



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

A Profit in Our Own Country

RECORD OF A SEMINAR CONDUCTED BY THE CRAWFORD FUND FOR INTERNATIONAL
AGRICULTURAL RESEARCH, PARLIAMENT HOUSE, CANBERRA, MAY 17 1994

EDITOR: JANET LAWRENCE



COSPONSORS:

Australian Centre for International Agricultural Research
Australian International Development Assistance Bureau
Department of Primary Industries and Energy

Canberra 1994



DAVID CONSTABLE is a former chairman of Victoria's Rivers and Water Supply Commission and General Manager of its successor body, the Rural Water Commission. In 1987 he was appointed as inaugural Director of the Centre for International Irrigation Training and Research at the University of Melbourne. He is also a Vice President Honoraire of the International Commission on Irrigation and Drainage and a Senior Consultant for the International Irrigation Management Institute and the World Bank.

Water Rights—And Wrongs

DAVID CONSTABLE

INTERNATIONAL IRRIGATION MANAGEMENT INSTITUTE (IIMI), SRI LANKA

Water pervades all aspects of human life—fresh water resources are an essential component of the earth's hydrosphere and an indispensable part of the world's ecosystems. The availability of adequate water and food remains a fundamental issue in addressing world population and environmental security.

These fundamental elements of food and water are brought together in irrigated agriculture, which on a global scale uses more than 85% of the water extracted from surface sources.

There have been substantial achievements following concerted efforts in agricultural research and development over the 30 years or so to the early 1980s, which have been largely responsible for achievement of a rough balance in food production and population growth on a global basis, setting aside another critical issue in regional poverty for the moment.

However, in looking at 'Water Rights' and 'Wrongs', we are now facing a situation where on the one hand, there are few countries in the world where there is a clearly defined framework for the identification and management of individual and community water rights, and on the other, in most countries, developed and developing alike, the 'wrongs' in terms of resource degradation are becoming increasingly evident.

Processes to fix the rights and right the wrongs are now seen as emerging priorities, and should attract the interest and involvement of agricultural water-users and policy-makers.

Within Australia, major irrigation development had largely been completed by 1970, and research and management efforts over the last 25 years have been directed towards improving the performance of irrigated agriculture, and 'righting the wrongs'. There is a large reservoir of knowledge and expertise

By the year 2025, the irrigated areas of the world will need to contribute 80% of the necessary incremental food output over 1990 levels.

being built up within Australia, which is now relevant to many other countries.

Challenge for Irrigated Agriculture

By 1980, 55% of the world's total food grain production was achieved under irrigation, and despite a slowdown in the expansion of irrigated area, FAO predictions are that this percentage will rise to some 65% by the year 2000.

Looking further ahead, by the year 2025, the irrigated areas of the world will need to contribute 80% of the necessary incremental food output over 1990 levels, based on the demands of a world population firmly predicted to be some 8000 million.

The demographic changes associated with this population growth, involving increased urbanisation and industrialisation, will increase competition for available water supplies and create additional potential for environmental degradation.

It remains a sobering recognition that a significant proportion of irrigated agriculture development to date has not delivered all of the anticipated benefits, despite some spectacular advances in research into plant breeding and crop management. In some areas, the incidence of waterlogging and salinisation of lands poses a threat to future productivity and environmental balance.

Irrigated agriculture is a complex undertaking, involving interactions between farmers and professionals representing a number of disciplines and technologies, of which agricultural science and engineering are significant ones. Intervention by governments has been essential to initiate large irrigation development projects, because of the necessity to mobilise the financial resources involved, together with the physical resources of land and water.

Traditionally, water supply systems supplying services to agricultural users have been managed by government agencies. In many cases responsibility for managing inputs to the farm production system on the one hand, and the water supply system on the other, has been in separate Ministerial areas, further adding to the difficulties in developing integrated research and development thrusts. As early as 1980, the International Commission on Irrigation and Drainage (ICID) and the World Bank recognised that existing institutional deficiencies in water supply system management would inhibit overall project performance, and were largely instrumental in the establishment of the International Irrigation Management Institute (IIMI) in 1984, with a charter to carry out research for improvement in irrigation system management.

