

The NIA-JICA Diversified Crops Irrigation Engineering Project: Background, Objectives and Concerns

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Abstract

The objective of rice-based irrigation systems is to increase the cropping intensity in their service area. However, actual cropping intensities are at levels generally lower than design targets due to water-related factors.

Expansion of the area that can be irrigated with the available streamflow is an inherent concern of NIA. One of the strategies envisioned is the large-scale cultivation of low-water-requiring non-rice crops. Target areas are irrigation-deprived areas and parts of usually rice-cultivated command areas of irrigation systems during the dry season.

However, the technology for the irrigation of mixed-crop and bi-modal cropping patterns is still under-developed. Thus, the National Irrigation Administration (NIA) had launched the Diversified Crops Irrigation Engineering Project (DCIEP). DCIEP's role is to formulate a Diversified Crops Irrigation Engineering Manual through the compilation of existing information, conduct of supplemental research work and field surveys, and the development of component specialized schemes.

DCIEP is technically and financially assisted by the Japan International Cooperation Agency (JICA). Project implementation started in May 1987 and is targeted for completion in May 1992. Field tests are being carried out in a 3-hectare trial farm located in San Rafael, Bulacan.

A special component of the Project is the construction, in 1989, of a DCIE Center which will consist of a training complex and a fully equipped soils laboratory.

The Project and the Center are supportive of the crop diversification program of the government.

Background and Objectives

Background. A 15-month study on *Food Demand and Supply and Related Strategies for Developing Member Countries: Phase I* jointly conducted by the International Food Policy Research Institute (IFPRI) and the International Rice Research Institute (IRRI) with technical assistance from the Asian Development Bank (ADB) was concluded in May 1984. This study supported the production of non-rice seasonal crops in existing rice-based irrigation service areas in the country during the dry season to augment future food requirements. Realizing the importance of the recommendation, the Philippine government emphasized the production of diversified crops while striving to expand its current rice production capability and output.

The resulting agricultural diversification program has been perceived to be adaptable in the country. Since the country is composed of relatively small islands, its streams do not have large catchment areas. It is thus, difficult for an irrigation project to have a large benefitted area corresponding to inherently large construction costs. Under such conditions, cultivation of low-water-requiring crops, particularly during the dry season in irrigation service areas, is very important. Aside from meeting local food consumption, a foreseen benefit from the program is an increase in cropping intensity in irrigation service areas resulting in the following:

- a) An expansion in irrigation-benefitted areas which is supportive of NIA's thrust to attain and maintain financial viability in

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- the operation and maintenance of irrigation systems;
- b) An increase in farm profitability and consequently the improvement of the living conditions of households within the irrigation service areas; and
 - c) A reduction, if not complete cessation, of dollar drain on account of feed raw materials importation and a likely reversal of dollar inflow from exportation of produce.

Considering these reasons, NIA proposed the *Diversified Crops Irrigation Engineering Project* (DCIEP) to the Government of the Philippines (GOP). Realizing the need to develop irrigation technology for crop diversification, the GOP requested for technical and financial assistance from the Government of Japan in May 1984. The request was favorably considered and the project was placed under the JICA Project-type Technical Cooperation Program. The Record of Discussions (R/D) between the Japanese Implementation Survey and NIA was signed on 28 May 1987 - the date when the Project formally commenced.

Objectives. Until recently, virtually all irrigation systems in the country were designed for rice production. A recent study indicates, however, that 38% of the designed 596,000-hectare aggregate area-isolate of 136 national irrigation systems are not sufficiently irrigated during the dry season. This situation is attributed mainly to low water flow available in the irrigation-tapped streams due to small watershed areas, denuded watersheds and inadequate rainfall.

Cultivation of irrigation-deprived areas to low-water-requiring crops with high market values is being considered. Intensive and extensive production of diversified crops under irrigated conditions is still a novelty to irrigation systems in the country. Domestic and basic technology is still under-developed. It was in this context that the Philippine Government based its request and the Project evolved.

