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AFRICA RISING - Enhancing partnership among Africa RISING, NAFAKA and TUBORESHE CHAKULA Programs for fast tracking delivery and scaling of agricultural technologies in Tanzania Quarterly Report

Quarter – 01 October 2018 – 31 December 2018

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COR/AOR Name: Elizabeth Maeda

Submitted by: **International Institute of Tropical Agriculture**
IITA Headquarters,
PMB 5320, Oyo Road, Ibadan 20000,1
Oyo State, Nigeria.
Tel: +234 700800IITA, +1 201 6336094

IITA

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Cover photo

Cover photo: Government of Tanzania (GoT) field extension staff from Mbarali and Momba districts undergoing practical training organized by Africa RISING and NAFAKA projects on establishment and management of rice fields at the government training Institute (MATI Igurusi). Photo credit: Filbert Mzee/ACDI/VOCA (NAFAKA Project).

I. ACTIVITY OVERVIEW/SUMMARY

Activity Name:	AFRICA RISING - Enhancing partnership among Africa RISING, NAFAKA, and TUBORESHE CHAKULA Programs for fast tracking delivery and scaling of agricultural technologies in Tanzania.
Activity Start Date:	1 October 2017
Activity End Date:	30 September 2020
Name of Prime Implementing Partner:	International Institute of Tropical Agriculture (IITA)
Contract/Agreement Number:	BFS-G-11-00002
Name of Subcontractors/Sub awardees:	• Agricultural Research Institute (ARI), Dakawa/Chollima • Agricultural Research Institute (ARI), Hombolo • Agricultural Research Institute (ARI), Uyole • International Center for Tropical Agriculture (CIAT)
Major Counterpart Organizations	• District Agricultural Councils
Geographic Coverage (districts, regions, and/or Zanzibar)	• Babati District (Manyara Region) • Wanging'ombe District (Njombe Region) • Kilombero District (Morogoro Region) • Iringa Rural, Mufindi and Kilolo Districts (Iringa Region) • Mbarali District (Mbeya Region) • Mbozi and Momba Districts (Songwe Region)
Reporting Period:	01 October 2018 – 31 December 2018

1.1 Executive summary

The Africa RISING-NAFAKA partnership project focuses on the delivery and scaling of promising interventions that enhance agricultural productivity in Tanzania. The key interventions include promotion of climate-smart agricultural innovations, dissemination of best-bet crop management packages, rehabilitation and protection of natural resources, and reduction of food waste and spoilage. The project focus is on three crop enterprises – maize, rice, and legumes – with nutrition and postharvest handling as cross-cutting themes. The key partners in the project include one USAID-funded project under the Global Food Security Strategy (GFSS) Initiative in Tanzania – CMSD/NAFAKA –, national agricultural research institutions (Dakawa, Hombolo, and Uyole), District Councils, the International Center for Tropical Agriculture (CIAT), as well as the private sector (seed companies, millers, and processors), and NGOs. During the current quarter, project activities were implemented in eight Districts in the Regions of Iringa, Manyara, Mbeya, Morogoro, Njombe, and Songwe, all in the GFSS Zone of Influence (ZoI).

Five key activities were implemented during the reporting period. (i) Feedback and team planning meetings were held in preparation for the cropping season for all eight project Districts (Momba, Mbozi, Mbarali, Wanging'ombe, Mufindi, Kilolo, Iringa Rural, and Kilombero). (ii) The rice team

harvested the remaining demo sites of the alternate wet and dry (AWD) management technology and rice-legume cropping. Results indicate that AWD contributes to increase yields increases by at least 1 t ha-1 compared with farmers' practice of flooding the fields. Legume yields from residual moisture after rice harvests varied across different sites owing to different challenges such as extreme drought and pest/disease infestation. Farmers harvested between 0.1 and 0.3 t ha-1 of grain for the different legume crops planted (chickpea, cowpea, and green gram). (iii) A series of four training activities was conducted. These were a residential bootcamp for 69 Government of Tanzania (GoT) extension staff (53 males, 16 females) aimed at enhancing their skills in agronomy and extension for better service delivery; training on protocols to be used during the cropping season for extension staff (77 males, 46 females); and training for 54 different stakeholders on Quality Declared Seed (QDS) production (39 males, 15 females). The rice team also held additional training for 140 stakeholders - extension staff, NAFAKA staff, and Lead farmers (102 males, 38 females) - who will be involved in hosting and management of demo sites and Model farms. (iv) Selection of demo sites was done and procurement of agro-inputs for the sites, Model farms, and QDS production. Most of the inputs were provided by Africa RISING and NAFAKA partners as part of the scaling efforts. The inputs included 9.48 t of rice seeds, 490 kg of maize seeds (mostly provided by agro-input companies), 2.54 t of common bean seeds (580 kg of which was provided by CIAT) and 16.5 t of fertilizers. (v) In Districts which had received adequate rains 107 demo sites were established – 25 in Mbozi, 15 in Momba, 10 in Wanging'ombe, 20 in Iringa, and 37 in Kilolo. For others, lay-out for demo sites has been accomplished, awaiting rains.

The key planned activities for the next quarter are: (i) establishment of demo and learning sites completed in all project Districts; (ii) training of farmers and QDS producers (iii) monitoring visits to project sites and data collection; and (iv) conducting a study on 'willingness to pay' for different services provided by the projects (Africa RISING and NAFAKA) as part of ensuring sustainability.

1.2 Summary of results to date

Indicators	FY 18/19 target	Q1 FY18/19	Q2 FY18/19	Q3 FY18/19	Q4 FY18/19	Achievements FY 18/19	Percentage achieved FY19	LOP target	LOP achievements to date	LOP percentage achieved
EG.3.2 Number of individuals participating in USG food security programs [IM-level]	62,500	303						62,500	36,107	57.77
*EG.3.2-24 Number of individuals in the agriculture system who have applied improved management practices or technologies with USG assistance [IM-level]	42,000							45,000	34,156	75.9
*EG.3.2-25 Number of hectares under improved	50,000							56,000	38,293.9	68.38

management practices or technologies with USG assistance [IM-level]										

*Data for these indicators are reported in the fourth quarter after the annual outcome survey.

1.3 Evaluation/assessment status and/or plan

Assessment Type	**Planned for (date)**	**Status**
Internal data quality assessment	February 2019	Planned

2. ACTIVITY IMPLEMENTATION PROGRESS

2.1 Progress narrative

Africa RISING and partners are involved in the delivery of agricultural information and technology packages through a network of projects and other public and private sector actors that include ACDI/VOCA that leads NAFAKA, the USAID-funded cereals project in Tanzania. These collaborations are aimed at improving efficiency and enhancing disciplinary integration while contributing to the goals of the Global Food Security Strategy (GFSS) of harmonizing regional efforts to fight hunger and poverty in countries with chronic food insecurity and insufficient production of staple crops. Attractive interventions in this project include promotion of climate-smart agricultural innovations, dissemination of GAPs, rehabilitation and protection of natural resources, and postharvest management.

The project focuses on three crop enterprises (maize, legumes, and rice) with postharvest handling and nutrition as cross-cutting themes. The key partners in the project include the International Institute of Tropical Agriculture (IITA) as the lead institution, the International Center for Tropical Agriculture (CIAT), three institutions of the Tanzania Agricultural Research Institute (TARI)—Dakawa, Uyole, and Hombolo—and one USAID-funded project (Cereal Market Systems Development/NAFAKA project) led by ACDI/VOCA. These work in partnership with the District Local Government institutions, specifically DAICOs, the private sector (seed companies, millers, and processors), and NGOs to deliver on the following objectives:

1. Introduce and promote improved and resilient varieties of food crops to farm households in a manner that complements their ongoing farm enterprises, contributes to sustainable agricultural resource management, and offers nutritional advantages and alternative market channels.
2. Disseminate GAPs along with the most promising new crop varieties suited to widely representative agroecological zones and market proximity.
3. Protect land and water resources and foster agricultural biodiversity through the introduction of soil and water management practices.
4. Introduce and promote postharvest management technologies for maize, rice, and legumes to reduce losses and bring quality up to market standards.
5. Offer and expand capacity-building services to members of grassroots farmers' associations, platform partners, and development institutions in the scaling process, paying particular attention to the special opportunities available to women farmers as technical and nutritional innovators and resource managers.

The project is currently being implemented in six Regions of Tanzania: Manyara, Njombe, Morogoro, Iringa, Mbeya, and Songwe, all in the GFSS ZoI (Fig. 1).

