[1]Water and Development

The evolution of water policy

Both human communities and living organisms adapt to and depend on natural hydrological cycles. One of the key factors that influence the way in which cities throughout the world expand is the supply of water. Rivers, desertification and floods have shaped civilisations. Man's obsession with controlling the natural hydrological cycle can be traced back to 560 BC when the first enclosed and covered spring was recorded in Athens (Morton, 1966). Storing and moving water is a major engineering feat, providing the foundation on which human civilisation has been able to develop. Over the centuries, problems of water scarcity were solved by developing infrastructure and relying on hydraulic assignments, such as the aqueduct in AD 226, a proof of human ingenuity and the triumph of Roman engineering.

The twentieth century was the era of dam building. Today around 3800 km^3 of fresh water is withdrawn annually from the world's lakes, rivers and aquifers, twice the volume extracted just 50 years ago (WCD, 2000, p. 3). Driven by modern science whose philosophy was to control, rather than to understand, nature (Turton, 2001), the consequences of large dams have been mostly disastrous. The Turkwel Gorge Dam in Northern Kenya threatens the thin strip of remaining forest as the water table is crucial to the survival of the trees and very large floods are essential for their regeneration. The Masinga Dam in
the Tana River Basin (Kenya) has reduced the size of the largest floods and in the long run the forest will cease to replace itself (Adams, 1992). The World Commission on Dams (2000) has shown that, globally, the largest numbers of dams were constructed in the 1970s. The stories of vanishing waters, man's arrogance and domination over nature and the disastrous consequences of this, have been well captured in Reisner's (1986) classic on the mismanagement of water, *Cadillac Desert*.

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Over the past 30 years there have been four important paradigm shifts affecting the water sector: (1) the recognition of water as a human right; (2) the focus on the software and not just the hardware aspect of water delivery; (3) the acknowledgement of water as an economic good; and (4) the shift from supply – with its socially and politically oppressive consequences – to demand. In an attempt to secure sustainable development and conserve water, a new water management paradigm emerged during the 1990s. The emphasis was on integrated water resource management (IWRM) and the decentralised management of water resources with an insistence on local user-group participation and action rooted in designated watershed areas (Ostrom, 1996; Farrington et al. 1999).

IWRM is a process which promotes the coordinated development and management of water, land and related resources without compromising the sustainability of vital ecosystems. Water is a multi-stakeholder issue and interested and affected parties are viable mechanisms to address human and ecological needs and to translate IWRM into practice. Despite the change in focus, the domain of water remains dominated by technological and economistic discourse where in-stream flows, pumps, pipes and the 'scientific' discourse of water delivery reverberate forcefully. The participatory approach involving water users at all levels and specifically focusing on ordinary water users is not easy to practice and it has been more or less successfully implemented in developing and developed contexts (Ostrom, 1996; Farrington et al., 1999).

Of critical importance in terms of the conceptual split introduced by IWRM, is how people adapt to changes in the supply of water rather than the availability of this resource itself (Ohlsson, 1999). The capabilities for organisation at the level of dwelling, village or town are as critical as the power structures and political agendas that drive water allocation and determine where and how much will be directed to satisfy the consumption needs of industry, agriculture, households and tourism. Rising incomes, rapid industrialization and agricultural production do not always match water availability. Water stress, defined by Turton et al. (2003) as an annual availability of less than 1600 m3 per person, influences water allocation. Poor management of water has consequences

in terms of cost and time and the capacity to manage water on all fronts is not just ‘nice to have’ but is fundamental for sustainable development.

Water and poverty

According to the *World Development Report*, more than a billion people in low-and middle-income countries, and 50 million people in high-income countries, lacked access to safe water for drinking, personal hygiene and domestic use in 1995 (World Bank, 2003, p. 2).Water supply services contribute directly and indirectly to income generation, health and education. Actual or even potential water shortages lead to significant social stress as well as physiological stress in individuals and communities (MacKay, 2004). Scarcity of water curtails economic production, food security and health. A Water Poverty Index (WPI) is currently being refined in an attempt to establish an international measure comparing

performance in the water sector across countries in a holistic way (see Lawrence et al., 2002). The index is intended to capture the diverse aspects of everyday living that are affected by water deprivation. Similar criticisms to those made against the United Nation’s Human Development Index can be made of this index, but the WPI is a significant interdisciplinary management tool. It makes the links between poverty, social deprivation, health, environmental integrity and water availability explicit, enabling policy makers to identify appropriate mechanisms to deal with the causes of poverty and water stress.

