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

Annual Report (01 October 2015 – 30 September 2016)

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Contract No. MTO 069018

IITA – International Institute of Tropical Agriculture

ANNUAL REPORT

(01 October 2015 – 30 September 2016)

Thematic Implementing Partners:

Agricultural Research Institute, Dakawa – Rice

AVRDC – Vegetables

CIMMYT – Maize

IITA – Postharvest and Nutrition

COVER PHOTO

Field day activities in Kilombero District. Photo credit: Charles Chuwa/ARI Dakawa.

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Acronyms and Abbreviations

ASA	Agricultural Seed Agency
Africa RISING	Africa Research in Sustainable Intensification for the Next Generation
ARI	Agricultural Research Institute
CIAT	International Center for Tropical Agriculture
CIMMYT	International Maize and Wheat Improvement Center
CMSD	Cereals Marketing Systems Development Project (NAFAKA II)
COUNSENUTH	Center for Counseling, Nutrition and Health Care
CRS	Catholic Relief Services
DAICO	District Agriculture, Irrigation and Cooperative Officer
FtF	Feed the Future
GAP	Good Agronomic Practices
GIS	Geographical Information Systems
HORTI Tengeru	Horticultural Research and Training Institute-Tengeru
ICRAF	The World Agroforestry Center
IITA	International Institute of Tropical Agriculture
MALF	Ministry of Agriculture, Livestock and Fisheries
NAFAKA	Tanzania Staples Value Chain Activity (USAID FtF Project)
TAHA	Tanzania Horticulture Association
TUBOCHA	Tuboreshe Chakula (USAID FtF Project)
USAID	US Agency for International Development
VAEO	Village Agricultural Extension Officer
VBAA	Village-based Agricultural Agent
WorldVeg	The World Vegetable Center
ZOI	(FtF) Zone of Influence

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1 EXECUTIVE SUMMARY

The Africa RISING-NAFAKA partnership project focuses on delivery and scaling of promising interventions than enhance agricultural productivity in Tanzania. The key interventions include introduction of improved crop varieties, 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 vegetables with postharvest handling and nutrition as a cross-cutting theme. Legumes are also promoted as a means of better natural resource management and improving nutrition. The key partners in the project are international agricultural research centers and one USAID-funded project under the Feed the Future (FtF) Initiative in Tanzania—NAFAKA. These work in partnership with national agricultural research institutions as well as local government authorities, private sector (seed companies, millers, and processors), and non-governmental organizations (NGOs) to deliver on the strategic objective of increasing the productivity of key value chains in Tanzania.

During the past year, project activities were implemented in the regions of Dodoma, Iringa, Manyara, Mbeya, and Morogoro, all in the FtF's Zone of Influence (ZoI). Project activities were implemented in 96 villages located in ten districts and these included: (i) the establishment of 746 demonstration plots of improved maize, rice, vegetables, and legume varieties—the demonstration sites act as learning sites for farmers; (ii) training extension staff and farmers on Good Agricultural Practices (GAPs); (iii) promotion and training on natural resource management practices. Key natural resource management technologies were integration of legumes with maize, use of tied ridges and rippers to manage soil and water resources especially in semi-arid locations, management of salt-affected and calcareous soils and alternate wet and dry water management in rice; and (iv) postharvest activities focusing on mechanized maize shelling to reduce drudgery, enhance proper storage, food processing, nutrition, and marketing. The project uses a scaling model that involves training farmers (volunteer trainers) who train others in the subsequent year in a cascading mode. Efforts of farmer trainers complement those of local government staff—the village agricultural extension officers—and village-based agricultural advisors who are part of the NAFAKA project model. The key project activities were supplemented by promotion of access to agro-inputs through rural agro-dealer networks facilitated by the NAFAKA project.

All the promoted improved crop varieties performed better than local varieties. However, the improved varieties did not perform to their potential due to poor rains in some locations and flooding in others. For maize, high yields of up to 8 t/ha for varieties such as H625, H614, and PAN 691 were attained in some locations. This is a tenfold increase when compared to average yields under farmer practices. For rice, yields of 5.4 t/ha and 4.9 t/ha of TXD 306 and Komboka varieties were attained under good agricultural practices, respectively, compared to 2.8 t/ha for a local variety under farmer practices. For salt-tolerant varieties (SATO1 and SATO6), yields of 7.3 t/ha were realized under good management compared to 3.6 t/ha with no management. Under calcareous soil conditions, yields of the most commonly grown rice variety, TXD 306, for such conditions increased from 3.8 to 6.7 t/ha when soils were treated with a combination of di-ammonium phosphate (DAP), sulphate of ammonia (SA), and farm yard manure.

The project trained 190 extension staff who facilitated access to technologies by 10 345 farmers as adopters of at least one technology introduced by the project (the total number of beneficiaries reached by the project was 11 142) . With these numbers, the project realized all its targets for the project year, except for the indicator on number of farmers and others who have applied improved technologies which was achieved at about 79%. The adoption level realized was attributed to changes in leadership of the rice theme as well as vagaries of weather which devastated some farms. Several targets were overachieved, thanks to the pro-active project design whereby we intensely engaged with local governments' extension staff and Village-based Agricultural Agents (VBAAs) who did a good job of training farmers. Linking farmers to the rural agro-dealer network also contributed immensely to timely access to agro-inputs.

The key challenges faced by the project during the reporting period were (i) termination of collaboration with one of the project sub-contractors (AfricaRice) which affected project progress—the new team started afresh during this year, (ii) unfavorable weather (poor rains, flooding, low temperatures in southern highlands), and (iii) poor accessibility to some locations as the project expanded to new locations.

The planned activities for the third year include (i) visiting all districts to discuss modalities of engagement with village agricultural extension staff in project activities, (ii) preparing information materials to be used by the project implementation teams, (iii) community sensitization meetings, review and planning meetings, and project management team meeting to ensure smooth project implementation, (iv) training of farmer trainers (VBAAs, district village agriculture extension officers (VAEOs)), and partner organizations (e.g., Catholic Relief Services (CRS) Private Service Providers (PSPs) in specific subjects to ensure quality project implementation; (v) farmer field days and exchange visits, and (vi) annual outcome survey to obtain information on outcome indicators.

The budget for the reporting period was US$1,875,000 and the actual expenditure will be reported separately once the accounts are completed.

2 INTRODUCTION

2.1 Project description

During the past year, Africa RISING partners have been involved in testing and delivery of promising interventions than enhance agricultural productivity. The interventions in this project include the introduction of improved crop varieties, dissemination of best-bet crop management packages, rehabilitation and protection of natural resources, and postharvest management. Details are available at the project link, http://africa-rising.wikispaces.com/AR_NAFAKA_TUBOCHA_Project.

The project focus is on three crop enterprises—maize, rice, and vegetables—with postharvest handling and nutrition as a cross-cutting theme. Legumes are also promoted as a means of better natural resource management and nutrition. The key partners in the project include international agricultural research centers (IITA, CIMMYT, CIAT, and ICRAF) which are part of the maize and postharvest management teams, Agricultural; Research Institute (ARI) Dakawa that leads the rice component; the World Vegetable Center (WorldVeg) leading the vegetable activities, and NAFAKA, a USAID-funded project under the Feed the Future Initiative (Note: TUBOCHA project ended in June 2015 but the current project interventions build on its achievements). These partners work together with national agricultural research institutions as well as local government authorities, 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 best-bet agronomic management packages around the most promising new crop varieties suited to widely representative agro-ecological zones and market proximity;
3. Protect land and water resources and foster agricultural biodiversity through the introduction of soil and water management practices;
4. Increase food security and improve household nutrition among the most vulnerable households and their members, especially women and children, by introducing locally adapted and nutrient-rich vegetables;
5. Introduce and promote postharvest management technologies for maize, rice, legumes, and selected vegetable crops to reduce losses and bring quality up to market standards;
6. Offer and expand capacity services to members of grassroots farmers' associations, platform partners, and development institutions in the scaling process (capacity building), paying particular attention to the special opportunities available to women farmers as technical and nutritional innovators and resource managers.

