Institutional capacity building on climate-smart and resource efficient rice production systems (with focus on System of Rice Intensification) in Tanzania

SRI-Tanzania project

Annual report

(*1st January 2023 to 31st December 2023*)

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Acronyms	**Full description**
AWD	Alternate Wetting and Drying
FGDs	Focus Group Discussions
IPM	Integrated Pest Management
LCC	Lef Coor Chart
MSSRF	M. S. Swaminathan Research Foundation- India
NIBIO	Norwegian Institute for Bioeconomy Research
NGOs	Non-Government Organizations
Norad	Norwegian agency for development cooperation
QDS	Quality Declared Seeds
IRRI	International Rice Research Institute
SRI	System of Rice Intensification
ToT	Training of Trainees
TARI	Tanzania Agricultural Research Institute
TOSCI	Tanzania Official Seed Certification Institute
VKCs	Village Knowledge Centres

1. Overview of SRI-Tanzania project Progress

The SRI-Tanzania project started on 1st December 2022 and will continue until the end of December 2025. The goal of the project is to build institutional capacity on climate-smart, resource efficient and sustainable production with emphasis on System of Rice Intensification (SRI). This will contribute to improved productivity and smallholders' livelihoods in Tanzania while reducing negative environmental impacts in rice producing areas. The specific objectives are to:

- **Strengthen institutional capacity and competence of** Tanzania Agriculture Research institute (TARI) scientists and other key stakeholders including extension agencies on climate smart rice production/ specifically on SRI technology, extension systems that will contribute to increased input use efficiency, value creation, and food security, and,
- **Foster institutional cooperation** between TARI (Tanzania) and NIBIO (Norway) and other institutional agencies through South-South cooperation in the sub-Saharan Africa and India National Research Rice Institute, NRRI and M. S. Swaminathan Research Foundation, MSSRF- India).

The SRI-Tanzania project is being implemented in five districts of Tanzania namely *Kilombero, Kibaha, Mbarali, Bunda, and Iringa* where rice is grown under irrigation schemes and/or rain-fed conditions. In this report, the main activities accomplished during the period between December 2022 to December 2023 are described work package (WP)-wise. The report also includes potential project risks/challenges encountered and measures taken and annual work plan for 2024. Though it is early in the project to report on the outcomes, we see a positive indication, in terms of farmers' trainings and adoption of SRI principles (in the first season; more farmers, women and youth showed interest to take part in trainings and practice SRI. Engaging other govt and civil society agencies was also observed.

In this report, the project contributions to the main outcomes (as per the agreed results framework in the project document) using the relevant indicators are mentioned briefly below:

Outcome 1: Improved sustainable rice productivity of smallholders in rice growing districts.

Measurable base line indicators: Crop yield increase by 25-30% in rice against baseline, Climate smart rice training modules

It is a bit early to report on the indicator: *crop yield improvement* since the project field implementation on various SRI practices is ongoing. However, during the first season, we have observed positive indications of yield improvements compared to the convention paddy cultivation.

Six climate smart rice training modules emphasizing on SRI practices have been prepared, evaluated and final versions of the SRI manual was published in local language. Using this manual, a series of trainings were conducted targeted for farmers, extension personnel, TARI researchers and other project stakeholders.

Outcome 2: Smallholder farmers (including women and youth) engagement in SRI practices improved.

Measurable base line indicators: smallholder farmers practising SRI technology increased by 25% (including women and youth).

There is an increased awareness, and interest among farmers for SRI adoption because of capacity building workshops/ trainings of extension agencies, and scientists. More farmers are following mat nursery technique which is introduced by the project and this technology is gaining popularity among the rice farmers in the project areas. Moreover, mat nursery has resulted in a significant decrease in seed rate from **30 kgs to 4 kgs/acre** and seed cost saving by **90,000 TZS**[1].

Outcome 3: Institutional collaborations strengthened on climate resilient rice and resource efficient.

Measurable base line indicators: Number of scientists, extension workers and private sector personnel trained:

Practical trainings on SRI practices were conducted in the project study sites where a total of **975 farmers and other stakeholders** participated. This includes all farmers trained and other partners who attended the inception workshop in Morogoro. (*Rikolto, Helvetas, Norgels vel, Rice Council of Tanzania, IRRI, National Irrigation commission*). In addition, **16 researchers/ field personnel, 207 lead farmers, 31 Local Government**, Agricultural Extension Department officers were trained.

As part of the institutional collaborations, a team of scientist and extension officers from TARI made study tour (15 to 20 July 2023) to Tamil Nadu, India to learn the experiences of Indian farmers on implementing SRI practices.

