A Reflection on Water

The Rüschlikon Conference on Sustainable Water Management

25–26 April 2002

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Foreword

Water is the origin of all life. It covers some 70% of the world's surface. And yet of this tremendous volume only a small fraction is fresh.

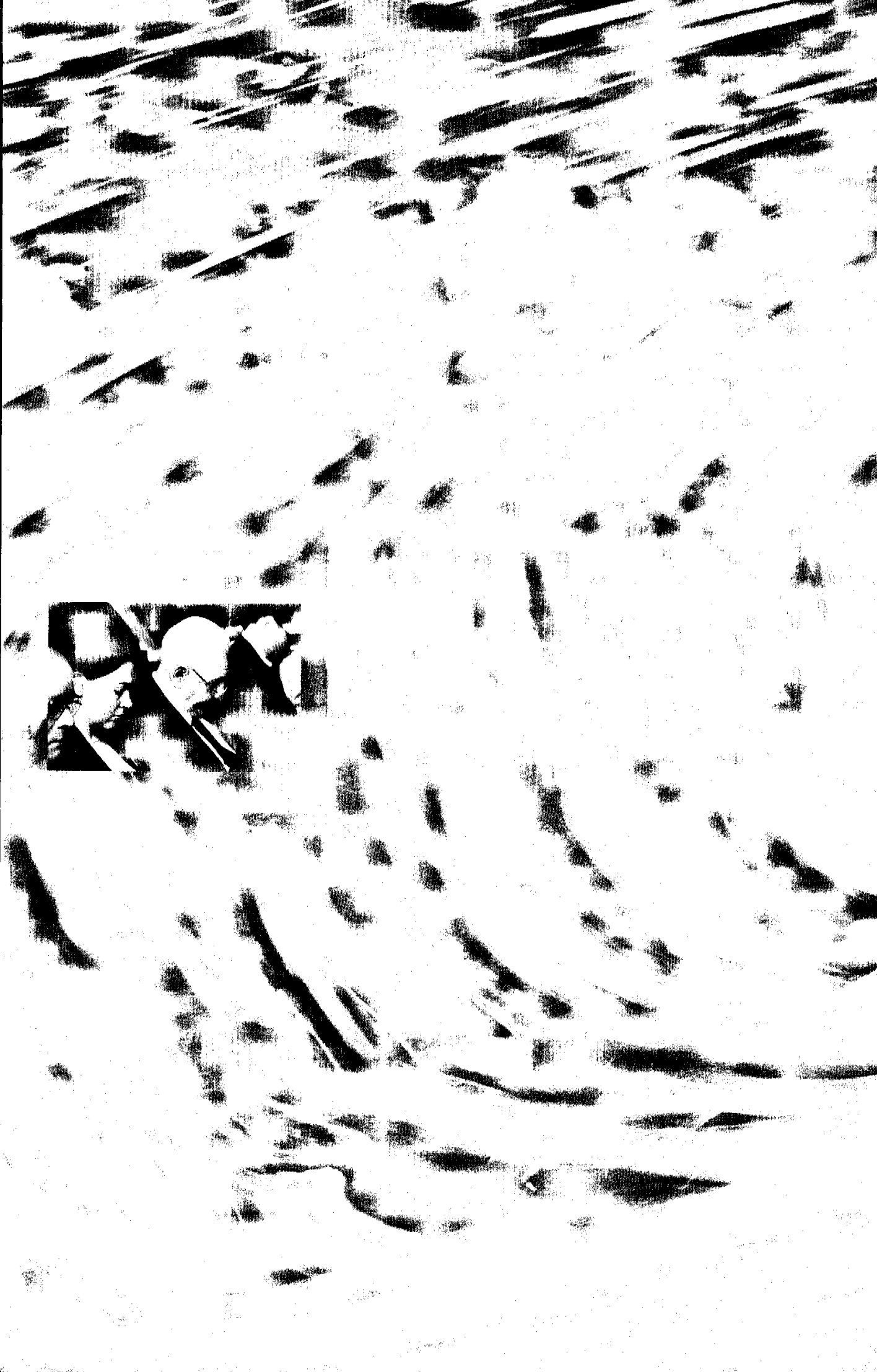
Growing populations, pollution, climate change, inefficient water management systems and reckless consumption habits are placing ever-greater demands on this life-giving liquid. The Rüschlikon Conference on Sustainable Water Management brought together a wide range of informed opinion on water – academic, governmental, non-governmental, environmental and business. It gave stakeholders from the sector an opportunity to engage in a constructive dialogue on best practice and policy frameworks. It set the scene for a broad discussion on how best to manage the water-related challenges that lie ahead. The conference provided a snapshot of the water debate at a particularly crucial moment, coming five months after the publication of the "Bonn Keys", the vision proclaimed at the International Conference on Freshwater, and four months before the World Summit on Sustainable Development in Johannesburg.

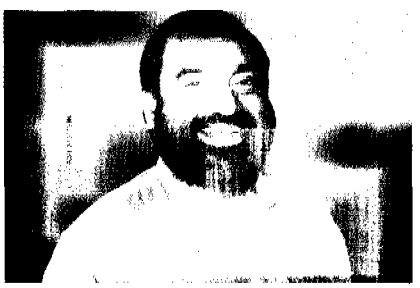
The conference at the Centre for Global Dialogue provided stakeholders with a forum to focus their messages, to exchange views, and to interact. It furnished the Swiss government and Swiss Re, sponsors of the event, with some of the in-depth knowledge they need in shaping their own policies and commitment. The richness of opinion expressed gave a true insight into the political and cultural sensitivity of water issues, as well as into the many economic interests involved. This report is a reflection *of* and a reflection *on* that debate.

Fritz Gutbrodt
Head of Centre for Global Dialogue

Thomas Streiff
Head of Group Sustainability Management

Rüschlikon, July 2002





The water solution

The water problem is not in our heads: it is real. But we must solve it in our *minds*.

