**FINAL REPORT**

**BASE LINE AND M&E MANUAL**

**FOR**
**TANZANIA NATIONAL RICE DEVELOPMENT STRATEGY (TZ-NRDS-II)**

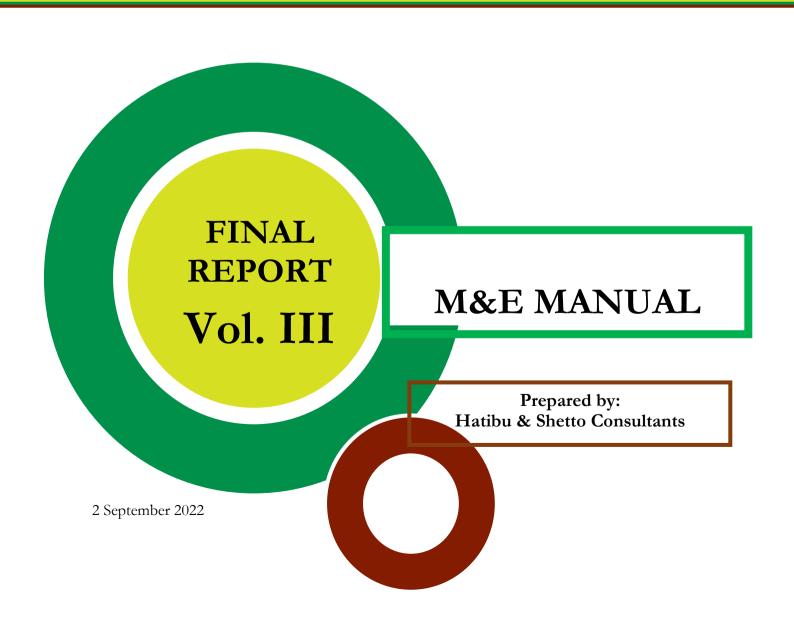**FINAL REPORT**

**Vol. III**

**M&E MANUAL**

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**ACRONYMS**

| | |
|---|---|
| AMCOS | Agricultural Marketing Cooperative Societies |
| ARDS | Agricultural Routine Data System |
| ASA | Agricultural Seed Agency |
| ASDP II | Agricultural Sector Development Strategy phase II |
| ASLMs | Agriculture Sector Lead Ministries |
| CARD | Coalition for African Rice Development |
| DC | District Council |
| DCD | Division of Crop Development |
| DMI | Division of Mechanization and Irrigation |
| DNFS | Division of National Food Security |
| DPP | Division of Policy and Planning |
| DTER | Division of Training, Extension and Research |
| GoT | The Government of Tanzania |
| IOs | Irrigators Organizations |
| JICA | Japan International Cooperation Agency |
| LGAs | Local Government Authorities |
| MDA | Ministries, Departments and Agencies |
| M&E | Monitoring and evaluation |
| MoA | Ministry of Agriculture |
| MoFP | Ministry of Finance and Planning |
| MITI | Ministry of Investment, Industry and Trade |
| MTs | Metric Tones |
| NBS | National Bureau of Statistics |
| NIMP | National Irrigation Master Plan |
| NIRC | National Irrigation Commission |
| NRDS | National Rice Development Strategy |
| NRDS TF | National Rice Development Strategy Task Force |
| PO-RALG | President's Office-Regional and Local Government Authorities |
| QDS | Quality Declared Seeds |
| SACCOS | Saving and Credits Cooperative Societies |
| SO | Strategic Objectives |
| SWOT | Strength Weakness Opportunities and Threats/Challenges |
| TCDC | Tanzania Cooperative Development Commission |
| TARI | Tanzania Agriculture Research Institute |
| TFRA | Tanzania Fertilizer Regulatory Authority |
| TMA | Tanzania Meteorology Agency |
| TOSCI | Tanzania Official Seed Certification Institute |
| UDSM | University of Dar es Salaam |
| VAEO | Village Agricultural Extension Officer |
| VICOBA | Village Community Banking |
| VSLA | Village Savings and Landing Associations |
| WAEO | Ward Agricultural Extension Officer |

# 1. INTRODUCTION AND CONTEXT

## 1.1 Background

1) The Goal of NRDS-II is to enable Tanzania to sustain national self-sufficiency in rice supply and produce a significant surplus to contribute to regional (EAC and SADC) self-sufficiency. This will make Tanzania a leading supplier to regional markets in Eastern, Central and Southern Africa[1]. Therefore, out of the 14 Indicators of NRDS-II, two will measure **achievement of this goal**: indicator **4** (*Self-sufficiency Rate (%)*), and indicator **9** (Share of local rice in the market (%)). Both will be driven by: (i) increased surplus of Tanzania rice that is competitive in the target export markets, (ii) conducive food export policies, and (iii) expanded enterprises in processing, transportation, and marketing of Tanzanian rice in regional markets.

2) To attain this goal, the strategy is to increase paddy production in the country by four folds, from 3.38 million MT/Year (or 2.2 million MT of milled rice) in 2018/19 to 13.5 million MT/year (equivalent to 8.8 million MT of milled rice) in 2029/30 (NRDS II, 2019).

3) The strategic goals and impacts of NRDS-II will be delivered through the work of all actors (public and private) working directly in the rice sub-sector and/or indirectly in sectors that influence performance of the sector. This is because, by its design NRDS-II is not a single program with full control of all inputs (especially financial), activities and outputs required to deliver its strategic goal. Therefore, the plan for M&E of NRDS-II, described in Section 6.3.2 of the strategy document, calls for **monitoring of** plans, budgets, activities, and outputs of a multitude of independent actors (public and private) (Box 1).

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**Box 1: NRDS-II Section 6.3.2: Monitoring and Evaluation**
*The following will be done to ensure effectiveness and efficiency in the implementation, monitoring and evaluation of all rice sub-sector programs/projects: -*
- *Follow-up of all stakeholders implementing projects supporting the Rice Sector, to obtain annual progress reports to the NRDS-II FP.*
- *Review the submitted reports to assess progress of rice programmes/projects, and then consolidate and produce an Annual Report.*
- *Track progress against the baseline data on various segments of the rice value chain (e.g., seed usage, fertilizer usage, adoption of good agronomic practices, postharvest losses, marketing practices).*
- *Annual stakeholders' workshop/meeting/platform for reviewing progress towards outcomes of NRDS-II and validate annual rice development report.*
- *Mid-term evaluation to be conducted in 2025 and ex-post evaluation to be conducted in early 2031.*

*These evaluations will help ensure effective monitoring of NRDS-II implementation through: -*
- *Assessment of effective implementation of projects/programmes;*
- *Identification of gaps in implementation by stakeholders;*
- *Avoiding overlapping/duplication of efforts/interventions through profiling of rice stakeholders in the country;*
- *Aggregation and dissemination of rice data and information; and*
- *Providing feedback to stakeholders on progress on NRDS-II implementation*

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[1] *However, it must be noted that this critical aspect of the goal of NRDS-II is not covered in the indicators. Therefore, a special provision should be made to evaluate this during the mid-term and end-line evaluations.*

4) For this reason, communication and sharing of M&E findings to provide feedback that influences each critical stakeholder/actor, is very critical, for the delivery of the planned outcomes and impacts of NRDS-II.

5) Therefore, the **purpose of this manual** is to provide guidance in details on how to deliver necessary and sufficient M&E of the NRDS-II.

6) Furthermore, the NRDS-II document (*in the rest of its chapter 6, as well as in chapter 5*), presents its **key priorities** for M&E. Table 1 presents these priorities against each of the 14 Indicators of NRDS-II.

**Table 1: Key Priorities Set by NRSD-II for M&E, with respect to the indicators**

| Indicator | NRDS-II Plan and Priorities for M&E | |
|---|---|---|
| | **Outputs and Outcomes, to be Evaluated** | **Inputs and enablers, to be monitored** |
| 1) Quantity of paddy production (**Million MT**) <br> 2) (a)Total area (**Million Ha**) planted with paddy | Significant increase of number of farmers and land suitable for paddy cultivation, that are fully under paddy production | The strongest enabler is commercial attractiveness of paddy production through competitive return to labor and capital for of small, medium and large-scale paddy enterprises. |
| (b)Total area (**Million Ha**) harvested with paddy | | Necessary and sufficient irrigation, GAPs and control of pests and diseases on paddy farms. |
| 3) (a) Yield (**MT/Ha**) per unit area planted <br> (b) Yield (**MT/Ha**) per unit area harvested | Increased productivity per unit area | Increased use of GAP, resilient and high yielding seeds, fertilizers, irrigation, mechanization, access to finance and adequate extension services. |
| 4) Self-sufficiency rate (**%**) | Enhanced position of Tanzania as a lead supplier of rice to regional markets in Eastern, Central and Southern Africa | • Supply of local rice is growing faster than the rate of rice consumption per person x population growth rate. |
| 5) Area (**Ha**) under irrigation for paddy production | • Rehabilitation of existing irrigation schemes <br> • Construction of new irrigation schemes. <br> • Rainwater harvesting and storage to enhance second crop per year; <br> • Effective capacity on operation and maintenance | • Policy that encourages private sector investments. <br> • R&D on technologies for enhancing water use efficiency. <br> • Capacity building on irrigation engineering and management. <br> • Adequate extension services to smallholder irrigators. <br> • Adequate financing (public, private and development funding) for investment and O&M. <br> • Enforcement of laws and regulations on water use management. <br> • Empowerment of women and youth to have equal access to irrigated lands. |
| 6) Quantity (**MT/year**) of seeds of resilient varieties | Number of farmers using, and hectares planted with, certified seeds or QDS of resilient varieties of rice | • Policies that enable institutions responsible for seed multiplication to efficiently provide services to farmers. <br> • Increased production and supply of certified and QDS seeds, through: <br> ➢ Adequate inspection and certification of seed production. <br> ➢ Improved business environment for seed producers. <br> ➢ Sufficient numbers of certified QDS farmers |