Risks /challenges encountered and measures taken

i) Extreme weather events/climate change: There were big floods in Bunda project area in the months of September to October because of El Nino rains. As a result, some nurseries were totally covered with floods which has led to delay in planting. However, the mat nursery technique introduced by the project helped in coping with the delay period. The mat nursery can be raised in areas where there is no flooding and can be easily transported to the field.

ii) Severe infestation of aphid insect attack in Kilombero project area due to proximity to the sugar cane plantations where aphids are easily transmitted to other crops. This has led to decreased in crop yield. The project will be introducing Integrate Pest Management (IPM) measures and training farmers to address such risks. The project is also sensitizing farmers/extensions officers and field personnel on the importance of joint IPM operations.

The Project does not provide all inputs to farmers as it is the normal procedure in other projects by providing support in kind and/or cash. Thus, to increase motivation of farmers and participate actively in the project, will take time. Once farmers see the results and benefits of SRI methods, it will become more easier for them to adopt the technology.

[1] *During writing the report, the exchange rate of 1 USD was equivalent to 2545 Tanzania shilling.*

Table 1: Result framework for a rice initiative in rainfed lowland areas of Tanzania

Goal: to build institutional capacity on climate-smart, resource efficient and sustainable production with emphasis on System of Rice Intensification (SRI).					
Outcome 1: Improved sustainable rice productivity of smallholders in rice growing districts.		**Outcome 2**: Smallholder farmers (including women and youth) engagement in SRI practices improved.		**Outcome 3**: Institutional collaborations strengthened on climate resilient rice and re-source efficient.	
Output 1.1	**Output 1.2**	**Output 2.1**	**Output 2.2**	**Output 3.1**	**Output 3.2**
• Crop yield increase by 25-30% in rice against baseline.	• Climate smart rice training modules • 25% improved in WUE, seed and fertiliser use from baseline.	• smallholder farmers practising SRI technology increased by 25% (including women and youth).	•30-35% more farmers accessing seed against the baseline.	• No. of institutions working on climate change adaptation and mitigation in rice increased by 20% • No. of scientists, extension workers and private sector personnel trained	• Farmers, extension officers, research staff (at TARI) knowledge on SRI increased • Policy frameworks brief

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Highlights

Some photos showing SRI training exercises by farmers, extension workers and TARI researchers in the rice field sites.










TARI staff study tour to rice farmers fields in Tamil Nadu state (India)

As part of the SRI-Tanzania project activity, A team of scientist and extension officers from TARI made study tour (15 to 20 July 2023) to Tamil Nadu, India to learn the experiences of Indian farmers on implementing SRI practices. The knowledge and skills gained by TARI team through a practical trainings and demonstrations of key SRI practices included *preparation of mat nursery, machine transplanting, use of cono-weeder for weeding operation, precision N management using LCC, alternate wet and drying irrigation, IPM, VKCs, capacity building and training of farmers on plant clinic program*. Moreover, the team was exposed to other climate smart rice cultivation practices, improved rice varieties, and how the government agencies and private sector help in accessibility of climate-smart rice seeds and inputs to smallholders. After the training and field exposure visit in India, the trainees used the knowledge to train other extension officers and farmers in the project sites in Tanzania.

Taking home paddy cultivation practices from India, says Tanzanian scientists at MSSRF

Pudukkottai: Certain methods of rice cultivation in India would richly contribute towards tackling the water crisis in Tanzania, said a delegation of scientists from Tanzania during a discussion with farmers and agricultural enthusiasts organised by the MS Swaminathan Research Foundation (MSSRF) in Pudukkottai on Tuesday. Five scientists from the Tanzania Agricultural Research Institute (TARI), visited Pudukkottai as part of a seven-day visit to India. "Our country is prone to water scarcity and drought. The SRI method used for paddy cultivation in Pudukkottai would greatly contribute to our eco-system where a better yield can be ensured through lesser seeds," said Atugonza Bilaro, principal research scientist who was part of the delegation.

The delegation from Tanzania in discussion with farmers and agricultural enthusiasts in Pudukkottai, on Tuesday | M MUTHU KANNAN

2. Explanation of the work carried out per Work Package

In this section, the main activities/outputs accomplished during the period December 2022 to December 2023) are presented in detail work package (WP)-wise as follows.

