing Financial Services
	Bobgu n-nye yaa association	Kutung	42	42	0
	Nayugu rice farmers Association	Nayugu	41	41	0
	Tiyumtaba	Kpatinga	47	47	0
	Di Gang Ataaya	Kpatinga	50	50	0
	Waayili Farmers Group	Waawu	31	31	0
	Yinyamba Farmers Group	Yinyamba	85	85	0
	Nawuhugu Farmers Group	Nawuhugu	60	60	0
	Kpakara farmers Group	Kpakaraga	60	60	0
	District Total		**1,109**	**1,109**	**0**
Yendi	Kpamanga ka wuni songda	Zakoli	20	20	0
	Kitingnan Farmers Group	Yinsala	38	38	0
	Asim Ntira 1	Zang	26	26	0
	Asim Ntira 2	Zang	25	25	0
	Wuni Zooya 1	Gukpegu	20	20	0
	Maligulana Bi Vihira	Wakpang	26	26	0
	Wuni Zooya 2	Gukpegu	19	19	0
	Kpanmang Kawuni Songda	Zagbang	15	15	0
	Bela Nnabra	Kunkon No:1	38	38	0
	Puanibi	Kunkon No: 2	28	28	0
	Bobgu nye yaa	Sakpaba	26	26	0
	Wumpini	Zakoli	18	18	0
	Yendi Rice farmers Association	Yendi	41	41	0
	District Total		**340**	**340**	**0**
Tolon	Golinga rice seed producers' association	Golinga	20	20	0
	Gbulahagu rice seed producers' association	Gbulahagu	26	26	0

Districts	Name of Association/ Famer Group	Name of Rice producing Area/District	Total Membership	Number Accessing Technical Services	Number Accessing Financial Services
	Suglo Nboribini rice farmers	Nafarung	31	31	0
	Gubkatimali farmers ass.	Gbulahagu	13	13	0
	Wunitera farmers ass	Kpalsugu	28	28	0
	Tungteeya women group	Tali Botingli	30	30	0
	Soyulo m-bori bini	Aseyili	20	20	0
	Bobgu vella	Tamaligu	20	20	0
	Gubkatimali rice faemer`s group	Dimabi	30	0	0
	Tibomyem rice farmers association	Tingoli	50	0	0
	Bonzali (Rice)	Kpalsugu	25	0	0
	Kpanmang ka wuni song	Kpanyili	44	0	0
	Wuni ntira association	Kpaachiyili	33	0	0
	Suglo N Bori Buni	Jagroyili	20	0	0
	Walma so ziya	Nyankpala	43	0	0
	Wumpini	Nyankpala	30	0	0
	Suglo konbo	Nyankpala	25	0	0
	Kuli noli dinvela	Naha	35	0	0
	Suglo mbori buni	Nyankpala	25	0	0
	Tungteeya	Galinkpegu	40	0	0
	Walima so zia	kasuliyili	18	0	0
	District Total		**606**	**188**	**0**
Mion	Kpang Mang Kawun Song	Jaashei	27	27	0
	Kpang Maga Kawuni Songda	Tuya	20	20	0
	Gubkatimali Rice Farmers Group	Kpachaa	27	27	0
	Nlandaknyan	Buli	23	23	0
	Kimoban	Kayan	35	35	0

Districts	Name of Association/ Famer Group	Name of Rice producing Area/District	Total Membership	Number Accessing Technical Services	Number Accessing Financial Services
	Sulognan	Buli	25	25	0
	Kpangmangna	Buli	35	35	0
	Naadonboni	Buli	29	29	0
	Nilimochar	Buli	63	63	0
	Tiiperkabi	Jakoya no 1	15	15	0
	Kimoban	Kayan	33	33	0
	Kinyouba	Tanado	8	8	0
	Kpangmangna	Kayan	30	30	0
	Tungteiya Rice Farmers' Group	Sanzie	25	25	0
	Tisongtaba Rice Farmers Group	Kpligine	30	30	0
	Bienieti Rice Farmers Group	Sang	25	25	0
	Zosimdi Rice Farmers	Sakpe	25	25	0
	Gubkatimali Rice Farmers Group	Kpachaa	27	27	0
	Wabankai rice farmers group	Kpukpalgu	25	25	0
	Daboagni rice farmers cooperative	Daboagni	109	109	0
	Tikpangan rice farmers group	Warivi	23	23	0
	District Total		**659**	**659**	**0**
Eastern Region					
Achiase	Maranatha Rice Farmers Association	Nyankomase	40	0	0
	Emmanuel Rice Farmers Association	Achiase	60	0	0
	District Total		**100**	**0**	**0**
Akyemansa	Vision Rice Farmers Association	Otwereso	25	25	25
	Gye Nyame Rice Farmers Ass.	Besease	25	25	-