| Indicator | | NRDS-II Plan and Priorities for M&E | |
| --- | --- | --- | --- |
| | | **Outputs and Outcomes, to be Evaluated** | **Inputs and enablers, to be monitored** |
| | | | • Number of farmers sensitized on the benefits of using certified seeds of resilient varieties |
| 7) Level of industrial milling capacity **(%)** | | Increased capacity of milling machines and quality of rice produced | • Support and strengthen private sector capacity investment in high capacity and modern milling machine.<br>• Adequate local capacity for O&M of those machines. |
| 8) Level of mechaniz-ation in production (**Nos of Machinery**) | a) Tractors<br>b) Power tillers<br>c) Combine harvesters | • Paddy production farms (Ha) that are fully mechanized.<br>• % Post harvest handling that is mechanized. | • Policies (e.g., reviewed TAMS), laws and regulations that create enabling environment for investment in agro-mechanization.<br>• Increased outputs and utilization of results from R&D on all aspects of mechanization<br>• Enhanced local capacity for manufacturing, assembly, dealerships and O&M of agricultural machineries.<br>• Adequate human resource at all levels from engineers to artisans.<br>• Vibrant machinery-hire services |
| 9) Share of local rice in the market **(%)** | | • Tanzania rice is competitive in Quality and Price for local and export (regional) consumers | • Rice "*diplomacy*" to aggressively promote Tanzania rice in the regional markets.<br>• Value adding processing.<br>• Competitive trade and supply system. |
| 10) Quantity (**MT/year**) of seeds of high-yielding varieties | | Number of farmers using, and hectares planted with, certified seeds or QDS of high yielding varieties of rice | *Similar to number 6 above* |
| 11) Smallholder farmers' accessibility to financial services **(%)** | | • Contract farming scheme promoted as one way of alleviating the lack of formal farm credit among the smallholder farmers<br>• Farmers groups and associations established and strengthened to increase their bargaining power and accessibility to credits | • Scale up agricultural inputs guarantee credit scheme in the rice producing areas and facilitate timely availability of agro-inputs to farmers<br>• Policies that increase smallholder farmers accessibility to financial services (subsidies, guarantee schemes, etc.) |
| 12) Smallholder farmers' accessibility to technical training and services (%) | | • Sufficient and fully function training centers<br>• Adequate number of extension officers with relevant skills for the entire rice value chain | • Strengthening coordination and collaboration between public and private extension service providers<br>• Capacity building for extension officers on relevant technologies<br>• Facilitate extensionists with transport facilities and working gears. |
| 13) Fertilizer utilized (kg/ha) by farmers in paddy production | | Number of farmers using, and hectares applied with, the correct types, rates and timing of fertilizers | • Policies that:<br>  ➢ Enable affordable access to relevant fertilizers<br>  ➢ Encourage investments in the manufacturing, importation and distribution of fertilizers and agrochemicals<br>• Fertilizer certification increased to eliminate counterfeit fertilizers |

| Indicator | NRDS-II Plan and Priorities for M&E | |
| --- | --- | --- |
| | Outputs and Outcomes, to be Evaluated | Inputs and enablers, to be monitored |
| | | • Soil maps for fertilizer recommendations developed and disseminated |
| 14) Post-harvest losses **(%)** | • New and appropriate innovative technologies and methods to reduce rice losses, utilized | • Favorable environment for promoting post-harvest technologies investment<br>• Standardization of methodology for estimating post-harvest losses |

7) Therefore, Monitoring & Evaluation (M&E) in the context of influencing all actors contributing to NRDS-II, will require a continuous process of collecting and analyzing data and information on what activities are planned and budgeted for, and what outputs are being delivered by all key players who contribute to the development of the rice sector in Tanzania.

8) Also, because Monitoring must begin at the planning stage, NRDS-II coordinating Task Force (TF), must keenly monitor and **influence** the planning, budgeting and implementation by all the necessary key actors.

## 1.2 Proposed Users of the Manual

9) The users of this manuals, will include but are not limited to:
   a) The Focal Person (FP) of the NRDS-II Task Force (TF).
   b) The M&E lead persons (or committee) of NRDS-II. If not in place, it is strongly recommended that such a team/committee should be constituted.
   c) Task manager for NRDS-II at the CARD Secretariat and/or M&E consultants working for CARD with respect to Tanzania NRDS-II.
   d) Government departments and parastatals, which have significant roles in delivering the results of NRDS-II. Some of these are already members of the TF. Others include organizations such as the Agricultural Seed Agency (ASA); and the Tanzania Fertilizer Regulatory Agency (TFRA).
   e) The PO-RALG is a crucial actor in NRDS-II and must become a member of the TF and a key user of this manual. This is because the local authorities from regions, districts, wards and villages, provide the foundation M&E on the delivery of NRDS-II, especially through data collection for ARDS, AASS and NSCA.
   f) Program and projects (*financed by Development Partners (DPs) as well as local organizations*) relevant to the rice sub-sector,. Efforts should be made to achieve synchronization of M&E of such programs and projects, to the M&E of NRDS-II.

## 1.3 Purpose, Context and Structure of the Manual

10) **Purpose of the manual** is to guide the TF on monitoring and evaluation of key actions, projects, and programs of the public and private sector, to track the progress, outputs, outcomes and results, for delivery of the Objectives and Impacts of NRDS-II. This has four main components:
   a) Continuous monitoring through the collection, analysis and documentation of data/information on inputs, activities and outputs, that are being implemented to deliver the objectives of NRDS-II.
   b) Evaluation, that uses the collected (monitoring) information to execute periodic and timely assessment of changes and progress towards timely delivery of outputs, outcomes and then impact and sustainability, against the objectives of NRDS-II. Continuous monitoring (at least

annually) helps to identify successes and failures leading to recommendation to enhance working strategies while improving and/or changing those that did not work.
   c)   Impact assessment – in relation progress towards delivering the goal of the NRDS-II.
   d)   Wide sharing of the findings of M&E with the main actors and stakeholders.

11) **The Context** of this Manual is the fourteen indicators of NRDS-II, and the baseline setting processes. The baseline was set using mainly secondary data, and for few indicators, primary data. (**see Appendix 1 for details of the methodology used for Setting the Baseline**). Eight potential secondary sources of data for <u>setting the baseline</u> for the indicators of NRDS-II; were identified:
   a)   Agricultural Routine Data System (ARDS) of the Agricultural Sector Lead Ministry (ASLMs);
   b)   National Sample Census of Agriculture (NSCA), by National Bureau of Statistics (NBS);
   c)   Agricultural Statistics (AGSTAT) for food security of MoA
   d)   Food and Agriculture Organization Statistics (FAOSTAT);
   e)   Agricultural Annual Sample Survey (AASS) of NBS
   f)   Basic Data Book (BDB) of MOA;
   g)   National Seed Catalogue of Tanzania Official Seed Certification Institute (TOSCI); and
   h)   Annual Reports of Fertilizer Use, from the Tanzania Fertilizers Regulatory Authority (TFRA).

12) Because, it is important **to make sure that the baseline reflects the reality as much as possible**, it was important that for each indicator, the best secondary source of data is used. Therefore, the NSCA is used in most but not all cases. **However, the NSCA cannot be used for continuous M&E since it is only done every ten years.** Therefore, it is recommended to use the Agricultural Routine Data System (ARDS) during the M&E, because as illustrated in Table 2, its methodology and coverage is closely similar to that of NSCA. Hence, figures collected by through ARDS for M&E will have high levels of comparability with the baseline figures from NSCA, to enable quality measuring of progress/change against the baseline figures.

Table 2: Comparison between ARDS and NCSA

| Attribute | ARDS | NSCA |
|---|---|---|
| **Institutions involved** | Includes MoA, MLF and PORALG | Includes NBS, MoA, MLF, PO-RALG and other ASLMs. |
| **Geographical scope** | District, Regional and National | District, Regional and National. |
| **Design** | Capture data from random samples of farmers. Samples a larger than those of NSCA. | Capture data from random samples of farmers. |
| **Frequency** | Monthly, Quarterly and Annually | Done every 10 years. |
| **Timing** | End of every month | One reference day in a year across the country. |
| **Enumeration** | Done by extension officers | Done by enumerators including extension officers. |
| **Timeliness** | Provides monthly, quarterly and annual data | Provides annual data, every ten years. |
| **Accuracy** | Limited use of standard measurement | Limited use of standard measurement |
| **Analysis** | Descriptive analysis | Descriptive analysis |
| **Relevance** | High | High |

13) Assessment of the Agricultural Routine Data System (ARDS) showed that it is capable of providing regular data for the M&E of most of the indicators, because data is continuously collected and uploaded monthly, quarterly, and annually. **The only limitation** is quality as illustrated in Table 3.