Work Package 1: Institutional Capacity building on climate smart and resource efficient agriculture production with emphasis on rice, Lead: TARI, (M01-M18)

Task 1.1: Capacity building needs assessment

The objective of this task is to identify the knowledge gaps among the target groups and ascertain the training and skills needed in climate smart and resource efficient agricultural production with emphasis on rice. Training needs assessment was conducted in the case study districts by conducting questionnaire surveys and focus group discussions (FGDs). Data was collected on demography, crop management, soil and water management, rice value chain/marketing, SRI awareness, challenges to SRI implementation and adoption. The data was analysed, and preliminary findings were shared and discussed with the key stakeholders during the kick off meeting and their feedback taken. Below are some of the key findings from the needs assessment study.

- Most farmers heard of SRI technology and that SRI adoption contributes to high yield per unit area compared to conventional methods of rice planting.
- Many farmers and extension officers interviewed, had partial knowledge of SRI related to planting in rows, the importance of young seedlings, alternate wetting and drying.
- Planting technique of young seedlings was found to be one of the main challenges especially the uprooting of young seedlings from the nursery, gap between uprooting to transplanting and technique of transplanting. This can be resolved by promoting mat nursery introduced by the project, which allows easier seed transfer and transplanting causing less injury.
- Most field activities are still done manually, and this increases the costs of production and increases the burden on women farmers who undertake most of the tasks in the farm from planting to harvesting and processing. There is a need to introduce small farm machinery/implements for facilitating SRI farm operations.
- Land levelling is a problem which is aggravated by poor water management within irrigation schemes. This situation makes difficult for farmers to practice alternate wetting and drying irrigation. There is a need for training on land levelling.
- Land levelling equipment is not available and/or inadequate and not affordable by small famers. There is lack of proper equipment such as laser land levellers.
- Access to quality seed is still a challenge and support to farmers is needed to access quality seeds by empowering them to produce seeds under Quality Declared seed (QDS) systems. Training, farmer registration and certification is provided by Tanzania Official Seed Certification Institute (TOSCI).

Task 1.2: Gender (and youth) analysis and strategy for integration

The objective of this task was to identify gender (and youth) needs in terms of access to knowledge, resources, and services, and develop a strategy for integration in the project activities. To address this, gender survey was carried out using questionnaire and FGDs. In addition, relevant inputs related to gender gaps/challenges were taken from the findings from surveys carried out in Task 1.1. The FGDs were held separately for women and men farmers.

From the FGDs, it was clear that farming activities such as transplanting, uprooting of the seedling and harvesting and winnowing are done manually by women while, land preparation which is mostly done by men has access to mechanization. Therefore, training on use of mat type rice nurseries, transplanters and motorized push weeders will provide flexibility and less

burden on women farmers. The level of understanding by men and women farmers on the factors affecting rice fields had non significance difference. Thus, training on rice production and factors affecting the rice production will increase adoption of SRI by farmers. They will enrich their knowledge by applying new practices.

Task 1.3: Developing capacity building /training modules for targeted groups

The initial SRI training manual was developed jointly by NIBIO and MS Swaminathan Foundation (MSSRF). The contents in the SRI manual were shared and further inputs were added, and revisions made by TARI and NIBIO to suit to the local context. During the preparation of the SRI training manual, the state of art of rice cultivation in Tanzania, existing gaps in knowledge and skills related to SRI and previous training manual on SRI, were considered. The training module focused on the principles and practices of SRI and gives simple guides and practical steps underpinned with illustrations. The SRI manual was translated into local language: *Kiswahili.* An overview of the front and back cover of the SRI manual is shown in Figure 1.

Figure 1: SRI manual front and back cover

The training modules were tested by imparting a first round of training of trainees (ToT) on SRI principle and practices. The training was conducted in Morogoro on 14 - 15th March 2023 where TARI researchers and extension workers participated. The first day training dealt on the six principles of SRI (Box 1) which was taught in a classroom using power point presentations, videos, and interactive group discussions. This was followed by practical training and demonstration in the nearby area of TARI research station.

Box 1: Basic principles of SRI
- *Transplanting young seedlings of 12-15 days old,*
- *Transplanting single seedling with 2-4 leaves stage per hill,*
- *Wider spacing (25 cm x 25 cm) and planted in lines/rows,*
- *Inter-cultivation between rows using hand/rotary weeding,*
- *Controlled intermittent irrigation/ alternating wetting with drying (AWD)* and
- *Organic fertilizer and mineral fertilizers (as needed*

Source: SRI training manual (2023) by MSSRF, NIBIO and TARI

The trainings included preparation of *mat nursery for raising rice seedlings, installation of field water tubes* to apply alternate wetting and drying irrigation, *using leaf colour charts* to apply site specific nitrogen fertilizer applications to the soils, and *integrated pest management practices* using yellow traps for insects.