Water is a tremendous challenge: huge, widespread, varied. It cannot be handled with any one method or toolbox of methods. It cuts across culture, climate and class. It extends through time. We usually think in terms of our families, our neighbourhoods, our jobs, our industrial sector, our country, our region. We usually think of next summer, next year, when our children are grown, when we retire. The water problem is bigger (and smaller). It is much, much more permanent (and also more immediate).

"The cold, hard truth is that the world's water problems will not be solved because of magic solutions, but rather because of a change in our mentality."

– Vijay Vaitheeswaran, *The Economist*

To meet the challenge, *we* must change. We must begin thinking in new ways, forge new forms of cooperation. Idealists (and ideologues) must become pragmatic; pragmatists and practitioners must discover (or rediscover) their ideals.

The UN Millennium Assembly's target for water is clear: "To halve, by 2015, the proportion of people who... are unable to reach or to afford safe drinking water". To do this, we must extend adequate water infrastructure and services to an additional 1.6 billion people. A similar goal for sanitation – not in the UN document but logically necessary – requires reaching over 2 billion people... by 2015! The cost: an estimated USD 500 million... per day.

"What is the cost of doing nothing?"

– Bruno Porro, Swiss Re

To supply basic daily needs (eg cooking, hygiene and drinking water), a person requires as little as 20 litres of water; consumption in more affluent societies, however, may easily reach 15 to 25 times that amount: 300 to 500 litres. Development requires water and demand is growing over twice as fast as the world's population. This will make it even more difficult to reach another UN target: "To stop the unsustainable exploitation of water resources." We have already tapped the most easily accessible ones. Too often, we have not bothered to ask ourselves how long they will last. We must now start using water in a sustainable manner or pass an even heavier burden to our children. If we do not meet this challenge, how can we expect them to meet a greater one? Once more: many of us need water – safe water – *now*. All of us want more; and soon, *more* of us will want more. We are depleting our resources, and many of the old methods aren't working.

"We need to promote models for partnerships that remove structural and competitive barriers to change."

– Erich H. Buxbaum, Unilever

We must meet the water problem in our *minds*.

We must realise what water means – for ourselves and for others. Access to clean water gives us life; but also health, food, and the benefits of development. It shapes and enables our lifestyles. By the same token, lack of water stifles our hopes and aspirations, and condemns us, and our environment, and the life around us, to disease, poverty and misery.

We must realise that water has *value*: intrinsic value as well as value in monetary terms. The price we pay for water is frequently lower than the cost of supplying it. The price we pay never includes the intrinsic value, the real cost of the raw water. This encourages waste. It abuses a finite resource. We must rethink our technology, both the successes

"The water problem is not due to a lack of information, but a lack of action."

– Anders Berntell, Stockholm International Water Institute

and the failures. We should discard or revise old solutions that do not work in the real world, or that no longer fit present requirements – particularly the requirement for sustainability. We should use the methods and principles that withstand this examination as indications of best practice; yet we should still be very cautious when transferring even "best" practice from one climate or culture to another.

We must redefine our models of cooperation in line with the principles of good governance. This will be difficult, because we have little experience working in truly complex interrelationships. Also, it will not be easy for any system or code of principles to overcome age-old habits, both individual and collective: greed, privilege, exaggerated self-interest, ideology... We must detect them when they arise, counter them as best we can, improve our governance – and keep going.

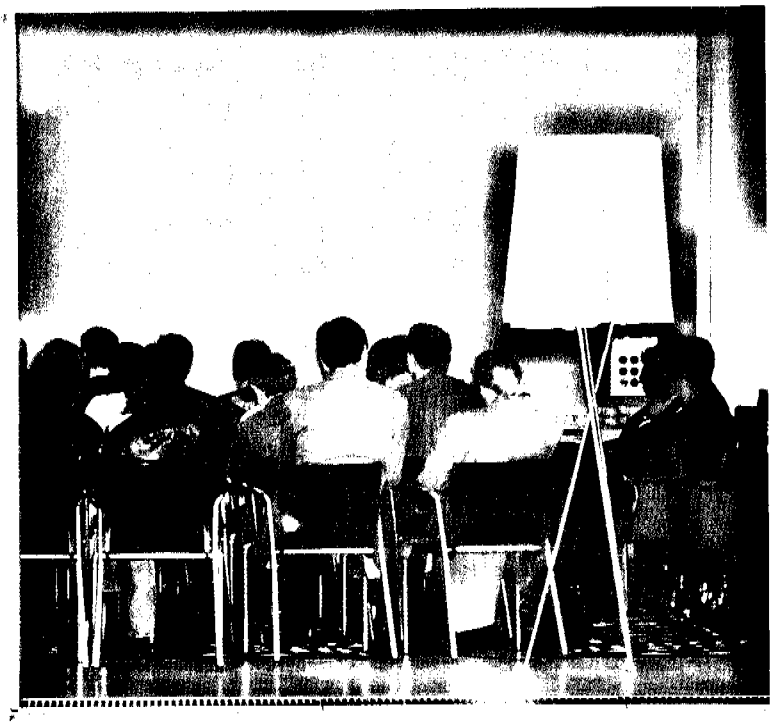
"...Planet, People, Participation..."

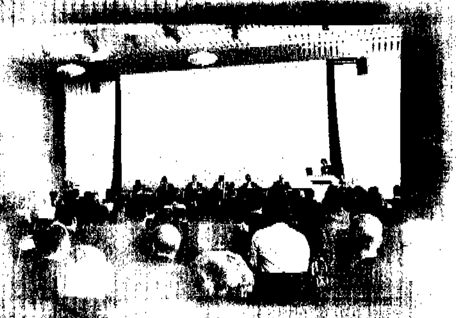
– Klaus Töpfer, United Nations Environment Programme, "explaining" PPP

Ultimately, our management of the water problem will hinge on political will. This does not mean the will of politicians, but advocacy and involvement by each of us. It means willingness to commit resources – ie money. It means a commitment to the earth, to our children, to the welfare of us all. This, too, will be difficult. Can we manage a problem that requires such cooperation, such consistency, over generations? Yet, of the mega-issues that are emerging in our shrinking but increasingly complex world – issues such as climate change, or biodiversity – the water problem is the one that we are best equipped to manage. In preparing our attitudes and minds to meet the water challenge, we will develop tools to help us in other areas as well.