Therefore, there is needed intervention (*monitoring of the ARDS*) from NRDS-II TF, to ensure that: (i) all weaknesses in data collection are removed, and (ii) generalized data are disaggregated by crops to ensure accurate monitoring of inputs, outputs, and outcomes on rice sector development as per the Indicators of NRDS-II.

**Table 3: Aspects of ARDS That Require Improvement for Effective M&E of NRDS-II**

| Completeness | Accuracy |
|---|---|
| There are gaps or missing data e.g., <br>• Indicator 13 (*Fertilizer utilized (kg/ha) by farmers in paddy production*) and <br>For some indicators, data is not properly segregated e.g., <br>• Indicator 5 (*Area (**Ha**) under irrigation for paddy production*) need disaggregation by ecologies <br>• Indicators 7 (*Level of industrial milling capacity*) Form entry 3(e) to disaggregate the milling machines according to their installed capacity to capture the % of milling machines with the capacity of ≥ 2 MT/hr <br>• Indicator 11 (*Smallholder farmers' accessibility to financial services (**%**)*) indicator should be added and data need disaggregation of farmers accessing financial services by crops, gender and age to establish women and youth inclusion <br>• Indicator 12 (*Smallholder farmers' accessibility to technical training and services (%)*) indicator should be added and need disaggregation of rice farmers accessing training and extension services by gender and age from the data collected by VAEO/WAEO to establish women and youth inclusion | i) Data collection methodology documented but verification and validation are not done regularly <br>ii) Dependence on recollection of respondents with no sample measurements of parameters |

14) Three other sources used during the setting of the baseline, are also recommended to be used for M&E. These are:
   a) The AGSTAT, for indicator 4.
   b) The TOSCI database, for indicators 6 and 10; and
   c) The TFRA's data on types and amounts of fertilizers used in each district per year, for indicator 13.

15) Only two indicators shall require primary data collection during the M&E. These are:

   a) Indicator 9 (*Share of Local Rice in the Market*). The methodology will involve (see detail in Appendix 1):
      i) Purposeful selection of supermarkets, while taking into consideration cities/towns with large populations and high purchasing power, and those close to leading rice producing areas. These cities/towns should include the ones (*Arusha, Dar es Salaam, Dodoma, Mbeya and Morogoro*) used in setting the baseline, but few more can be added.
      ii) Working with relevant City or Municipal Councils – through the Department responsible for Trade, to ensure regular, timely and complete collection of the required data and information.

   b) Indicator 14 (*Post-harvest losses (%)*). The methodology should be similar to the one being used by the Division of National Food Security (DNFS) to establish the baseline for this indicator.

16) The manual has two major parts:

a) Chapter 2, presents the key components, procedures, and work plan, for M&E. It identifies:
    i) Information flow;
    ii) Methods for data collection and/or extraction; and
    iii) Data validation and analysis.

b) Chapter 3 describes the guidelines for designing and executing a plan for communicating and sharing of the findings and recommendations of the M&E, to influence all key actors and stakeholders to act positively on those findings.

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# 2. M&E WORK PLAN AND IMPLEMENTATION

## 2.1 Hierarchy of the Indicators of NRDS-II with Respect to M&E at Different Levels

17) The standard hierarchy of M&E (Table 4) should be used to ensure that the NRDS-II TF drives for the intended impacts to be achieved. This is because, as already emphasized, the objectives and goal of NRDS-II will be delivered by the work of many actors in the public and private sector.

**Table 4: The Standard Hierarchy of M&E in the Context of NRDS-II**

| Level | What to M&E in relation to NRDS-II (*see details in Table 1*) |
|---|---|
| **Impact** | Delivery of the set targets with respect to highest-order objectives of NRDS-II, for the following impact indicators: <br> i) Self-sufficiency rate (%) (*Indicator 4*), <br> ii) Competitiveness in the national markets (*Indicator 9*). <br> *Also, although no indicators are set, it will be useful to measure impacts in terms of other stated ambitions of NRDS-II, such as:* <br> iii) Competitiveness in regional markets, and <br> iv) Incomes and wealth creation for actors along the value chain, from farm to markets. |
| **Outcomes** | Short and medium-term delivery in relation to the targets of the paddy sub-sector, against the objectives of NRDS-II, such as: <br> i) Quantity of paddy production (Million MT) per year (*Indicator 1*). <br> ii) Minimized post-harvest losses (%) (*Indicator 14*). <br> iii) Optimized profitability per MT for all enterprises along the value chain from farm to markets. |
| **Outputs** | Progress towards the targets (annual), in relation to the other 10 indicators (2, 3, 5, 6, 7, 8, 10, 11, 12 & 13) of NRDS-II, and with respect to significant contribution to the delivery of the outcomes. |
| **Activities** | Necessary and sufficient results from the actions taken or work performed by all the different actors (private and public ) working on different aspects of the rice value chains. For example: <br> a) Public sector (institutions) – that deliver specific outputs for the rice sub-sector, e.g.: <br>    i) Tanzania Agricultural Research Institute (TARI) (new rice varieties); <br>    ii) Agricultural Seed Agency (certified seed); <br>    iii) NIRC (expansion and management of irrigation for paddy); and <br>    iv) Development projects/programme in collaboration with ASLMs, (e.g., TANRICE). <br> b) Private sector delivery in relation to, for example: <br>    i) Expansion of area under paddy production. <br>    ii) Investments to expand mechanization, processing, supply of inputs, and trade and marketing of rice. <br>    iii) Expansion of financial services and special products for the rice sector. |
| **Inputs** | • Financial, human, and material inputs made available by the government, development partners and private sector investors (directly or indirectly) to the rice sub-sector. <br> • Improvement and implementation of policies and regulatory frameworks, to enhance support of the rice value chain in general and/or delivery against each indicator of the NRDS-II. |

## 2.2 Role of NRDS-II TF

18) As already indicated earlier, the role of the NRDS-TF, will be to:

a) Set targets (**see template in Appendix 2**), by specifying the quantity, quality, timing and location of the value of outputs or outcomes to be realized for each of the 14 indicators. Starting from the baseline values, the NRDS-II TF, should quantify the desired change at the end of a specified period. Targets should be realistic by taking into account the baseline value and the plans and resource allocation expected from key actors. Annual targets for each indicator should be updated in response to performance of the previous year vs the final targets.

b) Facilitate accurate and complete collection of necessary and sufficient monitoring data through the ARDS and other databases[2]. This shall require close collaboration with stakeholders implementing interventions in the rice value chain. Then, analyze the data to answer the key M&E questions presented in section 2.4.

c) Design and implement and/or supervise the implementation of mid-term evaluation in 2025 to assess the progress of the NRDS-II with respect to targets set for each of the 14 indicators. This should determine progress being made towards achievement of outcomes and impact targets. It will:
   i) Assess the effectiveness, efficiency and timeliness of implementation and delivery of outputs by key actors in the rice value chain;
   ii) Identify aspects of the NRDS plan that went well, and recommend actions required to sustain those successes in the next half period;
   iii) Identify failures and what caused them; and then
   iv) Review and recommend steps to be taken for enhancing implementation during the 2nd five-year period of NRDS-II.

d) Design and supervise the implementation of the Final Evaluation, as described in section 2.4.

## 2.3 Information Sheets for Monitoring Each of the 14 Indicators

19) This section provides design of **information sheets** and guidance on the collection and analysis of data needed for monitoring and evaluating against each of the 14 indicators of NRDS-II.

