



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.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.

DAMS: THE DILEMMA

Don J. Blackmore

Paper prepared for presentation at the “Food, Water and War Security in a World of Conflict” conference conducted by the Crawford Fund for International Agricultural Research, Parliament House, Canberra, Australia, August 15, 2000

Also published in ACIAR Monograph No. 73

Copyright 2000 by Don J. Blackmore. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copyright notice appears on all such copies.

DR DON J. BLACKMORE has been Chief Executive of the Murray-Darling Basin Commission since 1990. Prior to that he was Deputy Chief Executive for six years and worked for 15 years as a Civil Engineer with the Rural Water Commission in Victoria. He was also Deputy Chair of the Land and Water Resources Research and Development Corporation, a position that he held from 1990 to June 1999. Recently he has been appointed as a Commissioner to the World Commission on Dams who has a mandate to review the development effectiveness of large dams and criteria for the future investment in dams. He became a Fellow of the Institute of Engineers Australia in 1995 and a Fellow of the Academy of Technological Sciences and Engineering in November 1998. In May 2000 he was awarded the degree of Doctor of Science (honoris causa) by La Trobe University.

Dams: The Dilemma

DR DON J. BLACKMORE

Water is fundamental to human wellbeing in ways that are integral to the survival of life and protection of health on the planet, as well as to every single form of economic production—starting with food and drinking water. One of the many ways we control water is by building dams. Dams are unique. They epitomise developmental policy dilemmas concerning large infrastructures, and at the same time have consequences more profound than for any other kind of mega-installation. The intervention of a large dam in the riverine environment—not only at the site, but also upstream and downstream—has impacts on the ecosystems, politics, sub-economies and socio-cultural patterns in the entire river basin.

The purpose of this paper is to reflect on the current situation with regard to large dams and to discuss what the future may hold as we continue to strive to support basic human needs and development. In the myriad of issues associated with water and dams it is proposed to focus on the trans-boundary water sharing issues and the question of whether we are heading for water wars or whether water will be the catalyst for ‘peace’. I also develop a frame of reference to test whether trans-boundary water sharing arrangements are robust and will stand the test of time, improved knowledge, changing community values and in many cases substantial increases in population.

The framework against which I test robust river basin management arrangements includes:

- does a stable institutional organisation exist supported by an agreement or treaty?
- are decisions based on a sound knowledge base?
- are processes in place to enable integration across natural resource issues?

The relative power relationship in river valleys have to date largely determined the water sharing arrangements.

- are governance arrangements transparent and do they include strong community participation?

While the framework is objective, the position of riparian countries is usually anything but objective. The relative power relationship in river valleys have to date largely determined the water sharing arrangements.

Turkey and India have been in such a position to use their political power on the Euphrates and the Ganges, respectively. In contrast, the development plans of an upstream riparian state may be held in check by a downstream power as have, for example, Ethiopia's plans for Nile development by Egypt.

The question is how do we create an environment of 'enlightened self-interest' that will promote an integrated and balanced approach to the sharing of water in a River Basin?

Before discussing the broader agendas involved in trans-boundary water sharing or more correctly wealth sharing, let us review the state of the dams debate.

I am a Commissioner of the World Commission on Dams, which was established two years ago to examine the development effectiveness of large dams and to advise on criteria and guidelines for future investment. The work of the Commission has produced the most comprehensive knowledge base yet created associated with dams, their contribution to society and their costs and impacts. The examination of this knowledge base, together with over 800 public submissions from 79 countries, has provided a unique perspective on the role of dams in society and the sharing of natural resources, both within countries and between countries.

The World Commission on Dams was borne out of an IUCN-World Bank sponsored workshop held in Gland in Switzerland in 1997. At Gland, the moment came at which key protagonists in the long-running and bitter dams debate agreed that the turmoil of controversy surrounding large dam projects needed resolution. The parties to the 'war of words' had reached the point where, however warily, they wanted to embark on 'peace negotiations' in a spirit of reconciliation.

That spirit has been carried forward into the work of the Commission. The Commission and an independent international team, within whose ranks all sides of the debate are represented, have conducted their business rather like peace negotiations. Its role is to propose an accord which all parties will be able to agree to. The ending of hostilities and the protection and support of the 'innocent affected' are our primary point of departure.

On the World Commission we have listened to each other's different viewpoints in a genuine spirit of openness and desire to find a common path through the shoals of our diversity. For all of

us, it has been a learning process, and an enriching if sometimes uncomfortable experience.

We have guided the work program in such a way as to add an independent body of extra knowledge to existing databases and large dam analysis. We have also looked at alternative ways of meeting water supply, energy and flood control requirements. Along the way we have had discussions with affected people, environmental activists, the dam construction industry, the external credit agencies and private investors, and the international development community.

