IRRI

INTERNATIONAL RICE RESEARCH INSTITUTE

Development of a Training Course on Water-saving Technologies in Rice Production

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A proposal

submitted to the

Asian Development Bank

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Contact:

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Rice Science for a Better World

Cooperation Fund for the Water Sector
Pilot Demonstration Activity
Request Form

Activity Title: Development of a Training Course on Water-saving Technologies in Rice Production	
Proposer (Name, Div/Dept): Dr. B.A.M. Bouman International Rice Research Institute (IRRI) Los Baños, Philippines	
Request Date: October 10, 2002	
Region: Southeast Asia	**Country:** Philippines
Activity Start Date: January 1, 2003	**Activity End Date:** December 30, 2003
Cost Estimate: US$49,450	
Implementing Organization Contact: Dr. Michael T. Jackson Director for Program Planning and Coordination International Rice Research Institute (IRRI) Los Baños, Philippines	
Consultant Identified? None	**If so, Consultant(s) Contact:**

Short Description

1. Background and Rationale

Water for agriculture is increasingly getting scarce and expensive. The main cause is the increased demand from an ever increasing population, leading to increased irrigation demand to produce enough food (rice) and to competition for water from sectors such as cities and industry. Natural calamities such as droughts (El Niño) increase the severity of the problem. Rice is the most important staple food in Asia, and, because of its heavy water requirements, is also the biggest consumer of irrigation water. To safeguard food security and conserve water resources, scientists have been doing research on water-saving irrigation technologies for rice production. At this moment, a number of irrigation technologies have been developed that save water with no significant effect on yield (sometimes they even increase yield): controlled irrigation, direct seeding, land leveling, aerobic rice, to name a few. The implementation of such technologies has tremendous potential to produce rice using less water, to increase water productivity, and to save on water that can be used to irrigate more land. For the majority, however, these water-saving technologies have remained at the scientists' desks and little or no effort at extension or adoption by Asian rice farmers has been made. To remedy this situation in the Philippines, IRRI, the National Irrigation Administration (NIA), and PhilRice initiated a project in 2001 on the transfer of water-saving technologies in Tarlac and Nueva Ecija (TTWS project). The purpose of this project is to develop a strategy and methodology for the transfer, adaptation, and adoption of water-saving technologies. Pilot sites testing water-saving technologies were established in deep well systems in Tarlac and among shallow tubewell farmers in Nueva Ecija. Integrated crop-water management technologies are being developed

and demonstrated in a farmer-participatory mode. These pilot sites demonstrated that, using water-saving technologies, rice could be grown using 30-40% less water without significant effect on yield. Moreover, with restricted water supply, aerobic rice gave higher yields than traditional lowland rice. The project established an effective NIA-farmer-scientist partnership and a vision for widespread extension and adoption of water-saving technologies in the Philippines.

The TTWS project is the Philippines' implementation of the Water Workgroup of the International Irrigated Rice Consortium, which includes counterparts in China, India, and Thailand. As a next step toward technology transfer of water-saving technologies in the Philippines (beyond the established pilot sites) and in Asia in general, a training course on water-saving technologies is urgently needed.

2. Objectives

This proposal aims at the dissemination and implementation of water-saving technologies for rice to mitigate the water crisis in Asia in general and in the Philippines in particular. The specific objectives is to develop and to implement a training course on water-saving technologies and knowledge transfer, aimed at irrigation system managers, extension officers, leaders of irrigator associations, and water user groups.

3. Scope of Work/Description of Activities

A training course will be developed and given to about 30 persons from NIA, Agricultural Training Institute (ATI) of the Department of Agriculture, Bureau of Soil and Water Management (BSWM), selected regional field units (RFUs) and leaders of farmer irrigator associations (FIAs) in the Philippines. The participants will learn about water-saving technologies how to extend information to rice farmers, and how to draft action plans for follow-up training and extension of the technologies in their mandated areas.

