

GOVERNMENT LEADERS SLOW TO RESERVE WATER FOR ENVIRONMENT

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Many Fear Decisions Won't Stand up in Court

While the world's eyes have gradually opened to the importance of maintaining adequate water flows in rivers and streams to sustain aquatic environments, acting upon this need has proven a slow and challenging process. Lani van Vuuren reports.

Historically, infrastructure developments around the world have taken the requirements of downstream ecosystems (and often the people who depend on the services of these ecosystems) for granted. Examples abound in most countries, including South Africa, where the water needs of people have in the past been met to the detriment of aquatic plants and animals.

"We have emerged from a century of building dams and other major water-source developments that have changed the limnological profile of the world," notes Dr Jackie King of the Freshwater Research Unit at the University of Cape

Town. "Most of the developed world now benefits in some way from the irrigated agriculture, hydropower generation, assured water supply, flood control, improved navigation and more brought about by these developments, and developing countries are increasingly seeking and achieving the same benefits."

Dr King was speaking at the 2009 International Conference on the Implementation of Environmental Water Allocations (IEWA) held in Port Elizabeth in February. More than 400 delegates gathered from all over the world to share experiences, exchange ideas and make recommendations regarding the reservation of water

of adequate quality and quantity for the environment. "These infrastructure developments have not been without costs in terms of declining ecosystem services," Dr King said. "These are services upon which all humanity depends."

Countries now face a major challenge of how to support national development goals, meet food needs, safeguard the livelihoods of rural people and simultaneously protect the world's increasingly degraded aquatic ecosystems. Over the last decade or so, environmental water needs have become increasingly recognised in water sector reform and water policy reform processes globally.

According to Dr Rafik Hirji, Senior Water Resources Specialist at the World Bank, there are some important aspects included in environmental flow provisions in these policies. These are, among others, legal recognition of environmental flows (giving the environment equal standing with consumptive water uses); clear recognition of the links between environmental flows and the ecosystem services provided by the flows; and recognition of all relevant parts of the water cycle when establishing environmental flow provisions.

POLICIES ARE NOT ENOUGH

However, as Dr Tom le Quesne of the WWF in the UK pointed out at IEWA, simply having these policies is not enough to ensure aquatic environments get the water needed to be sustainable. He cited the example of Mexico where a specific definition of environmental flows was included in the 2004 reform of the country’s National Water Law. “This definition improves the recognition of environmental flows within the law. Unfortunately, it has promoted the concept of the environment as a water user that, under the present framework, is challenging other water users for available water.”

In addition, poor information and lack of enforcement by the water authorities, coupled with other factors such as the low cost of water and energy subsidies for the agricultural sector to pump water, is resulting in a growing tendency to over-abstract water in Mexico. It has been estimated that groundwater is depleted at a rate of 6 km³ a year, while the number of overexploited aquifers has increased from 20 to 104 in the last 36 years, reported Dr Le Quesne.

In 1991, a water accord was signed to allocate the waters from the Indus River between the provinces of Pakistan. In addition, the Indus Water Accord recognised the need for a certain volume of water to be allowed to flow into the Indus delta, deferring to later studies the final determination of necessary flow volume. A steady increase in exploitation of the water resources of the river has

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resulted in reduced water to the delta area resulting in severe saline intrusion. Unfortunately, ten years of squabbling passed over the terms of reference before three studies were finally commissioned. These studies have not been released to the public, however.

“Due to the non-transparent and contested mechanism by which the flow studies were undertaken, the conclusions remain to be accepted by any stakeholders,” Dr Le Quesne pointed out. “Moreover, the prospects for implementation remain weak. Water allocation on the Indus within Pakistan is largely dominated by the dispute between the two principle riparian provinces, Punjab and the Sindh.”

ENVIRONMENTAL FLOWS IN SOUTH AFRICA

Water reform in South Africa was initiated as part of the suit of major reform

processes initiated following the country’s democratisation in the 1990s. In 1998, the National Water Act (NWA) was passed, widely considered one of the most progressive and holistic pieces of legislation regarding water resource management.

Sustainable use of all water resources was established as one of the primary objectives of the Act. The NWA requires that an Ecological Reserve be set aside for all water resources. This Ecological Reserve basically entails retaining a portion of the flow that would occur naturally in a resource (such as a river or stream) to maintain the ecological functioning of the resource in a state agreed to by people making use of that resource (be it for agricultural, domestic, or industrial purposes).

Existing policy requires that the Reserve has to be determined before any water use license may be issued. Stephen Mallory from Water for Africa explained that ecological water requirements are not easy to determine since they depend not only on the large number of natural components present in nature and forming an integral part of the ecology, but also the wide range of hydrological conditions experienced (especially in South Africa rivers) from zero flow to extreme floods.



SA Tourism

According to South African water law the environment has a right to water of suitable quality and quantity.

16 Environmental water allocation

South Africa has been a major centre for the development of methodologies for the assessment of environmental flows, and Reserve determination has been diligently pursued by the Department of Water Affairs & Forestry (DWAF).