The International Conference on Water and the Environment, held in Dublin in 1992, set out the four ‘Dublin principles’ that are still relevant:

- *Principle one* holds that fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment, and
- *Principle two* that water development and management should be based on a participatory approach involving users, planners and policy makers at all levels.
- *Principle three* addresses gender issues: because women play a central role in the provision, management and safeguarding of household water, gender equality is crucial in determining a just allocation of water at the community and household levels.

● *Principle four* concerns the pricing and costing of water and declares that water has an economic value in all its competing uses and should be recognised as an economic good. At the operational level these agreed principles are not always easy to translate into concrete action.

Besides the UN Conference on the Environment and Development in 1992 that produced *Agenda 21*, other significant international events that debated and confirmed the Dublin principles were the Millennium Summit in New York (2000), the Second World Water Forum in The Hague (2000), the World Summit on Sustainable Development in Rio (2002), the Monterrey Conference (2002), the World Summit on Sustainable Development (WSSD) in Johannesburg (2003), and the Third World Water Forum in Kyoto (2003). These events all highlighted the importance of water for development and set goals and targets for action. One of the outcomes of the Johannesburg WSSD was that the United
States declared $970 million available over the next three years for water and sanitation projects and the United Nations an extra $20 million in resources for water and sanitation, particularly aimed at improving living conditions for the rural poor of developing nations.

The task of providing water and sanitation is a huge one and the World Commission on Water predicts that water users will increase by 50 per cent over the coming 30 years and that four billion people will live under conditions of severe water stress by 2025 (World Bank, 2003). Given the scale of the task, the Third World Water Forum recognised that $18 billion will be required annually to produce water security over the next 25 years.

Water and livelihoods

Agriculture is the world's biggest consumer of water and although 80–90 per cent of all consumed water goes onto fields, only half of that touches crops. Unwise planning in irrigation has resulted in unworkable canals and heavy debt.Water and livelihoods are intimately connected because water is a constraint on food production. Enhancing the productivity of land, water and human resources is a key feature of global poverty

reduction strategies. Unsurprisingly, some of the most progressive work in this domain is closely linked with managing the commons, small-scale agriculture and land-use practices of the poor. In this
field of research, the focus on conservation and sustainable use of scarce resources is paramount.

A balance is required between the use of water for human needs and the use of water for the survival of ecosystems on which people depend. Poor people depend more on commons than rich people do, as they do not have the resources to buy land, and the way that food is produced depends on the availability of water. Unless communities are able to increasingly understand the water cycle and its effect on the environment in the catchment or watershed region in which they are living, and to influence decision-making processes
that concern them, their long-term social and economic well-being will remain threatened. The politics of power continues to define how much water is distributed, at what cost and to whom, giving rise to a new academic discipline called 'hydropolitics' (Turton, 2002, p.16).

The price of water

There are presently 261 international river basins, and 145 nations have territory in shared basins (Turton et al., 2003). Political and watershed boundaries do not coincide neatly and progress in managing transboundary aquifers is slow. Despite alarmist claims concerning the acceleration of 'water wars' (Starr, 1991), Wolf (2002) considers that the record of cooperation is vastly superior to that of conflict, and posits that water is much more a vector of cooperation than a source of conflict. Water projects have provided examples for a number of pilot cases in developing country contexts that span an array of innovations in development planning. A recent study in Bolivia, for instance, has shown that the form, quality and conditions of access to water and sanitation are indicators of social segregation (Laurie and Crespo, 2003).

The debates about water as a public good or water as an economic good continue, but global trends favour privatisation and full recovery of costs to the consumer. Although these trends are fairly recent in developing contexts, there is some evidence that health problems are exacerbated when poor people are expected to pay. Several studies show that the urban poor pay high prices for water supply and spend a high proportion of their income on water. On the other hand, data on water vending suggests that households can afford to spend about 2–3 per cent of their income on water (Conradie et al., 2001). Jakarta et al. (in ibid.) found that households pay up to 50 times what they would pay for piped water when purchasing water from vendors. In Ukunda, Kenya, water vending is a competitive industry and households spend up to 9 per cent of their average annual income on water. According to the same source, in Onitsha, Nigeria, only 1 per cent of households have access to piped water and poor households spend 18 per cent of their income on water in the dry season (Conradie et al., 2001).

The shift to cost recovery has increased prices for those connected to the piped networks, however, many of the poorest and those living in low-income settlements have not been connected. Low-income households that have to buy from private water vendors spend a considerable proportion of their income on water and because these households struggle to pay connection costs and regular charges, increasing recognition is being given to the potential role of water subsidies.