### Indicator 1: Quantity of paddy production (MT)

| Level of results | Outcome |
|---|---|
| Responsible institutions | Division of Policy and Planning – M&E Section, MoA mandated to manage ARDS on behalf of ASLMs |
| Definition | Quantity of paddy produced locally |
| Formula | a) Paddy production = Sum of paddy produced in all regions (MT)<br>b) Milled rice = quantity of paddy produced (MT) X 65% |
| Data collection methodology | Data collection is done by LGAs using ARDS tools starting from the village level.<br>a) Village Agricultural Extension Officer (VAEO) samples 10-20 farmers' fields during harvesting to get estimates of paddy produced<br>b) VAEO extrapolates production data based on the area planted as captured in the village farmers' register |

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[2] A lot of attention and support is required for ensuring that the ARDS is delivering at its full design capacity in terms of quantity and quality of data. That is there should be a serious "*monitoring the ARDS*" with respect to data on rice.

| | c) | Submit the data to the Ward Agricultural Extension Officer who aggregates the data and submits the forms to the District Statistics Officers who enter the data in the ARDS. |
|---|---|---|
| | d) | District Statistics officer submits the data to the Regional Secretariat who aggregates the data at regional level and submit to the DPP |
| | e) | DPP aggregates the data from all regions to get total quantity of paddy produced in the country in that particular year |
| | f) | NRDS TF collects data from ARDS, validate and compile for reporting |
| Disaggregation needed | a) Total paddy produced | |
| | b) Total milled rice produced | |
| Source of Data | ARDS database | |
| Frequency | Annually – can be collected at the end of rice production season in each calendar year | |

### Indicator 2: Total area planted/harvested with paddy (million hectares)

| Specifications | a) Total area harvested with paddy (million hectares). |
|---|---|
| | b) Total area planted with paddy (million hectares). |
| Level of results | **Output** |
| Responsible institutions | Division of Policy and Planning – M&E Section. |
| Definition | Total area harvested or planted with paddy. |
| Formula | Sum of area planted or harvested with paddy produced in all regions. |
| Data collection methodology | The area harvested or planted with paddy is obtained from ARDS database which is compiled from the data collected from the villages and ward level and aggregated at district, regional, and national level. |
| Disaggregation needed | None. |
| Source of Data | ARDS database. |
| Frequency | Annually – can be collected at the end of rice production season in each calendar year |

### Indicator 3: Yield per unit area planted or harvested with paddy (MT per ha)

| Specifications | (a) Yield per unit area harvested (MT per ha). |
|---|---|
| | (b) Yield per unit area planted with paddy (MT per ha). |
| Level of results | **Output** |
| Responsible institutions | Division of Policy and Planning – M&E Section, MoA. |
| Definition | Average quantity of paddy grains produced per hectare of land planted or harvested with paddy. |
| Formula | Total paddy produced divided by area planted per harvested. |
| Data collection methodology | (a) Obtained by a simple division of the total quantity of paddy produced i.e., indicator 1, by total area planted (i.e., indicator 2) which result to MT per Ha. |
| | (b) Simple division of the total quantity of paddy produced i.e., indicator 1, by the total area harvested (i.e., indicator 2) which result to MT per Ha |
| Disaggregation needed | None |
| Source of Data | Extraction from ARDS database. |
| Frequency | Annually – can be collected at the end of rice production season in each calendar year |

### Indicator 4: The Self-Sufficiency Ratio (SSR) (%)

| Level of results | **Impact** |
|---|---|
| Responsible institutions | Division of National Food Security of MoA with mandate for monitoring food security status. |
| Definition | Coverage rate of rice needs by local production. |

| Formula | The Self Sufficiency Ratio (SSR) is derived by comparing production and requirement (consumption + non-food requirements [i.e., seeds, animal feeds, traded produce (imported and exported[3]) and crop losses]) in percentage. (e.g., baseline data of 2017/2018 shows that production of paddy was 2,219,628MT divided by rice requirement i.e., 990,044 MT times 100% to get 224%). |
|---|---|
| Data collection methodology | a) The data for computation of SSR is collected, compiled, and computed by DNFS using 10 different key data collection tools (Appendix 3). <br> b) The NRDS TF will extract data from AGSTAT report produced annually by DNFS to determine the extent of the rice self-sufficiency for that particular year and the trends of SSR for rice in the country. |
| Disaggregation needed | None |
| Source of Data | DNFS - AGSTAT report |
| Frequency | Annually |

## Indicator 5: Area under Irrigation (Ha)

| Level of results | **Output** |
|---|---|
| Responsible institutions | National Irrigation Commission |
| Definition | Area under rice cultivation with supplementary irrigation that could mitigate the negative impacts of weather fluctuations on rice production. |
| Formula | Sum of area planted with paddy under irrigation during short rainy season (ha) + area under paddy irrigated during long rainy season (ha). |
| Data collection methodology | Area irrigated with paddy during short rainy season (ha) and area under paddy irrigated during long rainy season (ha) will be collected from ARDS database to give a total area under irrigation each year. |
| Disaggregation needed | Need disaggregation by irrigated and non-irrigated rice systems |
| Source of Data | ARDS database. However, when the NIRC database become available it can be used for validation. |
| Frequency | Annually – compilation can be done after the end of short rainy season and after end of long rainy season and summed to get annual figure. |

## Indicator 6: Quantity of Seeds of Resilient Varieties (MT)

| Level of results | **Output** |
|---|---|
| Responsible institutions | Tanzania Official Seed Certification Institute (TOSCI). |
| Definition | Quantity of seeds of locally preferred varieties with resilient characteristics, locally produced and/or imported annually. |
| Formula | Quantity (MT) of Seeds of Resilient Varieties = Quantity of Certified Seeds of Resilient Varieties (locally produced + imported) + Quantity of QDS of Resilient Varieties locally produced (MT). |
| Data collection methodology | a) First step is to obtain information from the TOSCI catalogue that is published annually regarding the varieties, for which Certified and/or QDS seed was produced in the year under monitoring (See Appendix 4). <br> b) Use the catalogue to determine which of those varieties meet the resilience characteristics. <br> c) Extract information on the quantities of seed produced as certified, or approved as Quality Declared Seed (QDS), from Annual Reports produced by TOSCI to compliment the data from the Catalogue of Varieties. <br> d) Fill in the Table as presented in Appendix 2 to establish a summary that can be used for NRDS-II M&E. |

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[3] NRDS TF should ensure data for rice imports and exports is collected and disaggregated.

| | e) Validate the information with TOSCI and TARI-Ifakara, to obtain more insights on the characteristics of the rice varieties. |
|---|---|
| Disaggregation needed | Disaggregation of quantity of locally produced and imported rice seeds. |
| Source of Data | TOSCI |
| Frequency | Annually – can be collected at the end of rice production season in each calendar year |

## Indicator 7: Level of industrial milling capacity (%)

| Level of results | **Output** |
|---|---|
| Responsible institutions | Division of Mechanization and Irrigation (DMI). |
| Definition | Ratio of installed capacity of medium and large mills among all functional mills |
| Formula | Number of machines for paddy milling, with installed capacity ≥ 2MT per Hr per Total number of all functional mills times 100. |
| Data collection methodology | i. Field surveys to be conducted in leading rice producing regions in the country (Appendix 5). <br> ii. Multistage purposeful sampling to be used to select districts among the 64 major rice producing districts in the country. <br> iii. Key Informants (managers and supervisors) interviews to be used to collect data using a structured questionnaire complimented with physical observations/assessment of the milling machines. <br> iv. Random or snowball sampling procedure to be used to select the interviewees under the guidance of ward and village extension officers in the respective villages and wards. |
| Disaggregation needed | ARDS data Form entry 3(e) to disaggregate the milling machines according to their installed capacity to capture the % of milling machines with the capacity of ≥ 2 MT per hr. |
| Source of Data | ARDS |
| Frequency | Annually – can be collected at the end of rice production season in each calendar year |

## Indicator 8: Level of mechanization in production (Numbers)

| Level of results | **Output** |
|---|---|
| Responsible institutions | Division of Mechanization and Irrigation (DMI). |
| Definition | Number of machines (tractors, power tillers, combine harvesters) available for ploughing and harvesting (in rice producing areas). |
| Formula | Sum of the total number of tractors, power tillers and combine harvesters |
| Data collection methodology | i) Number of tractors, power tillers and combine harvesters counted and recorded by VAEOs when filling in monthly, quarterly, and annual forms for ARDS. <br> ii) The data is aggregated at ward, fed into the ARDS at district level, aggregated at regional and national level. <br> iii) The number of tractors, power tillers and combine harvesters in the 64 districts producing most of the rice in the country, should be used as a "proxy" for mechanization for paddy production in the country. |
| Disaggregation needed | None |
| Source of Data | ARDS |
| Frequency | Annually – can be collected at the end of rice production season in each calendar year |

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

| Level of results | Impact |
|---|---|
| Responsible institutions | NRDS TF/PO-RALG (City/Municipal Councils). |
| Definition | Share of locally produced rice in the total quantity of rice procured by major retail stores for a year. |
| Formula | Share of local rice in the market (%) = Quantity of locally produced rice sold in major retail stores for a year (MT) divided by the Total Quantity of rice sold in major retail stores for the year (MT) times 100. |
| Data collection methodology | i) Field surveys to be conducted in leading rice producing regions in the country (Appendix 6).<br>ii) Multistage purposeful sampling to be used targeting supermarkets cities or towns with large populations and high purchasing power, and those close to leading rice producing areas. These cities or towns should include the ones used for baseline setting (i.e. Arusha, Dar es Salaam, Dodoma, Mbeya and Morogoro), but other can added if necessary.<br>iii) Key Informants (managers and supervisors) interviews to be interviewed to collect data using a structured questionnaire.<br>iv) Random sampling of supermarkets will be done, and data collection to be done by the NRDS TF under the guidance of the Department responsible for Trade in LGAs. |
| Disaggregation needed | Disaggregation of quantity of locally produced and imported rice in supermarkets. |
| Source of Data | Primary data collection by NRDS TF itself or relevant department |
| Frequency | Annually, preferably in June of each year just at beginning of harvest time to avoid the influences of fluctuation of production at the harvest and lean seasons. |