As a result the World Commission on Dams has produced a 'knowledge base' which provides an authoritative resource for analysis of policy and practice concerning large dams in general.

The Commission has pioneered a new path for independent international commissions on issues relating to sustainable development and rights fulfilment in today's rapidly globalising world. For we are more than aware that the Commission is delivering its product in a rapidly changing international environment, in which debates proliferate. We have to conserve the world's precious resource base while meeting the needs of expanding populations ever more hungry for economic progress and a better quality of life not just for some, but for all humanity. Terms of investment, terms of trade, democratisation, the role of the state, the role of civil society, the obligation to preserve planet earth for future generations, the need to counteract the forces of marginalisation which leave some people languishing while others forge ahead—all these factors are part of the wider context in which any policy regarding large infrastructural projects has to be developed, whether for dams, or for highways, power stations, or other mega-installations. Enough of the World Commission on Dams—what are the lessons learnt?

If you define a dam as a structure at least two metres high, in the past century humans have built 800 000, at the unprecedented rate of nearly one dam per hour since 1900. Since 1950 that includes 40 000 large dams fifteen metres high, more than two per day. We have built, and are building dams for excellent reasons. Dams use and divert water for consumption, for irrigation, for cooling, for evaporation, for construction, for mills, for power and for recreation. However, even though we have constructed 40 000 large dams since 1950 we still cannot satisfy basic human requirements.

Despite all our dams, pipes, canals and levees, 1.2 billion people, or one in five world-wide, currently lack access to safe drinking water. Three billion, or half the world, live without basic sanitation. Each year five million children die of waterborne

If you define a dam as a structure at least two metres high, in the past century humans have built 800 000, at the unprecedented rate of nearly one dam per hour since 1900.

Despite all our dams, pipes, canals and levees, 1.2 billion people, or one in five world-wide, currently lack access to safe drinking water.

diseases. Farmers face new competition for water due to increasing urban demands. We mine fossil aquifers at an unprecedented rate. Saltwater intrudes on coastal groundwater. From China to Mexico to India, water tables are falling a metre a year.

Worse, in 25 years we must find 20 per cent more water for 3 billion new people. We are shoved hard up against a concrete wall of finite freshwater supplies. By 2025 one in three people will battle just to find water to drink and bathe, much less grow food. In short, water supply in the areas where it is critically needed is miniscule and finite; water demand is massive and unlimited. Scarcity locks both developed and developing nations into a desperate struggle, in which governments must satisfy the thirst, hunger and hygiene of restless populations confined within political borders.

Trans-National Waters

In 1978 there were 214 international river basins. With the break-up of the Soviet Union and Balkan states, there are now 261. These rivers cover 45.3 per cent of the land surface of the earth, and carry 80 per cent of its available fresh water. They include parts of 145 nations. Twenty-one nations, such as Bangladesh, lie entirely within a shared basin. Tensions and disputes are inevitable, with national interest so hard to define. Water, or even sediment, used or diverted in your country, upstream, is not available for me, struggling downstream, and I am likely to get rather tight jawed over your plans to develop it.

The negative vision for catchment management that we often see is communities looking towards the mountains but rarely towards the sea. They look upstream at what affects them and rarely consider people downstream affected by their own actions. Their primary interest is in what drives them rather than a broad River Basin perspective.

There are a number of 'hot spots' and 'flashpoints' around the globe—the Middle East, Southern Africa, South Asia, Central Asia and the Nile—all with water sharing issues unresolved.

In 1991, a senior international figure predicted that 'the political tensions between certain neighbouring countries over the use of international rivers, lakes and aquifers may escalate to the point of war, even before we move into the 21st Century.'

'My fear is that we're headed for a period of water wars between nations,' Klaus Toepfer, head of the United Nations Environment Programme, was quoted as saying in Newsweek. 'Can we afford that in a world of globalisation and tribalisation, where conflicts over natural resources and the numbers of environmental refugees are already growing?'

The negative vision for catchment management that we often see is communities looking towards the mountains but rarely towards the sea. They look upstream at what affects them and rarely consider people downstream affected by their own actions.

'Environmental scarcities are already contributing to violent conflicts in many parts of the developing world,' writes Thomas Homer Dixon. 'Moreover, these conflicts may be the early signs of an upsurge in violence in the coming decades—especially in poor countries—that is caused or aggravated by environmental change.'

'The wars of the next century will be fought not over ideology, but over natural resources...like water,' argued Robert Kaplan in a famous and widely influential essay in *Atlantic Monthly*.

'We view water scarcity as one of the most serious threats to peace and prosperity' said Ismail Serageldin, who convened World Water Forum.