SRI training schedules were planned for 2023-2024 in which the trainers will train their fellow farmers in their respective areas. The trainees have started implementing the training activities as agreed depending on the crop calendar and crop stage.

Table 1: Planned outputs and achieved outputs per tasks of WP1.

Tasks to be implemented	Work/Planned outputs	Achieved outputs
Task 1.1 Capacity building needs assessment *Lead: TARI, (M01-M07)*	• Needs assessment report (D1.1) that will serve as a reference to other tasks under WP1 and WP2	• Deliverable (D1.1) report has been completed
	• List of key knowledge gaps, opportunities to be identified and prioritized	• Work completed as per plan
	• Key training areas and skills needed by farmers, extension workers and scientist to be identified	• Work completed as per plan
Task 1.2: Gender (and youth) analysis and strategy for integration *Lead: TARI, (M04-M09)*	• Gender mainstreaming strategy report	• Deliverable (D1.2) report is in progress. Information that was not captured during needs assessment being gathered for finalization. • Two exchange visits were made by youth from Madibira and youth from Kilombero for experience sharing on SRI. They have been designated as SRI youth ambassadors.
Task 1.3: Developing Capacity building /training modules for targeted groups *Lead: NIBIO/TARI, (M04-M018)*	• Training Course materials to be produced. • Practical course materials to be produced. • Inputs to tasks under WP2	• SRI training manual completed. • First round of trainings to farmers, extension workers, researchers using the manual was conducted.

Tasks to be implemented	Work/Planned outputs	Achieved outputs
		• Inputs and comments from users such as size of the manual and font preference received for final printing in hard copies. • **200 copies printed** in first round and distributed to stakeholders

Work Package 2: Implementing on-farm trials/demo on SRI and targeted trainings, Lead: TARI, Duration: M01-M36

The implementation of the five tasks under WP2 started from M09 (September 2023) that will continue until the end of the project. Brief descriptions on the work progress per task is given below.

Task 2.1: Conducting training of scientist and extension workers

The first-round training of scientists and extension workers, selection of demo sites and farmers clusters were accomplished in the five case study districts. In total, 5 demos were established (one in each cluster) in *Ruvu, Pawaga, Madibira, Msolwa, and Mkula* irrigation schemes. This was followed by training of lead farmers and other extension officers in some selected sites as per the training plan (Table 2). In the first year of the project, the total number of farmers to be trained are 700 (295F, 405M).

Table 2: SRI training plan by case study irrigation sites and schemes in 2023.

District	Site/scheme	How many to train?	Which SRI practices to train?
Kibaha	*Ruvu-Chauru*	150 (80M, 70F)	• Fert appl (LCC), IPM, AWD, Mat-Nursery prep. Levelling, transplanting single seedling
Iringa	*Idodi*	50 (30F, 20M)	• Push weeder, LLC, IPM, AWD • Harvest management
	Pawaga	50 (30M, 20F)	• Fertilizer application (LCC), IPM, use of push weeder, • AWD, Harvesting operations
Kilombero	*Mkula, Mslowa*	100 (50 *Mkula*, 50 *Msolwa*)	• Fert appl (LCC), use of Push Weeder, IPM, AWD, Mat-Nursery prep. Levelling transplanting single seedling • Harvest mgmt, Documentation
Mbarali	*Madibira*	50 (30M, 20F)	• Fertilizer (LCC) application, IPM, AWD
	Ubaruku	50 (35M, 15F)	• LCC, push weeder, AWD, IPM, Harvesting operations management
	Igurusi	200 (120M, 80F)	• AWD, LCC, IPM • Mat nursery
Bunda	*Mariwanda*	50 (30M, 20F)	• Leveling, LCC, IPM, Mat Nursery, AWD
Total	-	**700 (405M, 295F)**	

M- male; F-female

Task 2.2: Training of lead farmers and farmers on SRI

i) Training of lead farmers on SRI at Msolwa Ujamaa & Mkula irrigation schemes *(Kilmbero district*)

A total of 141 participants (86 male and 55 female) attended the SRI training in Kilombero district (Table 1). The training was scheduled for two days, on 13rd and 15th May 2023. The trainees came from Msolwa Ujamaa and Mkula irrigation schemes. In Msolwa Ujamaa Scheme, the trainees were 56 in total, of which 24 were female, and 32 were male. Likewise, in Mkula scheme the participants were 85 in total, of which 31 were female and 54 were male. Most of the 125 participants were farmers. The remaining were extension officers (12), and agricultural officers (5) from Ifakara Town Council. For the sake of experience sharing, one farmer and one extension officer were invited from Mbarali district. These were selected based on their experience on practicing SRI.