**Indicator 10:   Quantity (MT) of seeds of high-yielding varieties**

| Level of results | Output |
|---|---|
| Responsible institutions | Tanzania Official Seed Certification Institute (TOSCI) |
| Definition | Quantity of seeds of locally preferred varieties with resilient characteristics, locally produced and/or imported annually |
| Formula | Quantity (MT) of seeds of high yielding varieties = Quantity of Certified Seeds of high yielding varieties (locally produced + imported) + Quantity of QDS of high yielding varieties locally produced (MT) |
| Data collection methodology | i) First step is to obtain information from the TOSCI catalogue that is published annually regarding the varieties, for which Certified and/or QDS Seed was produced in the year under monitoring<br>ii) Use the catalogue to determine which of those varieties meet the high yielding characteristics.<br>iii) Extract information on the quantities of seed produced as Certified, or approved as Quality Declared Seed (QDS), from Annual Reports produced by TOSCI to compliment the data from the Catalogue of Varieties<br>iv) Fill in the Table as presented in Appendix 2 to establish a summary that can be used for NRDS-II M&E.<br>v) Validate the information with TOSCI and TARI-Ifakara, to obtain more insights on the characteristics of the rice varieties. |
| Disaggregation needed | Disaggregation of quantity of locally produced and imported rice seeds |
| Source of Data | TOSCI |
| Frequency | Annually – can be collected at the end of rice production season in each calendar year |

**Indicator 11:   Smallholder farmers' accessibility to financial services (%)**

| Level of results | Output |
|---|---|
| Responsible institutions | Division of Policy Planning (DPP) - Monitoring section |
| Definition | Percentage of smallholders in pre-selected farmers' groups/associations regularly accessing necessary financial services (in rice producing areas). |
| Formula | Number of smallholder farmers who received credits divided by the total numbers smallholder farmers in selected farmers' groups and or associations in rice producing areas times 100 percent. |
| Data collection methodology | i) Sample survey to collect primary data from selected schemes in major rice growing districts to be conducted by NRDS TF in close collaboration with DAICOs. The structured questionnaire to be used is presented in Appendix 7. <br> ii) Focus group interviews with IOs leaders to be conducted in selected schemes |
| Disaggregation needed | Disaggregation of farmers accessing financial services by crops, gender and age from the data collected by VAEO/WAEO to establish women and youth inclusion |
| Source of Data | ARDS database, |
| Frequency | Annually – can be collected at the end of rice production season in each calendar year |

**Indicator 12: Smallholder farmers' accessibility to technical training and services (%)**

| Level of results | Output |
|---|---|
| Responsible institutions | Department of Training Extension and Research (DTER) |
| Definition | Percentage of smallholder in pre-selected farmers' groups and or associations regularly accessing technical training and extension services (in rice producing areas) |
| Formula | Number of smallholder farmers who are accessing technical training and extension services divided by the total smallholder farmers in selected farmers' groups and or associations in rice producing areas times 100 percent |
| Data collection methodology | i) Collect data from ARDS database and M-Kilimo data which the DTER is the custodian <br> ii) Sample survey to collect primary data from selected schemes in major rice growing districts to be conducted by NRDS TF in close collaboration with DAICOs. The structured questionnaire to be used is presented in Appendix 7. <br> iii) Focus group interviews with IOs leaders to be conducted in selected schemes |
| Disaggregation needed | Disaggregation of rice farmers accessing training and extension services by gender and age from the data collected by VAEO/WAEO to establish women and youth inclusion |
| Source of Data | ARDS database and sample survey |
| Frequency of data collection | Annually – can be collected at the end of rice production season in each calendar year |

**Indicator 13:   Fertilizer utilized (kg/ha) by farmers in paddy production**

| Level of results | Output |
|---|---|
| Responsible institutions | Tanzania Fertilizer Regulatory Authority (TFRA) & Division of Policy and Planning – M&E Section |
| Definition | Amount of fertilizer utilized (Kg/ha) by smallholder farmers in paddy production |

| Level of results | Output |
|---|---|
| Formula | Total (DAP + UREA) utilized in particular year x 20%/Area planted with paddy in that year |
| Data collection methodology | i) Two variables are used: total fertilizer used in paddy production, and the area planted with paddy in that particular year. <br> ii) Paddy production account for about 20% of the total DAP & UREA fertilizers used in crop production in Tanzania. <br> iii) Therefore, the quantity of fertilizer used in paddy production (kg/ha) is obtained by dividing the quantity of fertilizer used in paddy production (20% of the DAP & UREA utilized in crop production) as reported by TFRA, by the Area planted with paddy as reported by ARDS in that particular year. |
| Disaggregation needed | i) TFRA data records the type of fertilizer utilized in the country by region and district <br> ii) It should also be disaggregated by crop to capture percentage used in rice production. |
| Source of Data | TFRA (Quantity of fertilizer utilized in paddy production) and ARDS (Area planted with paddy) |
| Frequency of data collection | Annually |

## Indicator 14: Post-harvest losses (%)

| Level of results | Outcome |
|---|---|
| Responsible institutions | Division of National Food Security of MoA |
| Definition | Percentage of harvested rice that is lost before reaching the final consumer (at harvesting, processing, and transportation to the final consumer) |
| Formula | a) It is a complicated process that requires measurement of losses at each transition point, such as: <br> i) Harvesting loss <br> ii) Transportation (between the farm and the drying facility) loss <br> iii) Paddy storage loss <br> iv) Transportation (between the store and the milling facility) loss <br> v) Milling loss <br> b) At each transition point the loss (%) is measure by: (Dry weight equivalent before the step (X) **minus** dry weight equivalent after the step (Y)) divide by Dry weight equivalent before the step (X) times 100. That is: $\mathbf{100x(X-Y)/X.}$ |
| Data collection methodology | Field survey as defined by DNFS, and currently being implemented to set the baseline for this indicator |
| Disaggregation needed | None |
| Source of Data | DNFS |
| Frequency of data collection | Annually |

## 2.4 Evaluation of Outputs and Outcomes

### 2.4.1 Delivery of outputs

20) Evaluation of outputs of NRDS includes efforts made by the Government and other stakeholders to achieve NRD II objectives. These are short term results of interventions conducted by the Government and other stakeholders. These includes interventions conducted within an evaluation period. The NRDS secretariat should consolidate all outputs from stakeholders and projects.

21) Monitoring delivery of outputs should also include tracking of resources allocated, the use of resources, the progress of activities, how activities are delivered – the efficiency in time and resources and the delivery of outputs. For effective monitoring of outputs, the NRDS secretariat should identify all interventions in rice value chain throughout the country and consolidate their outputs as per monitoring schedule (annually, midterm evaluation and endline).

22) Evaluation of outputs should also include documentation of case studies (to capture success and failure stories) of different stakeholders. How different interventions lead to achievements on intended objectives/outcomes of NRDS II.

### 2.4.2 Measuring the extent at which progress is made

23) In monitoring progress, the indicators should be measured percentage (%) progress against the targets. This will give map of progress in terms of how much have been achieved from baseline and how long is the remaining journey to achieve the targets of NRDS-II.

24) This should answer the questions on What has worked well? What has been achieved? What has not worked well? and What should be changed for further progress. The progress should be presented in simple tables and graphics for quick interpretation and reflection by users of NRDS M&E reports.

25) According to Tz NRDS (2019-2030), the NRDS secretariat under the Ministry of Agriculture has the role to aggregate data from stakeholders, establish and maintain rice database, organize annual rice stakeholders' forum/workshops, monitor and evaluate the progress on rice value chain development and prepare annual report on progress on NRDS II implementation.

### 2.4.3 Mid-term evaluation

26) The mid-term evaluation focuses on the process of program implementation. The evaluation uses data and information from the strategy to assess progress in implementing; assess progress towards achievement of objectives; assess if interventions are sufficient to reach desired outcomes; identify barriers to achievement of objectives, and to provide recommended actions to guide the stakeholders through the last half of the strategy implementation.

27) According to NRDS II (2019-2030) the mid-term evaluation will be conducted in 2025. It is expected to provide five years achievements based on indicators and include the insights on contribution from various stakeholders' interventions on rice value chain.

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### 2.4.4 End line evaluation

28) The final evaluation should be conducted in 2030 focusing on assessing if the strategy met the stated goals and objectives; the effectiveness of implementation; lessons learned and propose focus area for the next strategy.

29) The endline evaluation will also contribute to the baseline setting for the next rice development strategy.

## 2.5 Data Analysis and Reporting

### 2.5.1 Validation and analysis

30) The analysis of NRDS II M&E data should involve simple descriptive analysis methods. Triangulations should be used to validate data collected from variety of data sources. Depending on type of variables and data for each indicator, analysis will further involve developing graphics and cross tabulations for comparisons and showing the relationships between multiple variables.

### 2.5.2 Triangulation

31) Adopting triangulation approach acknowledges available source of data from distinct methodological positions. While there are multiple sources, triangulation is done to enhance validity, to create a more in-depth picture, and to interrogate different ways used to collect data. The NRDS II M&E will consider databases of various MDAs including ARDS, NBS, FAOSTAT, other reports from development program/projects and the data to be collected from sample surveys.