In the following sections, we will present in more concrete form some of the issues that arose during the Stakeholder Dialogue on Sustainable Water Management at Rüschlikon. As you read, we invite you to participate in that dialogue held on the threshold of the Johannesburg World Summit on Sustainable Development. We urge you to consider the impact of water on the world around you and on you personally; and we encourage you to consider this dialogue in moulding your personal response to the water challenge.

We are all stakeholders. We are all part of the problem. We must all contribute to the solution.





[illegible]est practice is what works.

Delegates at the Rüschlikon Conference on Sustainable Water Management expressed [illegible] strong conviction that local resp[illegible]es and solutions and a bottom-up approach are require[illegible] to solve water problems; that, when all is said and done, best practice is [illegible] ab[illegible] academic principles and more about what can be made to work on the gro[illegible]

This section is dedicated [illegible] co[illegible]nce debate on whe[illegible] th[illegible] practice, what it might comprise and whether such a set of principles has any re[illegible]value in the face of the enormous complexity of "the water problem[illegible]

[illegible] shortages. The issues are much broader. They include flooding and droughts, domestic [illegible] industrial waste water, continuous population growth, water conflicts and competition, risi[illegible] pollution levels, lack of low-cost sanitation and the overexploitation or contamination of non-renewable groundwater aquifers. If we add to this the highly political nature of water as a transboundary phenomenon it soon becomes clear why best practice principles would have to be extremely wide-ranging and cross-sectoral to have any meaningful long-term impact. Opinions diverged as to whether best practice could be defined in any absolute form, given the huge cultural and economic differences that abound; however, in the course of discussion two primary positions emerged:

- Best practice *does* exist but it cannot easily be transplanted.
- Today's best practice may be tomorrow's worst.

[illegible] umbrella term "Integrated Water Resources Management" (IWRM). IWRM has featured in all recent political agreements, notably in the Ministerial Declaration adopted by ministers at the International Conference on Freshwater in Bonn in December 2001. This document states that:

"For sustainable development, it is necessary to take into account water's social, environmental and economic dimensions and all of its varied uses. Water management therefore requires an integrated approach."

Broadly speaking, IWRM aims to coordinate the development and management of water and other related resources in order to attain water security and sustainability. It draws its inspiration from the Dublin Principles, which recognise the finite and vulnerable nature of water resources; the importance of a participatory approach involving users, planners and policymakers; the special role of women as major water users; and the fact that water is also an economic good with economic value in competing uses. It points out that water policy is often compartmentalised and supply-oriented; that the focus is often on isolated aspects of the problem – grandiose supply projects, for example – to the neglect of the less glamorous demand-side tasks of encouraging conservation, preventing leaks in the distribution system or reforming inefficient or corrupt water authorities. It also notes that no clear distinction has been drawn in the past between the management of water as a public good (a resource) and the provision of services (supply chain).

"The sectoral approaches of the past have to give way to integrated water resources management. This is a slow process of capacity and institution building."

– Khalid Mohtadullah, Global Water Partnership (GWP)

Integrated Water Resources Management offers a set of practices designed to bridge the gap between institutions and areas of water policy that are often unrelated eg agricultural, domestic (both rural and urban), industrial, and commercial. It may be seen as a system that tries to accommodate vested sectoral interests and the common good. IWRM considers the entire hydrological cycle, as well as the interaction of water with other natural and socio-economic systems. Its aim is to include water as a key element in planning crop patterns, trade and energy policy and urban design. It is also concerned with upstream-downstream relations, including land use, coastal zone management, the unified management of surface and groundwater, and, crucially, it favours a shift to managing water at the catchment or river basin level. This approach seeks to ensure that national legislation and practices are harmonised to protect shared water resources.

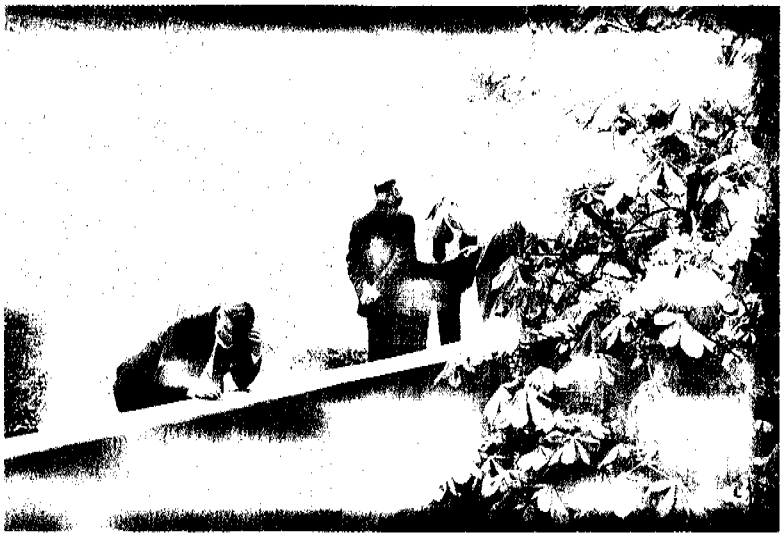
Khalid Mohtadullah, Global Water Partnership (GWP), was one of many delegates to emphasise the vital importance of this coordinated type of approach. He made it plain that introducing a cross-sectoral, best-practice approach to water management is a slow and laborious process which involves forging new partnerships and instituting appropriate laws and regulatory mechanisms. Integrated Water Resources Management might, then, be seen as one "best practice" model.

Several delegates, notably Jim Lamb, representing Severn Trent, advised that it was really only feasible to lay down *basic principles* for best practice.

"I believe we cannot define best practice. What works in London won't work in Calcutta."