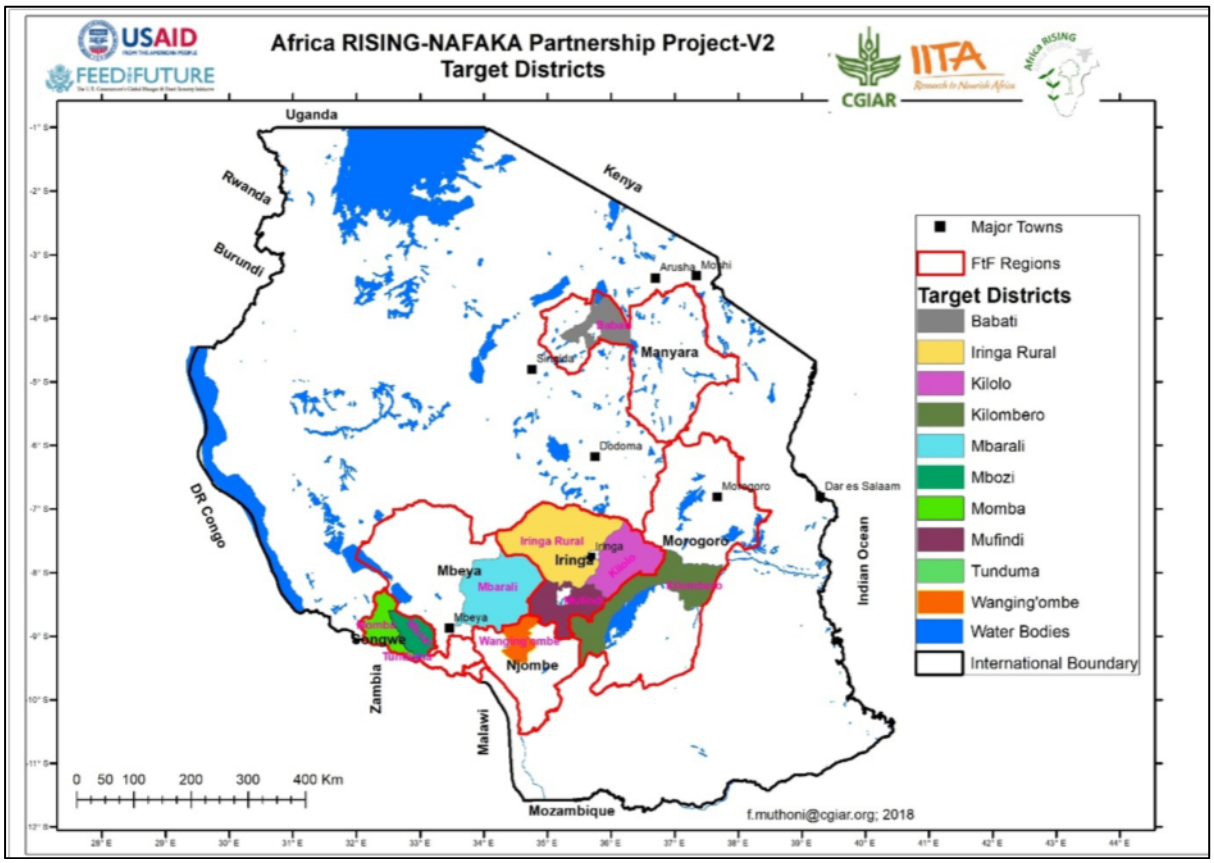


Figure 1. Project locations

All project activities contribute to the Development Objective (DO2) of the USAID Tanzania Country Development Cooperation Strategy (CDCS); including broad-based economic growth being sustained. This is Year 2 of the second project phase and we plan to achieve the Life of Project (LoP) targets of 62,500 individuals benefitting from the project activities and 56,000 ha under improved technologies as a result of the project interventions.

2.2 Implementation status and planned activities

2.2.1 Feedback and planning meetings

Project teams (maize/legumes and rice/legumes) met with District Local Government staff and selected Lead farmers from 8 to 20 October 2018 to share project results from the 2017/18 cropping season and to deliberate on what areas required improvement. After the feedback sessions, which focused on what was done and how (e.g., demo sites established, extension staff trained, farmers linked to markets), the common recommendations for improvement included the following:

i. Selection and confirmation of demo/training sites should be done earlier (September or October) before farmers allocate land to other activities.
ii. All the required agro-inputs should be delivered before the beginning of the cropping season (around 15 October).
iii. As the project continues to work with government extension staff as part of the scaling efforts, supervisors should identify and replace problematic staff (i.e., those who do not work or are ineffective).
iv. The project should put more emphasis on strengthening the QDS system through the training of more producers and support for their associations.

During the meetings, District staff also shared information on which organizations/institutions work in areas where this project is operational so that partnership opportunities can be explored. Table 1 shows the information on organizations with which the project can potentially form partnerships to take the technologies to scale.

Table 1. Projects/organizations implementing activities similar to AR-NAFAKA collaboration project

District	Organization/project	Crop	Approach
Kilolo	Clinton Foundation	soy bean	Farmer groups/demo plot
Iringa Rural	One Acre Fund	maize	demo plot
	AGRA TIJA Tanzania project	maize, beans	demo plot
Mufindi	BRITEN	maize	Farmer groups
Wanging'ombe	BRITEN	maize	Farmer groups
Mbozi	Hanns R. Neumann Stiftung	maize beans	Farmer groups
Momba	OBO Investments	maize	Farmer groups/demo plot
	NAMBURI Seed Company	maize	Lead farmers/demo plot

The maize/legumes team (16 people = 13 males, 3 females) met in Morogoro on 2 and 3 October 2018 to finalize protocols for the project. The team comprised staff of IITA, ACDI/VOCA (NAFAKA Project), TARI Hombolo, TARI Uyole, and District Extension staff (one Coordinator from each of the six Districts where maize/legumes are the focus of the project). Arising from the meeting, there was agreement on the following protocols.

(a) Maize protocols

Three protocols for maize were developed.

1. In partnership with the Soil Health Partnership led by the Southern Agricultural Corridor of Tanzania (SAGCOT), after preliminary studies, it was agreed that soil acidity is a limiting factor to effective fertilizer use, hence yields are below potential for most of the Districts in southern Tanzania. Therefore, it was agreed that all demo sites will have lime application to complement: (i) soil erosion control practices (terracing), (ii) fertilizer application, and (iii) deployment of Africa RISING - NAFAKA approved improved maize varieties. namely MAMS 913, WH 505, MERU 513/515, PAN 691, and PHB 30G19/3253. Decisions on which variety to use for which location will be informed by the agroecological suitability of a given variety.

2. In addition, it was agreed that soil and water management technologies will be established in areas receiving low rainfall, particularly in lower Kilolo, Isimani (Iringa Rural), and Wanging'ombe Districts. In-situ water harvesting technologies (tied ridges, fanya juu/chini terraces) in combination with drought tolerant varieties (MAMS HB 913, MERU 513, PHB30G19, and WH505) will be applied alongside farmers' practices.

3. Training on the proper timing of fertilizer application is of crucial importanc since timing has a significant effect on crop yields. Proper timing of the fertilizer application increases yields, reduces nutrient losses, increases nutrient use efficiency, and prevents damage to the environment. Therefore, a protocol on the timing of fertilizer application was developed to demonstrate recommended times for fertilizer application to be compared with common farmers' practices in Momba District (15 demo sites). The fertilizer combinations will be DAP+(KYNOPLUS+SA) + CAN, and DAP + urea + urea (top- dressing with urea fertilizer in two splits). The approved improved maize varieties are UH6303, SC719, MAMS HB913, WH505, HB515, and PAN 691.

(b) Common beans protocol

For common beans, the focus will be on improved varieties that are biofortified (iron- and zinc-rich) and have been proven to be drought and heat tolerant. These are Jesca, Njano Uyole, Uyole 03, Seliani 14, and Seliani 15.

(c) Soybean protocol

The soybean protocol will focus on improved varieties, proper fertilizer application, and use of inoculants. The improved varieties to be promoted are Uyole Soya 2 and Uyole Soya 4.
For rice activities, the team will use the protocols of last year without modification. These are attached as Annex 3.

2.2.2 Training activities

Three training activities were conducted. A two-day residential bootcamp (in four locations) was conducted for GoT extension staff between 23 October and 1 November 2018 to enhance their capacities to deliver quality services to project beneficiaries. The focus of the training was on the following: (i) Criteria for selection of sites for demo plots and demo layout; (ii) Soil properties and soil nutrients; (iii) Seeds and seed quality; (iv) Land preparation methods; (v) Soil and water management; (vi) Soil fertility management including the need to use soil amendments; (vii) Safe handling and use of chemicals; and (viii) Pests and disease

management/control methods. The training was attended by 69 participants as indicated in Table 2.