Districts	Name of Association/ Famer Group	Name of Rice producing Area/District	Total Membership	Number Accessing Technical Services	Number Accessing Financial Services
	Akyekrom Rice Farmers Ass	Akyekrom	25	25	20
	Kwaboadi Rice Farmers Ass	Kwaboadi	30	30	10
	Gyewani Rice Farmers Association	Gyewani	25	25	-
	Anidaso Rice Farmers Association	Otwereso	25	20	25
	Agriterra Farmers Association	Borteykrom	30	30	-
	Kyirimenken Rice Farmers Association	Kyirimenken	25	25	-
	Adwuma Nkoso Rice Farmers Association	Abenase	25	25	-
	Anidaso Rice Farmers Association	Abenase	27	10	-
	Adom wo wim Rice Farmers Association	Ofoase	19	5	-
	Kofinimo Rice Farmers Association	Kofinimo	25	8	5
	Omanba pa Rice Farmers Association	Nkansah	25	-	5
	Adepa Rice Farmers Association	Ofoase	15	3	-
	Sunkwa Rice Farmers Association	Ayirebi	17	5	7
	Success Rice Farmers Association	Ayirebi	26	10	-
	Joy Rice Farmers Association	Gyewani	15	15	-
	Nyame ye Rice Farmers Association	Adubiase	25	-	-
	Adujan Rice Farmers Association	Adujan	25	5	-
	Yonko do Rice Farmers Association	Mukyia	25	2	-
	Odumase Rice Farmers Association	Odumase	30	5	10

Districts	Name of Association/ Famer Group	Name of Rice producing Area/District	Total Membership	Number Accessing Technical Services	Number Accessing Financial Services
	Mmofranfadwen Rice Farmers Association	Mmofranfadwen	35	10	-
	Atanurum Rice Farmers Association	Atanurum	30	5	-
	Wawase Rice Farmers Association	Wawase	25	-	-
	Twumkrom Rice Farmers Association	Twumkrom	40	5	-
	Ankani Krobo Rice Farmers Association	Ankani Krobo	25	-	-
	Anyinase Rice Farmers Association	Anyinase	25	5	-
	Praho Rice Farmers Association	Praho	25	10	-
	Asabedie Rice Farmers Association	Asabedie	25	5	-
	Chia Rice Farmers Association	Chia	25	5	-
	Ofoasekuma Rice Farmers Association	Ofoasekuma	25	-	-
	District Total		**789**	**343**	**107**
Asene Manso Akroso	Akroso Rice Farmers' Association	Akroso	10	14	0
	Anto Stephen – Chairman	Appiadem	4	0	0
	Adombinti Maize Farmers' Association	Asuboa,Nsuofua,Kwablawa	20	20	0
	Akim Manso Rice Farmers' Group	Akim Manso	38	38	0
	Asene Ghana Rice Farmers Association	Akim Asene	25	25	0
	Odumase Rice Farmers Association	Odumase	30	30	0
	Nyamebekyere Rice Farmers' Group	Nyamebekyere	20	20	0
	Nyamenti Rice Producers Association	Nyamenti	21	21	0