– Jim Lamb, representing Severn Trent

He suggested that sustainable water management might be shaped around the following basic principles:



- partnership
- community involvement
- demand-side management
- minimisation of waste
- education
- hygiene
- involvement of women in water management

The real value of these seven points is that they are transferable and they all link to and depend on individual involvement. Many delegates emphasised that if best practice did not harness the enthusiasm and commitment of the people concerned, it was bound to be unsustainable in the long term. This insight is not new; however it is the cornerstone of successful water management, particularly in developing countries, and it was a recurring theme during conference discussions.

"Vision 21 – Water for People", published at the Hague Conference, was mentioned as a pioneering example of what might be achieved through new "people-centred" approaches. The voluntary action programmes now being implemented as a result of this initiative focus on mobilising the energy and creativity of individuals to plan and manage their own drinking water supply, sanitation and hygiene. The key principles of this vision include:

- encouraging water authorities and institutions to be accountable to their users/clients;
- using bottom-up planning, starting with households/neighbourhoods, and devolving decision-making to the lowest appropriate level (subsidiarity);
- promoting rainwater harvesting and exploring its use in the urban environment;
- putting basic household needs before industry or agriculture in water allocation;
- linking responsibility for local water and sanitation with responsibility for catchment planning, watershed protection and pollution control (here, careful attention must be given to the various stages of the hydrological cycle and the way they interact. Efforts must be made at the lowest level capable of attaining the desired objective);
- ensuring that appropriate training precedes decentralisation initiatives;
- stimulating private sector investment through new forms of public-private partnership;
- limiting subsidies to those who cannot afford even basic services;
- discouraging direct subsidy and promoting cost recovery from those with the ability and willingness to pay.

IWRM and Vision 21 were cited as two models containing valuable best practice recommendations accumulated over many years, and from a wide range of cultural contexts.

A practice that is successful in one location may prove unsuccessful when transplanted to another – this is a perennial problem. One good example of such a practice is "virtual water."

Wherever goods are traded within a country or between countries, the water embedded in these goods is also traded (see text box). The physical balance of water use is, therefore, greatly altered by trade in goods requiring water for their production. Realising that 70–80% of freshwater is used in agriculture, governments faced with chronic water scarcity have adopted a policy of importing water-hungry crops such as wheat and other cereals. This relieves their populations from water stress and their ecosystems from the over-exploitation of freshwater reserves.

Real water, virtual profits – and vice-versa

All Canada was alarmed when it emerged that an American company was planning to export Canadian water by the supertanker-load to thirsty Californian cities. Prevented from carrying out its plan by Canadian provincial law, the company then sued the Canadian government under the NAFTA trade agreement for the profits that it would lose. Litigation continues.

Such disputes are likely to become more common as water resources are globalised under the provisions of international trade agreements, and there is considerable apprehension and uncertainty surrounding this issue. The agreements are complex, and no one can be sure at present as to their ultimate effect. This promises to be a major governance headache in coming years. In the present case, however, the American company does not seem to have lost any profits at all. Estimates of the cost of tankered water range between USD 2–4 per cubic metre, several times the cost of local California water.

There is, however, an easier way to transport a cubic metre of water from Canada to California: import a loaf of bread instead! A cubic metre (1000 litres) of water weighs 1000 kilos; yet this is the amount needed to produce one kilo of wheat (a graphic illustration of why 70% of the world's fresh water goes into agriculture).
Thus, cereals and other foods provide a low-volume, light-weight way for dry countries to ease their water problems. Each kilo of cereals imported from a water-rich trading partner frees 1000 litres of local water for uses other than agriculture.

The burgeoning populations of most countries in the Middle East and Africa outstripped their water resources decades ago. "You will never have enough water in Libya or in Israel to meet all the needs including food production," says Alexander Zehnder of the Swiss Federal Institute for Environmental Science and Technology. "So you have to ship water around the world as food."
"Water has two faces," he says, "resource and trade... We have enough water worldwide if we include the trade part... We can only talk about protecting the ecosystem if we are economically strong enough to import the food. If we are not economically strong enough – forget it! We cannot protect our ecosystems."
"Our task," he continues, "is to support the development of those economies that don't have enough water, to enable them to buy the food on the world market."

Israel was quoted as an example of a country that had successfully implemented such a policy. Due to the region's semi-arid climate and rainfall inequalities – an annual average of 700 mm in the north versus 20 mm in the south – Israel's water resources cannot meet present, let alone future, demand. The country has been importing cereal crops since the 1960s, and has developed many sophisticated technologies for desalination, sewage water reclamation etc. However, such solutions are not cheap. Nations implementing such a policy must have sufficient wealth to import "virtual water" in the form of food and to develop high-tech solutions. Here, the virtual water debate runs into a chicken-and-egg dilemma on which the participants at Rüschlikon were unable to agree: is water a key to poverty alleviation or is poverty alleviation a vital prerequisite for effective water management? Alexander Zehnder, of the Swiss Federal Institute for Environmental Science and Technology, was sceptical about whether developing countries could apply any kind of best practice or protect their ecosystems in the absence of basic economic stability, adding that individual survival would always be the number-one priority in impoverished communities. A number of delegates were at pains to emphasise that "best" practice in a developing context is more about seeking a multitude of incremental improvements than about finding "blockbuster" solutions.

"If we can reduce the distance a woman has to travel to fetch a bucket of water from 5 km to 4 km, that, for me, would be best practice."

- Joe Madiath, Gram Vikas

Whilst shipping water around the world in the form of food might seem an attractive practice for wealthier nations, there was considerable disagreement as to how this might be transferred and made viable in developing countries. In a nutshell, the argument held that basic economic strength was a precondition for best practice in water management. On the other hand, some, including Beat Nobs, International Affairs Division at the Swiss Agency for the Environment, Forests and Landscape, maintained that these two areas were intimately connected and could not be treated in isolation.

"There would be no economic development if the environment, meaning the catchment area, is destroyed."

- Beat Nobs, Swiss Agency for Environment, Forests and Landscape

Some of the best water management practices have failed when applied in different cultural and institutional contexts. Sometimes this is due to corruption, sometimes to deficient infrastructures, and sometimes to sheer cultural incompatibility. Kondaker Azharul Haq of the Dhaka Water and Sewerage Authority in Bangladesh presented one such example.