Water and health

According to The *Global Water Supply and Sanitation Assessment Report* (WHO, 2000), Africa is lagging behind in water supply coverage both in urban (85 per cent) and rural (47 per cent) areas. In Latin America and the Caribbean, 85 per cent of the population in 2000, or 77 million people, lacked access to safe water – 51 million are rural and 26 million urban water users. In Asia, 65 per cent of the population are unserved – 60 per cent of the world's population but only 36 per cent of the world's water supply – and water deprivation is a grave concern.

Five million South Africans still need access to a basic supply of water. These are people who take water directly from dams, pools, streams, rivers and springs, or purchase water from water vendors. At the household level, being forced to live in areas that have poor water services not only entrenches poverty in social well-being, health and hygiene but also creates economic inertia.

Although water is the most widely occurring substance on the earth, only 2.53 per cent is fresh water while the remainder is salt water (World Bank, 2003). According to Professor Eugene Cloete University of Pretoria Water Institute, the problems experienced around water can be summed up as follows: there is either 'too much or too little or it is too dirty' (interview Cloete, 2003).

Uncontrolled urban discharges, climate changes, intensified agricultural practices and dense human settlements are some of the problems that provoke the widespread degradation of the environment and jeopardise the well-being of communities. Contrary to popular belief, problems of water pollution are not only due to overcrowding in dense population settlements. Mining activities in South Africa, for example, have resulted in radioactivity entering the sediment of streams and rivers in certain catchment areas (Wade et al., 2002) with unknown consequences for human health once this enters the food chain. In sparsely populated rural areas, where animal and human excrement mix with drinking water, water becomes microbiologically unsafe. Since 1991, between 200,000 and 600,000 cases of cholera have been reported worldwide on a yearly basis. In 1999 Africa accounted for 81 per cent of the cases reported worldwide (WHO, 2000). Sudden large outbreaks are usually caused by contaminated drinking water. Mobile populations are particularly at risk as the movement of people between countries (as in Southern Africa) encourages the spread of cholera.

Water-related diseases are among the most common causes of illness and death, affecting mainly the poor in developing countries. More than three million people each year, mostly the more vulnerable segments of the population (for instance, children under the

age of five) die from waterborne diseases such as gastro-enteritis and diarrhea, which are caused by contaminated drinking water. According to The World Water Development Report (2003), in 2000 the estimated mortality rate due to water-sanitation-hygiene associated
diarrheas was 2,213,000. Six hundred children in the world die daily from diseases caused by contaminated water, the equivalent of a jumbo jet crashing every day.

The World Health Organisation specifies reasonable access to water of *at least* 20 litres per person per day from an approved source within 1 km of the user's dwelling. Recent research has shown that in those dwellings where there is no piped water, the child mortality rate is twice as high, and for those households that do not have flush sanitation the child morality rate is four times as high. Evidently both water and sanitation have an acute effect on child mortality rates – a tragedy, as such deaths are usually preventable. The health gains from the provision of improved water supply and sanitation are obvious, and in the light of these appalling statistics, positive health externalities confirm the rationale for government subsidisation of basic water services. Generally, poor hygiene practices go hand in hand with poor health. Good hand-washing practices depend on higher levels of consumption of water, and rural and poor populations are lacking in this respect, thus health-related diseases such as diarrhoea, opportunistic diseases that stem from HIV/AIDS and cholera take their toll (Ashton and Ramasar, 2002).

Poverty reduction and better water management are inextricably linked. It is recognized that ill health is a very significant cause of households moving from having low incomes but managing to being chronically poor. Thus the international agreed target is to halve the proportion of people without access to drinking water and improved sanitation by 2015. But poor people are not only vulnerable to diseases related to water contamination. Between 1991 and 2000, more than 665,000 people died in natural disasters, of which 90 per cent were water related. Floods caused 15 per cent of deaths, droughts 42 per cent of deaths, and some 97 per cent of all natural disaster deaths occurred in developing countries (World Bank, 2003). Alarmingly, according to the World Water Development Report (2003), the number of hydro-meteorological disasters (floods and droughts) has

more than doubled since 1996. The poorest of the poor, the elderly, women and children, are the most affected. In 1988, floods devastated large parts of Dhaka in Bangladesh and donor countries evolved a strategy plan costing between 1 and 6 billion dollars to build huge dikes to 'control' the floods. A counter plan suggested that the construction would cost $6 million to maintain every year and that the solution was to build on the ingenuity of the people and their ability to adapt to floods.

The problems of water delivery are no longer to do with engineering and controlling nature. Key concerns in the water sector include understanding ways in which communities respond and adapt to water scarcity since the availability of social resources is as critical as the availability of water. Ignorance and lack of governance and ingenuity in managing water take their toll. Resolving the tension between water as an economic good and water as a public good includes taking into account the concerns around equity and efficiency and addressing the issue of politics and power and how unequal power relations in the domain of water impact on people.

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