The one-week course will have three components:

1. Water-saving technologies (about 3 days of classes plus field demonstrations); various modules: controlled irrigation; establishment techniques (e.g., dry direct seeding, aerobic rice); land preparation
2. Training-the trainer: 1 day to train the participants in the training, dissemination, and extension of water-saving technologies; training on the use of the extension and dissemination materials; how to organize seminars, how to organize farmer schools, how to setup demonstration sites, etc.
3. Development of a regional training plan: 1 day planning of follow-up technology dissemination in the mandated target areas of the participants

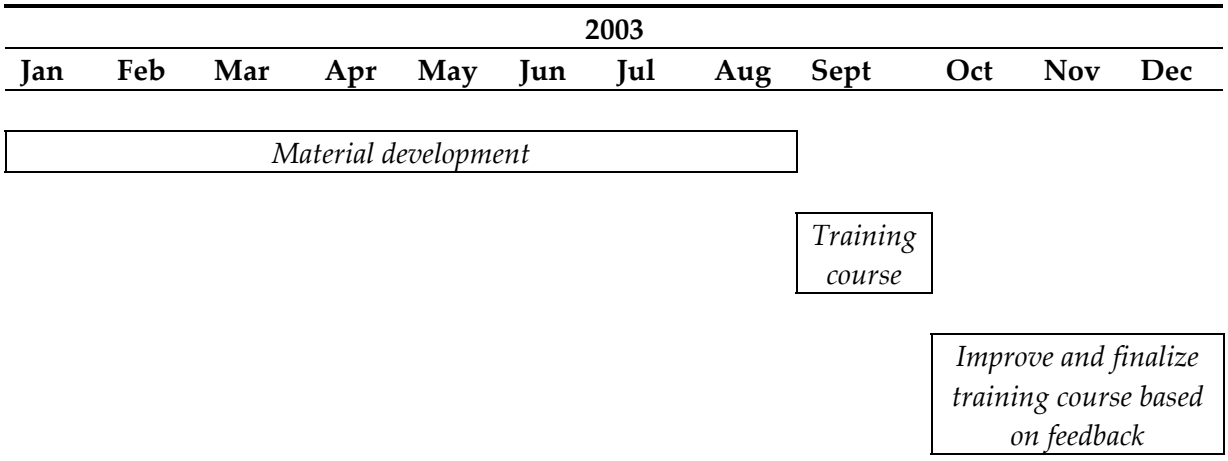
Course instructors will be researchers and trainers from IRRI, researchers from PhilRice, and personnel from NIA (all participants in the ongoing TTWS project).

Three types of training materials will be developed:

1. Courseware materials to be used at the training course: transparencies, PowerPoint presentations, reference manual, etc. This courseware will also be available through the internet and on CD-ROM.
2. A Manual/book on water-saving technologies
3. Extension materials that trainees can use in the dissemination of water-saving technologies to rice farmers: transparencies, brochures, posters

4. Implementation Schedule, Institutional Management Arrangements, and Proponent Qualifications

Timeline



Project team (members and responsibilities)

1. IRRI: Project Leader - responsible for developing and implementing the training course, development of courseware and dissemination materials. IRRI units involved: the Water Group of the Crop, Soil and Water Sciences Division, and the Training Center.
2. NIA: Co-project leader; co-host of the training course - assistance during the training course (specifically NIA-TGISRP personnel); dissemination to farmers in NIA-mandated irrigation systems; establishment of demonstration sites; will adopt training materials in their training programs (liaise with ATI).
3. PhilRice - training assistance in the training course; will adopt training materials in their training programs.
4. ATI - adoption of developed training materials in their training program.
5. BSWM - dissemination to farmers in selected BSWM-mandated irrigation systems.