Dhaka does not lack water. On the contrary, built on a flood plain near the confluence of several large rivers, it regularly floods. The highly polluted Buri Ganga river serves as a giant sewer for the 10 million inhabitants of this mega-city.

With 2,500 employees and very limited resources, Haq is responsible for providing the city with healthy water and sanitation. He admits that the magnitude of the problem is such that he himself can sometimes barely comprehend it. The city, which has grown at an exponential rate, has been built on human waste and rubbish in an attempt to raise the ground level. Forty percent of the city's 370 wells do not function as a result of severe problems with the electrical power supply. Six hundred of the 2000 km of piping in the city urgently need to be replaced: many of the pipes are made of dangerous asbestos cement. Deep wells supply 97% of the water: this is lowering the water table and is unsustainable in the long term.

The population is growing at a rate of some 6% a year. Only 30% of the city is serviced by the sewage system, and 90% of its sewage is discharged into the rivers untreated. He knows that his underpaid workers run their own private businesses by stealing and diverting water. Faced with this situation, what did Haq make of notions such as "best practice" and "Integrated Water Resources Management"?

"We invited an English company to help us improve our system. Three and a half years later and after spending approximately USD 3 million, the result is zero, because London is not Dhaka and Dhaka is not London."

– Kondaker Azharul Haq, Dhaka Water Supply and Sewerage Authority

He was quite prepared to admit that forms of best practice *do* exist, but he saw attempts to transplant developed-world water management principles into one of the world's poorest countries as naive. Saul Arlosoroff, of Isreal's Mekoroth-National Water Corp., summed up the enormous difference in the agendas and practices of developed and developing countries with his comment:

"It is very difficult to agree on best practice because these are *two different worlds*."

– Saul Arlosoroff, Mekoroth-National Water Corp.

In the course of discussions, it became clear that implementation of best practice in water management is a futile task unless it is buttressed by wide-ranging poverty alleviation measures. As long as survival remains the number-one priority, and as long as governance and enforcement mechanisms are weak, attempts to apply best practice will remain an ineffective "feel-good" exercise for developed nations. Haq's radical suggestion went largely unnoticed by the other conference members:

"Public agencies have been created to be inefficient and corrupt... Because most of our utilities are still in the public sector, I would like to make a very strong plea, namely that a private sector regulatory mechanism be set up to regulate the public sector."

Several participants recommended introducing benchmarking as a standard practice in the water sector. In some countries, regulators routinely publish indicators of utility service performance through the local media. Exposing the "worst in the class" has proved to be a powerful way of pressuring utilities to provide better services to consumers. This notion points to a wider truth: what gets *measured* gets *done*. A number of those present were keen to emphasise the vital need to set targets in water projects: concrete deadlines and achievement levels are key components of best practice.

"Introducing benchmarking in the water sector would increase efficiency, especially in the developing world."

– Simon Thuo, Ministry of Environment and Natural Resources, Kenya

Several examples of applied best practice were enumerated, including the installation of some three million handpumps in rural India, progress in basin management in Mexico and in the Philippines, as well as the historic Nile Basin Initiative. However, there was a tendency at the conference to define best practice negatively: what went wrong in the past and how can we avoid perpetuating the same mistakes?

Discussions touched on three major projects in this connection. The first was the Aral Sea crisis (see text box).

Oral Ataniyazova, Director of the Centre Percent in Uzbekistan, described the Aral Sea case as "a good example of bad practice in transboundary water management." This is a notorious example of how, during the Soviet era, the large-scale drainage of river water to irrigate cotton plantations has resulted in economic decline, desertification and rampant disease. The Aral Sea case clearly illustrates how the pursuit of exclusively economic objectives can disastrously impact the ecosystems, human inhabitants and, ultimately, economy, of an entire region.

The Aral Sea – going, going...

The Aral Sea in Central Asia was once the fourth largest lake on earth, and surrounded by one of the world's most fertile regions. Today, gross economic mismanagement is fast turning the area into a toxic desert. The Aral Sea started receding in the 1960s after Soviet state planners diverted its tributaries, the Amu Dar'ya and the Syr Dar'ya rivers, to irrigate cotton and other crops. By the year 2015, the Aral Sea could disappear altogether.

From 1960 to 1990, the area of irrigated land in Central Asia increased from 3.5 million to 7.5 million hectares. Cotton production soared, making the region the world's fourth largest producer. Yet by the 1980s, the annual flow of freshwater into the Aral Sea was barely one-tenth of the 1950 volume. The salinity level increased, virtually destroying the sea's flora and fauna; all but two of the sea's 30 fish species died out. The fishing industry suffered.

With no water running into it, the sea started to recede, eventually losing half of its former area and a third of its volume. The two main fishing ports, Moynaq in Uzbekistan and Aralsk in Kazakhstan were left high and dry, and fishing communities found themselves 100 kilometres or more away from the shore.

The uncontrolled use of pesticides and chemical fertilisers on the cotton fields of the Aral region has polluted the sea and the soil of the surrounding land. Dust storms rage for up to 60 days a year. The wind picks up tens of millions of tons of salt and chemicals, many of them toxic, from the exposed sea bed, and spreads these harmful substances over wide areas. Since the Aral basin is a closed system that has no drainage to the outside, the insecticides and herbicides sprayed on the fields percolate downward and accumulate in the groundwater. As most tap water comes from wells, the people drink a cocktail of diluted chemicals, some of which are known carcinogens. Today, the region's drinking water contains *four times the salt recommended as a limit by the World* Health Organization. Not surprisingly, the local medical literature is filled with stories of birth deformities, increased levels of liver and kidney disease, chronic gastritis, rising infant mortality, and soaring cancer rates. Anaemia rates are among the highest in the world; more than 95% of pregnant women are sufferers.

The devastating consequences of the Aral Sea tragedy are the direct result of short-sighted water management policy. Experts believe there is little hope of turning the tide and are focusing their attention on mitigating the immense human cost.