Table 2. Participants in the bootcamps conducted for GoT extension staff

District	**Males**	**Females**	**Total**
Iringa DC	6	3	9
Kilolo	8	2	10
Mufindi	7	2	9
Wanging'ombe	4	3	7
Mbarali	14	4	18
Mbozi/Momba	14	2	16
Total	**53**	**16**	**69**

In preparation for the cropping season, training was provided for 123 GoT extension staff on protocols and data management (77 males, 46 females). For the maize/legumes team, 76 staff were trained from 15 to 24 November 2018 (40 males, 36 females); for rice/legumes, 47 were trained (37 males, 10 females) from 2 to 27 November 2018. The focus of the training sessions was on (i) demo protocols for maize and legume sites, (ii) data quality standards - validity, reliability, timeliness, precision, and integrity, (iii) data recording, collection, and data flow, (iv) results-based report writing, and (v) documentation of success stories as a results of project interventions.

After selection of demo sites and Model farms for rice activities, setting these out was initiated by organizing additional hands-on training for GoT extension staff, NAFAKA staff, selected Lead farmers, and Model farm hosts in all beneficiary districts. This activity was conducted from 28 November to 7 December 2018. The total number of participants was 140 (Table 3).

Table 3. Trainees who attended the practical training on establishment of rice demo plots and Model farms

District	**Date**	**Type of trainees**	**Men**	**Women**	**Total**
Mbarali (Mbuyuni site)	28 Nov 2018	GoT extension staff	17	4	21
		Lead and Model farmers	27	10	37
		NAFAKA staff	1	1	2
		Subtotal	**45**	**15**	**60**
Momba (Makamba site)	1 Dec 2018	GoT extension staff	7	1	8
		Lead and Model farmers	9	3	12
		NAFAKA staff	1	1	2
		Subtotal	**17**	**5**	**22**
Iringa Rural (Nyamahana site)	5 Dec 2018	GoT extension staff	5	2	7
		Lead and Model farmers	13	4	17
		NAFAKA staff	1	0	1
		Subtotal	**19**	**6**	**25**

Kilombero (Michenga site)	7 Dec 2018	GoT extension staff	8	4	12
		Lead and Model farmers	11	8	19
		NAFAKA staff	2	0	2
		Subtotal	**21**	**12**	**33**
Grand total			**102**	**38**	**140**

The training activities were conducted at one of the selected Model farms in each district. In these trainings, participants acquired skills on how to efficiently prepare a suitable field for rice production. Some of the training items were how to demarcate the field boundaries (using ropes, measuring tapes, and pegs), factors to consider in deciding the size of the bunds, and how to calculate the dimensions of the bunds/ridges. The training sessions were normally concluded by the participants setting out a site in practice, building portions of the bunds and leveling part of the field as well as by providing evaluation of the training sessions.

On 18 and 19 December 2018, the project conducted training on QDS production for 54 participants drawn from QDS producers, District Seed Inspectors, and NAFAKA DIstrict Coordinators drawn from Mbozi, Momba, Mufindi and Wanging'ombe. The training was conducted in Njombe town, jointly by the staff of IITA, TARI Uyole, ACDI/VOCA, and the Tanzania Official Seed Certification Institute (TOSCI). The overall objective of the training was to build capacities on production of quality seeds for common beans in accordance with the Tanzania national seed laws and regulations (Table 4).

Table 4. QDS training participants by District

District	**Males**	**Females**	**Total**
Momba	20	2	22
Mbozi	3	9	12
Mufindi	10	2	12
Wanging'ombe	6	2	8
Total	**39**	**15**	**54**

The training focus was on production principles for QDS, Seeds Act and regulations governing seed industries in Tanzania, and formulation of a seasonal calendar/action plan for QDS producers in Momba, Mbozi, Mufindi and Wanging'ombe Districts.

Photos 1 (left) and 2 (right). Extension staff from Iringa and Kilolo districts participate in construction of tied-ridges for soil and water management in semi-arid agroecological zones during the residential bootcamp that took place in October 2018. Photo credit: Flavian Fortunatus/ACDI/VOCA (NAFAKA Project).

Photo 3. Participants construct a rice bund in one of the model farms at Nkala village, Momba district. Photo credit: Charles Chuwa/TARI Dakawa.

Photo 4. Leonard Sabula of TARI Uyole (right) and Filbert Mzee of ACDI/VOCA (NAFAKA Project) (2nd right) facilitate a group training session on QDS production principles in Njombe District. Photo credit: Japhet Frednand/IITA.

2.2.3 Selection of demo sites and procurement of agro-inputs

The selection of demo sites that will serve as learning sites for the project beneficiaries was successfully completed for a total of 252 sites – 117 for maize, 80 for common beans, 45 for rice, and 10 for soybean. An additional 45 sites were selected for Model rice farms. The list of sites selected for demos and Model farms are attached as an appendix. For all sites selected, soils were extracted for analysis to allow determination of the adequate amount of fertilizers and other appropriate management practices.

In addition, a variety of agro-inputs for the establishment of the demos was procured and delivered to the different locations. For maize, some private sector companies contributed some inputs as part of efforts to enhance scaling of technologies. The inputs included 9.48 t of rice seeds, 490 kg of maize seeds, 2.54 t of common beans seeds (480 kg provided by CIAT under the Technologies for African Agricultural Transformation [TAAT] project) and 16.5 t of fertilizers. Of these, the Africa RISING project procured 4 t of fertilizers, 1.96 t of improved bean seeds, and 9.48 t of rice seeds. The rest, 12.5 t of fertilizers, 490 kg of improved maize varieties, and 580 kg of common beans were provided by project partners who include seed companies – Meru Agro, Agriseed, AfricAsia, OCP, ETG, Corteva, and Beula Seeds – as well as one CGIAR center, CIAT, through the TAAT project. Tables 5, 6, and 7 show the distribution of the agro-inputs procured.

Table 5. Maize variety seeds procured and distributed for the different project locations

District		**Agro ecological Zone**	**Variety and amount (kg)**										**Total amount (kg)**
			UH 6303	**SC 719**	**MAMS HB 913**	**WH 505**	**HB 513**	**HB 515**	**HB 623**	**PHB 3253**	**PHB 30G19**	**PAN 691**	
Iringa **Rural**		Semi-arid			17		20			8	10.4		55.4
		Sub-humid				17		7				10.4	34.4
Kilolo		Semi-arid				9	7				6.3		22.3
		Sub-humid							20			90	110
Mufindi		Sub-humid			10	10	5	5	8	10	5.3	8	61.3
Wanging'ombe		Semi-arid			10		8			2	8		28
		Sub-humid				10		4	2			7.6	23.6
Mbozi		Sub-humid	20	20	15	15		15				15	100
Momba		Sub-humid	10	10	9	9		9				9	56
Grand Total													**490**

Table 6. Seeds of Rice varieties procured for each District for demos, QDS production, and Model farms

District	**Variety and amount of seeds per each group**											**Total** (kg)			
	Mother demos (kg)				**Baby demos** (kg)		**Micro-plots** (kg)		**QDS** (kg)	**Model farms** (kg)					
	SATO 6	SATO 9	TXD 306	Komboka	TXD 306	Komboka	TXD 306	Komboka	TXD 306	TXD 306	Komboka	SATO 6	SATO 9	TXD 306	Komboka
Mbarali	1	1	20	20	561	311	1000	1000	500	260	20	**1**	**1**	**2341**	**1351**
Momba	0	0	5	5	187.5	137.5	140	140	100	70	0	**0**	**0**	**502.5**	**282.5**
Kilombero	0	0	10	10	375	250	1200	1200	600	100	0	**0**	**0**	**2285**	**1460**
Iringa Rural	2	2	10	10	375	250	200	200	110	100	0	**2**	**2**	**795**	**460**
Total	**3**	**3**	**45**	**45**	**1498.5**	**948.5**	**2540**	**2540**	**1310**	**530**	**20**	**3**	**3**	**5923.5**	**3553.5**
Grand total												**9,483**			

Table 7. Fertilizer types procured and distributed for demo sites and Model farms and their sources

Source	Fertilizer type (kg)					
	YARA Otesha	YARA Amidas	DAP	Urea	CAN	YARA Cereal
Corteva	250	300	500	500		300
ETG			1,025	350		
OCP			5,000	3,000		
Africa RISING		150	900	2,100	900	
AfricAsia	100	100	350	350	350	100
Total	350	500	7,775	6,300	1,250	400

Establishment of demo sites

Most of the villages in Iringa and Songwe Regions received enough rains towards the end of December. Consequently, 107 demo sites for maize were planted in collaboration with project and extension staff, and farmers' group members in the respective villages. Table 8 shows the status of establishment of the demo sites in the different districts.

