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Training Based Rice Extension in Tanzania

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1. Introduction

Tanzania is located on the eastern part of the African continent. Tanzania has about 95.5 million ha of land, out of which 44 million ha are suitable for agriculture, 10.1 million ha are under cultivation, and 0.33 million ha are currently in use in irrigated agriculture. Tanzania's agriculture is dominated by small-holder farmers who have between 0.2 ha and 2 ha of land. About 70% of land cultivation depend on hand hoes, 20% on ox-ploughs and 10% on tractors.

After a series of development cooperation in agricultural sector since the 1970s, Japan International Cooperation Agency (JICA) and the Ministry of Agriculture Food Security and Cooperatives (MAFC) of the mainland Tanzania launched the Technical Cooperation in Supporting Service Delivery Systems of Irrigated Agriculture (TC-SDIA), nicknamed TANRICE, in June 2007 for a period of 5 years. Later, the Ministry of Agriculture and Natural Resources (MANR) of the Zanzibar government joined TANRICE in 2008.

Population and rice data between 1967 and 2008, shown in Table 1, indicate that: (1) Population increased 3.31 times; (2) Paddy production increased 11.6 times mainly due to expansion of area harvested (5.81 times) and partly due to increment of paddy yield (2.07 times); (3) More amount of rice has been imported though there were some export; and (4) Annual rice consumption per capita increased from approximately 7.6 kg in 1967 to 22.2 kg in 2002. Rice has become popular in Tanzania, and it is recognized as the second most important food crop after maize.

Table 1: Rice production and consumption in Tanzania

	1967	1978	1988	2002	2008	2008/1967
Population (x 1000)*	12,313	17,513	23,096	34,444	40.707	3.31
Area harvested	122	254	361	531	709	5.81
Paddy yield (kg/ha)	953	1,267	1,828	1,882	1,968	2.07
Paddy production	116	321	659	983	1,346	11.6
Rice import (x1000t)	19	42	31	135	51	2.68
Rice export (x1000t)	0.66	0.08	0.00	8.80	8.87	13.4
Rice consumption/ capita/year (kg)	7.6	14.3	19.9	22.2	21.5	2.83

Notes: *From census data excluding 2008 (estimated).
Area harvested(x 1,000ha), production, import and export data are means of 3 years (e.g. 1967=(1966+1967+1968)/3)
Sources: Population Census and FAOSTAT

The Japanese government has been organizing the Tokyo International Conference on African Development (TICAD) every 5 years since 1993. At the fourth TICAD in May 2008, JICA and the Alliance for a Green Revolution of Africa (AGRA) proposed the Coalition for African Rice Development (CARD) for targeting of doubling rice production in sub-Saharan Africa in a decade starting from 2008. Accordingly, the Tanzanian government announced the National Rice Development Strategy (NRDS, 2009) with a target to increase paddy production from 899 thousand tons estimated in 2008 to 1,963 thousand tons in 2018.

2. Development of Lower Moshi Irrigation Scheme

The Japanese government started cooperation for Kilimanjaro Region in the mid-1970s and conducted a study of Kilimanjaro Regional Integrated Development Plan (KRIDP). Based on the KRIDP submitted in 1978, among others, following projects were implemented for agricultural sector in the Region: (1) Construction of Kilimanjaro

Agricultural Development Centre (KADC) in 1981 (Grant Aid); (2) KADC Project from 1978 to 1986; (3) Construction of facilities for Lower Moshi Irrigation Scheme (LMIS) in 1987 (ODA Loan); (4) Kilimanjaro Agricultural Development Project (KADP) from 1986 to 1993; and (5) Construction of rice milling facilities in LMIS in 1989 (Grant Aid).

According to a Feasibility Report on Lower-Moshi Agricultural Development Project (October 1980), most people in the area were living in simple huts with earth floors, mud walls and banana leaf roofs. It also reported that "The prevailing irrigation practice at on-farm level is discouraging. It seems both inefficient and undisciplined. The reason may be attributed to the cultivation method and topographic condition of lands since there are always small undulations on the field surface which would cause both under-irrigation in some parts and water-logging in other parts. In the case of paddy fields, existing plots are of very small size and irregular shape." The report mentioned that average paddy yield was 1.4 t/ha in the area.