Unfortunately, as in other countries full implementation, including operationalising the flow requirements, and monitoring to see if objectives are met, has taken place in few instances in South Africa. For example, the Olifants River, one of the major rivers flowing into the Kruger National Park, has ceased flowing on two occasions in the last three years despite a Reserve determination having been undertaken in 2001.

There are also good examples emanating from South Africa. The Berg Water Project outside Franschhoek in the Western Cape is the first project of its kind in South Africa to incorporate structures that permit the release of both high and

low flows to meet the Berg River's environmental water requirements.

WILL IT STAND UP IN COURT?

One of the reasons for lack of implementation of the Reserve (not only in South Africa) is that in many cases there is insufficient water available in the resource to meet both the Reserve and existing water use. "Existing water users are understandably reluctant to give up their existing water use and strong action will be required in many cases to achieve implementation," Mallory pointed out.

The South African NWA allows for a process known as compulsory licensing whereby all water use licenses are revoked and reissued, with allowance for the Reserve. However, compulsory licensing has yet to be implemented in this country. "It can be expected to be a difficult and drawn-out process since legal challenges in the face of severe

economic prejudice to existing water users is highly likely," said Mallory.

It is also said that, in many cases, authorities fear that the results of environmental water requirement determinations are not legally defensible. "There are concerns that water users would challenge the provisions for the Environmental Reserve if it was seen to impact on their supplies and that the scientific basis for the Reserve would not stand up to legal scrutiny," reported Prof Denis Hughes of the Institute for Water Research at Rhodes University.

In many cases, institutional capacity to implement reforms has proved to be a major challenge across a range of issues, including the assessment of environmental reserves, the understanding of hydrological data, and the implementation and enforcement of any policy. In South Africa, while environmental flows are set at a national level, it is catchment management



South Africa's National Water Act is seen as one of the most progressive pieces of legislation in the world, but implementation has proved challenging.

agencies and water user associations that would give effect to implementing these flows. Staff for monitoring are scarce, and capacity is increasingly stretched. Compliance and enforcement staff are critical, yet very poorly resourced at present.

Another challenge concerns the type of resource that water needs to be allocated for. For example, most of the existing methods to determine environmental flow have been developed with rivers in mind. But what about groundwater?

“Behaviour of groundwater is different to those of surface water bodies, for example, rivers can respond within minutes to rainfall events, while the response of groundwater is generally much slower – rainfall could take weeks or months to reach the water table,” reported specialist groundwater consultant Roger Parsons. “Groundwater is more diffuse in character than surface water, and geohydrological processes in one part of a catchment may have little if any bearing on the geohydrology in another part of the same catchment.”

This makes groundwater quality aspects difficult to address. Parsons recommended that, instead of trying to quantify the role of groundwater in terms of the volume of groundwater discharged to surface water bodies or the amount of groundwater that can be abstracted, it might be more prudent to get a better appreciation of the role that groundwater plays in sustaining a surface water body, and then ensure that this role is not compromised. “Defining setback distances for abstraction and monitoring aquifer response to such management measures could achieve this,” he said.

The challenges are similar for estuaries, distinct and valuable environments in which the continual mixing of freshwater and salt water generates a complex array of ecosystems. Environmental flow determinations are important to support the intrinsic, ecological, social and



Lani van Vuuren

In many catchments, such as the Nkomati, water resources are already over-allocated to other users, leaving little room for applying the Environmental Reserve.


economic values of these water bodies. Yet, in most countries the environmental flow requirements of estuaries have only received recent attention, reported Prof Janine Adams of the Integrated Environmental and Coastal Management Unit at the Nelson Mandela Metropolitan University.

“In most countries it was incorrectly assumed that the minimum flows determined for rivers would protect downstream processes, while in others the omission was as a result of the sectoral

management of water resources,” Prof Adams explained. Four main countries have developed environmental flow assessment methods for estuaries, namely Australia, South Africa, the UK and USA. These methods have mostly developed from practical applications, a ‘learning by doing’ approach.

INTO THE FUTURE

Current pressures on our aquatic ecosystems are enormous, and there is no doubt that there will have to be trade-offs to balance socio-economic development with environmental protection. A pertinent question is how to achieve this balance so that we ensure maximum conservation benefit at the lowest possible social and economic cost?

A clear message emanating from the IEWA conference is that the world is standing at a crossroads, and now is the time for important decisions to be made. “Many more dams will be built, especially in developing regions, and there is opportunity to learn from the past, and to help ensure that developments would not result, as has happened too often in the past, in more being lost than is gained,” concluded Dr King. 

WHAT IS ENVIRONMENTAL FLOW?

Environmental flow refers to the water regime of a river, wetland or coastal zone necessary to maintain the biophysical components, ecological processes and health of aquatic ecosystems and associated ecological goods and services. *Source: Prof Janine Adams, Integrated Environmental and Coastal Management Unit at the Nelson Mandela Metropolitan University*