Figure 2: Trainees attending SRI training at Msolwa village in Kilombero District

Farmers in both Mkula and Msolwa Ujamaa villages complained on the occurrence of insect pests which was associated with the presence of sugarcane blocks, whose control was beyond their knowledge. Agricultural Officers from Ifakara town council explained to farmers the strategies on the ground to control the insect pest and disease using IPM approach.

To sum up. the training on SRI was successfully conducted in Msolwa, Ujamaa and Mkula villages in Kilombero district. Participation of direct beneficiaries (farmers) was over 100% of the targeted number. The training evaluation revealed that most participants met their expectations from the training which was to gain SRI knowledge. A follow up survey will be done on how the farmers/stakeholders trained will use the knowledge and practice SRI.

ii) Training of lead farmers on SRI at Maliwanda Irrigation scheme *(Bunda district)*

A total of 125 participants were trained on SRI training at Maliwanda scheme in Bunda district. Out of this, 120 were farmers (86 male and 34 female) while 5 were extension staff (4 male and 1 female). The training also included one TARI staff stationed at one of the nearest TARI technology dissemination Hub. After the training, 7 to 10 lead farmers were selected on voluntary basis. They were provided with seeds and assisted in land leveling of their fellow farmers to demonstrate the operations and benefits of SRI.

Figure 3: Preparation of mat nursery by participants during training session.

At present, the key activity is crop harvesting from the SRI demo site established at Mkula Kilombero in June and July. Farmers showed interest in using mat nursery that required less seed rate than the convention method of raising rice seedling in the nursey. The yields are relatively higher compared to those using conventional methods of rice planting. The only challenge affecting yield was high incidence of white fly pest. The pest originated from the nearby sugarcane plantations. IPM training on white fly would be initiated in 2024.

iii) Training of lead farmers/famers on SRI at Ruvu, Chauru irrigation schemes *(Kibaha district) Idodi and Pawaga (Iringa) Igurusi, Ubaruku and Madibira (Mbarali)*

In total 50 acres of land were leveled by hand hoe and banding to control water in and out of the field at Ruvu (Chauru) site. In other sites, training was conducted in December 2023 at the five project sites. This training activity on levelling was targeted to reach 550 beneficiaries, where at least 40% of participants should be women In total, 946 farmers (42% were females) and village agriculture & extension officers were trained on the different aspects of SRI which is higher than the targeted plan (Table 3).

Table 3: Number of farmers and extensions officers trained in Mbeya, Coast and Iringa regions

Region	Sites/schemes	Target	Trained		Total	*Trained groups*	
			Male	Female		*Farmers*	*Village agriculture & extension officers*
Mbeya	*Ubaruku*	50	64	50	114	109	5
	Igurusi	200	64	31	95	88	7
	Madibira	50	33	28	61	58	3
Coast	*Ruvu*	150	74	67	141	136	5
Iringa	*Idodi*	50	54	37	91	86	5
	Pawaga	50	88	92	180	174	6
Bunda	*M/wanda*	50	86	37	125	120	5
Kilombero	*Mkula*	50	54	31	83	74	11
	Msolwa	50	32	24	56	50	6
Total	-	**700**	549	397	**946**	895	53

Task 2.3: Conducting on-farm trials/demo sites in five districts

During July to September 2023, the TARI team in collaboration with the farmers and stakeholders implemented several field and capacity building activities in the project areas.

Soil sampling and analysis: As part of the requirement of soil testing to identify the inherent soil characteristics and collect base line soil information in the project sites, the TARI team collected soil samples in three districts of Iringa (2 irrigation schemes), Mbarali (3 irrigation schemes), and Chalinze (1 irrigation scheme) from each individual farms. Soil samples were collected using zigzag/grid sampling method in a farmer field. The soils samples were composite of several sub samples taken at different sampling points in the field. The samples were collected from the topsoil layer (0-20 cm) using shovel. The number of soil composite samples recovered were 11 samples from 29 acres in *Mbarali* site, 8 samples from 8 acres in *Iringa* site and 4 samples from 50 acres in *Chalinze* site, each weighing 500 grams. In total, 23 soil composite samples (see Annex) were collected and dispatched to TARI soil laboratory for physical and chemical analysis such as determination of soil texture, pH, total N, P.