Technology packages of irrigated rice cultivation for LMIS were developed by KADC Project. JICA experts and Tanzanian counterparts conducted trials of variety comparison, plant spacing, fertilizer rate, and so on.

Kilimanjaro Agricultural Development Project (KADP) started operation in 1986 with intensive training of farmers, provision of tractor hiring services for land preparation, management of irrigation water and facilities by and the Water Users Association (WUA).

Construction of the facilities for LMIS was completed in 1987. LMIS covers 1,100 ha of developed paddy plots and 1,200 ha of irrigated upland areas planned. Standard size of paddy plot in LMIS is 0.3 ha (30 m x 100 m); every plot is well leveled, has direct access to irrigation canal, drainage canal and farm road. IR54 variety developed by International Rice Research Institute (IRRI) became popular in LMIS.

As presented in Table 2, the plan was to grow rice in 1,900 ha every year in LMIS: 1,100 ha in the first season and 800 ha in the second season in a year. However, it was not realized due to the shortage of irrigation water caused by more water consumption in the paddy plots (than the amount previously assumed) and conversion from upland to paddy plots in the upper stream areas. Triple rice cropping in rotation in a year was introduced in 1988. In 1990, rice was planted in 1,525 ha and 9,943 tons of paddy were produced (paddy yield: 6.52 t/ha); it was more than the targeted production of 8,850 tons (1,900 ha x 4.5 t/ha).

Table 2: Area harvested, yield and production of paddy and maize from 1,100 ha of area (initially planned for paddy) in Lower Moshi irrigation scheme (plan vs actual)

Year	Paddy			Maize		
	Area (ha)	Yield (t/ha)	Production (t)	Area (ha)	Yield (t/ha)	Production (t)
(Plan)	*1,900*	*4.5*	*8,550*	*0*	*0*	*0*
1987	923	6.7	6,183	–	–	–
1990	1,525	6.5	9,943	–	–	–
1995	468	6.2	2,878	–	–	–
2000	1,004	6.5	5,764	–	–	–
2005	562	7.0	3,934	–	–	–
2010	479	5.2	2,491	519	4.5	2,336
2011	401	5.2	2,085	678	4.0	2,712

Note: Date are from Lower Moshi irrigation scheme office.

The Tanzanian government and farmers became interested in irrigated rice. This is probably the biggest impact of LMIS. Rice double cropping in a year is practiced in upper stream areas (680 ha) of LMIS and also neighboring areas with different water sources. Consequently, water has become scarce and there are conflicts over irrigation water in the lower Moshi area.

Upland crops were introduced in fallowed paddy plots in the rainy season. Recently maize has been a widely planted upland crop in the plots in the rainy season. It is planted at the onset of the rainy season; supplementary irrigation is practiced after the ending of the rainy season (during the flowering and grain-filling periods).

3. Kilimanjaro Agricultural Training Center

For dissemination of irrigated rice cultivation practices to other areas in the country, most of the KADC facilities were transferred from Kilimanjaro Region to the central government in 1994 and renamed Kilimanjaro Agricultural Training Center (KATC). The KATC Project was implemented from 1994 to 2001 and conducted trainings on irrigated rice cultivation and its related subject matters (e.g. water management, agricultural mechanization, tractor operation). There were 1,031 extension staff and key farmers participated in the trainings.

Considering the limited human and financial resources of the government for extension activities during the said time, the Project developed an approach of training extension staff and key farmers together for establishing farmer managed demonstration plots of irrigated rice cultivation. It was implemented as follows: (1) Conducting rice cultivation training for extension staff for 45 days (20 participants/time) (2) Identifying 3 key farmers by the extension staff and the village government; and (3) Conducting training for the extension staff and the key farmers together for 12 days (40 participants/time). The importance of bunds, plot leveling and transplanting rice seedlings in straight rows has been emphasized.

After participating in the training, groups of extension staff and key farmers established demonstration plots in their irrigation schemes. When a KATC team visited ex-training farmer plots in Dar es Salaam, an old key farmer said “if I had practiced such rice cultivation earlier, my life would have been much more different.”