Table 8. Status of establishment of demo sites in the different districts

District	Type of demo		Total
	Lime/maize variety/fertilizer	Lime/maize variety/fertilizer/Soil and Water management	
Iringa Rural	13	7	20
Kilolo	30	7	37
Mufindi	10		
Wanging'ombe	08	2	10
Mbozi	25		25
Momba	15		15
Total	**101**	**16**	**107**

Photos 5 and 6. Farmers setting up their demonstration and learning sites in Sambewe village (left) and Itepula village (right) in Mbozi District. Photo credit: Ibrahim Mkwiru/ACDI/VOCA (NAFAKA Project).

2.2.4 Yield data

The rice team harvested data on AWD technology as well as rice-legume follow-on crops. With AWD the rice crop performed comparatively better (average of 5.6 t ha^{-1}) compared to 4 t ha^{-1} with continuous flooding (Fig. 1).

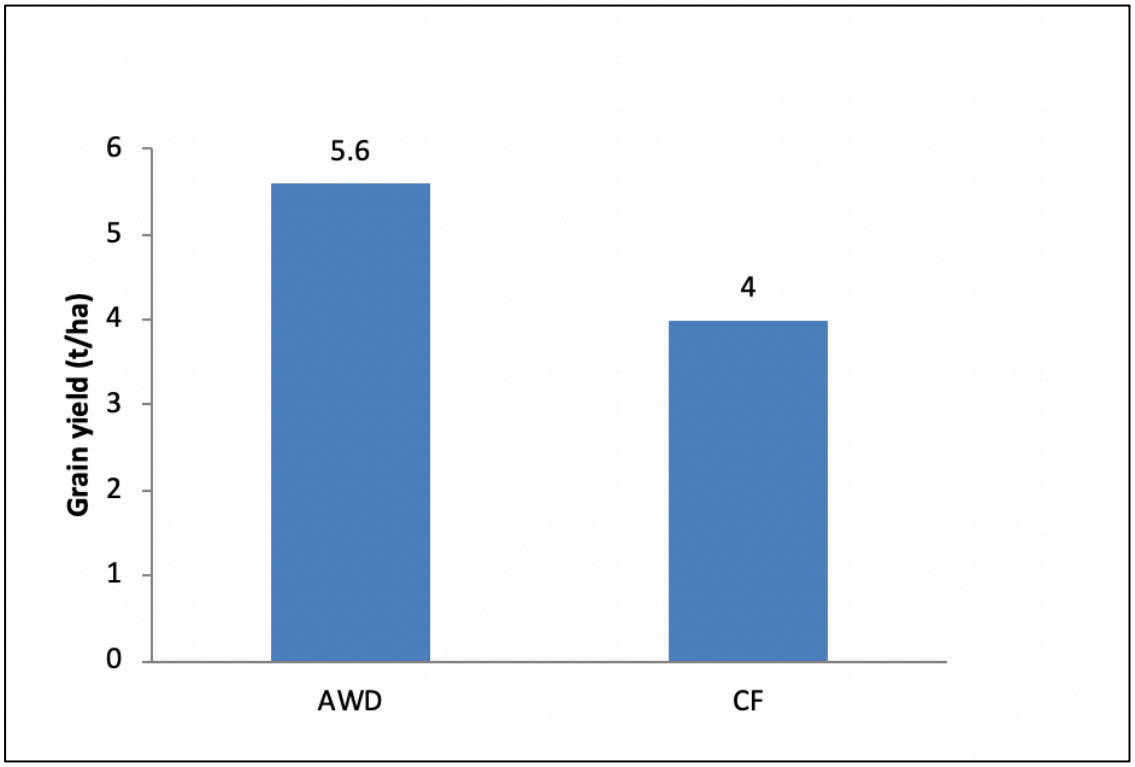


Figure 1. Grain yield under AWD technology (n=3) and continuous flooding (n=3) in Mbarali and Iringa Rural Districts.

For the legume crop, diseases and drought affected the production levels especially for greengram. Harvests of between 0.1 to 0.3 t ha^{-1} were obtained for the three crops (Fig. 2). The project will promote the technology again in 2019 before compiling better-informed information packages for farmers' use.

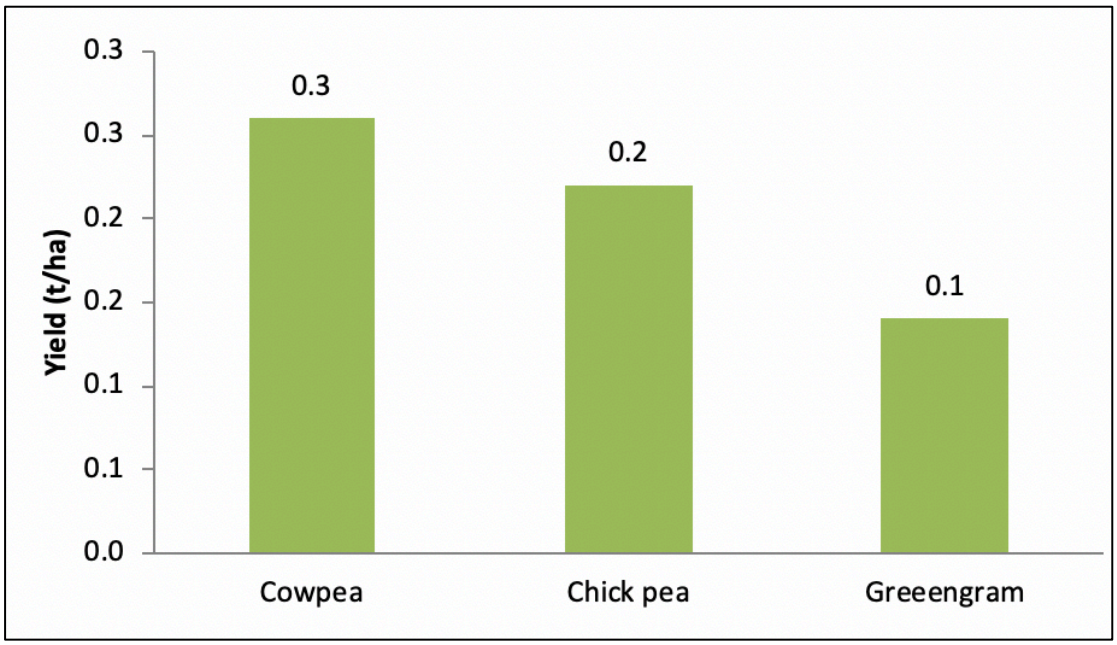


Figure 2. Yield of grain legumes grown as a sequential crop after rice in Iringa Rural and Mbarali Districts (n = 5).

2.2.5 Problems and challenges

Some of the identified demo sites were not big enough to accommodate the layout as indicated in the protocols. Since site identification was done early, team members were able to identify some alternative sites or reduce the plot size without affecting the message intended by the protocol design.

2.2.6 Planned activities

The key planned activities for the next quarter include the following.

i. Establishment of demo sites and Model farms in all identified project locations.
ii. Training farmers and QDS producers.
iii. Conducting monitoring visits to project sites and collecting data for reporting on FtF indicators.
iv. Conducting a study on 'willingness to pay' for different services provided by the Africa RISING and NAFAKA projects as part of sustainability and exit project.

3. INTEGRATION OF CROSS-CUTTING ISSUES AND USAID FORWARD PRIORITIES

3.1 Gender equality and women's empowerment

The Africa RISING-NAFAKA project approach emphasizes gender consideration at all levels of project implementation. In the process of building capacities of farmers, both males and females are trained, considering different gender groups, i.e., adult males and females and the youth (of both sexes). Both male and female members have equal opportunities in the groups and efforts are being made to increase the number of females taking part as males constitute about 70% of project participants.

3.2 Youth engagement

Youth involvement is a key aspect of the project interventions. The youth are equally encouraged to participate in all activities. So far, 51% of project participants are young adults under 35 years old.

3.3 Local capacity development

As in past years, the project continues to work with staff from Government agricultural extension at District and Village levels. In addition, collaboration by Africa RISING and NAFAKA continues in supporting and training VBAAs who not only complement extension staff trainings but also play a key role as frontline actors in the rural agro-input dealer network. Furthermore, the project works with farmers' groups and associations whose capacities are developed in GAPs and related technical areas.

3.4 Integration and collaboration

The NAFAKA field staff coordinated the Africa RISING-NAFAKA partnership project activities supported by Africa RISING in all the project DIstricts (except Babati). In addition, we have successfully sought collaboration with the private sector (Corteva, Seed Co, Meru Agro, ETG, Beula Seeds, Agriseed, Tanzania Fertilizer Association, and BASF) to support demo sites in all project Districts. The companies provided both inputs and technical support, and actively participated in organizing and implementing the field days.