2.2 Geographic zones of influence

During the second project year, activities were implemented in the regions of Dodoma, Iringa, Manyara, Mbeya, and Morogoro, all in the FtF's zone of influence (ZoI) (Fig. 1). Action sites were selected according to the following criteria:

i. Agro-ecological characteristics that are suitable for the selected technologies as well as availability of suitable partners

ii. Visibility, accessibility, and land suitability

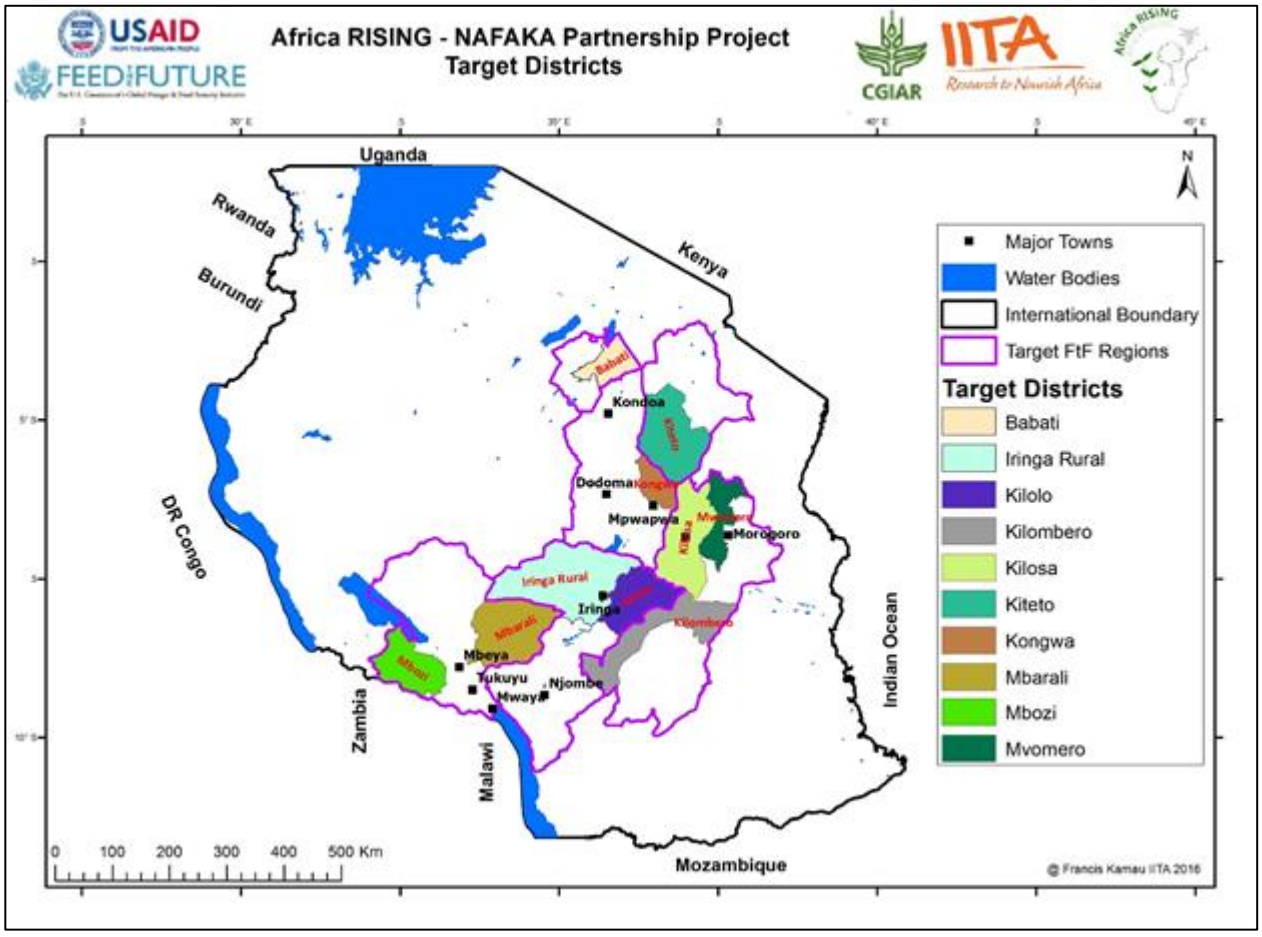


Figure 1: Project locations.

3 IMPLEMENTATION PROGRESS

All project activities address the strategic objective of increasing agricultural productivity and profitability in targeted value chains.

3.1 Maize/legume technologies and management practices

Improved maize and legume varieties were promoted in 49 selected sites across seven districts (Table 1). Figure 2 shows the locations of the maize/legume activities.

Table 1: Nature of demonstration sites established for the maize/legumes component.

Enterprise	District (sites)	Number of mother demos	Number of baby demos	Crop varieties	Other technologies
Maize	Babati (6)	9	118	MERU HB 515, MERUHB 513, MAMS H913, AMINATA H 105, AMINATA H104, SeedCo 627	(DAP, Urea, YaraMila cereal, CAN, Minjingu Mazao, Minjingu top dressing); legumes (pigeon peas and beans), Good Agronomic Practices (GAPs)
	Kilolo (5)	14	-	H 625, KIMKOKA, H628, H614, PAN 691 and UH6303	Fertilizers (DAP, Urea, YaraMila cereal, CAN, Minjingu Mazao, Minjingu top dressing)**;** legumes (soybean Uyole3) and GAPs
	Kilosa (5)	6	-	NATA 104, NATA 105, NATA K6Q TAN600, SITUKA	Fertilizers: DAP, urea, YaraMilla Cereal, Minjingu Mazao; legumes (cowpeas — Vuli 2) and GAPs
	Kongwa/Kiteto (12)	13	184	NATA K6Q; NATA H1O4; NATA H1O5; MERU 513; MERU 515 and DK 9089	Fertilizers: NAFAKA Plus, tied ridges, GAPs

	Mbozi (6)	16	-	UH6303, UH615, MERU 513, SC 719, PAN 691 and H614 D	Fertilizers (DAP, urea, YaraMila Cereal, Amidas, Sulfan, gypsum; legumes (groundnuts - Pendo, Nyekundu; beans – Uyole Njano, Mwaspenjele, Kablanket; soybean
	Mvomero (15)	26	320	DK 8031, SC 513, TZH 538 and DH 04	Fertilizers (DAP, urea and YaraMila Cereal); legumes (beans – Lyamungo and Uyole Njano) and soybean LN 8E
	TOTAL	84	622		