### 2.5.3 Quality assessment

32) Data quality assessment (DQA) should be adopted to evaluate data to determine whether they meet the quality required for NRDS M&E. The data sources should therefore be assessed on how best it guarantees validity, consistency, timeliness, completeness, accuracy and relevance for each indicator.
   a) **Validity**: This involves checking how suitable is the methodology used by the source to provide the best national level data for measuring an indicator.
   b) **Consistence**: This involves checking whether similar methodology of data collection is used across different locations and over time.
   c) **Timeliness**: This involves checking whether data can be accessed from custodian at clearly defined regular interval.
   d) **Completeness:** This involves checking the extent how required data are collected (whether there are gaps or missing data) across locations and over time.
   e) **Accuracy:** This involves checking how data collection and handling processes ensure less or zero errors.
   f) **Relevance**: This involves checking how data collected by the custodian is considered useful in decision making and accepted by authorities.

# 3. COMMUNICATION, SHARING AND UTILIZATION OF M&E RESULTS

## 3.1 Purpose

33) **The Objective is** to ensure that findings and conclusions of the M&E process, are put into use to solve problems, correct shortfalls, and accelerate the process towards outcomes and impact of NRDS-II. Effective communication and sharing of findings of M&E, to the widest range of stakeholders of NRDS-II, shall enhance relevant actions that will in turn lead to greater achievements of the developmental impact of the strategy. For example:

    a) **Higher and more focused contribution** by stakeholders will be driven by the information on achievements made, gaps and opportunities for improvement of interventions. Such information will drive course correction and higher and more focused contribution to the implementation of NRDS II, by all actors from farmers to the central government.

    b) **Accountability and transparency** of public sector stakeholders who are mandated to implement components of NRDS-II, will be enhanced through constructive feedback emanating from M&E. These include enhancing implementation, data collection, management and transparency by mandated parties.

    c) **Reflection and learning** on implementation of key components of NRDS-II, by both public and private sector actors, will enable stakeholders to measure their contribution on achievements while identifying gaps, challenges and opportunities for improvements.

    d) **Improvement and harmonization of monitoring and evaluation systems:** The communicated findings of M&E will encourage improvements in data collection and identify areas that require harmonization among parties involved.

    e) **Informing high level decision making** on rice value chain development. The findings will enable identification of areas that require prioritization in plans and budgets of (i) national and LGA levels, (ii) international development partners and (iii) the private sector partners.

    f) **Driving competitiveness of the Tanzania rice in national and regional markets**. The findings will enable identification of areas that require prioritization by both public and private sector actors to enhance competitiveness.

    g) **Designing of projects:** Identification of gaps in the necessary and sufficient actions, will enable stakeholders to identify areas that require more efforts and thereby providing justification and inputs in designing new projects proposals to source funds for rice sector development projects.

    h) **Collaboration among stakeholders:** Sharing M&E findings will inform, encourage and enhance collaboration of actors implementing various aspects of NRDS-II, from Farms-To-Markets. This includes collaboration in for example, fund raising, coordination of implementation plans, and value chain coordination.

34) This section provides guidelines of how to develop a robust plan for putting the necessary findings, interpretations and recommendations of M&E, in the hands of the key actors in the rice sector of Tanzania. As illustrated in Box 1, the NRDS-II documents already identified the following aspects:

    a) *Review the submitted reports to assess progress of rice programs/projects, and then consolidate and produce an Annual Report.*

    b) *Annual stakeholders' workshop/meeting/platform for reviewing progress towards outcomes of NRDS-II and validate annual rice development report.*

35) However, these two actions are inadequate for the purpose of informing and influencing planning, budgeting, investments and actions by all rice stakeholders at all levels, from farmers to the central government. Therefore, the purpose of this chapter of the manual is to provide guidelines on how to develop and implement a consequential plan for communicating and sharing findings and lessons of M&E.

36) Key aspects of a Communication and Sharing Plan, include the following:
   a) Setting up the core team that will be responsible for implementing the communication and sharing of M&E findings.
   b) Identification and description (*knowledge, attitudes and practices (KAP)*) of the key stakeholders who will be prioritized for the communication and sharing of M&E findings.
   c) Specification of findings of M&E that will be communicated/shared with each category of stakeholders, and the purpose of communicating with each category.
   d) Selection of correct media channels and materials for communicating with different categories of stakeholders (note – *annual stakeholders' workshop is not sufficient by itself*).
   e) Budget for communication and knowledge sharing.

## 3.2 Core Team Dedicated to Communication and Sharing of M&E Findings

37) The NRDS-II TF should set up a team that will focus on ensuring that the M&E findings are packaged into Communication and Knowledge Sharing Products (CKSP) suitable for each type of key stakeholders. Table 5, illustrate five key actions that require communication experts as part of a core team for packaging, communicating, and sharing of the findings to different categories of the stakeholders of NRDS-II.

**Table 5: Roles and Responsibilities of the Core Team**

| Define Critical Role *(example only)* | Define Team Member (by office) | Specify Timing of Delivery |
|---|---|---|
| Identify communication stakeholders of NRDS-II who must be informed of different findings, conclusions and recommendations of the M&E (*see section 3.3, for details*). | | |
| Categorize the recommendations of the M&E and decide which should be communicated to which stakeholders. This must be driven by what NRDS-II wants the stakeholder to do, e.g., communication to the Minister of Finance to justify increased budget, etc. (*see section 3.3, for details*). | | |
| Develop, Pre-test and Produce the relevant communication materials (*each need to be: specific for the target stakeholder(s); ease of use and fit for purpose of influencing action*). This also requires the use of correct media and channels, specific for each targeted stakeholder. | | |
| Implement Communication and Sharing, using the suitable media and channels | | |
| Make follow-ups to monitor and evaluate the actions taken by stakeholders as a result of the shared findings and recommendations of the M&E of NRDS-II. | | |

## 3.3 Key Stakeholders of NRDS-II to Receive Specific Findings and Recommendations of M&E

38) The 14 indicators of the NRDS-II, illustrate that there is a very high number of stakeholders that must be influenced to do more, new and different actions (policy, budgets, investments, business development, etc.) in response to findings of M&E.

39) Table 5 illustrate what is required in identifying and assessing the stakeholders, so that specific communication products can be designed and shared appropriately. The example presented in

Table 6, is related to, for example, an M&E finding that shows that in the year under review, public programs/projects supporting the rice sub-sector, did not receive adequate budget allocation and/or disbursement.

**Table 6: An Illustration of the Planning for Communication to Relevant Stakeholders**

| Target Stakeholder | Communication objectives: What do Want Done, Added and/or Corrected (*Examples…*) | Current Knowledge, Attitude, Practice (KAP) of Stakeholders | Examples of communication channels and media through which M&E findings and recommendations will be communicated |
|---|---|---|---|
| Ministry of Finance and Planning | ✓Supportive Fiscal Policies (specially to attract private sector investment in the Rice Sector); and <br> ✓Budget Allocation and Disbursements for necessary and sufficient public sector working in the Rice Sector. | National policy makers in Tanzania prioritize agriculture in general. <br><br> However, other ASLMs tend to prioritize their own sectors – and effort is required to drive action on rice sub-sector (*e.g. getting the Ministry of Investment Industry and Trade (MIIT) to prioritize rice milling industries as part of industrialization agenda*). | ✓Executive summaries of NRDS-II M&E Findings and Recommendations; <br> ✓Policy briefs (*co-authored where possible by senior staff of the target ministry*); <br> ✓One-to-one meetings with heads of relevant departments or Chairs of relevant parliamentary committees; <br> ✓Short workshops (physical and virtual) with specific group of stakeholders (e.g., department directors); and <br> ✓News media to raise awareness of the public at large to emphasize the urgency of the required action |
| Min. of Agriculture | ✓Support to the NRDS-II Task Force; <br> ✓Budget allocation for rice work in the ministry's departments and agencies; <br> ✓Guidelines and support to the extension services; and <br> ✓Supportive policies for supply of inputs and marketing of outputs. | | |
| Other ASLMs including PO-RALG | ✓Support to the NRDS-II Task Force in data collection for M&E including conducting field surveys for indicator 9, 12 and 14. <br> ✓Budget allocation for rice work in the LGAs and relevant ministry's departments and agencies. | | |
| MPs – especially those from rice producing districts | ✓Championing of NRDS-II and its support, in Parliament and District Councils. | | |

40) Based on the example given in Table 6, NRDS-II TF, should prepare such check lists for communicating and sharing each specific M&E finding to stakeholders relevant to the actions required to respond to the findings. Certainly, the targeted stakeholders will change each year depending on the M&E findings. This means, the planning as illustrated in Table 6 will be driven by the M&E findings that need to be communicated. Table 7 gives examples of the key communication stakeholders for each of the indicators of NRDS-II.