3.5 Sustainability

The close collaboration with the GoT extension staff at District level and private sector actors aims at linking the farmers to partners and development initiatives that will provide support beyond the life of the project. In collaboration with the NAFAKA project, the team works with VBAAs and selected Lead farmers who manage demo plots, provide access to inputs, and produce QDS for legumes and rice to sustain the availability of varieties being taken to scale. Furthermore, the project team plans to continue linking local input and other service

providers (e.g., machinery, crop insurance) with farmers and local extension staff to ensure the technologies continue to be accessible after the project ends.

3.6 Environmental compliance

In accordance with the project PERSUAP and other guidelines, the team emphasizes the judicious use of agro-inputs by promoting integrated soil fertility management without damaging the natural resource base. In semi-arid locations, we encourage farmers to use improved in-situ water conservation technologies, such as tied ridges. Management technologies for soils on steep slopes or those affected by acidity or high salinity and calcium content underlie the approach used in this project. Given the increase in problems of water availability for production, we emphasize the importance of using organic manure and minimizing the use of water in rice production. This is done, among other methods, by promoting the water-saving technologies such as the AWD technology and by establishing bunds around paddy plots.

3.7 Global climate change

Since the project is operating in the context of climate change, we have embraced scaling of technologies and agricultural practices that enhance resilience to climate variability.

3.8 Policy and governance support

The project's activities are in line with the GoT policy of fostering agricultural development. Consequently, the team has received tremendous support from National, Regional, District and Village local governments in all areas where the project activities are implemented.

3.9 Private sector engagement, Public Private Partnerships (PPP), and Global Development Alliance (GDA) collaboration

The project works directly with three agro-input/seed companies in Tanzania—Syngenta, Seed Co, and BASF. Their staff have been instrumental in providing guidance on matters related to agro-inputs as well as in participating in the rural agro-input network spearheaded by the NAFAKA project.

The demand for the mechanical shellers/threshers and hermetic storage bags is gradually increasing owing to the increase in awareness about the technologies. We established a partnership with the Poly Machinery Co. Ltd based in Dar es Salaam that can supply mechanical shellers/threshers and provide spare parts and after-sales services to farmers. We also established partnerships with two manufacturers of hermetic storage bags, i.e., A to Z Textile Mills Ltd and PPTL Co. Ltd. The companies have shown an interest in continuing to work with farmers and other supply chain actors to strengthen the supply network especially in the rural areas. This will enhance continuity of the use of the technology.

3.10 Science, technology, and innovation

Nothing to report this quarter.

4. STAKEHOLDER PARTICIPATION AND INVOLVEMENT

See sections 3.3 and 3.4.

5. MANAGEMENT AND ADMINISTRATIVE ISSUES

Nothing to report this quarter.

6. MONITORING, EVALUATION, AND LEARNING

The PMP indicators are presented in Annex 1.

7. SPECIAL EVENTS FOR NEXT QUARTER

None.

8. ANNEXES

8.1 Annex I. Performance against PMP indicators for Project Year V (2018/19)

Indicator / disaggregation	Target 2019	Quarter 1 (Oct–Dec 2018)	Quarter 2 (Jan– Mar 2019)	Quarter 3 (Apr–Jun 2019)	Quarter 4 (Jul – Sept 2019)
EG.3.2 Number of individuals participating in USG food security programs [IM-level]	56,255	303			
* EG.3.2-24 Number of individuals in the agriculture system who have applied improved management practices or technologies with USG assistance [IM-level]	42,000				
*EG.3.2-25 Number of hectares under improved management practices or technologies with USG assistance [IM-level]	50,000				

*These indicators are measured annually. Therefore, data for 2018/19 will be available in the last quarter of the project year and reported in the annual report.

8.2 Annex II: Status of demo sites for maize and rice

Rice demos: **Selected mother demo sites for major technologies.**

District	Site/village	Type of technology	Farmer Group
Mbarali	Madibira, Mkunywa	VarFer	Mkunywa Farmers
	Madibira, Ikoga	VarFer	Ikoga Kilimo Group
	Madibira, Chalisuka	VarFer	Chalisuka Group
	Mahongole	VarFer	Changamoto
	Igalako	VarFer	Juhudi
	Mbuyuni	VarFer	Juhudi
	Ruiwa	SAS	Maruima
	Majengo	VarFer	Majengo
	Chamoto	VarFer	Upendo
	Kapunga	VarFer	Kasi mpya
	Ukwama	VarFer	Ujamaa
	Mtamba	VarFer	Juhudi
	Mwaluma	VarFer	Faraja
	Kongolo Mkola	VarFer +AWD	Upendo
	Utengule Usangu	VarFer	Wakulima maendeleo
	Ukwavila	VarFer	Mshikamano
	Mwakaganga	VarFer	Mwendamtitu
	Mhwela	VarFer	Pamoja
	Ibohora	VarFer	Jifunze
	Ihahi	VarFer	Mshikamano
Momba	Makamba	VarFer +AWD	Chaulanda

	Nkala	VarFer	Mkombozi
	Mlomba	VarFer	Jitumeni
	Tindingoma	VarFer	Muungano
	Msangano	VarFer	Ndawakwizi
Iringa Rural	Magozi	VarFer + SAS	Mshikamano
	Kimande	VarFer	
	Itunundu	VarFer	
	Kinyika	VarFer	Kazamwendo
	Isele	VarFer	Mshikamano
	Mbuyuni	VarFer	Fighters Group
	Tungamalenga	VarFer + SAS	Kazamwendo
	Mapogoro	VarFer	Tumaini
	Nyamahana	VarFer	Twende pamoja
	Idodi	VarFer	Nguvukazi
Kilombero	Sagamaganga	VarFer	Chama cha wakulima Sagamaganga
	Msalise	VarFer	MSAMCOS
	Michenga	VarFer	Msimamo group
	Mofu	VarFer	Jitegemee
	Idete	VarFer	Amani Group
	Mkangawalo	VarFer	Mkangawalo Farmers Association
	Katindiuka	VarFer	Umoja wa wakulima Katindiuka
	Lipangalala	VarFer	Kikundi cha sanaa na Kilimo Lipangalala (KISAKILI)
	Kisawasawa	VarFer	Kikundi cha Wakulima Wa Mpunga Kisawasawa (KIWAMKI)

	Ichonde	VarFer	Kikundi cha wakulima Ichonde

Model rice farms: **Selected Model farm sites.**

District	**Site/village**
Mbarali	Madibira, Sc 2, Block 2, Left
	Madibira, Sc 4, Block 6, Right
	Madibira, Sc 6, Block 6, Right
	Madibira, Sc 5, Block 1, Right
	Madibira, Sc 3, Block 2, Left
	Mahongole
	Igalako
	Mbuyuni
	Ruiwa
	Majengo
	Chamoto
	Kapunga
	Ukwama
	Mtamba
	Mwaluma
	Kongolo Mkola
	Utengule Usangu
	Ukwavila
	Mwakaganga
	Ihahi
	Mhwela

	Ibohora
Iringa Rural	Magozi
	Mbuyuni
	Itunundu
	Kimande
	Kinyika
	Isele
	Nyamahana
	Idodi
	Mapogoro
	Tungamalenga
Kilombero	Katindiuka
	Lipangalala
	Michenga
	Mofu
	Idete
	Mkangawalo
	Sagamaganga
	Kisawasawa
	Ichonde
	Msalise
Momba	Makamba
	Naming'ongo

	Tindingoma
	Msangano
	Nkala
	Usoche
	Mlomba

Status of maize demos in the different locations.

Maize demo plots in Iringa, Njombe, and Songwe regions.