KATC Project was succeeded by KATC Phase II Project in 2001 for 5 years. A training based extension approach, which consists of baseline survey, residential training and infield training, was adopted. The Project selected 6 irrigation schemes as model sites (one irrigation scheme per Irrigation Zone) in Tanzania and one each in Kenya, Malawi, Uganda and Zambia.

There was an increase in paddy yield from 3.1 t/ha to 4.3 t/ha on average among farmers who participated in the model sites in Tanzania. Irrigation scheme management was improved in some model sites. Awareness on gender consideration in rice farming and livelihood improvement was enhanced.

One feature of KATC Phase II Project was gender consideration through inviting equal number of men and women farmer participants in the training. There were baby sitters who took care of babies while their mothers participated in the trainings. Push weeders introduced by the Project were welcomed because men farmers became interested in using them.

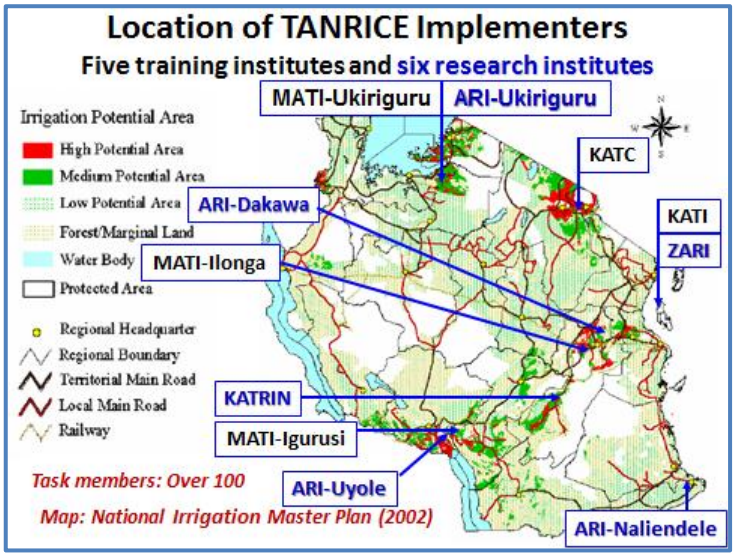
Mombo irrigation scheme in Korogwe District, Tanga Region was a model site of KATC Phase II Project. The irrigation facilities were constructed in the 1980s with support from Germany. It covers 220 ha of communal rice farm, and farmers plant rice 3 times in 2 years (by rotating 100 ha and 120 ha per season). The facilities were heavily damaged by floods in the early 1990s and rehabilitated by support of the World Bank in the early 2000s. Since then, they have been well maintained by the farmers. TANRICE utilized Mombo for developing the subject matter trainings on gender and rice marketing.

4. Outline of TANRICE

4-1 Setup

For up-scaling the success of KATC Phase II Project, TANRICE began its implementation in June 2007 for a period of 5 years.

This map is based on a study on the National Irrigation Master Plan supported by JICA in the early 2000s. Red and green colored areas indicate high and medium potential areas for irrigation development, respectively.



TANRICE started its activities in the mainland Tanzania with 4 agricultural training institutes and 5 agricultural research institutes. They were namely: KATC, Ministry of Agriculture Training Institute at Igurusi (MATI-Igurusi), MATI-Ilonga and MATI-Ukiriguru for training institutes; Kilombero Agricultural Training and Research Institute (KATRIN), Agricultural Research Institute at Dakawa (ARI-Dakawa), ARI-Naliendele, ARI-Ukiriguru, and ARI-Uyole for research institutes. Later, one each training institute and research institute of the Zanzibar government, namely, Kizimbani Agricultural Training Institute (KATI) and Zanzibar Agricultural Research Institute (ZARI) joined with TANRICE. Six (6) long-term and 8 short-term JICA experts (including 2 Filipinos) and over 100 Tanzanian task members worked for TANRICE.

4-2 Preparation

TANRICE conducted training for tutors of newly joined 3 MATIs, organized workshops for collaborators (Zonal Irrigation Offices and District Councils) and target groups. Features of the TANRICE training were: (1) “Training extension staff and farmers together”, and (2) Inclusion of practical training.