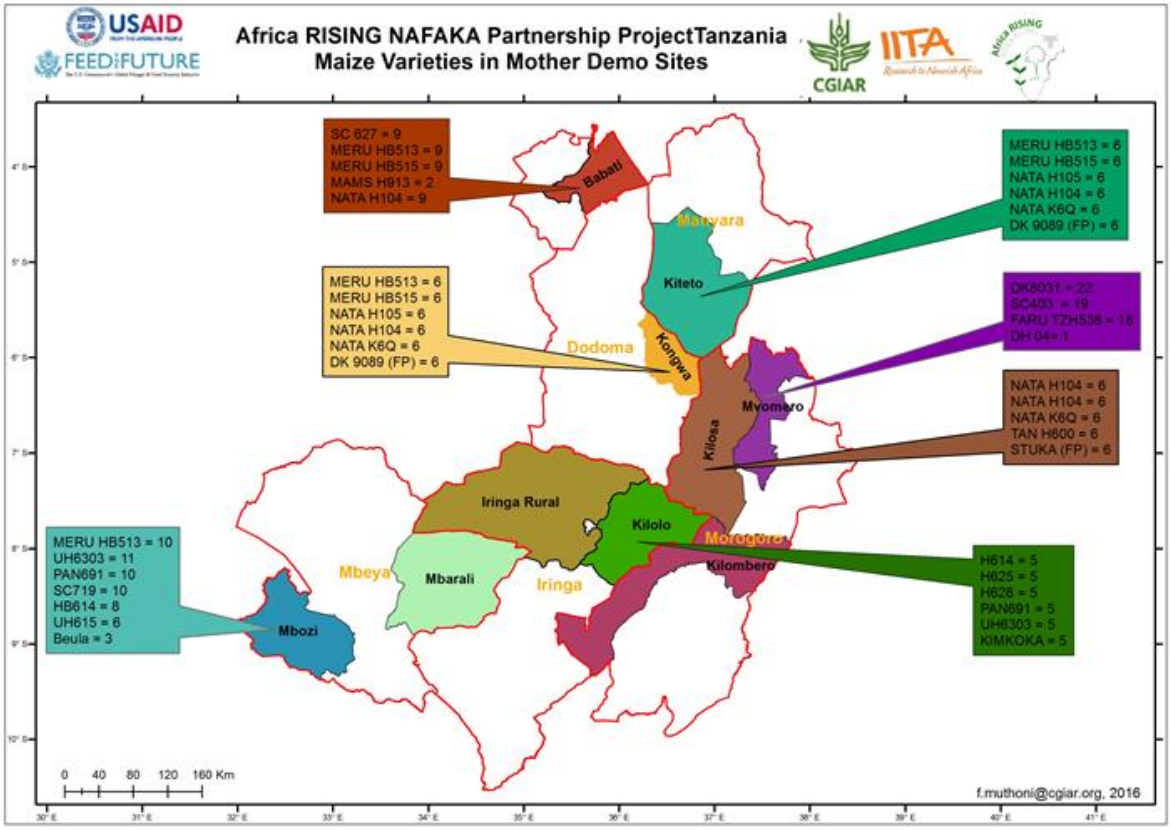


Figure 2: Location of maize/legume activities.

In addition to improved crop varieties, Good Agricultural Practices (GAPs) were demonstrated in all villages, which included timely planting, timely weed management, timely fertilizer application, and timely thinning to maintain the recommended plant population. For natural resource management, legumes (cowpeas in Kilosa, soybean and groundnuts in Kilolo, Mbozi, and Mvomero districts) were planted either as an intercrop or in rotation with maize to provide advantages of adding nitrogen to the soil through nitrogen fixation. Tied ridges were also promoted in semi-arid locations (Kongwa and Kiteto districts) to demonstrate an option for soil and water conservation. As a result of the maize activities, 82 agricultural extension staff, and 8726 farmers were trained.

Generally, improved varieties performed better than local varieties in all demo sites. However, the improved varieties did not perform to their potential due to poor rains and severe drought in most of the locations. For maize, results from selected districts are briefly discussed. In Kilolo District, since this was the first year of the project, data was only available from mother demos. Maize hybrids (H 614, H 625, H 628, UH 6303, and PAN 691) were demonstrated against the local check, Kimkoka. These varieties were selected through a consultation process during sensitization meetings held in November 2015. The fertilizer demonstration included Yaramila Cereal, DAP, and urea as the most common fertilizers used by farmers and Minjingu fertilizers (Mazao and Minjingu top dressing) as the locally available fertilizer appropriate for acidic conditions. These fertilizers were demonstrated under the blanket application rate of 1 bag per acre, a common farmers practice, and the recommended rate of 40 kg/ha P and 120 kg/ha N for the sub-humid agroecological zone.

The performance of the varieties with GAPs in terms of mean yields for Kilolo district was as follows: H625 (8.6 t/ha), H614 (8.3 t/ha), PAN 691 (8.1 t/ha), H 628 (7.1 t/ha), and UH 6303 (7.3 t/ha). Surprisingly, yield of the local variety, Kimkoka, with GAPs (8.1 t/ha) was higher than that of some hybrid varieties. This was largely attributed to sporadic precipitation, some diseases, and logging (specifically for UH 6303) which some of the selected varieties could not tolerate to the same level as the local check. The team will collect additional data next year to confirm the status advantages of the improved varieties over the local variety. In addition, farmers indicated a preference even for the relatively low yielding hybrids such as H 628 maize due to their taste and marketability (sold for roasting as green maize in urban locations), confirming that high yields is not the only criterion used by farmers to select improved varieties for adoption.

In Babati District, except for Mamseed, all the varieties responded well to fertilizer application and other agronomic practices, with yields ranging between 2.6 t/ha and 3.6 t/ha (Fig. 3). Highest maize grain yields were observed with Meru HB 513, Meru HB 515, and SC 627. Response to fertilizer in these three varieties was high, varying from 75% to 135% over the control. Aminata seeds (NATA H 104) had a moderate response to fertilizer and increased yield by 53%. Data for Kilosa District, showed a similar trend.

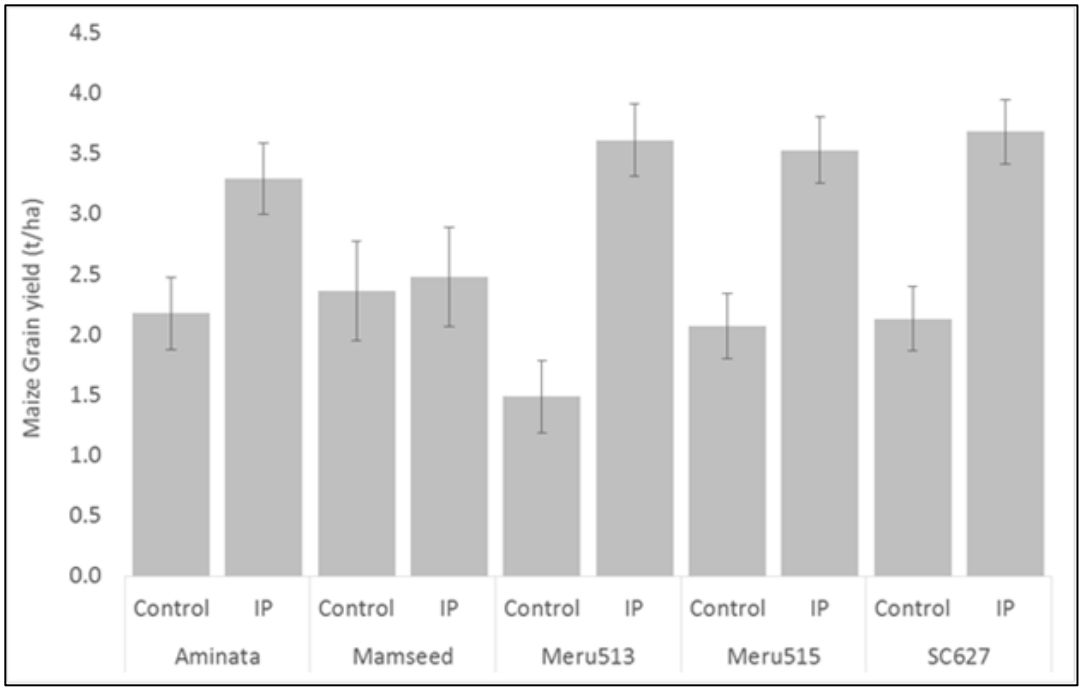


Figure 3: Maize grain yield in Babati District for 2016/17 season.

