

## 3.2 Better management of water for irrigation

### Background

Agriculture is by far the greatest user of water resources in most developing countries, often in the range of 70–80 % of freshwater supplies. Irrigated cereal production is crucial for the world's food security, and irrigated cotton for fibre production. Inefficient use of water in agriculture is also responsible for land and water degradation, and water wastage represents an opportunity cost to other potential users of water resources.

There is a direct link between the quality of irrigation water supply—and associated problems of salinity and waterlogging—and poverty in developing countries. The poorest inhabitants are those that suffer most from reductions in supply, or variability in supply, and are those at most risk from water-borne diseases. In the least-developed countries, agricultural productivity is likely to be of greater immediate priority than environmental protection in the use of irrigation water.

Several countries in ACIAR's mandated regions have been ranked as having absolute water shortages, and they are predominantly in the poorest regions of Asia (Pakistan, North and central India, northern China) and southern Africa. Irrigated agriculture in these arid climates is particularly susceptible to salinisation and waterlogging. Just as important in terms of global food production are those areas, including Indonesia, Thailand, Laos, Vietnam, southern China, the Philippines, and some of the smaller Pacific Island nations, that have

sufficient water but poor spatial and temporal distributions of the resource.

### Key strategies

ACIAR's partner countries and regions fall into four main categories and the irrigation research needs of countries or regions differ.

- In the least-developed regions with low industrialisation and arid climates (e.g. Pakistan, northwestern India, western China), it is likely that water distribution and supply, and prevention or amelioration of waterlogging and salinity, including drainage, will be the largest problems.
- In the least-developed regions with low industrialisation and wet climates (e.g. Bangladesh, Vietnam), research for management of water for rice production is the highest priority.
- In rapidly developing regions with arid climates (e.g. northern China), water supply and efficient use of irrigation water in the context of intense competition from other sectors, and potential salinisation and waterlogging, will be prominent.
- Finally, in rapidly developing regions with wet climates (e.g. southeastern China, Thailand), efficient use of water for rice production is under pressure from competing uses.

In combination with a consideration of the distribution of poverty and livelihood analysis between countries and regions within countries, this provides a framework for identifying priorities for irrigation research for ACIAR's mandate region. Australia shares





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challenges in achieving sustainable irrigation practices and has substantial research expertise that can be applied in less-developed countries.



Policy constraints to improved irrigation water management, particularly the near-universal under-pricing of water, are related to the lack of defined water rights. This is a major constraint to the uptake of scientific, technological and institutional innovations in irrigation management. There is a trend for steadily increasing water prices, in the first instance to recover the cost of delivery of irrigation water, and technological solutions will always be needed to implement changes on the ground.



### **Implementing the strategies**

- Water pricing and related subjects are high priorities, especially in partner countries with serious water shortages.



- Additional constraints relate to the institutional arrangements for managing irrigation systems for equitable distribution of water. Much progress can be made by application of existing knowledge to problems relating to irrigation water. The basic requirement to apply water according to crop needs (scheduling) is still not widely practised. However, widespread adoption of even coarse techniques to improve water scheduling for field crops has the potential to reduce excessive irrigation.
- Irrigation systems have large capital costs, and ongoing needs for infrastructure improvement and maintenance. An important role for research is to provide information to support decisions for the refurbishing of irrigation systems.



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