Districts	Name of Association/ Famer Group	Name of Rice producing Area/District	Total Membership	Number Accessing Technical Services	Number Accessing Financial Services
	Onomabo Rice Farmers' Cooperative	Onomabo	35	35	0
	District Total		**203**	**203**	**0**
Atiwa East	Frimponso Rice Group	Frimponso	20	10	0
	Tiawia Rice Farmers Association	Tiawia	47	47	0
	Nkabom Rice Farmers Association	Akutoase	46	46	0
	Bowohomoden Rice Farmers Association	Awuronsua	51	51	0
	Enyiresi Rice Farmers Association	Enyiresi and Accra Village	26	24	0
	Adom Rice Farmers Association	Osoroase Krobom	12	8	0
	Osoroase Rice Farmers Association	Osoroase Krobom	36	36	0
	Subriso Rice Farmers Association	Subriso, Yosem,	12	8	0
	Bebume Rice Farmers Association	Bebume	25	15	0
	District Total		**275**	**245**	**0**
Atiwa West	Kae me Brae	Awenare	35	35	0
	Bomdwen	Akropong	25	25	0
	District Total		**60**	**60**	**0**
Birim Central	Believers Rice Farmers Association	Essam	28	28	0
	Enso Nyame Ye Rice Farmers Association	Essam	24	24	0
	Adom Wo Wum Rice Farmers Association	Essam	35	35	20
	Biako Ye Rice Farmers Association	Essam	31	31	31
	Osoro Boa Rice Farmers Association	Oda Nkwanta	26	26	26
	Nyame Ne Boafo Rice Farmers Association	Oda Nkwanta	25	25	25

Districts	Name of Association/ Famer Group	Name of Rice producing Area/District	Total Membership	Number Accessing Technical Services	Number Accessing Financial Services
	Anidaso Rice Farmers Association	Oda Nkwanta	25	25	15
	Nyame Bekyere Rice Farmers Association	Oda Nkwanta	25	25	10
	Community 6 Rice Farmers Association	Oda	31	31	15
	Nyame Bekyere Rice Production Group	Gyadam	26	26	0
	District Total		**276**	**276**	**142**
Birim North	Nyamebekyere Rice Farmers Association	Praso Kuma	24	13	0
	Nkosuo Rice Farmers Association	Pankese	35	28	0
	Afam Rice Farmers Association	Nkwrteng	28	16	0
	Amenam Rice Farmers Association	Amenam	32	26	0
	Yesu Mo Rice Farmers Association	Tweapease	15	11	0
	Adom Rice Farmers Association	Oturoku	14	8	0
	Anikorkor Rice Farmers Association	Anikorkor	26	22	0
	Subriso Rice Farmers Association	Old Abirem	14	9	0
	Bebume Rice Farmers Association	Bebume	25	15	0
	District Total		**213**	**148**	**0**
Birim South	Beposo Rice Growers Association	Apoli Beposo	30	26	0
	Babianeha Rice Farmers Association	Babianeha	20	20	0
	Abidjan Rice Farmers Association	Abidjan	37	37	0
	Kroboase Rice Production Association	Kroboase	18	9	0
	District Total		**105**	**92**	**0**

Districts	Name of Association/ Famer Group	Name of Rice producing Area/District	Total Membership	Number Accessing Technical Services	Number Accessing Financial Services
Lower Manya Krobo	AK C1 Water Users Association	Akuse	88	88	13
	C3 Water Users Association	Akuse	233	209	19
	Seed Grace Association	Akuse	48	31	14
	District Total		**369**	**328**	**46**
Denkyembour	Mmoframfadwen Rice Farmers Association	Mmoramadwen	25	25	0
	Akenkanor Rice Farmers Association	Akenkanor	25	25	0
	Kwabena Nduro Rice Farmers Association	Kwabena Nduro	24	24	0
	Kura Fitaa Rice Farmers Association	Kura Fitaa	23	23	0
	Anwiaso Rice Farmers Association	Anwiaso	21	21	0
	Towoboase Rice Farmers Association	Towoboase	24	24	0
	Aboabo Rice Farmers Association	Aboabo	23	23	0
	Apraku Rice Farmers Association	Apraku	22	22	0
	Larbikrom Rice Farmers Association	Larbikrom	25	25	0
	Kusi Rice Farmers Association	Kusi	7	7	0
	M)Denbo Rice Farmers Association	Soabe	30	30	0
	Nkwa Na Ehia Rice Farmers Association	Takorasi	25	25	0
	Boafo Ye Na Rice	Number 4	30	30	0
	District Total		**304**	**304**	**0**
Fanteakwa South	Bosuso Zongo Rice Farmers Association	Bosuso Zongo	15	9	0
	Manee Rice Farmers Association	Manee	21	7	0