In Kongwa and Kiteto districts where the project has been operational for two years, yield data was collected from the field of farmers who planted the varieties promoted by the project. —. Typical yields from farmers' fields were less than 1 t/ha (about 0.5 t/ha). The mean grain yield obtained from farmers' fields from both districts is depicted in Figures 4 and 5. The yields ranged from 0.5 t/ha for NATA K6Q to 4.7 t/ha for Meru HB 515. The yields for all varieties were below potential because of low rainfall and prolonged drought which were experienced in both districts. In fact, most farmers who planted local varieties had almost no harvest.

Farmers in Ngipa village, Kiteto District who planted local varieties lost nearly their entire crop due to drought conditions (left photo) whereas those who planted resistant varieties promoted by the project in the same locality (right photo) expect some harvest. Photo credit: Haroon Sseguya/IITA.

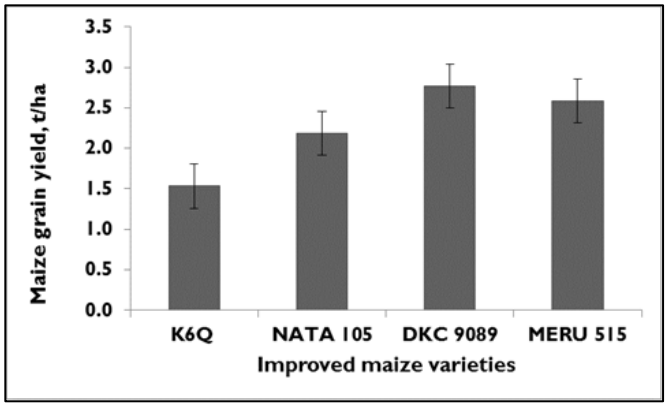


Figure 4: Mean maize grain yield from farmers' fields in Kiteto district during the 2015/2016 cropping season.

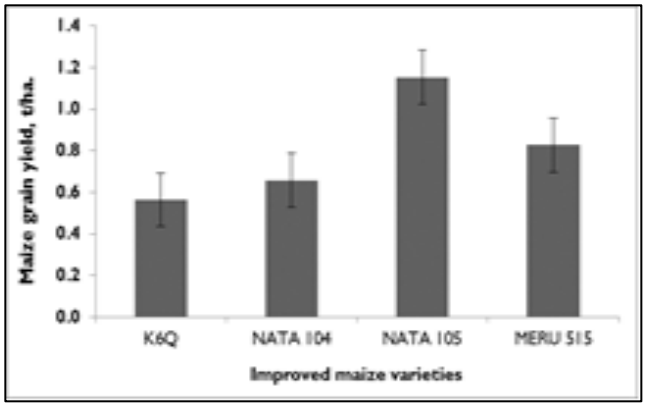


Figure 5. Mean maize grain yield from farmers' fields in Kongwa district during the 2015/2016 cropping season.

3.2 Rice technologies and management practices

Demonstration plots were established in 25 villages in four districts. In each village, one or two types of demonstration plots were established, involving innovations to address the prevailing limitation to rice productivity (Table 2 and Fig. 6).

Table 2: Rice demonstration sites established in the four project districts.

District	Village	Irrigation scheme	Type of technology
Mbarali	Ruiwa	Gwiri	Salt affected soil (SAS) management
	Majenje	Luanda Majenje	Variety & fertilizer (VarFer)
	Chamoto	Bethania	SAS management
	Igalako/Mahongole	Ipatagwa	VarFer
	Uhambule	Bethania	VarFer
Iringa Rural	Nyamahana	Nyamahana	VarFer
	Idodi	Idodi	VarFer
	Magozi	Magozi	SAS management
	Luganga	Luganga	VarFer
	Ilolo Mpya	Ilolo Mpya	VarFer
Kilombero 1	Signali	Signali	VarFer & alternate wetting and drying
	Sululu	Signali	VarFer
	Mkula	Mkula	VarFer
	Msufini	Mkula	VarFer
	Msolwa Ujamaa	Msolwa Ujamaa	VarFer
Kilombero 2	Mahutanga	None (rainfed)	VarFer
	Michenga	None (rainfed)	VarFer
	Kisegese	None (rainfed)	VarFer

	Vigaeni	None (rainfed)	VarFer
	Njage	Njage	VarFer
Mvomero	Dakawa	Dakawa	Calcaric soil management & VarFer
	Bungoma	Mkindo	VarFer
	Mbogo	Mbogo	VarFer
	Kigugu	Kigugu	VarFer
	Dihinda	Kilolo	VarFer

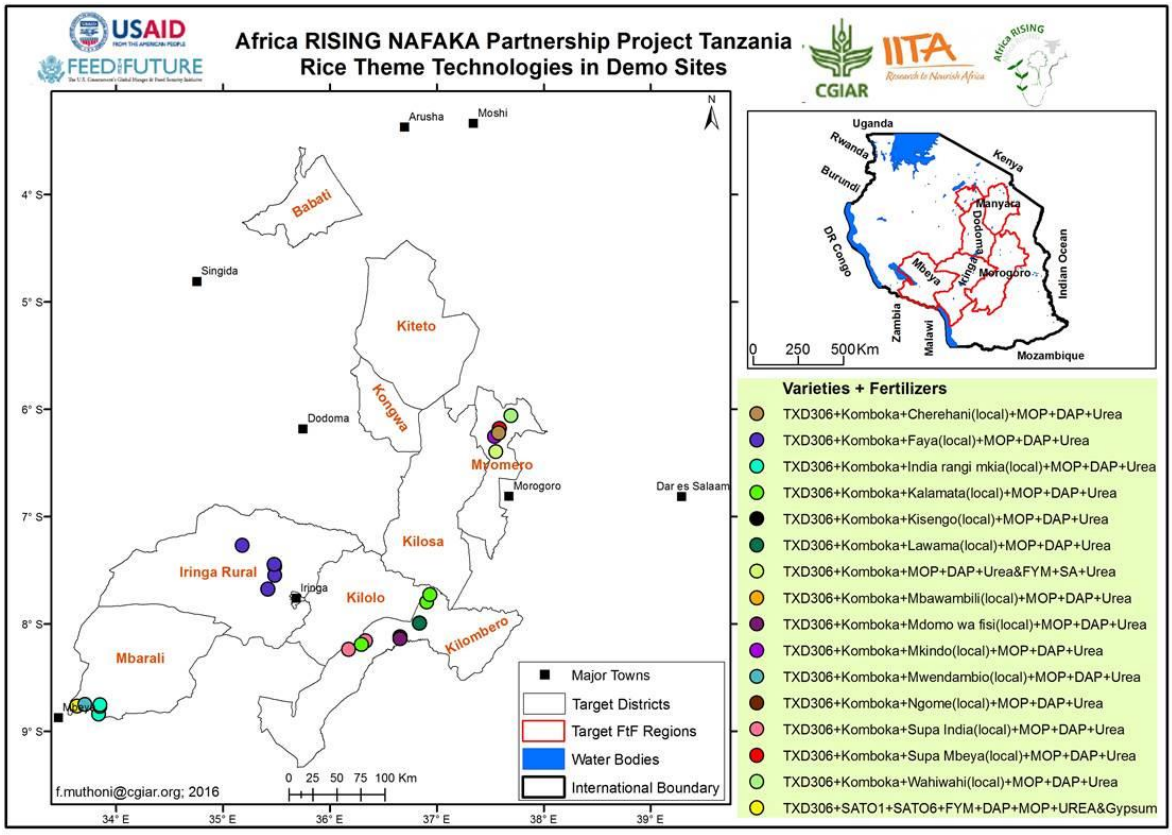


Figure 6: Location of rice activities.