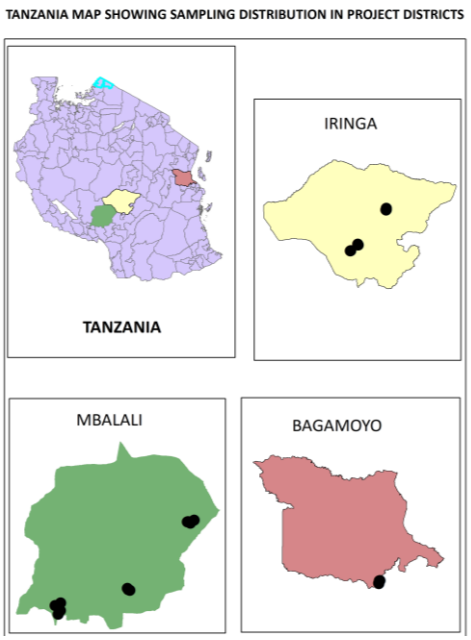


Figure 4: Sampled sites by district and collecting soil samples

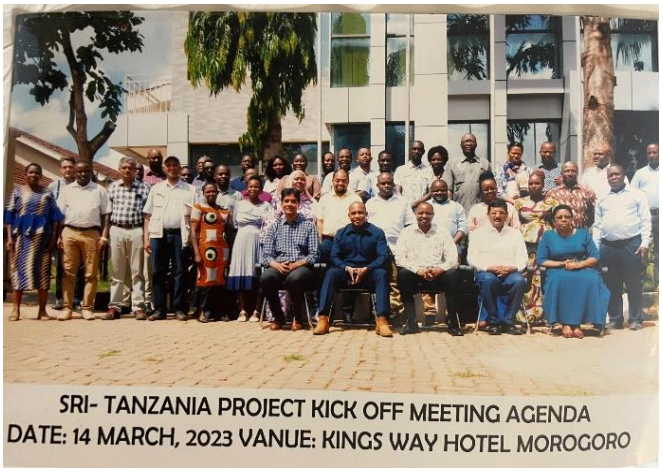
Activities/Tasks to be implemented, annual planned outputs and achievements made in the different tasks in the period between M01 and M12 are described in detail below.

Table 4: Planned outputs and achieved outputs per tasks of WP2.

Tasks to be implemented	Planned outputs	Achieved outputs
Task 2.1: Conduct training of scientist and extension workers *Lead: NIBIO/TARI, (M09-M36)*	Scientists (40-50) and extension staff (approx.200) to be trained	The work has been already initiated and **16 researchers** and **30 extension workers** trained so far.
Task 2.2: Training of lead farmers and farmers on SRI *Lead: TARI, (M09-M36)*	Lead farmers and farmers to be trained	The work has been already initiated. In total **207 lead farmers** trained. and 975 other farmers trained so far.

Tasks to be implemented	Planned outputs	Achieved outputs
		(45% of them were women. The total percentage of participants that fall under the category of youth was approx.. **35%**)
Task 2.3: Conducting on-farm trials/demo sites in five districts *Lead: TARI/NIBIO, (M09-M36)*	8-10 on-farm trials/demo clusters/per district planned and implemented	The work has been already initiated in three project areas. Bunda (8); Iringa (20); Mbarali (25; Kilombero (5), Ruvu (50)
Task 2.4: Document results of on-farm trials *Lead: TARI/NIBIO, (M09-M33)*	A field report summarizing results from on farm trails	The work is in progress crops in the field
Tasl 2.5: Rice seed value chain *Lead: /TARI, (M09-M36)*	500 kg model seed units & Protocol for climate resilient rice QDS developed	The work is in progress. In each location in the project site 50 kg of improved seed has been provided, at Ruvu site, 180kg were provided

Work Package 3: Project Coordination & Management, Lead: NIBIO & TARI, Duration: M01-M36



The SRI-Tanzania project kick-off meeting was held on 14th March 2023 in Morogoro, Tanzania where 40 people from relevant agencies linked to climate smart agriculture participated re. The participants composed of government officials, staff from TARI, Ministry of Agriculture, Irrigation departments, non-government organizations (NGOs), International Rice Research Institute, journalists and two rice experts from India. During the meeting, the participants got an insight on the project aims/objectives and key implementation activities. In addition, the basic principles of System of Rice Intensification (SRI), advantages and constraints in SRI adoption, was presented.