Districts	Name of Association/ Famer Group	Name of Rice producing Area/District	Total Membership	Number Accessing Technical Services	Number Accessing Financial Services
	Osino Rice Farmers Association	Osino	12	4	0
	Heman Rice farmers Association	Heman	9	2	0
	Bosuso rice farmers Association	Bosuso	15	7	0
	Akron rice farmers Association	Bosudumasi	13	4	0
	District Total		**85**	**33**	**0**
Kwahu Afram Plains North	Tornu Rice Farmers Association	Amankwa Tornu	36	36	5
	The Millennium Rice Farmers Association	Amankwa	20	20	0
	Grace Rice Farmers Association	Awonakofe	15	15	0
	District Total		**71**	**71**	**5**
Kwahu Afram Plains South	Gyidiman Farms	Odumasua/NoahKrom	200	200	190
	Bondaso Rice Farmers	Bondaso	12	12	0
	Koranteng Krachie Rice Farmers	Korateng Krachie	12	12	0
	Atonsu rice farmers ass	Atonsu	10	10	0
	Asanyanso rice farmers ass	Asanyanso	15	15	0
	Hwanyanso rice farmers ass	Hwanyanso	10	10	0
	Maame Krobo rice farmers ass	Maame Krobo	15	15	0
	Tailorkope rice farmers ass	Tailorkope	10	10	0
	District Total		**284**	**284**	**190**
Kwaebibirem	Abompe Rice Farmers Association	Abompe	18	18	0
	Pramkese Rice Farmers Association	Pramkese	17	17	0
	Kwamang Rice Farmers Association	Kwamang	15	15	0

Districts	Name of Association/ Famer Group	Name of Rice producing Area/District	Total Membership	Number Accessing Technical Services	Number Accessing Financial Services
	Okyinso Rice Farmers Association	Okyinso	21	21	0
	District Total		**71**	**71**	**0**
Kwahu West	Adom Rice Farmers Association	Kwahu Fodoa	32	32	0
	Women Rice Producers and Processors Association	Kwahu Fodoa	33	33	0
	Biakoye Rice Farmers Association	Ekawso	26	26	0
	Nkabom Rice Farmers Association	Ohene Akuraa	23	23	0
	District Total		114	114	0
Upper Manya Krobo	Akokoma Sisi Rice Farmers Association	Akokoma Sisi	45	45	0
	Dzobger Rice Farmers Association	Dzogber	57	57	0
	Akotoe Tsrebuanya Rice Farmers Association	Akotoe Tsrebuanya	29	29	0
	Battor Kope Rice Farmers Association	Battor Kope	58	58	0
	District Total		**189**	**189**	**0**
Upper West Akim	Upper West Akim Rice Farmers Association (UWARFA)	Adeiso	65	20	15
West Akim	Women Rice Farmers Association	Asamankese	28	25	0
Grand Total			**17,721**	**16,468**	**6,768**
Percentage of farmers accessing Technical and Financial Services				**92.9%**	**38.2%**