The project trained 27 agricultural extension staff and 702 farmers. Yields of two rice varieties promoted under VarFer (TXD 360 and Komboka) were higher when the recommended fertilizer dose (basal and top-dressing) was applied compared to farmers' practices (Fig. 7). Common farmers' practices included one or more of the following: (i) planting local, unimproved, low-yielding varieties, (ii) use of fertilizers that supplied only nitrogen or phosphorus but no potassium, (iii) untimely application of fertilizers, e.g., only late top-dressing with nitrogen-supplying fertilizers without basal fertilizers, and (iv) application of lower or higher doses of fertilizer than required. The recommended practices include planting the improved high-yielding varieties combined with good fertilizer application practices that include timely application of N, P, and K- fertilizer as basal (pre-planting) followed by top-dressing application of N-supplying fertilizer at the recommended rates of 80:40:40 per hectare. (P and

K were applied at a basal rate of 87 kg/ha of DAP and 98 kg/ha of MOP, respectively, and N as top dressing at 174 kg/ha of urea split equally into two.) It is also worth noting that the improved varieties yielded more than the local ones even under farmers' practices compared to the local variety.

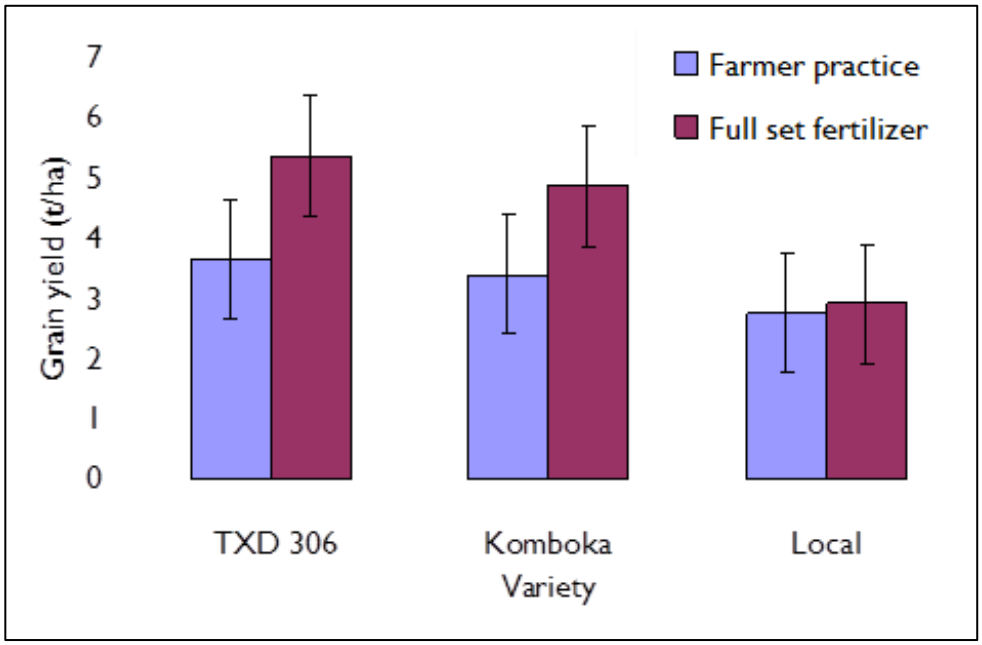


Figure 7: Grain yield of two improved and one local rice varieties under two fertilizer management regimes across all project sites, excluding salt affected and calcaric sites.

For management of salt-affected soils, yields of two salt-tolerant varieties (SATO 1 and SATO 6) and a non-tolerant (check) TXD 306 were determined after having been planted in demonstration plots where salt-management amendments (farm yard manure (FYM) and gypsum) were applied, and also in non-treated plots. The yields of all rice varieties were higher in plots where gypsum and FYM were applied (i.e., with management) compared to non-treated (i.e., without management) (Fig. 8). The highest yield (7.3 t/ha) was recorded for SATO 6 followed by SATO 1 (6.7 t/ha). The lowest yield was 4.2 t/ha obtained from TXD 306. Moreover, even without salt-management SATO 1 and SATO 6 performed better than TXD 306 which had an overall lowest yield of 3.3 t/ha.

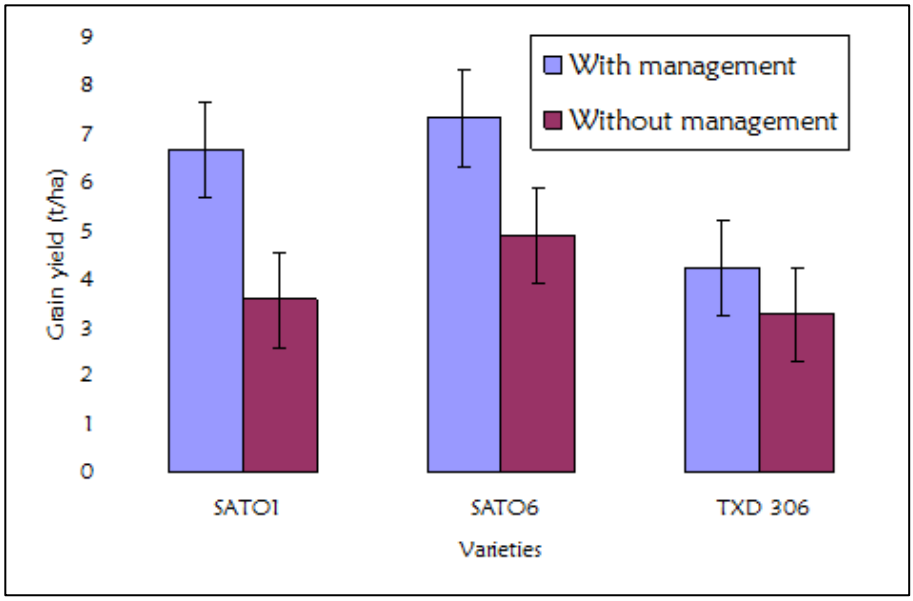


Figure 8: Rice grain yield of two salt-tolerant and a non-tolerant rice varieties under two salt-managements across sites.

For management of calcaric soils we demonstrated the response of the most commonly grown rice variety (TXD 306) to different management practices: (i) no fertilizer, (ii) FYM, (iii) urea, and (iv) a combination of di-ammonium phosphate (DAP), sulphate of ammonia (SA), and FYM. Yield data indicate that grain yields of 6.7 t/ha were recorded in plots where a combination of DAP, SA, and FYM was applied, followed by 6.2 t/ha and 5.2 t/ha in plots where urea and FYM were applied, respectively. The lowest grain yield (3.8 t/ha) was obtained in plots where no fertilizer was applied (Fig. 9).

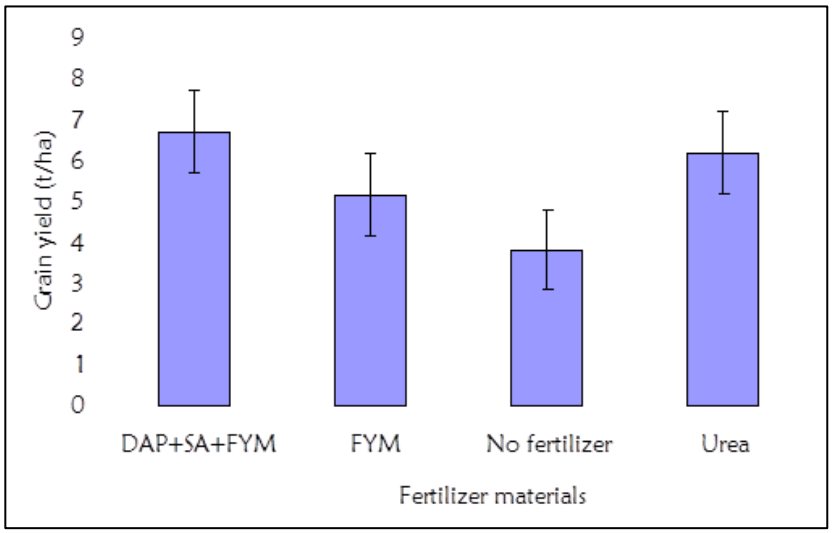


Figure 9: Rice grain yield of TXD 306 variety after application of different fertilizer types on a calcaric soil at Dakawa irrigation scheme, Mvomero District.