In general, the Project aims to develop an irrigation engineering technology for diversified cropping under local conditions to promote diversified crop production and accelerate agricultural development programs in the country. Specifically, the Project aims to:

1. Study the most appropriate methods of providing irrigation to diversified cropping;

2. Establish technology criteria and standards for planning and designing irrigation and drainage facilities for non-rice crops; and
3. Conduct technical training for NIA technical staff, and an information campaign for the introduction of diversified cropping.

Implementation Schemes

Cooperation and General Strategy. The Project is a joint undertaking of the Government of the Philippines and the Government of Japan.

The responsibilities of the Government of the Philippines are the following:

- 1) Creation of composite Project implementing committee;
- 2) Appointment of full-time Project Manager and staff;
- 3) Assignment of counterparts for expatriate experts;
- 4) Provision of office space and facilities; and
- 5) Provision of transportation facilities for Project use.

The Government of Japan, on the other hand, shall contribute the following:

- 1) Dispatch long- and short-term experts to the Project;
- 2) Provide equipment and machinery; and
- 3) Accept NIA technical staff for training in Japan.

The general strategy laid out and observed for the attainment of Project objectives is composed of the following:

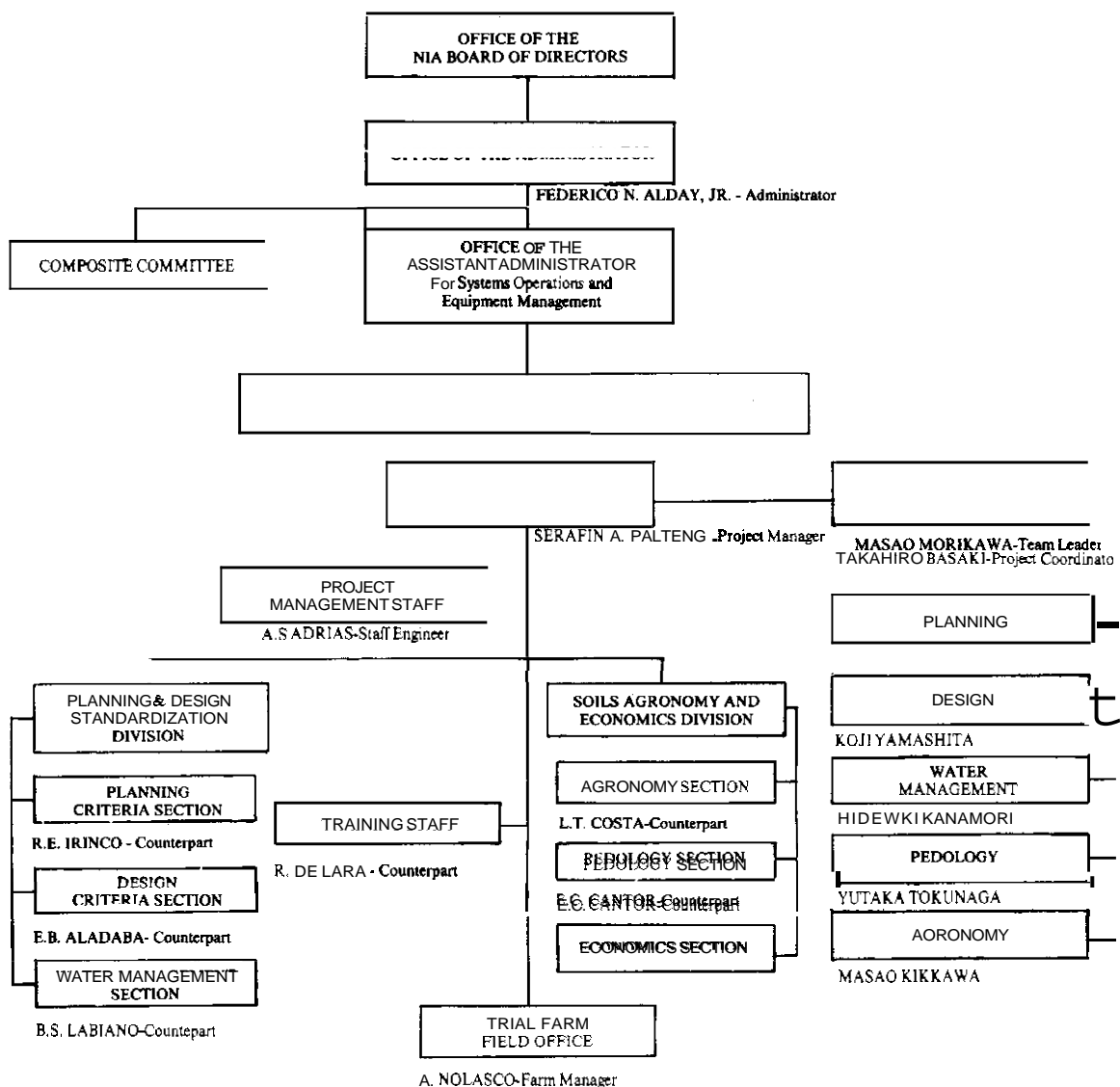
- 1) Investigation, collection and, if necessary, analysis of existing relevant materials and literature;
- 2) Conduct of field studies on the establishment of appropriate irrigation methods for diversified cropping;
- 3) Preparation of technology criteria and standards for the planning and design of irrigation systems for diversified cropping;
- 4) Training of concerned technical staff of the Project and of the implementing agency (NIA); and
- 5) Conduct of insight-gathering surveys in related research centers and premier irrigation systems.