A project work plan was drafted by NIBIO team in collaboration with TARI and presented in the meeting. The work plan was discussed, and changes made accordingly. This was followed by a discussion of field activities/ crop calendar, and training plan for 2023 on SRI and agreed by the representatives of each case study districts/irrigation schemes. Throughout the reporting period, communication among TARI, NIBIO and project stakeholders was regular and continuous (through physical meetings, joint field visits, online meetings, emails, WhatsApp, messages, etc.). The project partners, the extension workers, and farmers helped to plan the different tasks and their implementation in each demo sites.

Project Coordination & Management (Work Package 3)

The Project work plan was prepared jointly, discussed by stakeholders at the planning workshop and approved. First year work progress was according to the plan, with some minor deviations due to untimely rains/floods in 2 project sites. The project kick off was organized during March

2023, and it provided an opportunity to engage several stakeholders (government and civil society) and share the project goals and plan of action. Communication among TARI, NIBIO and project stakeholders was regular and continuous (through physical meetings, joint field visits, online meetings, emails, WhatsApp, messages, etc.) throughout the year. The project partners, the extension workers, and farmers helped to plan the different tasks and their implementation in each demo sites, which were further used for trainings and capacity building.

Table 5: Planned outputs and achieved outputs per tasks of WP3.

Activities/Tasks to be implemented	**Planned outputs**	**Achieved outputs**
Task 3.1: Project activity management *Lead: NIBIO/TARI, (M01-M36)*	Project progress reports for Year 1	Report submitted in February 2024
Task 3.2: Project consortium meetings and annual reporting: *Lead: TARI/NIBIO, (M01-M36)*	Project Kick off and consortium meeting to be held	Completed in March 2023

3. Annual Work Plan: 01 January 2024 to 31 December 2024

Work Package 1: Institutional Capacity building on climate smart and resource efficient agriculture production with emphasis on rice, Lead: TARI, (M01-M18)			
Tasks to be implemented	**Start - End month**	**Work/Planned outputs**	**Remarks**
Task 1.3: Developing Capacity building /training modules for targeted groups *Lead: NIBIO/TARI, (M04-M018)*	M13-M18	Updating the Training Course materials /Practical course materials	Collecting feedbacks from previous trainees (farmers, extension workers, researcher)

Note: Tasks 1.1 (Capacity building needs assessment and Task 1.2: Gender (and youth) analysis and strategy for integration), were completed at the end of first year of the project. Under this work package, 2 tasks were successfully implemented, and 2 deliverables submitted. Information from the WP1 will guide the WP2/tasks.

Work Package 2: Implementing on-farm trials/demo on SRI and targeted trainings, Lead: TARI, Duration: M01-M36			
Tasks to be implemented, lead partners and task duration	**Start - End month**	**Work/Planned outputs**	**Remarks**
Task 2.1: Conduct training of scientists and extension workers/others *Lead: NIBIO/TARI, (M09-M36)*	M13-M24	Scientists (40); Agri-extension officers (60); Others (15) 14 workshops in total planned	Trainings and exposure visits also outside Tanzania to be organized
Task 2.2: Training of lead farmers and farmers on SRI *Lead: TARI, (M09-M36)*	M13-M24	Lead farmers to be trained– 100 Other farmers - 2500	Training manuals printed and to be distributed to each farmer/ 1000 copies to be printed in Swahili / Norges vel has requested to use/print the manual
Task 2.3: Conducting on-farm trials/demo sites in five districts *Lead: TARI/NIBIO, (M09-M36)*	M13-M24	On farm Demo trails planned: 90-100 in total (20 in each project district)	The demo has been established in each participating irrigation scheme
Task 2.4: Document results of on-farm trials *Lead: TARI/NIBIO, (M09-M33)*	M13-M24	Measurements (seed rate, yield, costs, farmer income, water use efficiency (WUE), etc to be done on 50 (10 each) plots	In Ruvu site, WUE measurements will be made

Tasl 2.5: Rice seed value chain *Lead: /TARI, (M09-M36)*	M13-M24	15 QDS units to be established/ TXD 306 TARI Rice 2/ farmers trained and registered.	High yielding, good grain quality, good market value; TARI will provide the foundation seed
Work Package 3: Project Coordination & Management, Lead: NIBIO & TARI, Duration: M01-M36			
Tasks to be implemented	**Start - End month**	**Work/Planned outputs**	**Remarks**
Task 3.1: Project activity management *Lead: NIBIO/TARI, (M01-M36)*	M13-M24	Project progress reports for Year 2	
Task 3.2: Project consortium meetings and annual reporting: *Lead: TARI/NIBIO, (M01-M36)*	M13-M24	Annual meeting was held in Mbeya at Uyole with field visit to one of the project sites in Ingurusi. Meeting was attended by lead farmers and all implementing partners	The project received feedback from farmers implementing SRI and training by MSSRF experts

Annexes

Soil sampling in the study sites

Tables 1, 2 and 3 show the locations of the soil sample in each district and their GPS coordinates.