"We are on the way to best practice."

– Viktor Dukovny, Interstate Commission Water Coordination, Uzbekistan

The second was the case of Bangladesh (see text box) where contamination from naturally occurring arsenic is thought to be putting the health of some 80 million people at risk. At the time they were being installed by the million, tube-wells seemed an ideal solution to the high levels of infant mortality and disease caused by drinking infected surface water. The result may be the world's worst case of accidental public contamination. In the former case, the prospect of economic gain blinkered planners' insight; in the latter, good intentions ricocheted with tragic consequences.

The third case was the construction of the Three Gorges Dam in China (see text box overleaf). This mega-project, whilst promising enormous benefits, is also certain to have major knock-on effects on ecosystems; the human cost – that involved with resettling well over a million people – is hard to estimate.

Bangladesh: the arsenic crisis

Bangladesh is grappling with the largest mass poisoning in history because the ground water it now uses for drinking is contaminated with naturally occurring inorganic arsenic.

Surface water sources in Bangladesh carry microorganisms that have historically caused disease and significantly increased mortality. Infants and children, particularly, used to suffer from acute gastrointestinal illnesses from this bacterial contamination: nearly a quarter of a million died each year from water-borne diseases.

Consequently, during the 1970s, the United Nations Children's Fund (UNICEF) and other agencies worked with the Department of Public Health Engineering to provide a "safe" source of drinking-water. The tube-wells installed in this campaign are now the principal source of potable water in 59 of Bangladesh's 64 districts and supply 97% of the rural population. This has been credited with bringing down the high incidence of diarrheal diseases and contributing to a 50% reduction in infant mortality.

At the time, this was a fine example of best practice and the application of "appropriate" technology.

Tube-wells have been used in Bangladesh since the 1940s. However, the problem of arsenic contamination has only recently come to light due to the increase in the number of tube-wells over the past 20 years and in the number of people drinking from them. Studies in other countries with similar problems indicate that of persons drinking water with arsenic concentrations of 500 mg/l, one in ten may ultimately die from cancer, mainly of the lung, bladder or skin.

It is estimated that of the 125 million Bangladeshis, between 35 and 77 million are at risk from drinking the contaminated water. The toll of this man-made environmental disaster will surpass any known to history: the 1984 accident at Bhopal, India, for example, or that at Chernobyl, Ukraine, in 1986.

There are no easy solutions. Potential long-term approaches include drilling deeper tube-wells to tap aquifers with potentially lower arsenic concentrations; filtering water to remove arsenic; chemically treating surface water; and harvesting rainwater. However, all of these present difficulties. Surface water and rainwater, even if treated, still carry the risk of disease; and high-tech solutions rarely work in developing countries.

Not just in Bangladesh but in other countries such as China, Vietnam, Mexico, Argentina, Chile and even some parts of North America, arsenic levels are also known to be high. In the pursuit of clean drinking water, has the world shot itself in the foot? Could we have done any differently, even if we had known 20 years ago that arsenic might be present in groundwater? Should the people drinking arsenic-contaminated water be advised to go back to drinking water contaminated with microorganisms?

The Three Gorges Dam

This engineering marvel (the largest engineering project of any kind in the world) is so huge, it will be considered the eighth wonder of the world by the time it is completed in 2009. Its purpose, purportedly, is to control the devastating floods that regularly occur along the Yangtze River, while generating 84 billion kilowatt-hours of hydroelectric power each year. This project is expected to bring enormous benefits – as well as enormous social and environmental consequences, some of which are listed below. Is this mammoth undertaking an example of best practice? Perhaps it appears so today – after all it will produce enough clean hydroelectric power for most of central and eastern China. But what will the social cost be? How will it impact ecosystems and biodiversity in the long run? Some of the effects are clear today; for others, it will be years or even decades before the consequences fully emerge.

The project

- Excavated volume: 102,600,000 m^3 of earth and stone
- Concrete: 27,200,000 m^3
- Reinforcing steel: 354,000 t
- Height: 185 m at crest
- Length: 2,309 m in three sections: a central spillway section (484 m) with 23 bottom outlets and 22 sluice gates; two power stations to the left and right of the spillway
- Capacity: 18,200 MW (equal to 18 nuclear power stations); 26 turbine generators (world's largest hydro-power units at 700 MW each)
- Schedule: Phase 1 (1994–1997): initial diversion of the Yangtze River; Phase 2 (1998–2003 [projected]): water level rises to 156 m, power generation begins; Phase 3 (2003–2009 [projected]) water level rises to 175 m, full-capacity power generation begins.

The reservoir

- Average width: 1.1 km
- Length: 600 km
- Impounded volume: 39.3 billion m^3
- Water level: 175 m above Yangtze River level
- Inflow: 451,000,000,000 m^3 per year (typical)
- Silt: 530,000,000 t per year (typical)

The impact

- Water pollution in the dammed portion of the Yangtze will double: the dam traps more than 50 types of pollutants from mines, factories and human settlements that were formerly flushed out to sea by the swift Yangtze currents.
- About 1300 archaeological sites will be moved or flooded.
- The Yangtze's heavy freight of silt will form thick deposits near the upstream end of the reservoir, and may clog important river channels to the city of Chongqing.
- Facing inundation: 632 km^2, 19 cities, 326 villages, 27,000 ha of farmland and orchard.
- Facing resettlement: 1.1 million to 1.9 million people.

"The biggest environmental problem in China is air pollution, but this does not easily justify massive construction projects. Unfortunately, water does."

– Vijay Vaitheeswaren, *The Economist*

All three of these cases raised similar questions. How can we achieve a balance between economic and environmental sustainability? What will the consequences of today's "best" practice be 20 years from now?