The clear challenge for irrigated agriculture is to increase overall production, without significant increase in available agricultural land, and with reduced water use.

The circumstances giving rise to this challenge formed part of the background against which the U.N. Conference on Environment and Development (UNCED) was held. The outcomes from UNCED outline future development requirements.

What Are the World Needs?

The guidelines and philosophies for future development strategies to provide adequate food and water for increasing populations without creating long-term environmental degradation are expounded in the UNCED Report—Agenda 21—Chapter 18 (Freshwater Resources).

The development of future programs must lie within an integrated approach to water resources management, based on the perception of water as an integral part of the ecosystem, a natural resource and a social and economic good.

Such integrated water resources management, including the integration of land and water related aspects, should be carried out at the level of the catchment basin or sub-basin, with pursuit of four principal objectives:

- (a) to promote a dynamic, interactive, iterative and multisectoral approach to water resources management that integrates technological, socioeconomic, environmental and human health considerations;
- (b) to plan for the sustainable and rational utilisation, protection, conservation and management of water resources based on community needs and priorities within the framework of national economic development policy;
- (c) to design, implement and evaluate projects and programs that are both economically efficient and socially appropriate, based on an approach of full public participation in water management policy-making and decision-making;
- (d) to identify and strengthen the appropriate institutional, legal and financial mechanisms to ensure that water policy and its implementation are a catalyst for sustainable social progress and economic growth.

In pursuit of those objectives, development programs will have seven priority thrusts.

1. Integrated water resources development

- Institutional strengthening, improved national policy formulation

Irrigated agriculture must increase overall production, without significant increase in available agricultural land, and with reduced water use.

Implementation and management of projects and the delivery of services should be carried out at the lowest appropriate level.

- The creation of 'enabling environments', with changes in legal, administrative and institutional processes
- Increased training and development of human resources

2. Improved water resources assessment

- Surface and ground water

3. Protection of water quality and ecosystems

- Integration of measures for protection of existing and potential water supply sources
- Prevention of future pollution
- Abatement of existing pollution where feasible

4. Drinking water supply and sanitation

- Accelerated programs to provide minimum standards of water supply and sanitation in developing countries.

5. Water and sustainable urban development

- Water supply, waste water treatment, pollution control

6. Water for sustainable food production and rural development

- Major challenge to increase efficiency of water use and increase food production

7. Impacts of climate change

- Accelerated research programs to overcome the current uncertainties

Implementation and management of projects and the delivery of services should be carried out at the lowest appropriate level, and a concentrated effort in building up the community capacity to do this will be required.

Such capacity building is required at four levels:

1. Sector level

- National water resource assessment
- Policy and development planning, administrative structures, water law

2. Institution level

- Integrated resources management
- Strategy and program coordination

3. Individual Agency/Community Level

- Development of managerial competence
- Integrated policy, planning, management and budgetary control processes
- Creation of organisational environment to optimise use of collective skills of individuals

4. Individual Level

- Increase skills and competence of individuals
- Provide for personal development

What Does Australia Have To Offer?

Firstly, Australia has a range and depth of experience from our own development patterns probably unequalled in the world. In the driest continent on earth, there have been national imperatives that strengthened our research capacity and institutional development over a relatively short period, just on 100 years, for example, from initial irrigation developments to a fully mature water economy by the early 1970s.

This development pattern has had the following features.

- An initial phase of private development with limited success
- A following period of some 70 years of reconstruction and extension of irrigation infrastructure by relatively strong and technically competent agencies at the State level
- The introduction of intensive agriculture guided by national research capacity provided by CSIRO, the universities, State agricultural departments and agro-industries, in the absence of indigenous agricultural development
- A strong legal and regulatory basis for water resources assessment
- A strong legislative basis for the allocation and administration of Water Rights
- A strong legislative basis for the establishment and regulation of local water authorities

These are some of the 'rights' which have provided a legacy of knowledge, experience and expertise in research, extension and operational management.