**Table 7: Key Stakeholders for Communication and Sharing of Findings of M&E**

| Indicator | Stakeholders to be Targeted for Sharing of M&E Findings | |
|---|---|---|
| | Public (*examples*) | Private Sector (*examples*) |
| 1) Quantity of paddy production (**Million MT**) | Ministries of Land, Housing and Human Settlements Development and Ministry of Water - regarding land and water allocation for expanding irrigated land under rice cultivation. | Local and foreign investors, to attract investment for expansion of modern irrigated rice farming. |
| 2) (a)Total area (**Million Ha**) planted with paddy | | |
| (b)Total area (**Million Ha**) harvested with paddy | | |
| 3) (a) Yield (**MT/Ha**) per unit area planted | MoA and PORALG, with respect to expansion of training and extension services to ensure that all small and medium scale farmers are implementing GAPs to the full. | Local and foreign investors, to attract investment for expansion of productivity enhancing technologies in rice farming. |
| (b) Yield (**MT/Ha**) per unit area harvested | | |
| 4) Self-sufficiency rate (**%**) | Similar to 1 and 2 above | Similar to 1 and 2 above |

| Indicator | Stakeholders to be Targeted for Sharing of M&E Findings | |
|---|---|---|
| | Public (*examples*) | Private Sector (*examples*) |
| 5) Area (**Ha**) under irrigation for paddy production | • Ministry of Water,<br>• National Irrigation Commission, and<br>• PO-RALG (on irrigation extension) | Local and foreign investors, to attract investment for expansion of modern irrigated rice farming. |
| 6) Quantity (**MT/year**) of seeds of resilient varieties | • TARI<br>• TOSCI<br>• ASA | • Private Seed companies to attract investment for expansion of production, distribution and marketing of Certified Seeds<br>• Medium scale farmers, to produce and distribute QDS. |
| 7) Level of industrial milling capacity (**%**) | • Ministry of Investment, Industries and Trade<br>• Small Industries Development Organization (SIDO) – to expand local manufacturing of especially spare parts.<br>• Vocational Education Training Authority (VETA) – to expand human resource capacity for O&M of milling machines. | • Private companies (local and international) to attract investment for expansion of investment in high capacity and modern rice milling machine and industries. |
| 8) Level of mechanization in production | • MoA; CAMARTEC and TEMDO, etc. - Increased outputs and utilization of results from R&D on all aspects of mechanization. | • Local and foreign investors, to attract investment for manufacturing, assembly, dealerships, O&M and vibrant machinery-hire services |
| 9) Share of local rice in the market (**%**) | • MIIT – for competitive trade and supply systems. | • Local and foreign investors, to attract investment for marketing and trading rice locally and across the borders |
| 10) Quantity (**MT/year**) of seeds of high-yielding varieties | *Similar to number 6 above* | *Similar to number 6 above* |
| 11) Smallholder farmers' accessibility to financial services (**%**) | • Bank of Tanzania (BoT), for Special Loan Fund (SLF) for banks and other financial institutions to enable affordable loans to small and medium scale farmers. | • Development of contract farming with small and medium scale farmers.<br>• Supplier credits for inputs supply to small and medium scale farmers. |
| 12) Smallholder farmers' accessibility to technical training and extension services (%) | • PO-RALG to increase budget and number of extension officers with relevant skills for the entire rice value chain | • Private extension services in contract farming and out-grower schemes |
| 13) Fertilizer utilized (kg/ha) by farmers in paddy production | TFRA – adequate supply of the right types of fertilizers.<br>MoA - Soil maps for fertilizer recommendations per agro-ecology. | Local and foreign investors, to attract investments in the manufacturing, importation and distribution of fertilizers and agrochemicals. |
| 14) Post-harvest losses (**%**) | MoA and PORALG, with respect to expansion of extension services to ensure that all small and medium scale farmers are practicing good post-harvest handling techniques including use of machinery like reapers, threshers, winnowers and combine harvesters during harvesting, and driers. | • Local and foreign investors, to attract investment for manufacturing, assembly, dealerships, O&M and vibrant machinery-hire services for post-harvest handling technology that are affordable to smallholders<br>• Smallholder entrepreneurs to provide mobile services for reaping, threshing, winnowing and drying services to small and medium scale farmers |

### 3.4 Selecting the Correct Media Channels for Communicating Findings of M&E

41) There are two sets of channels that can be used for communication and sharing of findings and recommendations from M&E. These include: (i) media tools and (ii) activities. Tools are equipment, instruments or any piece of technology that can be used in communication. These include computers, telephones, projectors, television, radio, printed media (e.g., books, journal articles, policy briefs, leaflets, posters, reports, letters, newspapers, etc.). On the other hand, activities refer to any functions or actions that are performed by an individual or a group of people to communicate. These include demonstrations plots, field days and tours, workshops, conferences, meetings, training events, extension visits, and drama. Not all the available media of communication work for every stakeholder and/or message to be communicated.

42) It must be noted that different stakeholders pay attention to type of media used to communicate to them. Also, the level of office you are communicating with, determines what media channel to use. For example, we cannot communicate policy recommendations to the minister, through WhatsApp or SMS messages. Therefore, the media used must be the most appropriate for the message and the intended recipient, so as to effectively meet the objectives of communicating the M&E findings to different stakeholders. This requires analysis-based matching of the media chosen with the audience, the message, and the purpose of communication.

### 3.5 Budget for communication and sharing of M&E Findings

43) Good communication and sharing of knowledge and findings, has a cost attached to it. The main cost will be the staff time for the "communication core team" defined in section 3.2. However, over and above this personnel cost, the NRDS-II TF, needs to set aside at least 15% of its budget for communication and sharing of findings of M&E. At the same time, it is important that NRDS-II TF maintains flexibility to ensure that this aspect of its work is allocated sufficient budget. Of course, sharing of resources and cost with the departments and institutions forming the TF, will be necessary to enable availability of adequate resources for communication, sharing, learning, and acting on the findings of the M&E of NRDS-II.

# APPENDICES

**Appendix 1: Summary of Methodology Used in Setting the Baseline**

44) Assessment and extraction of secondary data and information, was through:
    a) Meetings and consultations with the custodians of each of the database.
    b) Desk reviews and Key Informants Interviews (KIIs), including (i) collectors of primary data at village and ward levels; (ii) processors of data at district, regional and national levels; (iii) managers and directors at national level.
    c) SWOT analysis of each of the databases.
    d) Review of the reports emanating from each database, in relation to capturing data required for the baseline as well as the M&E of NRDS-II indicators.

## Collection and Processing of Primary Data

45) Field surveys and primary data collection was conducted using multi-stage approach of purposive, area, and snowball sampling. Eight (8) districts were purposively selected. The selected districts came from the three major ecologies producing rice in Tanzania, i.e., Southern Highlands, Eastern and the Lake zone. These included the leading district for production of rice which each zone. More districts were chosen in Morogoro regions as it provides the largest numbers of district in the top 20 rice producing districts in the country. The purpose was:
    a) In-depth verification of data feeding into ARDS, AASS as well as M-Kilimo[4]; and
    b) Primary data collection for indicators to validate data from existing databases.

46) With respect to the ARDS, AASS and M-Kilimo databases:
    a) The main focus was to validate the processes of data collection from village levels and feeding upwards to the district, regional and then national levels.
    b) The main respondents were Regional Agricultural Advisors (RAA); Regional, District Agricultural, Irrigation and Cooperative Officers (DAICO) and District Statisticians (particularly those who are directly engaged in the ARDS); Village and Ward Agricultural Extension Officers (VAEOs and WAEOs).

47) KIIs were conducted with rice millers (mainly through managers and supervisors) to collect data for Indicator 7 (*Level of industrial milling capacity (%)*). A total of 173 milling enterprises were surveyed in Mbeya, Morogoro, Shinyanga, Simiyu and Tabora regions.

48) KIIs with managers, and/or supervisors of supermarkets to collect data for Indicator 9 (*Share of local rice in the market (%)*). A total of 21 supermarkets were surveyed in: Arusha city (10), Mbeya city (3), Dodoma city (3) and Morogoro Municipal (5). The purpose was to find out proportions of local and imported rice products that are sold in the supermarkets. Information was also gathered with respect to brands of imported rice, branding of locally produced rice, and prices. However, efforts must be made to enable routine collection of such data by the ARDS system, to enable adequate M&E of Indicator 9.

49) Eight irrigation schemes were also surveyed in the five regions. In the five regions surveyed Focus Group interviews with leaders of Irrigation Organizations (IOs) to collect data for
    (i)      Indicator 11 (Smallholder farmers' (SHFs) access to financial services (%)) and
    (ii)     indicator 12 (Smallholder farmers' accessibility to technical training and services (%)).

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[4] M-Kilimo is still under development and thus it is not yet able to provide data for M&E but has potential

50) Data Quality Assessment was done on the eight main data sources with respect:
   i) **Validity**: This involved checking how suitable is the methodology used by the source provides the best national level data for measuring an indicator.
   ii) **Consistence**: This involved checking whether similar methodology of data collection is used across different locations and over time.
   iii) **Timeliness**: This involved checking whether data can be accessed from custodian at clearly defined regular interval.
   iv) **Completeness:** This involves checking the extent how required data were collected (whether there are gaps or missing data) across locations and over time.
   v) **Accuracy:** This involves checking how data collection and handling processes are ensure less or zero errors.
   vi) **Relevance**: This involves checking how data collected by the custodian is considered useful in decision making and accepted by authorities.