In TANRICE training, rice cultivation technologies were not only taught, but also demonstrated both at training institutes and in irrigation schemes. Appearance of the rice plants improved after changing the rice cultivation practices. With improved paddy plots and yields, the tutors, extension staff and farmers became confident on contents of the training. In fact, the first beneficiaries of the training were the tutors and the training institutes because they got better yields from their plots.

Forty (40) irrigation schemes were targeted for the standard training in the mainland Tanzania: 10 each per training institute. Later, 4 irrigation schemes were targeted for Zanzibar.

TANRICE planned to support the rice research program for conducting a multi-location trial of 6 NERICA (New Rice for Africa) varieties at 6 sites in 2007/08 and 2008/09 cropping seasons for releasing them in the mainland Tanzania. The sites were located across the country.

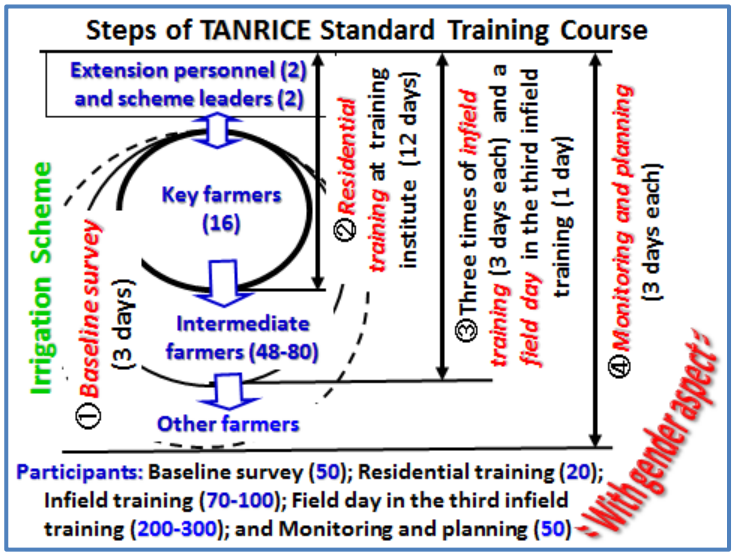
4-3 Implementation

With some modification, TANRICE succeeded the training based rice extension approach developed by KATC Phase II Project. It consisted of (1) baseline survey (needs survey) at an irrigation scheme, (2) residential training at a training institute,

(3) 3 times of infield training, and (4) 2 times of monitoring and planning.

A baseline survey and residential training were conducted before the beginning of the cropping season. The baseline survey included (1) courtesy call to the district and village offices, (2) observation of irrigation facilities and living situations, (3) collection of information with historical profile, mapping and rice farming statistics, (4) introduction of gender, and (5) briefing on TANRICE training including criteria for selection of key farmers.

Two (2) extension personnel for the irrigation scheme, 2 scheme/village leaders and 16 farmers (8 each men and women) were invited in the residential training. It covered rice production technologies and practices, other related topics and visit to an advanced irrigated rice farming area. At the end of the residential training, the participants prepared an action plan for improving rice cultivation practices in their irrigation scheme.



After the residential training, there were 3 opportunities of infield training at nursery preparation time, transplanting time and harvesting time. During the third infield training, there was a field day where other stakeholders in and out of the irrigation scheme were invited. Monitoring and planning session was conducted 2 times: about 1-2 months after harvesting and 1 year after the first one.

The key farmers played a facilitation role in the infield training. Every key farmer was supposed to identify 3 to 5 intermediate farmers to participate in the infield training together; every intermediate farmer was supposed to identify 2 other farmers. Gender was considered in implementation of TANRICE. There were equal numbers of men and women farmers invited for all steps of the standard training course.

Based on observation of some irrigation schemes with relatively better yields but poor management of facilities and irrigation water, TANRICE developed subject matter trainings for sustaining irrigated rice farming communities. Short-term experts and task group members developed and conducted the subject matter trainings on gender, irrigation scheme management and rice marketing. It was planned as such that respective subject matter training would end within a week.