Table 1: Soil samples collected from Mbarali district.

Ward	Village	Sample ID.	Farmer name	Area (acre)	Eastings (36 L)	Northings (UTM)	Elevation (m.a.s.l)
Idodi	Idodi	I-1	Juma Muhinga	1	0740428	9139907	891
		I-2	Rehema Kindole	1	0740921	9139044	942
	Tungamalenga	I-3	Liberata Kiseo	1	0731731	9132190	986
		I-4	Gerald Mbunda	1	0732097	9132592	987
Pawaga	Itunundu	I-5	Bahati Sanga	1	0773385	9181556	748
		I-6	Juma Kingalata	1	0773374	9180075	750
		I-7	Amimu Mlondoye	1	0773026	9179655	751
		I-8	Kagela Mposewa	1	0772790	917981	753

Table 2: Soil samples collected from Iringa district.

Ward	Village	Sample ID.	Farmer name	Area (acre)	Eastings (36 L)	Northings (UTM)	Elevation (m.a.s.l)
Igurusi	Chamoto	M-1	Shufaa Lusekelo	1,0	0590569	9030273	1121
	Majenje	M-2	Kumekucha Group	1,0	0592852	9023459	1221
	Uhambule	M-3	Mtukazi Group	7,0	0594706	9032264	1104
	Ilolo	M-4	Joel Mwaipopo	1,0	0594538	9026390	1177
Ubaruku	Majengo	M-5	Montfort Secondary	2,0	0647612	9041921	1022
		M-6	Fidelis Mlowe	1,0	0646489	9042353	1064
	Utyego	M-7	Evaristo Mgiye	1,0	0645772	9043368	1063
Madibira	Mahango	M-8	Agness Nziku	7,5	0694175	9093810	1076
		M-9	Consolatha Mwinuka	2,5	0692274	9094949	1062
		M-10	Yohana Ngovano	2,5	0691784	9094893	1007
		M-11	Michael Mjola	2,5	0697049	9096117	1033

* 1 acre is equivalent to 0.40 ha. Ward is an administrative structure for one single town or portion of a bigger town.

Table 3: Soil samples collected from Chalinze district, ward Vigwaza and village Visezi

Sample ID.	Farmer name	Area (acre)	Eastings (37M)	Northings (UTM)	Elevation (m.a.s.l)
C-1	Ramadhani Yange	7	0463673	9254965	20
C-2	Aloyce Siame	12	0463862	9254710	24
C-3	Rosi Angetile	16	0464686	9256947	28
C-4	Tecla Nyoka	15	0464040	9256857	28

Table 4: List of KPIs under each impact area to monitor & assess impacts of SRI-Tanzania project.

Name of indicator/impact area	Units/ equation	Source
Precision soil health and water management practices/tools		
1) Soil health status (major nutrient contents)	(%, mg) of nutrients/kg soil	Soil sampling, testing/monitoring
*2) Nutrient use efficiency (NUE) – Nitrogen using partial factor productivity Nitrogen (PFPN)**	$PFPN = \frac{Y\ (kg\ grain/ha)}{FN\ (kg\ N\ fertiliser\ applied/ha)}$	N monitoring and Water flow/level measurements
3) Water productivity/use efficiency	$WP = \frac{crop\ yield\ (kg)}{irrigation + precipitation\ \ (m^3)}$	
Precision agronomy practices/crop management practices /tools		
4) Crop yield (rice)	Grain yield (kg/ha)	Farm records and monitoring
5) Household income from farming	Tanzanian shilling[2]/capita/year	
6) IPM and other pest measures practiced	% of farmers practicing	
7) Farmers (men and women) adopting SRI technology	% of farmers adopting	
8) Farmers (men and women) accessing Quality Declared Seeds of rice	% of farmers accessing QDS	
Knowledge dissemination/ training/capacity building		
9) Farmers (men and women) trained in SRI technology	No. of farmers (men and women) trained	Record at training centre
10) Extension workers/private sectors trained in SRI technology	No. of trainees	
11) Research scientists trained in SRI technology	No. of scientists trained	
12) Institutional collaboration promoting SRI technology	No. of collaborations (national, international)	Participatory consultations

** Partial factor productivity Nitrogen (PFPN) is often used to determine Nutrient-use efficiency (NUE).*

[2] *1 USD is equivalent to 2545 TZS*