District	Village	Demo type	Demo status
Mufindi	Rungemba	Lime/Variety/Fertilizer	Well germinated
	Kikombo	Lime/Variety/Fertilizer	Well germinated
	Kibada	Lime/Variety/Fertilizer	Well germinated
	Igomaa	Lime/Variety/Fertilizer	
	Nyanyembe	Lime/Variety/Fertilizer	Well germinated
	Mtambula	Lime/Variety/Fertilizer	Well germinated
	Ipilimo	Lime/Variety/Fertilizer	Well germinated
	Nundwe	Lime/Variety/Fertilizer	Well germinated
	Utosi	Lime/Variety/Fertilizer	Well germinated
	Mtura	Lime/Variety/Fertilizer	Well germinated
Wanging'ombe	Imalinyi	Lime/Variety/Fertilizer	Well germinated
	Mkeha	Lime/Variety/Fertilizer	Well germinated
	Mambegu	Lime/Variety/Fertilizer	Well germinated
	Luduga	Lime/Variety/Fertilizer	Well germinated
	Iponda	Lime/Variety/Fertilizer	Well germinated
	Kasagala	Lime/Variety/Fertilizer	Well germinated
	Usuka	Lime/Variety/Fertilizer	Well germinated
	Ikwega	Lime/Variety/Fertilizer	Well germinated
	Uhambule	SWM/Variety/Fertilizer	Well germinated
	Mayale	SWM/Variety/Fertilizer	Well germinated
Iringa DC	Kalenga	Lime/Variety/Fertilizer	Well germinated
	Mngalali	Lime/Variety/Fertilizer	Well germinated
	Kikombwe	Lime/Variety/Fertilizer	Well germinated
	Kibebe	Lime/Variety/Fertilizer	Well germinated
	Magunga	Lime/Variety/Fertilizer	Well germinated
	Ng'enza	Lime/Variety/Fertilizer	Well germinated
	Ibangamoyo	Lime/Variety/Fertilizer	Well germinated
	Ilandutwa	Lime/Variety/Fertilizer	Well germinated
	Wenda	Lime/Variety/Fertilizer	Well germinated
	Malagosi	Lime/Variety/Fertilizer	Well germinated
	Mgama	Lime/Variety/Fertilizer	Well germinated
	Ugwachanya	Lime/Variety/Fertilizer	Well germinated

	Mkungugu	SWM/Variety/Fertilizer	Well germinated
	Magulilwa	Lime/Variety/Fertilizer	
	Ilambilole	SWM/Variety/Fertilizer	
	Kising'a	SWM/Variety/Fertilizer	
	Igula	SWM/Variety/Fertilizer	
	Kihorogota	SWM/Variety/Fertilizer	
	Uhominyi	SWM/Variety/Fertilizer	
	Mikong'wi	SWM/Variety/Fertilizer	
Momba	Nzoka	Maize variety/Fertilizer	
	Mfuto	Maize variety/Fertilizer	
	Myunga	Maize variety/Fertilizer	
	Mpui	Maize variety/Fertilizer	
	Nkangamo	Maize variety/Fertilizer	Well germinated
	Mpande	Maize variety/Fertilizer	Well germinated
	Namole	Maize variety/Fertilizer	Well germinated
	Msamba II	Maize variety/Fertilizer	Well germinated
	Isanga	Maize variety/Fertilizer	Well germinated
	Chiwezi	Maize variety/Fertilizer	Well germinated
	Nandanga	Maize variety/Fertilizer	Well germinated
	Nasele	Maize variety/Fertilizer	Well germinated
	Chiwanda	Maize variety/Fertilizer	Well germinated
	Nakawale	Maize variety/Fertilizer	Well germinated
	Ndalambo	Maize variety/Fertilizer	Well germinated
Mbozi	Isansa	Lime/Variety/Fertilizer	Well germinated
	Nansama	Lime/Variety/Fertilizer	Well germinated
	Iganya	Lime/Variety/Fertilizer	Well germinated
	Iporoto	Lime/Variety/Fertilizer	Well germinated
	Bara	Lime/Variety/Fertilizer	Well germinated
	Ikonya	Lime/Variety/Fertilizer	Well germinated
	Harungu	Lime/Variety/Fertilizer	Well germinated
	Chasia	Lime/Variety/Fertilizer	Well germinated
	Ibembwa	Lime/Variety/Fertilizer	Well germinated
	Itepula	Lime/Variety/Fertilizer	Well germinated
	Msanyila	Lime/Variety/Fertilizer	Well germinated
	Itewe	Lime/Variety/Fertilizer	Well germinated
	Iwalanje	Lime/Variety/Fertilizer	Well germinated
	Magamba	Lime/Variety/Fertilizer	Well germinated
	Itumpi	Lime/Variety/Fertilizer	Well germinated
	Iyenga	Lime/Variety/Fertilizer	Well germinated
	Hangomba	Lime/Variety/Fertilizer	Well germinated
	Shiwinga	Lime/Variety/Fertilizer	Well germinated
	Igamba	Lime/Variety/Fertilizer	Well germinated
	Iganduka	Lime/Variety/Fertilizer	Well germinated
	Igake	Lime/Variety/Fertilizer	Well germinated
	Idiwili	Lime/Variety/Fertilizer	
	Iyula	Lime/Variety/Fertilizer	
	Ichesa	Lime/Variety/Fertilizer	

	Sembewe	Lime/Variety/Fertilizer	
Kilolo	Lusinga	Lime/Variety/Fertilizer	
	Kidabaga	Lime/Variety/Fertilizer	Well germinated
	Ihimbo	Lime/Variety/Fertilizer	Well germinated
	Italula	Lime/Variety/Fertilizer	Well germinated
	Utengule	Lime/Variety/Fertilizer	Well germinated
	Isoliwaya	Lime/Variety/Fertilizer	Well germinated
	Itimbo	Lime/Variety/Fertilizer	Well germinated
	Luhindo	Lime/Variety/Fertilizer	Well germinated
	Lulanzi	Lime/Variety/Fertilizer	Well germinated
	Kilolo	Lime/Variety/Fertilizer	
	Luganga	Lime/Variety/Fertilizer	
	Mtitu	Lime/Variety/Fertilizer	
	Lukani	Lime/Variety/Fertilizer	
	Kihesa mgagao	Lime/Variety/Fertilizer	
	Masege	Lime/Variety/Fertilizer	
	Isuka	Lime/Variety/Fertilizer	
	Ukumbi	Lime/Variety/Fertilizer	
	Masalali	Lime/Variety/Fertilizer	Well germinated
	Kitowo	Lime/Variety/Fertilizer	Well germinated
	Winome	Lime/Variety/Fertilizer	Well germinated
	Mawambala B	Lime/Variety/Fertilizer	Well germinated
	Image No8	SWM/Variety/Fertilizer	Well germinated
	Lyasa	SWM/Variety/Fertilizer	Well germinated
	Ibumu	SWM/Variety/Fertilizer	Well germinated
	Vitono	SWM/Variety/Fertilizer	Well germinated
	Irole	SWM/Variety/Fertilizer	Well germinated
	Mawala	SWM/Variety/Fertilizer	
	Kilalakidewa	SWM/Variety/Fertilizer	
	Magome	Lime/Variety/Fertilizer	Well germminated
	Ilamba	Lime/Variety/Fertilizer	
	Ndengisivili	Lime/Variety/Fertilizer	
	Mawambala A	Lime/Variety/Fertilizer	
		Lime/Variety/Fertilizer	

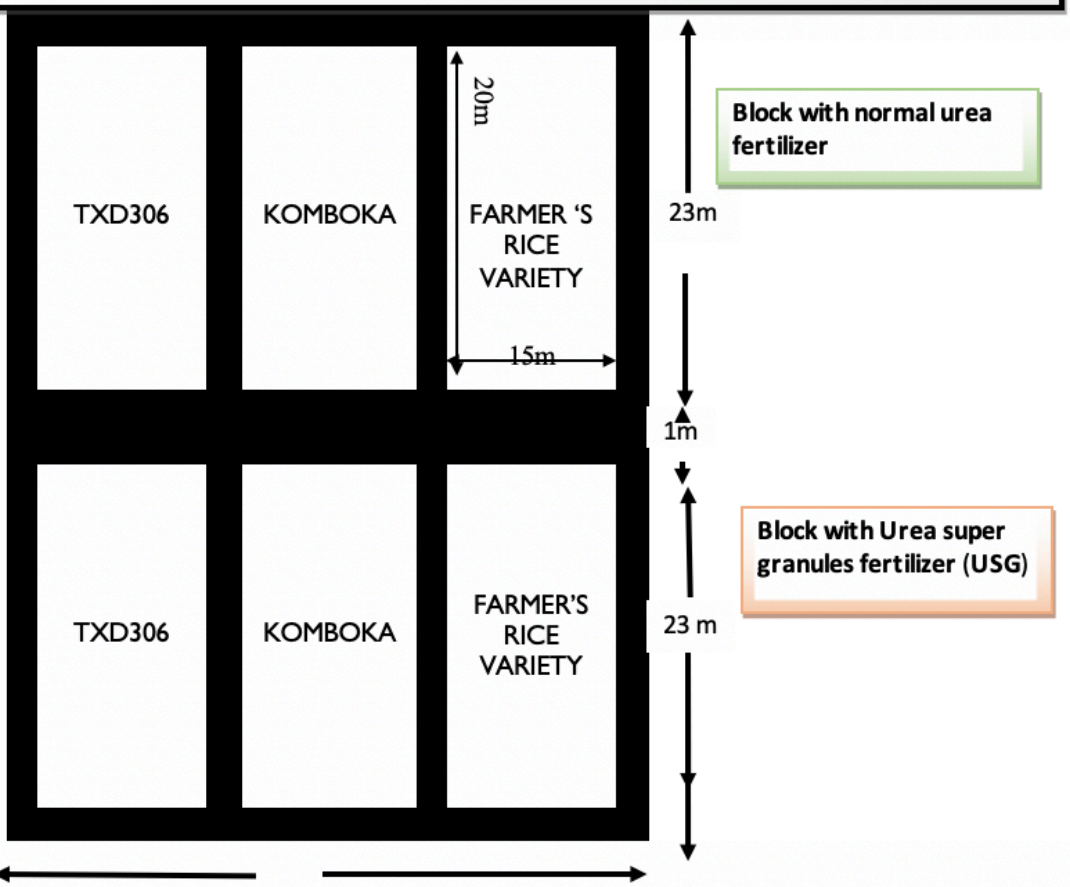
8.3 Annex III: Summary of technologies and protocols to be used for rice technologies during 2018/19 cropping season.