However, it is also the experience of the last 25 years in attempting to 'right the wrongs' from the sometimes bitter experiences in terms of the impact of that development on land and water resources and the associated ecosystems, that provides Australia with a further reservoir of research expertise and talents relevant to the needs of the developing world.

This is best exemplified by the nationally coordinated research programs in developing future management strategies in the Murray–Darling Basin in south-eastern Australia, in extent the fourth largest river system in the world and underlain by one of the most complex hydrogeological systems on earth.

Some of the research techniques and outcomes, and the institutional arrangements for community participation in strategy development and program implementation have

Australia has a range and depth of experience from our own development patterns probably unequalled in the world.

Australian strengths include innovative applied research programs leading to high levels of field performance.

already had application by IIMI in salinity mitigation programs in the Indus Basin in Pakistan, and have attracted interest for potential in addressing environmental concerns associated with the Aral Sea problem in Central Asia, and the Mekong Basin, among others.

Other Australian strengths include:

- innovative applied research programs within irrigation agencies leading to high levels of field performance in terms of regulation, control and measurement of water;
- development of financial management strategies for improved asset management in irrigation systems;
- research and implementation of measures for cost recovery from water users, both urban and rural, recognising water as a social and economic good;
- measures for the further devolution of management control of water supply systems to local and regional communities, including irrigation farmers;
- review of Water Legislation to reflect modern trends in resources management and agency accountability;
- the development of market mechanisms for the transferability of Water Rights, and supporting legislation;
- the development of a comprehensive approach to improving managerial and technical skills in the water industry.

On this latter point, Australia was the only country identified in international conferences as part of the UNCED process to have developed training programs based on National Assessments of Training Needs.

The Australian experience has already figured largely in the development of World Bank technical manuals for guidelines for strategy development in the management, operation and maintenance of irrigation systems, and for training programs in irrigation agencies.

Support for International Research: What is Australia's Gain?

In irrigation management much of the research is site- and system-specific. However, technology adaptation and transfer are important elements in the development process. To this end, the World Bank and ICID in 1990 initiated the International Program in Technology Research in Irrigation and Drainage (IPTRID), which encourages collaborative action among developing countries, donors and research institutions in the assessment, formulation, implementation and monitoring of priority research projects.

Indeed, during its own post-war development period in the 1950s and 1960s Australia has probably gained a great deal more from international research, and from the interaction of researchers and professionals in international associations, than it contributed in cash or kind.

Some of Australia's gains during this period included the adaptation of modern canal design and construction techniques, use of new materials and the introduction of new and improved technology, notably micro-irrigation.

This paper suggests that the position may now be reversed, in that we might have more to give than receive. However, the maintenance of research skills and the continuing development of individual research personnel by their involvement in international activities does have positive benefits for their activities in Australia. It would be reasonable to assume, for example, that Australian financial support to programs in IIMI and IPTRID would result in additional involvement by Australian institutions and individual professionals.

However, it is suggested that there are other strategic implications which would justify continuing and even greater Australian support to the international programs in the irrigation and water resources areas. It is not fanciful to suggest that competition for water is certain to produce international tensions, even open conflict, within the next decade between countries sharing international river basins.

More than 65% of the irrigated areas of the world lies in Asia and the Indian Sub-Continent. Australia is one of the few countries which has direct operational and management experience and supporting research capacity which is most relevant to these irrigation systems. It is one of the few countries with established legal and institutional frameworks to successfully manage water as a scarce resource.

Contributions to research programs would almost certainly create opportunities for Australian involvement in education, training and capacity building. These in turn are links in the chain of association and commercial involvement that are important to Australia's future in the Asian region.

*It is not fanciful to suggest
that competition for water is
certain to produce
international tensions,
even open conflict,
within the next decade.*