Five (5) NERICA varieties (NERICA 1, NERICA 2, NERICA 4, NERICA 7 and WAB 450-12-2-BL1-DV4) were released by the national seed release committee in December 2009. After obtaining consent from concerned authorities, TANRICE produced NERICA 1 seeds for training material. TANRICE conducted training for tutors, who in turn conducted training for extension staff and farmers.

TANRICE conducted NERICA training (2 days) for 9 districts before the 2010/11 cropping season and 6 districts before the 2011/12 cropping season. Participants of the training consisted of a representative of District Agricultural and Livestock Development Officer (DALDO), 4 Village Agricultural Extension Officers (VAEOs) and 4 key farmers (2 men and 2 women) per VAEO. At the end of the NERICA training, each key farmer received 4 bags of NERICA; 1 bag (5 kg/bag) each for the key farmer

and 3 intermediate farmers.

Zanzibar joined TANRICE later. After releasing 3 NERICA varieties (NERICA 1, NERICA 10 and NERICA 12), TANRICE supported NERICA seeds production in Zanzibar in 2009 and NERICA training in 2010. KATC conducted training for tutors of KATI and Irrigation Department (Zanzibar) and guided them the steps of TANRICE standard training course for the first irrigation scheme in Zanzibar trained in 2010.

4-4Main Outputs

It was targeted that the paddy yield would be increased by 1 t/ha at every irrigation scheme through the TANRICE standard training course. By the end of the cooperation period, there were sets of data of paddy yields before and after the training available from 30 irrigation schemes. Out of them, paddy yields increased in 23 irrigation schemes in the first season. In the second season, out of 4 irrigation schemes, where sets of the data were available, the paddy yields increased in all of them.

Paddy yields increased by more than 1 t/ha in 53% and 50% of irrigation schemes in the first season and the second season in a year, respectively. On average, the paddy yields increased by 1.1 t/ha in the first season (from 2.6 t/ha before to 3.7 t/ha after the training course). The figure was 0.8 t/ha in the second season (2.6 t/ha before to 3.4 t/ha after the training course).

Table 3: Differences of paddy yields of 30 irrigation schemes before and after the TANRICE standard training

Training Institute	Decreased	Not changed	Increased		Total
			< 1t/ha	1t/ha =<	
KATC, Moshi	0 (0)	0 (0)	0 (1)	4 (1)	4 (2)
MATI-Ilonga	0 (0)	0 (0)	1 (1)	7(1)	8 (2)
MATI-Igurusi	4 (0)	0 (0)	4 (0)	2 (0)	10 (0)
MATI-Ukiriguru	1 (0)	1 (0)	2 (0)	1 (0)	5 (0)
KATI, Zanzibar	1 (0)	0 (0)	0	2 (0)	3 (0)
Total	6 (0)	1 (0)	7 (2)	16 (2)	30 (4)
%	20 (0)	3 (0)	23 (50)	53 (50)	-

(1) Data in parentheses are those of second season.
(2) Mean paddy yield increased 1.1 t/ha（2.6 t/ha --->3.7 t/ha） and 0.8 t/ha (2.6 t/ha --->3.4 t/ha) for main and second seasons, respectively.

Natural conditions (e.g. drought, flood, disease) and management problems (e.g. construction of irrigation facilities preventing smooth running of irrigation water) were the main reasons that adversely affected the paddy yields.

TANRICE conducted 7 gender, 6 irrigation scheme management and 4 rice marketing trainings in the mainland Tanzania. Improved rate of payment of irrigation water fee and repair of irrigation facilities were observed at some irrigation schemes. There were changes of mind sets among some farmers who participated in the trainings of gender awareness and rice marketing.

In the 2010/11 cropping season, average paddy yield of NERICA 1 was 1.04 t/ha, but if the data for the 4 districts adversely affected by late planting and early stop of rains are taken out of account, the figure becomes 1.67 t/ha. Average of key-farmers (1.23 t/ha) was higher than that of intermediate-farmers (0.97 t/ha).

5. Aspects of Development Cooperation

Agricultural and rural development aims at realizing more effective utilization of human, natural and other resources for farming and livelihood improvement. Both institutional capacity and individual capacity are necessary for successful rice farming. With realization of an increase in income and other benefits through marketing of agricultural and other produce, and proper management of income generated, rice farming becomes sustainable. It is common that development intervention creates necessities of follow-up activities.