Appendix 2-Rice Retail Market Survey

District	Serial number	Name of Retailer/Store	City/Town	Rice Procured		Percentage
				Total Quantity of rice (Imported+local) in Tonnes per annum	Total Quantity of Local Rice in tonnes per annum	
Volta Region						
North Dayi	1.	The Young Shall Grow Retail Shop	Vakpo Afey	9.10	2.60	28.57
	2.	Sister Vi Retail Shop	Vakpo Fodome	9.10	1.30	14.29
	3.	Awate Store Retail Shop	Anfoega Akukome	10.66	3.12	29.27
	4.	Rock of Ages Retail Shop	Vakpo Post Office	11.70	3.90	33.33
Greater Accra Region						
Ayawaso East	5.	Hajia Azara	Nima	150.02	0.00	0.00
	6.	Bontulgou cereals and legumes	Nima	26.8	0.90	3.36
	7.	Sadiq Enterprise	Nima	347.1	0.00	0.00
	8.	Aisha Ventures	Nima	980.2	0.00	0.00
	9.	Nyame na nye	Nima	83.2	0.00	0.00
	10.	Maame Ajoa Enterprise	Nima	7.80	2.60	33.33
	11.	Aunty Ama Enterprise	Nima	7.80	2.60	33.33
Ashiedu Keteke	12.	Eva 1 Enterprise	Agbogbloshie	41.86	0.00	0.00
	13.	Genadzie Enterprise	Agbogbloshie	114.14	0.52	0.50
	14.	Yesumo Enterprise	Agbogbloshie	28.24	0.52	1.8
	15.	kate Enterprise	Agbogbloshie	57.72	0.00	0.00
	16.	Maa Aunty Enterprise	Agbogbloshie	89.96	0.78	0.9%
	17.	Akosua Seiduaa Enterprise	Agbogbloshie	9.1	0.00	0.00
	18.	Ibrahim Enterprise	Agbogbloshie	72.8	0.00	0.00
	19.	Jane One Ventures	Agbogbloshie	29.12	0.00	0.00
	20.	Christy's Enterprise	Agbogbloshie	3.64	0.00	0.00
	21.	Adihud Enterprise	Agbogbloshie	27.3	0.00	0.00
	22.	Adisatu Enterprise	Agbogbloshie		5.20	0.00
	23.	Amoro Imoro	Agbogbloshie	57.2	57.2	100.00
	24.	Janet Enterprise	Agbogbloshie	5.20	5.20	100.00
	25.	Abena		3.90	3.90	100.00

District	Serial number	Name of Retailer/Store	City/Town	Rice Procured		Percentage
				Total Quantity of rice (Imported+local) in Tonnes per annum	Total Quantity of Local Rice in tonnes per annum	
Northern Region						
Tamale Metropolis	26.	Mma Maata	Aboabo, Tamale	18.10	13.57	75.00
	27.	Tampuli Enterprise	Aboabo, Tamale	1560.00	0.00	0.00
	28.	Moopaya Fatima	Aboabo, Tamale	13.57	0.00	0.00
	29.	Nash Enterprise	Aboabo, Tamale	65.00	0.00	0.00
	30.	MH Plus (Mohammed Nuhu)	Aboabo, Tamale	390.00	0.00	0.00
	31.	Rasham Enterprise	Aboabo, Tamale	312.00	0.00	0.00
Eastern Region						
New Juaben South	32.	Diana Ofori	Koforidua central Market	5.20	5.20	100.00
	33.	Vincencia Monbenou	Koforidua central Market	2.60	0.00	0.00
	34.	Kwatema Ama	Koforidua central Market	20.80	0.00	0.00
	35.	Moree 313 Enterprise	Koforidua central Market	78.00	0.00	0.00
	36.	Amina Mohammed	Koforidua central Market	10.40	0.00	0.00
Upper East Region						
Bolga Central	37.	Mmaapika	Bolga Main Lorry Station	780.00	0.00	0.00
	38.	Madam Zulfa Rice shop	Bolga new market	1300.00	0.00	0.00
	39.	DADIN KOWA (Cynthia Aburika)	Bolga Main Lorry Station	780.00	0.00	0.00
Kassena-Nankani	40.	Madam Jane Kanoseh rice shop	Navrongo Market	3.90	3.90	100.00
Ashanti Region						
Kumasi Metropolis	41.	Daniel Owusu	Kumasi Adum market/Kejetia	55.90	23.40	41.86
Kumasi Metropolis	42.	Adom Kuraba Enterprise	Kumasi Adum market/Kejetia	52.78	4.68	8.87
Kumasi Metropolis	43.	Amanda Gyasi	Kumasi Adum market/Kejetia	39.91	3.51	8.79
Kumasi Metropolis	44.	Rindolf Lartey	Kumasi Adum market/Kejetia	54.60	2.60	4.76

District	Serial number	Name of Retailer/Store	City/Town	Rice Procured		Percentage
				Total Quantity of rice (Imported+local) in Tonnes per annum	Total Quantity of Local Rice in tonnes per annum	
Kumasi Metropolis	45.	Hajia Rashida	Kumasi Adum market/Kejetia	54.99	3.51	6.38
Kumasi Metropolis	46.	Maswudu Haruna	Kumasi Adum market/Kejetia	41.34	2.34	5.66
Kumasi Metropolis	47.	Akua Tewiah	Kumasi Adum market/Kejetia	37.44	2.34	6.25
Kumasi Metropolis	48.	Debora Achiaa Mante	Kumasi Adum market/Kejetia	30.94	2.34	7.56
Kumasi Metropolis	49.	Rose Fordjor	Kumasi Adum market/Kejetia	29.51	3.51	11.89
TOTAL				**7,920.64**	**161.24**	**2.04%**