Formulation of the targeted *Diversified Crops Irrigation Engineering Manual* of the Project is governed by the following principles:

- 1) Adoption with supplementation of the existing irrigation engineering technology in the country;
- 2) Development of new supplemental irrigation engineering technology, if needed;
- 3) Systematic compilation of data and information generated in the course of Project implementation; and
- 4) Contents of the design package to be prepared by the Project shall deal only on the sizing of irrigation facilities.

Organizational Set-up and Facilities. The Project is under the Office of the Assistant Administrator for Systems Operation and Equipment Management (SOEM) where a Composite Committee created under the Office of the Administrator develops policies. Under a detached set-up, the Project Office is composed of two divisions with three regular sections and two special units - Project Management Staff and Trial Farm Staff. Each regular section is assigned with an Expatriate Expert with an overall Team Coordinator and Team Leader (Figure 1).

Figure I- Organizational set-up, NIA-DCIEP



The main office of the Project is located at the NIA Headquarters in Quezon City. Field tests are being conducted at the Project's 3-hectare Trial Farm located in San Rafael, Bulacan where a newly renovated Field Office is also located. Close to the trial farm is the NIA Training Center which will be used by the Project for its future training programs. For soil and water analyses, the NIA Laboratory at Muiioz, Nueva Ecija (a 2-hour trip away from the trail farm) will be utilized.

Study Areas

The Project's Master Job Plan (MJP) and Tentative Schedule of Implementation (TSI) show four job items, namely, collection and analysis, field study, technology (criteria) formulation, and training. The details of the first two items are:

Compilation and processing of existing information on:

- Nationwide agricultural situation
- Diversified crops suitability conditions
- General irrigation situation
- Irrigation system formulation criteria
- Nationwide hydro-meteorological observations
- Irrigation facility design principles
- Drainage facility design criteria
- System design assumptions
- Basic water requirements
- Terminal irrigation methods

- System management schemes
- System level operation schemes
- System maintenance schemes
- Nationwide soil classification
- Irrigated areas land classification
- Diversified crops' soil conditions
- Diversified crops' statistics
- Diversified crops' characteristics
- Cropping calendars and patterns
- Crop cultural management practices

Field studies and/or survey on:

- Socio-economic conditions
- Irrigation network patterns
- Irrigated cropping patterns
- Water supply and consumption
- Terminal irrigation methods
- Terminal irrigation facilities: kinds and criteria
- Irrigation methods (system level)
- Water requirements and irrigation interval
- Operation and management systems and components
- Soil physical and chemical characteristics
- Soil-water relationships
- Water requirement components
- Diversified crops' characteristics

The Project is in progress and has accomplished some of its objectives. Its target output, i.e., Diversified Crops Irrigation Engineering Manual, will be completed before the Project ends in May 1992.