3.3 Vegetable technologies and management practices

During the second project year, the vegetables team operated in four regions (six districts) as indicated in Table 3. By the close of the year, the team was in advanced stages of rolling out to additional districts in Mbeya Region. A variety of vegetables were also promoted, depending on agroecology and community requirements, including tomatoes (Tengeru 2010), African eggplant (DB 3 and Tengeru white), amaranth (Madiira I and II), African nightshade (Nduruma), jute mallow (SUD 2), vegetable soybean (AGS 292), vegetable cowpea (Ex Iseke), okra (TZ SMN 86), Ethiopian mustard (Rungwe and Arumeru), and pumpkin (GKK 174). In total, the team established 15 vegetable demos in the various locations. Variety promotion goes hand in hand with various training activities as indicated in Table 3; 36 extension staff and 1061 farmers were trained.

Table 3: Vegetable-related activities in the different regions, districts, and villages in 2015/16.

Region	District	Village	Scope of activities conducted in 2015/16
Manyara	Babati	Maweni	Seed multiplication training
		Endodosh	Market access training
	Kiteto	Kibaya Kaloleni Sunya	Seed multiplication training
Dodoma	Kongwa	Songambele Tubugwe	Seed multiplication training
Morogoro	Kilombero	Misufini Kisawasawa Ichonde Mahutanga Lungongole Nyamwezi Mkasu Muhelule Magombela	Season-long production training and seedkit distribution *(sensitization, nursery management, soil improvement, good agricultural practices including IPM, harvest and postharvest techniques, organoleptic tests)*
Iringa	Iringa rural	Kalenga Mangalali	Season-long production training and seedkit distribution

		Kitowo	
	Kilolo	Mtitu Luhanzi Luhindo	Season-long production training and seedkit distribution

Locations where vegetable activities were implemented in Year 2 are shown in Figure 10.

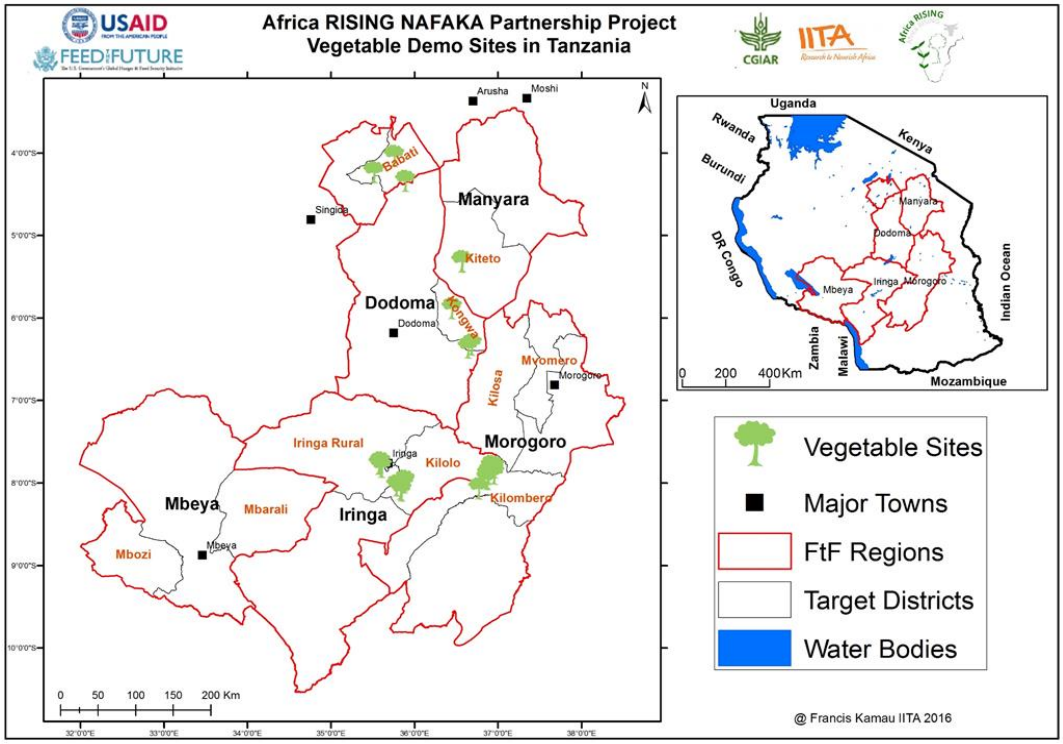


Figure 10: Locations of vegetable activities.

3.4 Postharvest management and nutrition

To help address postharvest management constraints, the project team trained lead farmers and also conducted demonstrations on postharvest handling of maize (shelling, drying, storage, and processing). This activity focused on improving the skills of smallholder farmers to reduce postharvest losses. Specifically shelling, proper drying, and storage technologies were introduced to farmers in the three districts of Kilosa, Kilolo, and Mbozi. These included maize shellers (motorized—diesel-run and electric), collapsible drier case and hermetic storage bags (PICS bags, grain safe bags). Three villages (one village in each district) were selected for the training sessions and demonstrations for lead farmers. In Kilosa District (Maguha village), 44 farmers were trained (21M, 23F). In Kilolo District (Kitowo village), 133 farmers were trained (65M, 68F) while in Mbozi district (Itumpi village) 44 farmers were trained (25M, 19F). The participants were trained on the use of a small-scale mobile shelling

machine (1500 kg/hr capacity), use of collapsible drying cases for safe drying of maize, and storage of maize in hermetic storage bags. To enhance the chances of adoption, 3 shelling machines, 3 drying cases, and 288 hermetic bags were distributed to lead farmers in all the three villages. A community warehouse system was established in each village in the three districts to store maize grains.

For nutrition activities, 27 participants (13 males and 14 females) from 6 districts – Kilolo, Kilosa, Kiteto, Kongwa, , Mbozi, and Mvomero were trained at NAFAKA offices in Morogoro. The participants included 13 Village Health Workers (two from each village), 12 lead farmers, one home based care provider, and one VAEO. The key topics focused on the broad areas of food groups and nutrition; breast feeding and complementary feeding; food hygiene, sanitation and water safety; preparation of complementary foods for children (6 to 24 months) and the elderly. The graduates from the training have been utilizing their newly acquired skills in their communities either on their own, or in partnership with other interventions such as the USAID-funded Mwanzo Bora Nutrition Program. In addition, 12 maize processors (5F, 7M) from three districts (Mvomero, Kiteto, and Kongwa) were trained on fortification of maize flour (addition of iron, zinc, folic acid, and Vit. B12). The training focused on technical, nutritional, and economic aspects (marketing of fortified flour). The vegetables team also trained 77 farmers (29M, 48F) farmers in Iringa Rural and Kilolo districts on postharvest handling techniques and organoleptic tests. The training focused on principles of food safety during food preparation followed by an organoleptic test. During the organoleptic tests, all vegetable crops represented in the demonstration plots were cooked using different recipes to facilitate further decision making for adoption.