51) Then, descriptive analysis with Microsoft Excel was used in data analysis.

**Appendix 2: Table for Setting Targets and Projections**

| Indicator Variable | | Recommended Base-line Value | 2025 Mid-term | 2030 End of strategy |
|---|---|---|---|---|
| 1) Quantity of paddy production (**Million MT**) | | 3.38 | | |
| 2) (a)Total area (**Million Ha**) planted with paddy | | 1.69 | | |
| (b)Total area (**Million Ha**) harvested with paddy | | 1.49 | | |
| 3) (a) Yield (**MT/Ha**) per unit area planted | | 2.00 | | |
| (b) Yield (**MT/Ha**) per unit area harvested | | 2.30 | | |
| 4) Self-sufficiency rate **(%)** | | 224.00 | | |
| 5) Area (**Ha**) under irrigation for paddy production | | 80,370.00 | | |
| 6) Quantity (**MT/year**) of seed of resilient varieties | | 397.80 | | |
| 7) Level of industrial milling capacity **(%)** | | 58.00 | | |
| 8) Level of mechanization in production (**Nos of Machinery**) | d) Tractors | 4,096.00 | | |
| | e) Power tillers | 5,635.00 | | |
| | f) Combine harvesters | 267.00 | | |
| 9) Share of local rice in the market **(%)** | | 85.40 | | |
| 10) Quantity **(MT/yr)** of seed of high-yielding varieties | | 359.30 | | |
| 11) Smallholder farmers' accessibility to financial services **(%)** | | 3.80 | | |
| 12) Smallholder farmers' accessibility to technical training and services **(%)** | | 7.00 | | |
| 13) Fertilizer utilized (kg/ha) by farmers in paddy production | | 28.00 | | |
| 14) Post-harvest losses **(%)** | | N/A | | |

**Appendix 3: Methodology for collection and computation of the Self-Sufficiency Ratio**

52) The Self-Sufficiency Ratio (SSR) is derived by comparing production and requirement from the data collected, compiled, and computed by the Division of National Food Security (DNFS) to understand the trends in food SSR. The SSR is computed annually giving preliminary and final forecast reports and trigger vulnerability assessment that help the Ministry to detect hotspots likely to face food shortages at district and household level. The DNFS has developed 10

different key data collection tools for use in Crop Monitoring and Early Warning system (CMEW) to record, validate, and prepare data for retrieval and monitoring food crops production situation in the country.

53) The main instruments consist of forms filled manually in the field to collect data on weekly, bi-weekly, and monthly basis. The forms are also used during the preliminary and final food crop production forecast surveys. These instruments include the following:
   a) Weekly Retrieval System 1 (WRS1): this form collects information on the targets and implementation of crop cultivation at field level
   b) Weekly Retrieval System 2 (WRS2): the form is filled during phenological phases of the field crops
   c) Weekly Retrieval System 3 (WRS3): data collected in this form include information about any occurrence of crop pests both at pre-harvest and post-harvest phase
   d) Weekly Retrieval System 4 (WRS4): the tool captures data on food availability at local markets
   e) Weekly Retrieval System 5 (WRS5): provide information about rainfall precipitation as locally perceived
   f) Food Security Questionnaire 1 (FSQ1): captures various food security variables applied in National Bureau of Statistics (NBS) based sample villages. This sample survey is conducted to align data collected by DNFS and the data collected by NBS based on sampled villages to address subjectivity problems.
   g) Routine Reporting System 1 (RRS1): collects data on various agricultural and food security variables on monthly basis
   h) Snap-Shot Stories (Triple S Analysis - TSA): to provide conventionally reported information by local authority as guided by Crop Monitoring and Early Warning
   i) Jed6: the form captures monthly average price trend at local markets
   j) Jed7: it captures monthly average rainfall (mm) and number of days as received per local station.

54) Data collected from the above instruments are analyzed and conversions are made to get the following data and information:
   a) Production figures: At national and regional levels.
   b) Food Requirement for the year based on population (mid-year population), food consumption requirement, and non-food requirements. Non-food requirements include seeds, animal feeds, traded produce (imported and exported) and crop losses that are a certain percentage of food crops produced based on the factor of estimated post-harvest losses.
   c) Food Surplus/Shortage: surplus or shortages is calculated based on the production of the specific season deducting (-) the requirement (i.e., production less requirement), where the answer may be positive (+) indicating surplus or negative (-) indicating deficit depending on the production situation. The results concentrate on national and regional level food status with brief district level highlights of vulnerable areas.
   d) The Self Sufficiency Ratio (SSR) is derived by comparing production and requirement (consumption + non-food requirements [i.e., seeds, animal feeds, traded produce (imported and exported) and crop losses]) in percentage. Whereby: **0 – 99** percent represents food shortages; **100 - 119** percent denotes food self-sufficiency while **120** percent and above, indicates food surplus.

55) Data collection is done in close collaboration with Tanzania Meteorological Authority (TMA). Assumptions made on data collected and computed, include the following:

a) Harvested areas are equivalent to planted areas
b) Weather conditions are favorable throughout the season
c) The sample villages represent all villages in the country.

## Appendix 4: Seed Quantity Data Sheets (Indicator 6 & 10)

| S/No. | Name of the Variety | Characteristics (tick where appropriate) | | QUANTITIES OF CERTIFIED + QDS SEED (MT) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Resilient | High yielding | Locally produced (MT) | Quantity Imported (MT) | Total (Local + Imported) | Amount Exported (MT) | Net Used in the Country (MT) |
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |

## Appendix 5: Questionnaire for milling capacity

| Business name/Millers' association: | | | | | |
|---|---|---|---|---|---|
| Respondent name: | | Designation: | | Mobile contact: | |
| Location/Street: | | | | | |
| District: | | | | | |
| Region: | | | | | |
| Number of milling machines installed | | Year installed | Installed milling capacity (MT per hour) | Utilized capacity (MT per day) | Number of months operating per year |
| Machine 1 | | | | | |
| Machine 2 | | | | | |
| Machine 3 | | | | | |
| Machine 4 | | | | | |
| Machine 5 | | | | | |
| Machine 6 | | | | | |
| Machine 7 | | | | | |
| What are the major challenges affecting your installed milling efficiency? …………………………………………. …………………………………………. …………………………………………. | | | | | |

## Appendix 6: Market Survey Questionnaire (Indicator 9)

| 1. Name of supermarket: | | | | |
|---|---|---|---|---|
| 2. Respondent name: | Designation: | | Mobile contact: | |
| 3. Location/Street: | | | | |
| 4. District: | | | | |
| 5. Region: | | | | |
| 6. Do you sell imported rice? Put √ where appropriate | | Yes | | No |
| 7. What is the total quantity of rice sold in your shop in the current year? (MT) | | | | |
| 8. Out of the total quantity of rice sold, what is the quantity of local rice sold? (MT) | | | | |

| 9. | Out of the total quantity of rice sold, what is the quantity of imported rice sold? (MT) | |
|---|---|---|
| 10. | Calculate the percentage (%) of local rice out of the total quantity of rice sold in the shop in current year? | |
| 11. | Branding and price | |
| | i) Percentage of local rice which was branded | |
| | ii) Percentage of imported rice which was branded | |
| | iii) Average price of branded local rice | |
| | iv) Average price of branded imported rice | |
| | v) Average price of local unbranded rice | |
| | vi) Average price of unbranded imported rice | |
| 12. What is the uniqueness of imported rice that attracts customers? | i) …………………………………………..……... <br> ii) ………………………………………………… <br> iii) ………………………………………………… | |

### Appendix 7: Access to finance, training, and extension questionnaire (Indicators 11 & 12)

| 1. Access to finance | | | | | |
|---|---|---|---|---|---|
| Name of irrigation scheme: | | | | | |
| Respondent name: | | Designation: | | Mobile contact: | |
| Location/Street: | | | | | |
| District: | | | | | |
| Region: | | | | | |
| Number of members of IOs | | No. of Male | | No. of Female | |
| Did your members receive any financial service in 2018/19 season? Put √ where appropriate | | Yes | | No | |
| Types of financial services received | | | Number of recipients of financial services | | |
| Inputs credits | | | | | |
| Cash loans | | | | | |
| Members in VSLA/VICOBA | | | | | |
| Others (mention) | | | | | |
| What is the percentage (%) of members of irrigators organization that received financial services in the current year? | | | | | |
| 2. Access to training and extension services | | | | | |
| i) What is the numbers of members of irrigators organization who have received training in the current year? | | | | | |
| ii) What is the percentage (%) of members of irrigators organization who have received training in the current year? | | ……………………….. | | | |
| iii) Which organizations are providing training in your scheme | | (i) ……………………………<br>(ii) ……………………………<br>(iii) …………………………… | | | |
| iv) What is the percentage (%) of members of irrigators organization who have received extension services in the current year? | | ……………………….. | | | |
| v) Mention the providers of extension services | | i) ……………………………<br>ii) ……………………………<br>iii) …………………………… | | | |