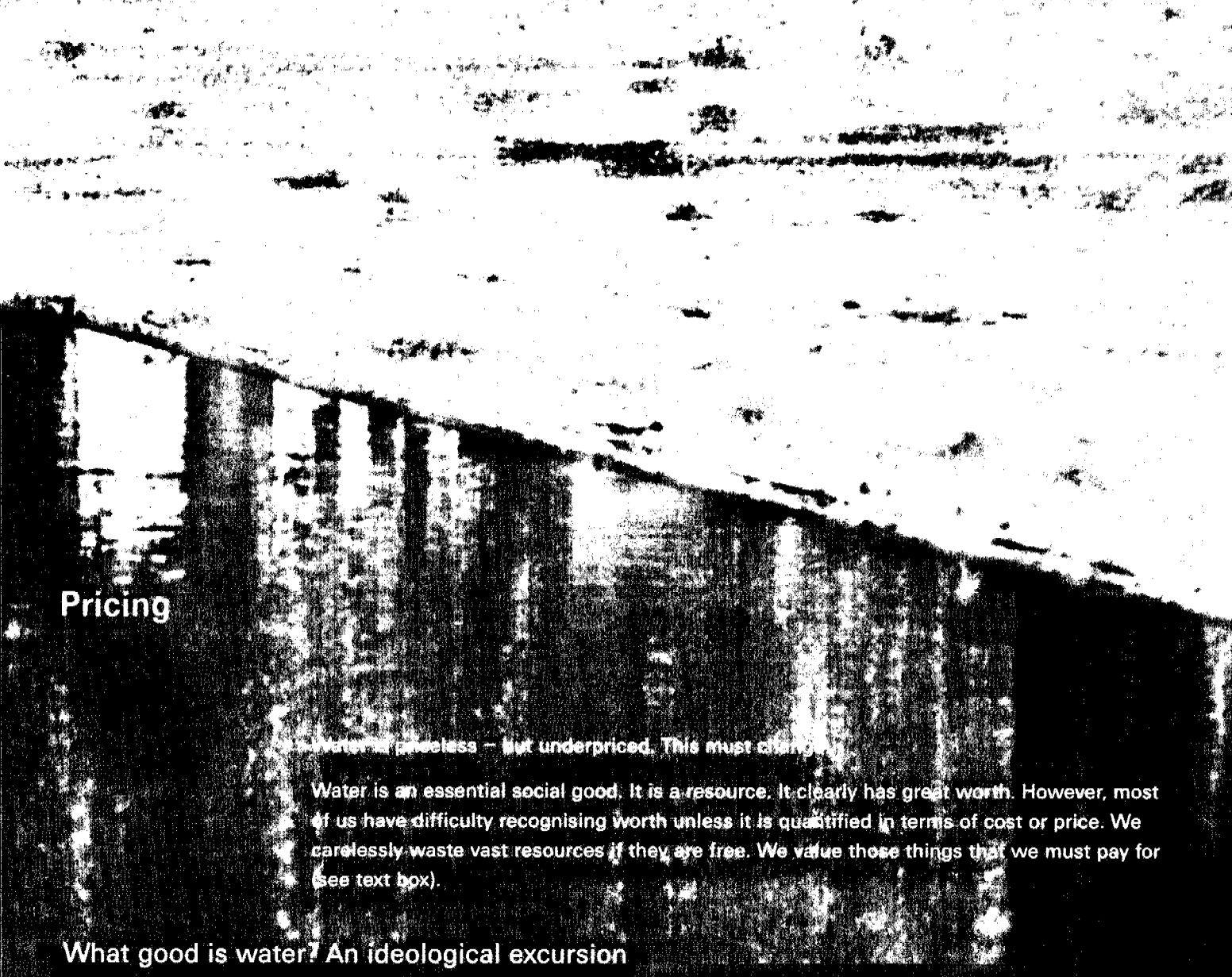
The temptation to think in blueprints is very real. However, there was a reassuring absence of neat solutions during this debate on best practice. Delegates concluded that notions of best practice were of no value unless they include strong regulatory frameworks, are tailored to local needs and cultural traditions, and involve full participation by users and stakeholders. This was summed up by Gourisankar Ghosh of the WSSCC:

"How does this regulatory framework work? It has to go down to the local level, it has to be a democratic structure with the people's participation: that is the definition of 'right' or 'best'. It is clearly about decentralisation of democracy, empowerment, giving the local level governance, and local decision-making."

The discussion of negative examples, of bad practice, highlighted the large number of conflicting interests – economic, environmental, political – that surround water issues. It showed how intimately water is interwoven with these shifting interests and with the process of generating political will. Most importantly, it revealed how the challenge of applying best practice in the water sector is as much about galvanising democratic involvement and good governance as it is about managing the resource per se.

"We have to reinvent global knowledge locally and we can only do this by mobilising local knowledge."
– Walter Fust, Swiss Agency for Development and Cooperation

Best practice *is* what works. But what works is not static. Our definitions of best practice are not static – they are permanently evolving.



Pricing

Water is priceless – but underpriced. This must change.

Water is an essential social good. It is a resource. It clearly has great worth. However, most of us have difficulty recognising worth unless it is quantified in terms of cost or price. We carelessly waste vast resources if they are free. We value those things that we must pay for (see text box).

What good is water? An ideological excursion

"Water is a social good for all the world's inhabitants. All of us must have dependable, reliable access to water. We can go for weeks without food. But water? Three days? Five? Only air is more vital to our continued survival."

Those who see water as a social good think of water as a necessity, as a *right*. It must not be traded and sold as a commodity. It is wrong to derive profit from the dire need of others; and water resources must remain the property of us all.

"Water is a commercial good. The raw material must be collected or extracted, treated and delivered. These services have their price. Yet beyond the simple idea of paying for services rendered, the commodification of water is beneficial, because we only behave responsibly towards the things we pay for, towards the things we own."

Proponents of this view blame today's inadequate water infrastructure on decades of underpricing. The authorities – whether from expediency or stupidity – never told their populations that water has a price. The vague idea that water was a "right" was not enough to mobilise the necessary resources, and their water systems got into trouble. Now they are turning to the private sector for help. Pricing systems are becoming more transparent and consumers are shocked to find out how much water really costs. Such ideological differences emotionalise debate and make agreement difficult. Though peacemakers with a balanced perspective seldom have an easy time, and just make enemies on both sides, it actually should be possible, in the present case, to support both sides of the question – validly, without being an indecisive "fence-sitter."

