The Study on "Development of Improved Infrastructure and Technology for Rice Production in Africa"

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1. Background

1-1. The study

The Japan International Research Center for Agricultural Sciences (JIRCAS) started the study on Developing Improved Infrastructure and Technology for Rice Production in Africa (DIITRPA) in 2008 financially aided by the Ministry of Agriculture, Forestry and Fisheries (MAFF) in Japan. The study is currently focusing on validating techniques that JIRCAS has acquired through a year-and-añhalf study in Ghana, and JIRCAS has been in the stage of disseminating a technical manual to other countries in Africa including Ethiopia. JIRCAS has begun validity study in Ethiopia because of its enough potential to develop rice production. In this paper, I would like to explain about an idea of dissemination based on the activities implemented so far by JIRCAS to be understood by stakeholders as well as institutes concerned in Ethiopia.

1-2. Why JIRCAS started the study

Demographic study shows that rapid population growth in Africa is observed, so food shortage in Africa has been one of the world-wide serious problems in near future. On the other hand, since food production in Africa is still not sufficient to demand, imports of food from Asia and North America are currently observed.

In 1970s, rice consumption was growing in Africa, and governments of Western Africa gathered and established a new agency of the West Africa Rice Development Agency (WARDA, currently ìAfrica Riceî) aided by international cooperation agencies, such as FAO, etc. WARDA was produced new rice varieties in Africa (NERICA) since established, and Japan also supported disseminating NERICA varieties, but NERICA hasnít been popular yet in African countries because of the poor experience of rice cultivation, etc.

In May 2008, Japan started the concept of the Coalition for African Rice Development (CARD) together with the Alliance for Green Revolution in Africa (AGRA) whose aim targeted to double the rice production in ten years, and Japanese government simultaneously started the study to fulfill the goal of CARD.

2. Concepts of the study

The study was designed to explore ways to increase rice production in accordance with diverse forms of rice ecosystems in Africa, especially to improve farmland and facilities and develop farmersí cultivation skills in rain-fed lowland areas, by improving methods for rice field construction and cultivation management, introducing appropriate cultivars, and providing seeds as well as equipment and materials. A basic study of rice production in rain-fed lowlands was conducted in 2008 in the eastern and western regions of sub-Saharan Africa through site visits in each region. Based on that basic study, it was decided to execute a verification study in rain-fed lowland areas in Ghana from 2009 and Ethiopia from 2010 utilizing the results in Ghana. The verification study is being done with farmers at selected model sites on the following topics; (1) establish construction methods of farmland and simple irrigation facilities suitable for topography and water resource, (2) select suitable varieties and improved cultivation techniques, (3) organize farmer groups to manage facilities, machineries and materials, (4) establish extension and support system to disseminate technologies and (5) make instruction manual for farmersí leaders to utilize according to local condition. At the same time, on-the-job-training to the extension workers and irrigation engineers will be also carried out,

and technical manual for dissemination of the result of this study is to be made by consolidating the results. Finally, this study shares the same goal with CARD in increasing rice production in Africa.

3. Outline of the project in Ghana

3-1. Other projects done in Ghana

3-1-1. Sawah project

In Western Africa, such as Nigeria and Ghana, a particular way of rice cultivation called ìSawahî system led by Dr. Wakatsuki, professor of Kinki University in Japan, is conducted and remarkable results by the system are reported. Using these experiences, JIRCAS would like to enhance the expertise acquired through the practice of ìSawahî system. According to Buri et al. (2009), technical definition of Sawah is a (1) bounded and (2) well-leveled rice field with (3) an inlet for irrigation and (4) an outlet for drainage, and JIRCAS would like to trace the same method of (a) bounding paddy field, (b) leveling and puddling by power tiller and (c) delivering irrigation water to the farming plot.

3-1-2. Characteristics of the projects

In Ghana, a lot of projects are conducted by international agencies, such as JICA, the African Development Bank (AfDB), French government and Korean governmental agency. In which, JICA project named ìSustainable Development of Rain-fed Lowland Rice Productionî was also targeted small inland-valley in Ashanti Region, but they decline to introduce power-tillers to level and puddle the paddy field to stabilize the rice production because micro-credit system should be facilitated, as sustainable manner JICA has targeted, before its applying.

Table-1: Differences of the concepts among several rice projects in Ghana.

Development / Investment	**Small area**	**intermediate**	**Large area**
Small investment (by farmers group)	Sawah projects	JICA project in Ashanti Region	JICA project in Northern Region
Intermediate (Limited government intervention)	Proposal by JIRCAS	Proposal by JIRCAS	
Large investment (International intervention)		AfDB project	French project at Northern Region

Source: Author

3-2. Validity study at the four JIRCAS sites

3-2-1. Validity study sites

JIRCAS chose project sites in Ashanti Region in Ghana because counterpart institutes, the Crops Research Institute (CRI) and the Soil Research Institute (SRI), who had experienced several rice projects applying ìSawahî system are situated. JIRCAS did several researches to choose project sites, and decided four (4) project sites (PSs) in fiscal year (FY) 2009 and eight (8) PSs in FY2010, respectively. Since JIRCAS has understood the importance of dissemination, asked the Ministry of Food and Agriculture (MOFA) in Ghana to help dissemination. On the job trainings (OJTs) have been conducted by experts of CRI and SRI to expansion engineers, who are staff of MOFA and have knowledge of the land conditions of PSs.

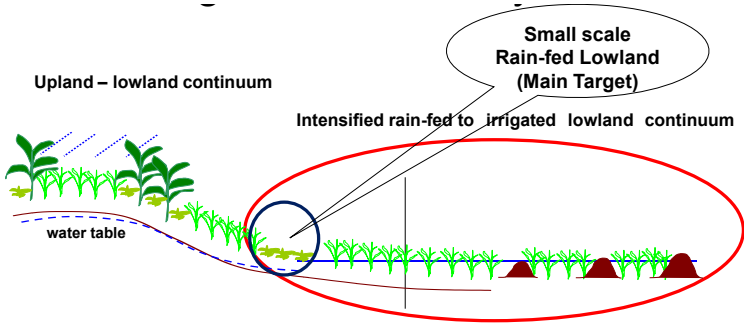

Fig-1: Target area of study.

3-2-2. Betterment

During the validity study in Ghana, JIRCAS encountered several difficult conditions of both topography and precipitation. JIRCAS has proposed three type of betterment on water resources at the site, such as dike and weir type, canal type and water-harvesting type to overcome these difficulties, and all of these techniques are effective at paddy fields of bounded and leveled conditions likely to traditionally-practiced paddy fields in Japan.

Table-2 Three types of betterment for paddy field

Types	PSs in FY2009 applied	Notes
Weir-and-canal type	Nsutem	Lack of WR, Flat
Water-harvesting type	Kodawen	Lack of WR, Slope
Divided-canal type	Sokwae, Baniekrom	Enough WR

Source: Author

3-3. Draft Manual

JIRCAS realizes its importance to compile the manual in local language when itís delivered to farmers or farmers group, so the draft manual should be revised after shown to the government officials and extension workers and acquiring comments and/or questions by them.

4. Summary

Table-3: Objectives, Budget and Duration.

Items	Summary
Objectives	To establish Small Scale Rice Production Models in inland valley
Budget	About one million US Dollar / year
Duration	4 years (FY2008 - FY2011)
Funding Agency	Rural Development Bureau, Ministry of Agriculture, Forestry and Fishery (MAFF), Japan

Source: Author

5. References

The “Sawah” System of Rice Production: M.M. Buri, R.N. Issaka and T. Wakatsuki, SRI, 2009.