Key personnel: project leaders and managers

1. B.A.M. Bouman; project leader, IRRI; water-scientist. V. Balasubramanian, head, Training Center
2. A.M. Mejia; project leader, NIA
3. V. Vicmudo: project leader, NIA-TGISRP

4. J.L. de Dios: coordinator, PhilRice
5. R.G. dela Cruz: coordinator, ATI
6. R. Lucas: coordinator, BSWM

5. Expected Results (outputs/outcomes/impacts)

Concrete outputs:

1. Training course (including courseware) on water-saving technologies in rice production
2. Extension materials (brochures, posters)
3. Manual/book on water-saving technologies (also available on CD-ROM)
4. Trained "water-saving officers" in the Philippines
5. Action plans for wide-scale dissemination of water-saving technologies in the Philippines

There are three types of beneficiaries:

1. The ultimate users of the project results are rice farmers in water-deficit irrigated areas (with spin-off to farmers in rainfed areas). Water-saving technologies can help mitigate on-farm water shortage and improve farmers' livelihoods.
2. Intermediate beneficiaries are agricultural extension agents and irrigation managers who will have an overview of options of water-saving technologies and increased skills in knowledge transfer and dissemination activities.
3. When water savings at the farm level get adopted and spill over to higher spatial scales, indirect beneficiaries are the a) the population in Asia in general through increased food security in the face of water scarcity, and b) the environment, cities, and industry to which more abundant water supplies can be diverted.

The adoption of water-saving technologies will contribute to increasing water productivity, safeguarding food security, and alleviating poverty. Assuming an average farm size of 1 ha, some 17 million farmers who face physical water scarcity and 22 million farmers who face economic water scarcity in 2025 will benefit from water-saving technologies. Two examples are given of early results of adoption of water-saving technologies. At two sites in northern China, farmers who adopted aerobic rice for the first time in 2001 realized net economic returns of US$400-600 ha^{-1} on fields where water scarcity prohibited the growing of lowland rice (Bouman et al 2002). The returns on water use, both physical (grain harvest) and financial, were 50-100% higher than in no water-limited lowland rice. Moreover, mechanization cut labor needs by half to three-quarters. In the Philippines, farmers who, for the first time, adopted alternate wetting and drying in 2002 in a deep well pump irrigation system saved on average, 20-30% water and improved their farm income from rice by $25 ha^{-1} (IRRI, unpubl. data). The first experiments with aerobic rice in the wet season indicated a 20-30% yield increase over conventional lowland rice under conditions of water shortage.

6. Measurable Performance Indicators

- Thirty "water-saving officers" trained by the end of the project
- Concrete action plans developed by course participants
- Thirty sets of extension materials to be used by participants: brochures, posters
- Thirty sets of PowerPoint slides and reference manuals
- Manual/book on water-saving technologies
- Training course integrated into IRRI's on-line Knowledge Bank and training system
- Training course materials adopted by NIA, PhilRice, and ATI
- Training course materials made available to other relevant institutions in Asia

7. Stakeholder Participation

In the TTWS project, an effective partnership was developed between IRRI, NIA, and PhilRice. At the pilot sites in Central Luzon, farmer-participatory research and development of water-saving technologies are ongoing since the 2002 dry season. Frequent meetings with farmers and leaders of water user groups (FIAs) ensure feedback and strong involvement in the project. In 2002, the TTWS team established contact with the ATI and BSWM and developed a plan for the development of a training course on water-saving technologies and for the dissemination of technologies to farmers in the Philippines.

8. Scope for Replication/Use in Other DMCs

Following IRRI's training philosophy, the course materials will be designed in a way that they can easily be integrated with national training programs in and outside the Philippines. Existing contacts with training and extension institutions in Asia will be maximally exploited—e.g. via the Irrigated Rice Research Consortium. In the Philippines, the training materials developed will be integrated in training programs provided by NIA, PhilRice, and ATI.

9. Cost Estimate

	Requested funds			
	IRRI	**NIA**	**PhilRice**	**Total**
Local staff (Consultant for 3 months)	6,000			6,000
Office & research supplies, local travel, additional field work	5,000	1,500	1,500	8,000
Course materials				
Courseware (manuals, handouts, etc.)	1,500			1,500
Book	7,500			7,500
Extension materials	5,000			5,000
Training Course				
Training costs	12,000			12,000
Travel of participants	3,000			3,000
Sum	40,000	1,500	1,500	43,000
Indirect costs	6,000	225	225	6,450
Total sum	46,000	1,725	1,725	49,450