1. Use of improved rice varieties (TXD306 SARO5, Komboka, SATO1, and SATO6) and fertilizer (MOP, DAP) during planting and urea fertilizer for vegetative and reproductive growth in normal soil to increase rice yields
2. Use of saline –sodic tolerant rice varieties, gypsum and farmyard manure in soils affected by salinity and sodicity.
3. Use of safe AWD in rice fields to improve minimum utilization of water and to avoid soil salinity in the irrigation scheme.
4. Use of relay cropping (alternate rice and legumes) to improve soil fertility and proper land utilization
5. Use of simple farm implements for sowing rice seeds.
6. Use of simple farm implements to control weeds in rice fields.

TECHNOLOGY OF INCREASING RICE YIELDS BY USE OF IMPROVED VARIETIES AND FERTILIZER (VARFER)

Field layout

Targeted Area = 42 m × 47 m; Area of the plot = 15 m × 20 m; Width of the bund/path= 50 cm



Land preparation

Plow the field, make bunds, harrowing, wetting, and proper leveling before sowing /transplanting

Planting

Age of seedlings = 15 – 21 days
Spacing between hills = 20 cm × 20 cm
Number of seeds/seedlings per hill = 1-3
Gap filling 7-10 days after germination/transplanting

Fertilizer rates for each plot

	For planting (Basal)		For vegetative growth	For reproductive growth	For vegetative and reproductive growth
	DAP	**MOP**	**UREA**	**UREA**	**USG**
Rate (kg)	2.7	2.4	3.9	3.9	4.5
Days after planting	0-5	0 - 5	15 - 20	50 - 55	15 - 20

Grain yield data collection

Harvested area
=1 m × 5 m (5 m^2)

Control of weeds and other vices

Hand weeding and appropriate herbicides will be timely used to manage weeds depending on nature and pressure of weeds.

Grain yields data collection form
(VarFer technology)

Village----------District: ----------

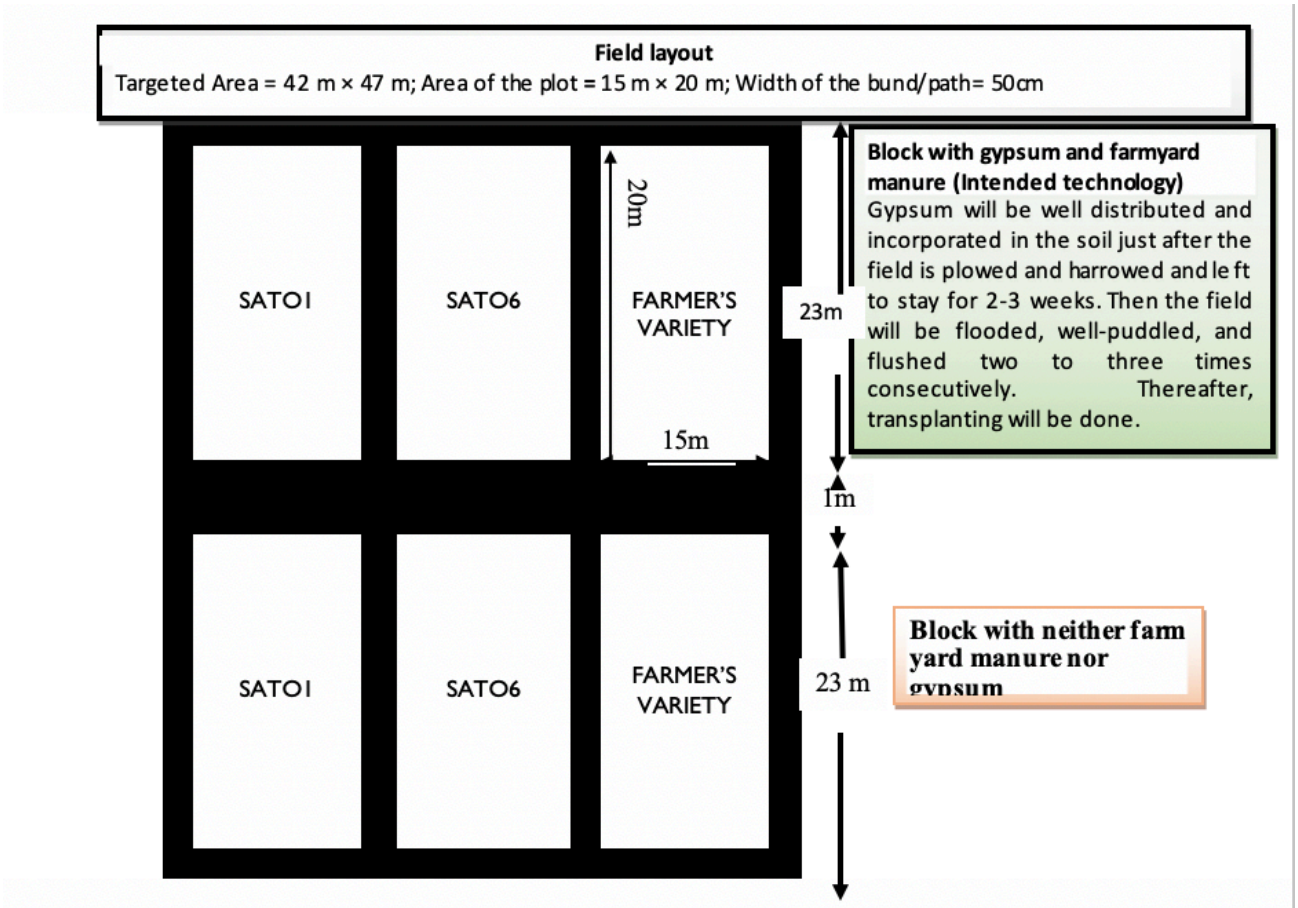
Date of data collection----------

Days after planting: ----------... ……. (If applicable)

Days after transplanting: ---------- (If applicable)

Name of variety	**Normal urea fertilizer**		**Urea super granules (USG)**	
	Grain yield (kg/5m^2)	Grain moisture content (Average of 3 samples) (%)	Grain yield (kg/5m^2)	Grain moisture content (Average of 3 samples) (%)
TXD306				
KOMBOKA				
FARMER'S VARIETY				

TECHNOLOGY FOR INCREASING RICE YIELDS IN SOILS AFFECTED BY SALINITY-SODICITY BY APPLICATION OF FARMYARD MANURE, GYPSUM, AND USE OF SALT TOLERANT RICE VARIETIES (SATO1 and SATO 6)



Land preparation

Plow the field; make bunds, do proper leveling when field is flooded, then apply gypsum and farm yard manure before

Planting

Plant seeds or seedlings of 15 – 21 days. Spacing between hills = 20 cm × 20 cm, Seeds/seedlings per hill = 1-3; Gap filling 7-10 days after transplanting

Gypsum, farm yard manure (FYM) and fertilizer for each plot

	To reduce sodicity-salinity before planting		Fertilizer for planting		Fertilizer for vegetative growth	Fertilizer for reproductive growth	Fertilizer for vegetative and reproductive growth
	Gypsum	**FYM**	**DAP**	**MOP**	**NORMAL UREA**		**USG**
Rates (kg)	120	75	2.7	2.4	3.9	3.9	4.5
Days after planting	(-)14	0	0-5	0 - 5	15 - 20	50 - 55	15 - 20

Control of weeds and other vices

Hand weeding and appropriate herbicides will be used timely to manage weeds depending on nature and pressure of weeds. Use pesticides to control insects and diseases.