Michael Gorbachev maintains 'The potential for a conflict over water is perhaps at its most serious in the Middle East where water supplies are extremely limited, political tensions traditionally run high, and water is just one of the issues that may divide countries and make cooperation difficult.'

There is certainly a strong body of opinion that if we continue with 'business as usual' then this will inevitably lead to armed conflict. On the other hand, the fear of water wars, like the prospect of nuclear war, can force nations to cooperate.

Water, by its very nature, tends to induce even hostile riparian countries to cooperate, even as disputes rage over other issues. The weight of historical evidence demonstrates that organised political bodies have signed 3600 water-related treaties since AD 805. Against this there have been seven minor water-related skirmishes, all of which began over non-water issues. Most of these 3600 treaties dealt with navigation, but since 1814 states have negotiated a number of treaties deals with flood control, water management, hydropower projects and allocation for consumptive and non-consumptive use.

Without dismissing the concerns of others about water wars, I'd rather explore what is needed if we are to help communities and countries determine what is a fair and equitable outcome for them. After that we need to work out how to promote cooperative solutions. The question is how can we create an environment of 'enlightened self-interest' between riparian states and the river basin state?

My own observations are that there is a number of trans-boundary water sharing arrangements which fit within the framework mentioned earlier. Examples include the Rhine River Commission and the Boundary Waters Treaty between the US and Canada. The treaty between Brazil and Paraguay for the world's largest hydro-electric dam on the Parana River has also successfully survived its first 25 years.

'The wars of the next century will be fought not over ideology, but over natural resources...like water.'

However, if we look at those parts of the world with extreme development pressures the record is not nearly so encouraging. The current arrangements for the Jordan, Nile, Euphrates, Mekong and the two main central Asian rivers do not come close to meeting my criteria for stable river basin management. For many basins the knowledge base on which decisions are made is both narrow and thin and generally only focussed on water quantity with little consideration of water quality or environmental issues. Some do have institutional frameworks in place but generally they are poorly resourced, narrowly focussed and only fully activated when the matter is in the interest of all parties—a rare event.

An example is the Aral Sea Basin. Under the former Soviet Union rapid expansion of irrigation occurred from the early 1960s. This has resulted in approximately 7 million ha of irrigation and a massive reduction in the size of the Aral Sea. With the break-up of the former Soviet Union five independent countries manage the area. Water sharing arrangements were in place, however these have not proved to be robust. For example, major dams, on which one country depends for its irrigation, are now entirely within the borders of a neighbouring country. Perhaps the most concerning aspect in this case relates to salinity. The irrigation development of the region has now resulted in over 100 million tonnes of salt being mobilised into surface water systems each year. Despite this, no pollution sharing treaty exists, even though salinity problems are likely to threaten the very existence of these nations.

The Way Forward

Given that we have very few trans-boundary agreements that by any objective test could be seen to be robust, what contribution can we collectively make to improve the situation?

First—we must recognise that there are no repeatable, objective rules for sharing water between countries. Sharing arrangements are a negotiated outcome. There needs to be an international body that can provide consistent, objective, dispassionate support to the negotiation process.

Second—the process must be empowered with knowledge. It has never been cheaper to collect data. The problem is to convert it into knowledge, which is relevant to the range of issues to be addressed. Too much emphasis is still being placed on dealing only with water quantity.

Third—communications must be kept open and transparent.

Fourth—the international community must be consistent in the sanctions they place on non-performing countries. It is inter-

esting to note the behaviour of export credit agencies that fill the gap left when the World Bank or Asian Development Bank withdraws from a project because it does not meet their guidelines on operation between countries.

Fifth—realistic milestones need to be set for the development of the ‘stepping stones’ of trans-boundary water sharing, such as institutional arrangements, water sharing principles, water sharing details (the heart of any agreement), environmental protection etc. This is needed to assist in the management of the four points above by both the countries involved and by the international community via aid or other means.

The jury is still out on whether there will be water wars, but there is no doubt there will be every increasing demand for scarce water resources and that the current trans-boundary agreements are consistently weak.

There are few examples of trans-boundary water sharing frameworks that meet my criteria for sustainable management arrangements. But a disciplined and coordinated international approach holds out the best hope for supporting riparian countries as they strive to establish robust trans-boundary arrangements.

In summary, there are currently no examples of countries that are at war over water. War is expensive and very destructive of infrastructure. Negotiated outcomes, no matter how protracted the process, have to date been seen as preferable. However, if the needs of current and future generations are to be fully met, then further large dam infrastructure is inevitable, as is further pressure on trans-boundary water resources.

Water for peace has the right ring—let’s hope the bell tolls.

The jury is still out on whether there will be water wars, but there is no doubt there will be every increasing demand for scarce water resources...