There are lowland rainfed areas where direct sowing paddy cultivation is practiced. After construction of irrigation facilities and participating in the TANRICE standard training course, farmers construct bunds, level the plots and transplant rice seedlings in straight rows.

Any irrigation facility will deteriorate. It needs proper operation, maintenance and rehabilitation by individuals and organizations.

5-1 Plot Level Rice Cultivation Practices

JICA conducted a survey on the rates of (1) paddy plots with good bunds, (2) well leveled paddy plots and (3) areas of rice seedling transplanted in straight rows at 4 irrigation schemes in May-June, 2012. Results of the survey showed that all paddy plots in Mussa Mwijanga (in Kilimanjaro Region, covered by KATC) were transplanted rice seedlings in straight rows even in 2008 (before starting the training). Because of its location (about 20 km from LMIS), farmers in Mussa Mwijanga have been familiar with rice cultivation practices in LMIS for a long time. Distance from LMIS/KATC to Kitivo (in Tanga Region, covered by KATC), Kiroka (in Morogoro Region, covered by MATI-Ilonga) and Ruanda Majenje (in Mbeya Region, covered by MATI-Igurusi) is about 200 km, 500 km and 1,000 km, respectively.

Table 4. Differences of basic paddy cultivation practices of 4 irrigation schemes between 2008 and 2012 (%)

	Year	Mussa Mwijanga	Kitivo	Kiroka	Ruanda Majenje
(1)	2008	50	10	0	40
	2012	75	50	<50	50
(2)	2008	50	20	0	5
	2012	75	50	<50	50
(3)	2008	100	40	10	1
	2012	100	100	90	<5

Note: (1) Paddy plots with good bunds; (2) Well leveled paddy plots; and (3) Areas transplanted rice seedlings in straight rows.

Results of the survey indicate that the farmers think the paddy plots have been improved in all irrigation schemes. Images of good bunds of paddy plots and well leveled paddy plots may vary among farmers in different countries or different locations (and sometimes even in the same location).

In Japanese word, paddy plots are written as 田 which looks like 4 pieces of squares joined together. Shapes and sizes of paddy plots vary according to the topography and workability but the form (or ***Kata*** in English of Japanese origin) of paddy plot is the same: well bunded and well leveled. Experiences in northern and other parts of Tanzania indicate that there is a possibility of increasing paddy yields with improving paddy plots and adoption of basic rice cultivation practices.

5-2 Irrigation Scheme Management

In any country, it is not easy for small-holder farmers to construct irrigation facilities by themselves, but they can operate and maintain the facilities with appropriate

guidance of concerned authorities. Unless making efforts by stakeholders, irrigation facilities are easily deteriorated.

TANRICE collaborated with Same District, Kilimanjaro Region, for reactivating management of Ndungu Irrigation Scheme (NIS) whose facilities were constructed in 1990. Later, the facilities were deteriorated under decentralization and privatization process. TANRICE conducted subject matter training on irrigation scheme management in March 2009 which contributed to the registration of Ndungu Irrigators Association in July 2009. With concerted efforts of Same District Council and the re-established Association, the management of NIS has been gradually reactivating.

TANRICE organized a workshop on irrigation scheme management for 13 irrigation schemes (including NIS) in February 2012. Stakeholders of District Councils (irrigation officers and irrigation scheme managers) and farmer representatives (chairpersons, one each man and woman board members of respective irrigators organizations) were participated in the workshop. It was observed that good relationship between an irrigation scheme and the local government is important for sustaining the management of an irrigation scheme.

Collective efforts of all stakeholders (beneficiaries) for sustaining the irrigation facilities should be sought with consideration of site and time specific conditions. Positive contributions and compromises among beneficiaries are necessary for properly utilizing limited amount of water available for irrigation.