Collection grain yield data

Harvested area = 1m × 5 m

Grain yield data collection sheet
(Sodic - saline management technology)

Village: ----------District: ----------

Date of data collection: ----------

Days after planting: ---------- (If applicable)

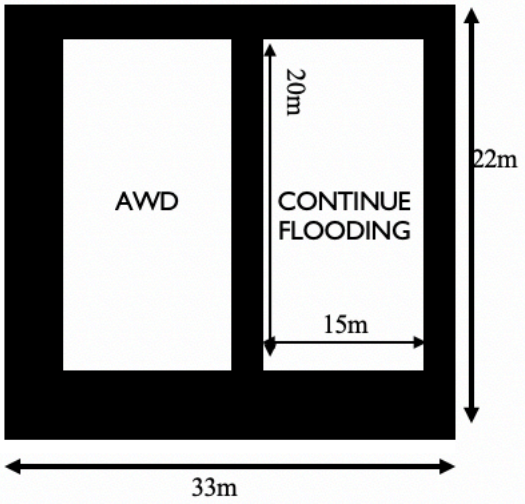
Days after transplanting: ---------- (If applicable)

Name of variety	**Portion with gypsum and farmyard manure (Intended technology)**		**Portion with neither farmyard manure nor gypsum)**	
	Grain yield (kg $5m^2$)	Grain moisture content (Average of 3 samples) (%)	Grain yield (kg/$5m^2$)	Grain moisture content (Average of 3 samples) (%)
SATO 1				
SATO 6				
FARMER'S VARIETY				

TECHNOLOGY FOR INCREASING RICE YIELDS BY SAFE ALTERNATE WETTING AND DRYING (AWD) IN THE RICE FIELDS

ARRANGEMENT/APPEARANCE OF THE FIELD

Targeted Area = 22 m × 33 m; Area of the plot = 15 m × 20 m; Width of bund/path = 1 m



Block 1. AWD

After transplanting, water (about 3 cm deep) will be maintained on the soil surface in the field for about 15 days to enable early plant establishment. Within that period 3 perforated plastic tubes (40 cm long) will be inserted vertically in the soil to a depth of 20 cm in Block 1 (AWD practice).

The perforated tubes will be used to monitor the water table movement in the field. Fifteen (15) days after transplanting, irrigation water will be introduced in the field to a depth of 5 cm on the soil surface and allowed to subside into the soil to a depth of 15 cm.

Block 2 (Farmers' practice)

Rice field will be flooded throughout the growing season (farmers' normal practice). Key farmers will be trained to monitor and take records of the demo.

Field layout

The area will be divided in two blocks. Block 1 will be of AWD practice; block 2 will be flooded throughout the growing season (normal practice) as shown in the figure.

Land preparation

The field will be plowed and harrowed to a good tilth using locally available equipment such as tractor-drawn implements, power tillers, animal-drawn tillers, or hand hoes. The field will then be leveled manually or by using a wooden board.

Planting

Name of variety: TXD306 (SARO5), Seeds or seedlings of 15-21 days. Spacing between hills = 20 cm × 20 cm, Seeds/seedlings per hill = 3, Gap filling 7-10 days after germination/ transplanting.

Fertilizer for each plot

	For planting		For vegetative growth	For reproductive growth
	DAP	**MOP**	**UREA**	**UREA**
Rates (kilo)	2.7	2.4	3.9	3.9
Days after planting	0-5	0 - 5	15 - 20	50 - 55

To control weeds and other vices

Hand weeding and appropriate herbicides will be timely used to manage weeds depending on nature and pressure of weeds. Use pesticides to control insects a once these appear.

Collection of irrigation grain yields data

The numbers and dates of irrigations applied throughout the growing season will be recorded to determine the amount of water used for irrigation in the AWD practice as compared to conventional irrigation. Yield data will be recorded from the area of 1 m × 5 m

Date of admitting water in the field (from 15 days after transplanting)	Frequency of irrigation from 15 days after transplanting (number of irrigations per plot ?)	Depth of water applied in the plot (target 5 cm) (cm)		Remarks (If available)
		Portion of AWD	**Portion farmer practice (Water throughout)**	
	1			
	2			
	3			

Data collection form for grain yield data
(AWD technology)

Village: ----------District: ----------

Date of data collection: ----------

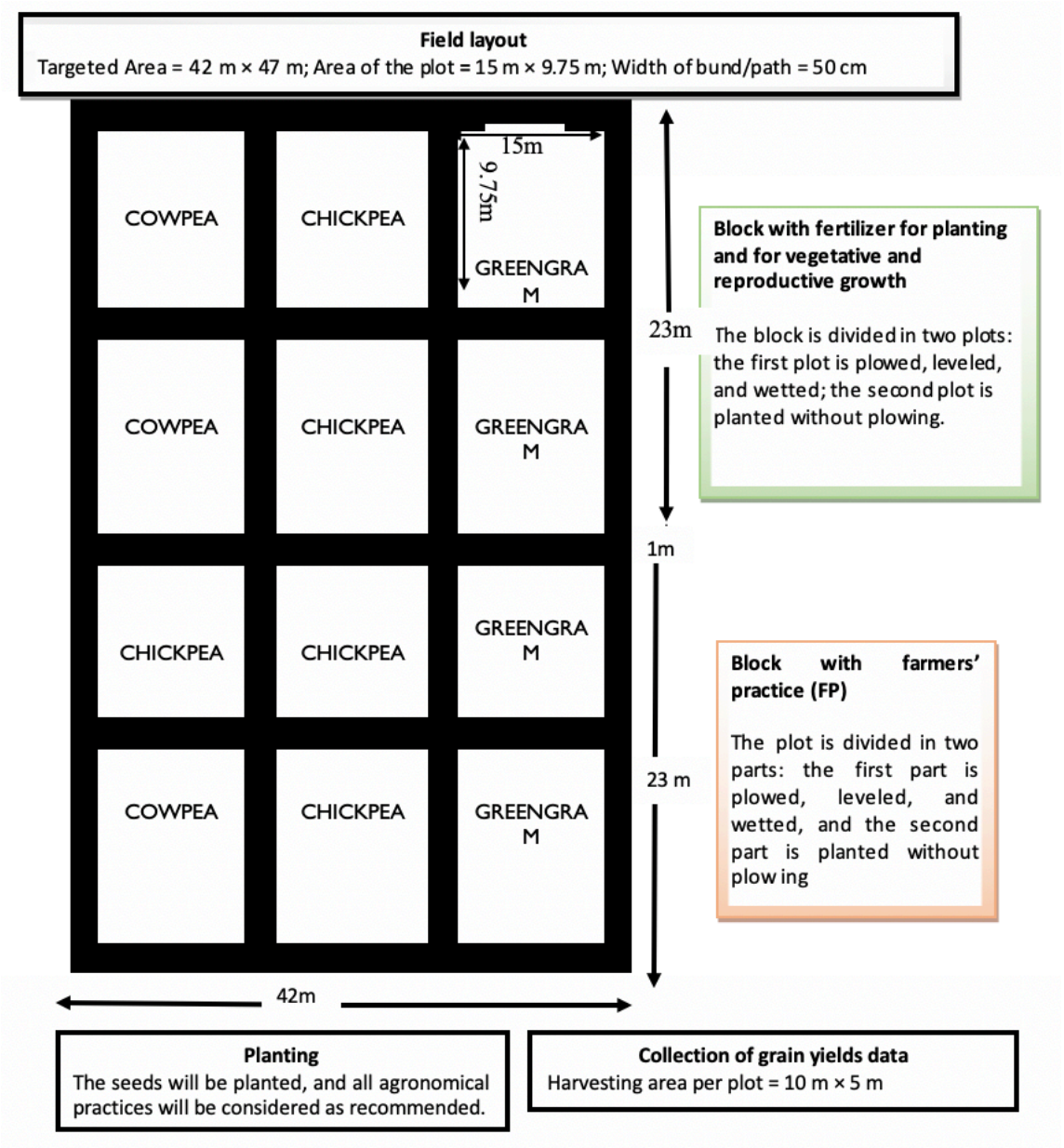
Days after planting: ---------- (If applicable)

Days after transplanting: ---------- (If applicable)

Portion of AWD (Intended technology)		**Portion of farmers' ordinary practice (Water throughout)**	
Grain yields (kg/5m^2)	Grain moisture content (average of 3 samples) (%)	Grain yields (kg/5 m^2)	Grain moisture content (average of 3 samples) (%)

TECHNOLOGY FOR INCREASING SOIL FERTILITY PROPER LAND USE RICE - LEGUMES RELAY CROPPING (RICE -LEGUME)

Generally, legumes will be planted and cared in areas and plots which rice has been harvested (where other technologies have been shown). For example, in an area where the technology of improved variety and fertilizer has been shown, the field arrangement will be as follows:



Data collection form for legume yields

Village: ----------District: ----------

Date of data collection: ----------

Days after planting seeds: ----------……. (If applicable)

Days after transplanting seedlings: ---------- (If applicable)

Type of crop	**Yields (kg/ 50 m^2)**			
	Portion with fertilizer for planting and vegetative and reproductive growth		**Portion of ordinary farmers' practice (FP)**	
	Portion without plowing	Portion plowed	Portion without plowing	Portion plowed
COWPEA				
CHICKPEA				
GREEN GRAM				