Appendix3: Level of Access to Technical/ Financial Services by smallholder farmers in key rice growing districts

Name of Region/District_____

Name of Association/Famer Group	Name of Rice producing Area/District	Total Membership	Number Accessing Technical Services	Number Accessing Financial Services

Appendix 4-Rice Retail Market Survey Questionnaire

A1. Name of Retailer/Store: ……

A2. City/Name of market …….

A3. Date of Interview /……. /……/……/ ……..
(dd/mm/yy)

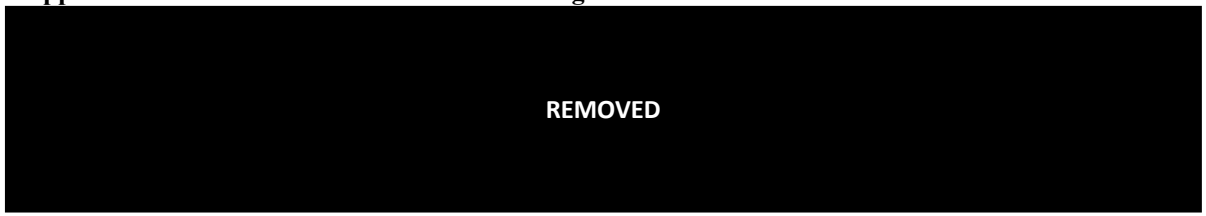
Rice retail volumes

Category	**Average number of bags sold per week**	**Indicate average weight of a bag in Kilograms**	**List names of imported/ local brands of rice sold in the appropriate row**
Average Quantity (bags) of **imported** rice sold per week			
Average Quantity (bags) of **local** rice sold per week			

Appendix 5: Persons Contacted During Field Visits

REMOVED

Appendix 6- Names and Contacts of Private Irrigation Schemes



Appendix:7 Milling Capacity of 44 Rice Mills Surveyed

S/N	District	GPS COORDINATES	CAPACITY (MT/HR)
Medium-Large Mills ≥1.6 Tons/Hour:			
1.	Ningo Prampram	REMOVED	2.5
2.	Lower Manya		1.7
3.	Ketu North		1.7
4.	South Tongu		1.7
5.	Sagnarigu		1.8
6.	Yendi		
7.	Tolon		1.7
8.	West Mamprusi		1.7
9.	Central Gonja		1.7
10.	Abuakwa Catwi		1.7
Small-Scale Mills ≤ 1.5Tons/Hour			
11.	Kumbungu		1.5
12.	East Gonja	REMOVED	0.5
13.	Builsa South		0.5
14.	Kassena-Nankana		0.5
15.	Bolgatanga East		0.8
16.	Wa		0.5
17.	Wa		0.5
18.	Wa		1.2
19.	Atwima		1.5
20.	Atima West		1.3
21.	Ejura-SekyedumaseAshanti		1.5

S/N	District	GPS COORDINATES	CAPACITY (MT/HR)
22.	Asonafo North		1.2
23.	Asunafo North		1.1
24.	Tano South		1.5
25.	Atebubu- Amantin		1.5
26.	Atebubu- Amantin		1.2
27.	Atebubu- Amantin		1.5
28.	Sefwi Wiaso		3.5
29.	Shama		1.8
30.	Bibiani		3.3
31.	Sefwi Wiaso		1.5
32.	Sefwi Wiaso		1.5
33.	Bibiani		1.5
34.	Akyemanse		1
35.	Kwabibirem		1
36.	Ho municipal		1.5
37.	Ho municipal		1.5
38.	Hohoe		1.5
39.	Hohoe		1.2
40.	Shama		1.5
41.	Assin North		1
42.	Assin North		1
43.	Assin Central		1
44.	Gomoa East		1.5