

**Output 3: Ecological sustainability enhanced and livelihoods improved through ecoregional approaches to integrated natural resource management**

In recent years, extension workers and land-use planners have changed their perceptions from single-commodity to diversified farming and are looking

at brackish water as a resource rather than a constraint to production. IRRI researchers have therefore started to carry out farm surveys with a view to developing credible information and knowledge explaining the impact of regional- and farm-level resource management on the livelihood of farmers in the coastal zones of the Mekong

Delta, Vietnam, and Bangladesh. Surveys of smallholders (Bangladesh) and farming systems (both Bangladesh and Vietnam) were completed in 2006.

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## PROJECT 9

### Consortium for Unfavorable Rice Environments (CURE)

Low and unstable yields are a feature of rice farming in rainfed unfavorable environments, which are also characterized by poverty and high population density in both rural and urban areas. Difficult conditions and heavy

reliance on unpredictable rains have meant that, in the past, farmers have been averse to risk and either unwilling to grow modern high-yielding rice varieties or unwilling to use sufficient inputs if they do try modern varieties.

Hence, productivity gains have been incremental and small. It is essential, if we are to meet the challenges posed by unfavorable ecosystems, to develop a well-structured strategic research approach to address key constraints.

The Consortium for Unfavorable Rice Environments (CURE) offers a strong framework within which researchers, extension workers, policymakers, and farmers can tackle key problems.

Increasing and stabilizing rice productivity in unfavorable rice environments will help reduce risk in rice cultivation for risk-averse subsistence farmers. The flow-on effects of improved productivity include improved household food security and livelihood without harming the environment or depleting available natural resources. Throughout the highly diverse unfavorable environments, CURE's strategy involves on-site work with our NARES partners and a multidisciplinary approach to technology development and dissemination.

CURE fosters cooperation in research and development between NARES and IRRI, who jointly identify strategic problems through collaborative research at NARES sites. CURE was created in 2002 following the restructuring and consolidation of the Rainfed Lowland Rice Research Consortium and the Upland Rice Research Consortium into a single entity. NARES membership in the Consortium involves 10 countries: Bangladesh, Cambodia, India, Indonesia, Lao PDR, Myanmar, Nepal, the Philippines, Thailand, and Vietnam. The research activities are described in projects 7 and 8.

### **Output 1: A planning and management network to prioritize research needs and to implement interdisciplinary research in partnership with NARES nurtured and sustained**

The fifth annual meeting of the CURE Steering Committee, held in Dhaka, Bangladesh, 6-7 March 2006, reviewed research reports given by its six sub-ecosystem-based working groups. The Steering Committee appraised the progress of the working groups, approved



2006 work plans, and made strategic decisions regarding future research in rainfed ecosystems.

*Drought-prone lowlands.* CURE has developed a package of site-specific crop management practices that can improve rice performance under drought stress and that permits an earlier harvest for a timely sowing of a nonrice sequence crop. This package includes modern varieties and improved weed and nutrient management, which farmers can adapt according to their socioeconomic situations and the biophysical requirements of the local ecosystems.

*Submergence-prone lowlands.* The submergence-tolerant variety *SwarnaSub1* demonstrated its survival ability and yield performance under flash-flood conditions in on-station and on-farm tests at CURE sites. New crop management practices can optimize *SwarnaSub1*'s performance and further enhance its ability to cope with uncertainties of flood-prone environments. Other popular varieties have been introgressed with the submergence-tolerance *Sub1* gene and will be tested for performance and farmer acceptability.

### *Salt-affected environments.*

Through CURE's efforts, saline coastal communities in India have access to improved varieties developed decades ago for this ecosystem. Farmers can now intensify their cropping system for year-round production by employing these varieties in a package of new crop management practices for coastal saline ecosystems. These varieties considerably improve rice productivity in both wet and dry seasons, leading to better food security for communities in coastal saline areas.

*Shifting rotational upland systems.* Promising rice varieties for upland conditions have been identified through participatory varietal selection trials in remote areas of the five northern provinces of Lao PDR. The seeds have been further distributed to local agricultural officers for scaling out to resource-poor households through an IFAD investment loan program for Lao PDR. These varieties are suited for either the rotational cropping systems on sloping lands whose fallow has been reduced by population pressure, or lowland paddy where improved rice



production could relieve pressure of growing crops in sloping fields.

*Drought-prone plateau uplands.* A moderate drought-tolerant variety with good blast resistance, Anjali, is gaining farmer acceptability for upland fields in Jharkhand State, India. The shorter duration allows farmers to establish a postrice sequence crop to intensify system productivity. The working group has engaged 20 nongovernment

organizations to disseminate the new variety across six northern districts of Jharkhand.

*Intensive uplands with long growing season.* A community seed bank (CSB) is a network of farmers who have been trained in seed health management practices in order to produce a reliable supply of good-quality seed for rural householders. A CSB has been successfully established in Arakan Valley,

Mindanao, in southern Philippines, and is also being adapted to CURE's key site in Lampung, Indonesia. Local government units in Arakan Valley have also adopted the CSB model, which will institutionalize this organization beyond CURE sites.

A training course on community-based participatory research for technology validation and upscaling was organized for NARES partners and held at IRRI headquarters on 7-18 August 2006. Eight staff members from seven of CURE's nine key sites successfully completed the course, entitled *Participatory approaches to agricultural research and extension*. Including the staff participating in the 2005 workshop, all key sites have at least one person, if not more, trained in participatory research methods, resulting in strengthened capacity of national programs for linking research with development.

We held an international workshop, *Natural resource management for poverty reduction and environmental sustainability in fragile rice-based systems*, to review past achievements in natural resource management research in NARES participating in CURE. The workshop was conducted on 8-9 March 2006, in conjunction with the annual CURE Steering Committee meeting in Dhaka, Bangladesh, and plans are under way to publish the proceedings in 2007. The 35 participants from CURE's 10 host countries and IRRI are now able to refine NARES plans for natural resource management research under CURE.

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