3.5 Field days and exhibitions

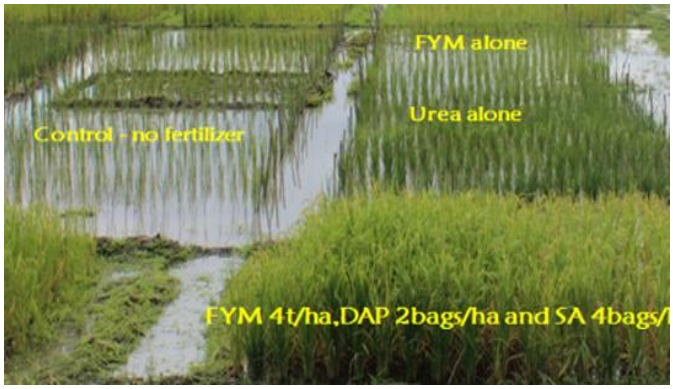
As a means of sharing project results with participating farmers and other stakeholders, field days were organized in a number of project districts by the maize and rice teams (Table 4). Over 2000 people participated in the field days. In all cases, local government staff, research staff from agricultural research institutes, input dealers, and the media attended as a sign of support for project activities and a strategy for scaling and sustainability. During field days, seed kits were distributed to farmers to stimulate adoption and scaling.

Table 4: Field day participants for the maize and rice activities.

Team	District	Participants		
		Male	**Female**	**Total**
Maize	Babati	325	116	441
	Kongwa	101	131	232
	Kiteto	142	173	315
	Kilolo	288	324	612
	Kilosa	83	82	165
	Mvomero	143	158	301
	Sub total	***939***	***826***	***2066***

Rice	Kilombero	117	106	223
	Mbarali	46	91	137
	Iringa rural	60	79	139
	Mvomero	122	88	210
	Subtotal	***345***	***364***	***709***
	TOTAL	**1284**	**1190**	**2775**

Farmers follow proceedings during a field day in Kiteto District. Photo credit: Gloriana Ndibalema/IITA.



One of the field lay outs for field day activities in Kilombero District. Photo credit: Sophia Kashenge-Killenga/ARI Dakawa.

Field day participants being shown the effect of managing calcareous soils at Dakawa irrigation scheme fields, Morogoro Region. Photo credit: Charles Chuwa/ARI Dakawa.

Farmers attending field day activities in Babati District. Photo credit: Gloriana Ndibalema/IITA.

The project also took part in the annual nane nane agricultural exhibition in Morogoro and Dodoma. In Morogoro, over 500 persons visited the project activities and were provided with additional information on agricultural productivity enhancement technologies.

3.6 Community empowerment

The project works with NAFAKA as a scaling platform. The NAFAKA project has developed a vibrant network of farmer groups and associations, farmer trainers (VBAAs and lead farmers), local development organizations, private sector actors, and input suppliers with which the project works. However, in districts such as Babati and Kilosa where the NAFAKA project is not present, the project team has developed the capacities of farmers and input suppliers to fill the gap resulting from NAFAKA's absence. The capacity building activity for farmers' groups and organizations will continue with deeper involvement of local government extension staff (VAEOs) in all project locations. This arrangement will also potentially enhance sustainability of the intervention.

3.7 Problems and challenges

There are four general challenges that affected realization of project targets.

i. In agreement with USAID, IITA discontinued the involvement of AfricaRice due to poor performance during Year 1. Unfortunately, this posed challenges for the achievement of the set targets. However, these would also not have been achieved if the partnership was continued. ARI Dakawa took over leadership of the rice component, but the new team started from scratch since they chose not to entirely promote technologies that had been identified by AfricaRice. As a result, some of the indicator targets were negatively affected.

ii. Rain distribution was poor and it affected the performance of the demonstration plots and farmers' activities. In some locations such as the vegetable sites in Babati District, the plots were flooded. In other locations, such as the maize sites in Kilosa, Kiteto, and Kongwa, the plots dried up. However, in the maize demonstration plots, the improved varieties performed better than the local varieties in many locations given the drought conditions.

iii. Relatedly, specifically for vegetables in Iringa Rural District, the project team works with villages at a high altitude (up to 2000 m above sea level). This has strong implications on the demonstration plots. Due to heavy rainfalls and soil erosion, the soils lack bio-organic matter and minerals. The project team therefore emphasized the importance of using organic manure to improve the soil quality. Furthermore, due to the high altitude African eggplant seedlings in the nurseries required 6–7 weeks instead of the usual 4–5 weeks before they could be transplanted to the demonstration plots.

iv. As we plan to scale up by expanding to more locations, accessibility to all beneficiaries poses a challenge. Our approach of deeply engaging the village extension staff and using ICT applications such as WhatsApp to enhance communication with farmers may have the potential to address this challenge but is not yet fully explored.

3.8 Planned activities for Year 3

At general project level, the following activities will be conducted next year:

i. Visiting all districts to discuss modalities of engagement of village agricultural extension staff in project activities. As part of meetings with the VAEOs and DAICOs, they will be prepared regarding their expected roles and reporting requirements with respect to the project.

ii. Information materials will be finalized and multiplied for use by the project implementation team.

iii. Community sensitization, review, and planning, and project management team meetings will be held at appropriate dates to ensure smooth project implementation.

iv. Training of farmer trainers at different levels (e.g., VBAAs, VAEOs, and CRS PSPs) in specific subjects to ensure quality project implementation.

v. Farmer field days and exchange visits will also be conducted.

vi. Annual outcome survey will be conducted to obtain information on outcome indicators.

Additionally, some of the teams will conduct unique activities not similar to those of other project components. The **vegetables** team will test small-scale screen houses at WorldVeg premises in Arusha and in five villages located in Babati District. The small-scale screen houses will be scaled out as a new technology in 2017.

The **postharvest** team, together with NAFAKA, will develop a scaling strategy for the technologies. To enhance integration of GIS in scaling activities, calibration of spatially explicit models to evaluate the recommendation domains for crop varieties and GAPs will be done as well as improvement of extrapolation domain analysis for crop varieties and GAPs using the data collected during the reporting period.

4 MONITORING AND EVALUATION

4.1 Data management and reporting

Following the advice from the USAID Tanzania M&E staff that we need to have a project database separate from the NAFAKA project, this database is now being developed by the GIS expert. This is meant to improve data management and reporting. In addition, in all locations where beneficiaries benefit from both, this project and the NAFAKA project, will be will be made clear in a way that double reporting is avoided.

4.2 Performance against PMP indicators

During the reporting period, data on all output and outcome indicators was collected. Table 5 provides an overview of the achievements of the targets.

Table 5: Project performance against PMP indicators.

Indicator	FY 2016 target	FY 2016 Achievement			FY 2016 percent achieved	LOP target	LOP achievement	LOP Percent Achieved	% Female	% Male
		AR and NAFAKA	*AR only*	Total						
4.5.2(2) Number of hectares under improved technologies or management practices as a result of USG assistance	9400	10,852.4	2100.56	12,952.96	137.8%	58,000	12,952.96	22.3%	N/A	N/A
4.5.2(5) Number of farmers and others who have applied new technologies or management practices as a result of USG assistance	13,120	6627	3718	10,345	78.9%	47,000	10,345	22%	39.1%	60.9%
4.5.2 (7) Number of individuals who have received USG supported short-term agricultural sector productivity or food security training	10,925	7412	3893	11,305	103.5%	47,200	11,331	24%	48.8%	51.2%

4.5.2 (11) Number of food security private enterprises (for profit), producer organizations, water user associations, women's groups, trade and business associations, and community-based organizations (CBOs) receiving USG assistance	122	118	35	153	125.4%	200	164	82%	N/A	N/A
4.5.2 (13) Number of rural households benefiting directly from USG interventions	7200	4727	2856	7583	105.3%	47,000	7608	16.18%	40.8%	59.2%
Custom indicator: Number of beneficiaries with home gardens or alternate crops as a proxy for access to nutritious foods and income	200	-	1643	1643	8.215%	4,000	1853	46.33%	54.6%	45.4%

As indicated in the table, the project realized all the set targets except for the indicator on number of farmers and others who have applied improved technologies which was achieved at about 79%. This was attributed to changes in leadership of the rice theme, from AfricaRice to ARI Dakawa, with different technologies being considered for promotion by ARI Dakawa from those suggested by AfricaRice. This meant that the rice theme was contributing to Year 1 targets in the second year of the project. The other constraint was vagaries of weather which devastated some farms, in the process affecting technology adoption. For all the achievements that are over 100% the results are largely attributed to the pro-active project design whereby we intensely engaged with local government extension staff and VBAAs who did a good job of training farmers. Linking farmers to the rural agro-dealer network also contributed immensely to timely access to agro-inputs.

