

Annex 1. Specification and description of the training course in:

**INTEGRATED WATER MANAGEMENT IN RICE PRODUCTION –TECHNOLOGY
TRANSFER FOR WATER-SAVINGS**

By:

The International Rice Research Institute (IRRI)

In collaboration with the following Philippine Agencies:

National Irrigation Administration (NIA)

Philippine Rice Research Institute (PhilRice)

Bureau of Soils and Water Management (BSWM)

Agriculture Training Institute (ATI); and

Central Luzon State University (CLSU)

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I. Course Description and Background

Traditional lowland rice production in Asia consumes more than 50% of all irrigation water use in Asia. Water resources are, however, increasingly getting scarce and expensive. In the last decade, researchers have studied and developed a number of water-saving irrigation technologies. Although these technologies have been demonstrated to save water and increase water productivity, their adoption by farmers is low. Hence, this training course was developed to familiarize water saving officers with water-saving technologies, and with participatory tools and frameworks that they could use in planning and implementing scaling up activities with rice farmers. It consists of three parts listed as follows:

- Water-saving technologies: classes plus field demonstration of various modules on controlled irrigation, land preparation, and crop establishment techniques (e.g., dry direct seeding, wet direct seeding, aerobic rice, etc),
- Impact design: participatory planning and farmers decisions, diagnostic tools and frameworks for scaling up, and
- Development of a regional training plan to scale up adoption of water-saving technologies in the mandated target areas of the participants.

II. Objectives

At the end of the training course, the participants will be able to:

- discuss the rice plant – its morphology, growth stages and development,
- explain crop diversification as an alternative option in increasing productivity in irrigated rice production systems,
- describe the basic principles and components of the water balance of rice fields,
- determine the evapotranspiration and field water requirements of rice fields,
- describe soil-water-plant relationships, water-saving technologies and irrigation methods,
- explain the processes and techniques in participatory planning and diagnostic tools to understand farmers' decisions on water-saving technology, e.g., focus group discussions (FGD), farmer surveys, and scaling up strategies, and
- conduct an FGD, use FGD results to develop a survey instrument and design an extension and communication strategy to scale up adoption of water-saving technologies.

III. Course Content

The course content is grouped into three parts:

- A. General Principles of Rice Production Systems,
- B. Water Management Practices, and
- C. Technology Transfer and Implementation

A. General Principles of Rice Production Systems (*duration : ½ day*)

This topic was designed to provide the participants' the basic knowledge and understanding about the rice plant and the essential cultural and management practices. It covers the morphology, growth stages and development of the rice plant, methods of growing rice, weed control and fertilizer management under non-flooded and water short conditions.

Crop diversification was added to provide an alternative to the mono rice-rice cropping system when the water supply is inadequate to support a rice crop. It is a practical strategy for increasing the cropping intensity and productivity in irrigation systems particularly in the dry seasons when rainfall and stream flows are very low. The specific subjects are as follows:

- Morphology of the rice plant,
- Growth stages and development of the rice plant,
- Integrated crop management,
- Fertilizer management under water-short conditions,
(This includes Leaf Color Chart (LCC) for Real-Time N Management in Rice, and exercise for the measurement and calculation for LCC-based N application, etc),
- Weed control and management under water short conditions, and
- Crop diversification: An alternative production strategy for increasing profitability in irrigated rice production systems.

B. Water Management Practices (*duration: 2 days*)

This topic was designed to provide and enhance the participants' knowledge and understanding of the basic principles and practices in water management. It specifically, enhances their understanding of the water-saving technology meant for increasing the water use efficiency and productivity.

It covers the basic soil-water-plant relations with emphasis on the response of the rice plant to varying intensities of water application and fertility levels. It includes a discussion of the components of water balance in the rice field, determination of water requirements, water-savings technologies, and methods of water application, e.g., surface irrigation, drip irrigation,

field instrumentation for monitoring the water status in the rice field. The specific topics are as follows:

- Water Scarcity: An Overview
- Management and Performance of Irrigation Systems (NIA-Managed)
- Management and Performance of Small Water-Impounding Systems (Farmer-Managed)
- Soil-Water-Plant Relationships
- Water Balance in Irrigated Rice Field
- Principles of Sound Field Water Management
- Instrumentation for Field Water Measurement in Alternate Wetting and Drying (AWD) Irrigation Method
- Water-Saving Practices: Alternate Wetting and Drying (AWD)
- Water-Saving Practices: Aerobic Rice System
- Drip Irrigation for Water Conservation

C. Technology Transfer and Implementation (*duration: 2 ½ days*)

This topic will provide the participants with the basic knowledge and understanding of the processes and techniques in disseminating water-saving technologies. Moreover, it will also discuss the theory and practice in field surveys, strategic communication campaigns, project planning techniques, and management of change. It covers the following topics and activities:

- Technology Transfer and Implementation: TTWS Model. This topic explains the approaches to participating R & D and dissemination of water-saving technologies in the Philippines. A prelude to the lecture-discussion is a video showing on (i) Needs and Opportunities Assessment (NOA), (ii) Conducting Field Demonstration, and (iii) Technology Transfer on Water-Saving (TTWS).
- Participatory Planning and Farmers' Decisions: This topic includes a discussion on the overview of impact design framework, participatory planning, etc.
- Diagnostic Tools: This topic describes various tools to understand farmers' problems, e.g., focus group discussion, farmer survey, and other quantitative tools such as transect walks, mapping, etc. The specific subjects includes (i) Diagnostic tools and farmers' knowledge: A short introduction, Diagnostic tools and farmers' knowledge: Values grid, Quantifying rice farmers' pest management decisions: beliefs and subjective norms in stem borer control, Beginning focus group discussions (Example), Field exercise on FGD in a typical gravity irrigation systems.
- Group discussion: Inventory of water shortage/ delivery problems and Inventory of water-saving options and constraints. Please refer to Annex 6 for details.

- Values Grid – The values grid approach used in Entertainment-Education will also be introduced to participants. This approach consists of specifying the educational issues involved in irrigation water delivery and utilization. For each issues, the positive values (or opportunities) and negative values (constraints, weaknesses) need to be identified. Focus group discussions results serve as the basis of the values grid entries. Refer to values grid output of participants (Appendix 5).

IV. Project Team and Training/Resource Persons

Project Leader	:	Dr. Bas A. M. Bouman (IRRI-CSWSD)
Co-Project Leader(s)	:	Engr. Avelino M. Mejia (NIA-IDD) Dr. To Phuc Tuong (IRRI-CSWSD) Dr. Vicente R. Vicmudo (NIA-TGISRP) Dr. Vethaiya Balasubramanian (IRRI-TC)
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Coordinators	:	Mr. Jovino L de Dios (PhilRice) Dr. Rumelia G. dela Cruz (ATI-DA) Engr. Samuel M. Contreras (BSWM-DA) Dr. Teresito G. Aguinaldo (CLSU)
Members	:	Engr. Romeo J. Cabangon (IRRI-CSWSD) Dr. Rubenito M. Lampayan (IRRI-CSWSD) Dr. Armando Espino, Jr. (CLSU) Mr. Alex Espiritu (PhilRice) Mr. Armelito Lactaoen (NIA-TGISRP)
Resource Persons	:	Dr. Albert Atkinson (formerly IRRI) Dr. Mark Bell (IRRI/TC-IPMO) Dr. Monina Escalada (IRRI-IPMO) Dr. Joseph Rickman (IRRI-ES) Engr. Eugenio Castro, Jr. (IRRI-TC) Ms. Gina Zarsadias (IRRI-TC) Ms. Ma. Teresa Clabita (IRRI-TC)

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