Managing Water and Land Resources for Sustainable Livelihoods at the Interface Between Fresh and Saline Water Environments in Vietnam and Bangladesh (CPWF PN 10)

What is happening?

- Millions of people living in the tidal ecosystems in Asia are among the poorest and most food-insecure.
- Agricultural production is hindered by seawater intrusion.
  Mono shrimp culture is risky due to shrimp diseases and pollutes the environment.
- Conflicts in water quality requirement among resource users.
- Common management interventions fail to recognize the diversity of rural livelihoods, social sectors and the environmental consequences.

Diverse livelihood and water use in coastal zone.

The Project's response

To identify appropriate integrated management of land, saline-water, and freshwater resources, and technologies that contribute to increased land and water productivity, benefiting various resources users without adversely affecting the delicate ecological balance.

Approaches

Holistic, INRM research-for-development approach:

- Systems approaches: integrating field experiments and simulation and utilizing the Sustainable Livelihood Framework
- Inter-disciplinary among natural resources, agriculture, aquaculture, fishery, environment, and socioeconomics
- Cross scale: from field to farm to provincial level
- Multilevel stakeholders and effective partnership (see bottom of the poster): from farmers to policymakers, including NGOs, local authorities, and development agencies who play the dual role of research partners and clients.

Activities

- Household-level surveys and participatory rural appraisal
- Field monitoring of water quality, aquatic biodiversity, and inland fisheries
- Developing ecologically sound, economically viable, and socially acceptable farming systems and techniques
- Developing decision-support tools and an institutional framework for water management
- Training, developing, and disseminating recommendations for resource management at the farm and regional levels

Study sites

- Satkhira and Khulna districts, Ganges River Delta, Bangladesh
- Bac Lieu Province, Mekong River Delta, Vietnam

What has the Project achieved?

Products

1 New farming systems and techniques

- Change from single rice cropping in Bangladesh to double cropping, using new varieties and innovative water management
- Sustainable and eco-friendly rice (rainy season) – shrimp (dry season) system with new rice varieties and improved shrimp raising techniques
- Replacing mono shrimp culture by poly-aquaculture by integrating shrimp, crab, and brackish-water-fish


Rice-shrimp system: a farmer catching shrimp from his field (left); rice-shrimp experiments in Paikgacha, Khulna Bangladesh (right)


Dr. Tuong, project leader, and project collaborators are checking the rain gauge at rice experimental field in Polder 30, Khulna, Bangladesh

2 Hydraulic-salinity-acidity VRSAP and BayFish models to support decision making in water management and solving conflicts among agriculture, fishery, and aquaculture

3 Land-use and water resource management recommendations to local governments to make effective use of both fresh (for agriculture) and saline (for aquaculture) water

4 Four Ph.D., 4 M Sc., knowledge-enhanced farmers, extension workers, and local government officials

Outcome and Impact

1 The Bac Lieu local government changed its land-use policies from monorice to diversified farming system accommodating both agriculture and aquaculture.

2 The Bangladesh Water Development Board and Local Government Engineering Department adopted the Project's water management strategies to increase cropping intensity in the coastal areas of Bangladesh.

3 The Water Management Bureau of Bac Lieu Province adopted the recommended sluice operation procedures.

4 About 2,000 rice farmers in Khulna adopted double cropping of rice in 2006-07, increasing their annual economic returns by 50-100%.

5 Rice-shrimp farmers in Satkhira used new salt tolerant rice varieties and integrated fresh-water prawn and genetically-improved farm-tilapia into their rice crop, increasing their economic returns by 157%.

6 More than 8,700 households in Bac Lieu adopted the diversified and multiculture farming systems and technologies.

7 The project contributed greatly to the annual economic growth of 16% of Bac Lieu province in recent years.

The CPWF Project 10 is a collaborative effort of these **Research institutes:** International Rice Research Institute, International Water Management Institute, WorldFish Center, Can Tho University, University of Agriculture and Forestry, Research Institute for Aquaculture No.2, Bangladesh Rice Research Institute, Bangladesh Fisheries Research Institute; **Local government and development agencies:** Bac Lieu Provincial Government , Sub-institute for Water Resources Planning, Integrated Resources Planning Center, Bangladesh Water Development Board, Local Government Engineering Department; and **NGOs and the private sector:** Health, Education & Economic Development, SocioConsult Ltd.

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