5 MANAGEMENT AND STAFFING

A number of project management meetings including planning and review sessions were held at project and component levels. The project has a wiki page which can be visited following this link: http://africa-rising.wikispaces.com/AR_NAFAKA_TUBOCHA_Project. The key project level meetings held during the past year and all posted at the wiki page include:

i. Inaugural meeting of the rice component after the implementation leadership for rice activities changed from AfricaRice to ARI Dakawa. The meeting took place on 21 January 2016 in Morogoro. The main purpose was to bring together the team responsible for implementation of rice activities for the project for sensitization and planning. http://africa-rising.wikispaces.com/Rice+team+stakeholders%27+planning+meeting%2C+Morogoro+-+Tanzania in Morogoro,

ii. Quarterly project review meeting held from 18 to 19 April 2016 in Arusha to review progress and plan for the rest of the year.

iii. Monitoring and evaluation review and training meeting held from 3 to 4 May 2016 in Morogoro for all the 18 project field liaison staff.

iv. Annual review and planning meeting held from 4 to 5 July 2016 in Dar es Salaam to review progress and plan for the third year of the project (2016/17) (http://africa-rising.wikispaces.com/AR-NAFAKA-TUBOCHA_rev%26plan_July2015).

v. Project management team meeting held on 5 July 5 2016 in Dar es Salaam.

Staffing for the rice component changed as a consequence of the change in leadership. One field liaison officer was recruited to help with implementation of maize/legume activities in Mvomero District. Also, at the end of the first phase of the NAFAKA project, one of the coordination team members (Victor Mgoo) left the team. In addition, one of the postharvest team members left IITA (Ibrahim Shabani) and was replaced with another pre-existing staff (Audifas Gaspar). Table 6 shows the project staffing by project component (coordination, maize/legumes, rice, and postharvest).

Table 6: Project team composition.

Name	Gender	Institution	Disciplinary expertise	Qualification	Project role
Project Coordination					
M. Bekunda	M	IITA	Chief Scientist/agronomy	PhD	Management
H. Sseguya	M	IITA	Technology scaling/socioeconomics	PhD	Project Leader/ Coordinator
S. Feleke	M	IITA	Economics	PhD	Implementation
F. Kamau	M	IITA	GIS	PhD	Implementation
G. Ndibalema	F	IITA	Research communication	BA	Implementation
S. Mruma	M	ACDI/VOCA	Horticulture	MSc	Implementation
Maize team					
B. Jumbo	M	CIMMYT	Breeding	PhD	Team leader
A. Kimaro	M	ICRAF	Soil Fertility	PhD	Implementation
F. Baijukya	M	IITA	Agronomy	PhD	Implementer
F. Kizito	M	CIAT	Land/water management	PhD	Implementation
J. Kihara	M	CIAT	Agronomy	PhD	Implementation
Z. Mduruma	F	Aminata Seeds Company	Breeder (seed production/trading)	PhD	Implementation
G. Chacha	M	Meru Agro Seed company	Seed production/trading	MSc	Implementation
E. Swai	M	ARI Hombolo	Soil Fertility	MSc	Implementation
J. Mabuga	M	ARI Hombolo	Agronomy	BSc	Implementation

Y. Luhenda	M	ARI Selian	Agronomy	BSc	Implementation
J. Masigo	M	IITA	Ag. Extension Education	BAEE	Implementation
Rice team					
S. Kashenge-Killenga	F	ARI Dakawa	Breeding	PhD	Team leader
C. Chuwa	M	ARI Dakawa	Plant pathology	PhD	Implementation
J. Zakayo	M	ARI Dakawa	Agronomy	MSc	Implementation
N. Mvukiye	M	ARI Dakawa	Agronomy	MSc	Implementation
I. Paul	M	ARI Dakawa	Agronomy	BSc	Implementation
K. Joseph	M	ARI Dakawa	Socioeconomics	MSc	Implementation
Vegetables team					
A. Gramzow	M	WorldVeg	Economics	PhD	Team leader
H. Mndiga	M	WorldVeg	Agronomy/training	MSc	Implementation
M. Tilya	M	HORTI -Tengeru	Agronomy	MSc	Implementation
A. Laizer	M	WorldVeg	Agribusiness	BSc	Implementation
T. Stoilova	F	WorldVeg	Genetic resources	PhD	Implementation
P. Joseph	M	WorldVeg	Agribusiness	BSc	Implementation
Postharvest management team					
A. Abass	M	IITA	Postharvest	PhD	Team leader
A. Gaspar	M	IITA	Food technology	BSc	Implementation
G. Michael	F	IITA	Food technology	BSc	Implementation

K. Mwinyigoha	M	IITA	Lab analyst	BSc	Implementation
E. Kabula	F	IITA	Statistician	BSc	Implementation
G. Ndunguru	M	True Foods Co.	Food technologist	PhD	Implementation
W. Mwakyami	M	TSSPMP	Food technologist	PhD	Implementation
L.H. Kyungu	F	COUNSENUTH	Nutritionist	PhD	Implementation

Changes in staffing are expected as follows: The project will conduct sensitization and training activities on aflatoxin management in maize and legumes. A plant pathologist from IITA, Dr. George Mahuku, will join the team to handle this role.

6 BUDGET

A total of US$1,875,000 has been received for Year 2. IITA has been submitting quarterly financial reports to USAID Tanzania. The report for the period July to September 2016 is under preparation und will be submitted to USAID before 31 October 2016. This report will show any unspent balance as of 30 September 2016 as after Year 1, any unspent funds will be carried over and added to the Year 3 budget.

7 OTHER ISSUES

7.1 Activities undertaken to ensure sustainability and transition

i. The project will deepen working with District Agricultural, Irrigation and Cooperative Offices (DAICOs) in all the ten districts where the project is operational. In each district, we will work with at least 15 village agricultural extension officers to implement project activities.

ii. Identifying NGOs and projects with a long-term presence and attachment in locations where we work or plan to work (e.g., CRS and TAHA for vegetables) and engage with them in the work of this project.

iii. Developing the capacities of farmer leaders, VBAAs, groups, and associations (NAFAKA as lead) and connecting them to other actors in the value chain (agro-input suppliers, traders, and processors).

7.2 Coordination with host government and local partners

The project coordinates with officials from the Tanzania Ministry of Agriculture, Livestock and Fisheries (MALF) through organizing project visits for key officials. We also provide briefs to these officials on project progress. As we did this year, we plan to continue providing bi-annual updates to DAICOs to enhance coordination and close-out. During key project activities such as field days and training sessions, DAICO and ARI staff are actively engaged in the activities as members of the project team. The village agricultural extension officers are also trained in agronomic practices during the time when they are being prepared to co-manage the demonstration plots, postharvest machinery, weeders, and other technologies. The staff are also provided with information materials that they can use after the end of the project to enhance agricultural productivity in Tanzania.

8 SUCCESS STORIES

The success stories listed below reported by the project in this reporting period.

- From a training on postharvest loss management to a booming maize shelling business
- No small change: Vegetable farmer cashes in on new varieties introduced by project
- Improved agricultural technologies tipping the scales of gender equity in a rural Tanzanian community
- Zipporah's redemption

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