5-3 NERICA

In the process of developing NERICA training the following ideas were carried out: (1) Transfer of knowledge from rice researchers to tutors through workshop; (2) Production of only NERICA 1 seeds at one training institute with intensive monitoring; (3) Developing NERICA training materials by JICA experts; (4) Training of crop tutors on NERICA; (5) Training of DALDO representative, 4 VAEOs and 16 key farmers together at a training institute; (6) Distribution of the NERICA seeds to training institutes, from training institutes to key farmers and from key farmers to intermediate farmers; (7) The DALDO, 4 VAEOs and 16 key farmers acted as supervisors, advisors (monitoring agents) and implementers, respectively; (8) Workshop of DALDO representatives, crop tutors and rice researchers on the results of monitoring. More farmers and the local governments became interested in NERICA.

5-4 Cost Sharing

Japan's ODA is implemented based on ownership and partnership. Both human and financial resources are necessary for successful implementation of any development cooperation. Before TANRICE, the Tanzanian government allocated human resources to the cooperation projects but with minimal amount of budget for operation. TANRICE started after the introduction of general budgetary support and sector wide approaches in Tanzania.

Table5: Cost sharing of stakeholders for conducting the TANRICE standard training course

Training Institute	Cost Sharing (%)				Total (T.Shs.)
	District	MAFC	JICA	Others	
KATC, Moshi	30.1	19.0	50.9	0	168,500,977
MATI-Igurusi	59.4	4.7	35.9	0	219,260,398
MATI-Ilonga	56.0	9.2	34.8	0	226,525,970
MATI-Ukiriguru	59.3	6.7	34.0	0	139,398,040
KATI, Zanzibar	0	20.7	74.7	4.7	68,611,400
Total	47.5	10.5	41.6	0.4	822,296,785

Cost of conducting a standard training course (from baseline survey to 2nd monitoring and planning) was about 15,000-20,000 US dollars (about 10,000 US dollars for nearby irrigation scheme to a training institute). District Councils made efforts for application and allocation of the budgets for implementation of TANRICE activities. Over one-half of the cost for the standard training course was shouldered by the Tanzanian side (mainly District Councils). JICA supplemented the gap for smooth implementation of the standard training.

There were delays of the budget disbursement from the central government to the District Councils. Proper arrangement for sustaining training based rice extension approach should be sought.

5.5 South-South Cooperation

TANRICE requested to the Philippine Rice Research Institute (PhilRice) for 2 short-term experts in 2011. They were dispatched for 2 months starting May 2011. Together with Tanzanian counterparts, they visited concerned institutes, rice producing communities and others for collecting information especially on farmers' organizations and rice mechanization. They presented what they observed and suggested further areas of cooperation. There were 8 TANRICE personnel (2 JICA experts and 6 Tanzanian task members) visited the Philippines for 11 days in September 2011. They visited IRRI, PhilRice and rice farming areas.

Knowing each other's similarities and differences of rice cultivation between Africa and Asia may be a pre-requisite for successful cooperation. Interesting areas of cooperation between concerned organizations should be carefully identified with taking account of available resources.

Regional cooperation should also receive attention. Some TANRICE personnel (1 JICA expert and 7 Tanzanian task members) visited Uganda for familiarization of NERICA and there were some visitors from Uganda and Ethiopia for sharing experiences of training based rice extension approach. Cooperation within the African continent is also important for sustaining rice farming in the continent.

6. Future Direction

In lower Moshi area, nowadays, it is not easy to find the simple huts with earth floors, mud wall and banana leaf roofs which were common about 30 years ago. Introduction of improved irrigated rice cultivation practices has contributed to the betterment of rice farmers and rice related people in the area.

The Japanese and Tanzanian governments are in the process of starting the Project for Supporting Rice Industry Development in Tanzania. The Project will cover irrigated, rainfed upland and rainfed lowland rice production areas. Coping with financial situations of the Tanzanian and Japanese governments and increasing number of agricultural extension staff in the local governments in the recent years, there may be some modification of the training based rice extension approach in the future.

Numbers of implementers, collaborators, target groups as well as development partners for rice industry development are increasing in Tanzania. It is expected that MAFC will coordinate such stakeholders for realizing the target of NRDS. Improvement of rice farming will contribute to the betterment of rice farmers and rice related people in the country.

Views expressed in this paper are not representing any organization.