Consider the benefit conferred on a consumer by one additional litre of clean drinking water per day. To those with very little water, the benefit would be very great: life itself perhaps, or the ability to prepare food. To those with more, it still might improve hygiene and reduce the danger of illness. At the other end of the scale, to the "developed" consumer who can regularly visit a swimming pool, the benefit would be nil.

Can't we differentiate? Why not consider water that supports life and health to be a non-commercial public good? Why can't water for the swimming pool be a freemarket commodity? It should be possible for governments (or perhaps the "developed" consumer) to provide the water necessary for life and health to those in need, either free or at affordable cost. The great benefit to be conferred by giving such a small amount of water might be considered one of the world's best bargains – and though difficult to implement, this simplistic idea might be enough to free the ideological logjam.

"Are water prices set in such a way that they provide an incentive to use this resource sparingly?"

– Thomas Streiff, Swiss Re

Water pricing began to excite interest at the same time that water's commercial nature was being recognised. Actually, this was long overdue: though the pricing debate arose because of changes in the way we see water, the idea of price actually extends beyond commerce. It partially explains the inadequacy of the world's water infrastructures, and provides insights as to how they – and their chance of long-term success – may be improved.

Pricing is a *sustainability* issue: both *environmental sustainability,* to which we will return, and *economic sustainability*, which we will consider here (see text box).

Two sustainabilities?

Sustainability – the word conjures up an image of our blue world floating in the blackness of the universe: spaceship earth. Our ark. It reminds us to treat our planet kindly, because it's the only one we've got. Either we learn to manage resources sustainably, or we don't; either we survive, or we don't.

The word is used frequently in water literature: "sustainable resource utilisation"; "sustainable urban development"; "sustainable food production". It occurs about 25 times both in Chapter 18 (the "water" chapter) of Agenda 21, and in Bonn's "Recommendations for Action".

At the Rüschlikon Stakeholder Dialogue on *Sustainable* Water Management, the word was also heard many times. This was not surprising. What was surprising were the subtle differences in the way the word was used. Perhaps because the participants at Rüschlikon were more concerned with *practice* than *policy*, the word often had more to do with maintaining systems than protecting resources.

The "systems" type of sustainability is easy to define: if quality water still comes out of the tap 20 or 25 years after the ribbon-cutting ceremony (and there have been no major interruptions in between), then the system is sustainable. This is refreshingly simple. It is not something that you *work towards*, but something you can *achieve;* and it is gratifying when it has been done. It means that the engineering was sound and the execution was competent and integrated; but also that all the many human factors were adequately considered, and that someone – whether consumers or the government – cared enough about the system to fund its operation.

Finally, it is a sign that progress is being made; and that one day, we may even be able to tackle more concretely the problem of *resource sustainability.*

Many water projects start out as subsidised infrastructure investments; however, despite this "head start" to cost recovery, relatively few are operated so as to produce the cash they need to keep them going. In addition to the normal operating and maintenance costs, several other factors today tend to accelerate their degeneration:

- increased urbanisation, and also higher *per-capita* water consumption;
- competition for water resources, a switch to less favourable water sources;
- changes in the regulatory environment (eg mandated higher water quality).

Unless something is done, the systems decay. Abandoned water infrastructure is a subject that no one likes to talk about, but it is not uncommon. When this happens, the crisis is not environmental – the water sources are still intact – but economic: a crisis

of governance due to unsound management practice. Pricing to achieve cost recovery can avoid this. In other words, the consumer must cover the cost for the services used.

Pricing is also a *water management* issue.

Speakers at the Rüschlikon conference emphasised that supplied water is scarce. They supported the idea of price as an aid in shaping demand and cutting waste. This requires user-specific billing based on consumption. Metering is necessary for this: yet in 1991, a major city – one with a history of years-long drought and water shortages – was still not metering nearly 60% of its customers, meaning that these customers were not billed on the basis of the water used. Which city was it? New York! Some other cities have made greater progress; many have made less. Yet fair prices for water will come eventually or eventually, we ourselves will go. Below-cost water is poor management, and is ultimately unsustainable. Sooner or later, the consumer must begin covering the real cost.

"Pricing is justified only in the control of water over and above the lifeline."

– Fritz Brugger, Helvetas

But pricing is a *human* issue as well.

While insistence on the commercial aspects of water can perpetuate injustice and poverty, the doctrine that water is a *right* may encourage irresponsible waste. Here too, a metered, consumption-based pricing structure might be a solution: such an approach might provide for a base amount of free or low-cost water, with higher prices charged for higher consumption. Access to water for fundamental needs would thus be assured; and "convenience" water would be available at a rate that would encourage water conservation and recover costs. Thus a graded pricing regime could mitigate some of the water problem's sensitive ethical aspects.

"I would say we need a global welfare taxation system."

– Riccardo Petrella, Advisor to the European Commission

Price supports for "lifeline" water would shift the burden of cost recovery towards the more affluent, but in a very small way: per capita, the supported water would be only a small fraction of a "developed" user's water consumption. However, in many cities a majority of the population lives below the poverty line. In such cases, a compensatory system might not be practical, and one Rüschlikon participant suggested using a broader, global framework. The important point, again, is for consumers to cover, directly or indirectly, the full cost of the services provided.

Finally – and here, we come almost full-circle – pricing is an *environmental sustainability* issue.

Water is a resource. The world's freshwater reserves are becoming scarcer, because every day more of us use them – and what we do not use, we pollute. Thus water has worth, and the price of water resources must rise to reflect that worth.

Pricing raw water at source would be a means of disciplining exploitation by both suppliers and consumers. The power of such a scheme for raising awareness can hardly be overstated. It would be effective at all levels, from governmental to private.

However, at present, such source pricing is carried out only on a very small scale: usually when a country taps a source outside its national borders. Singapore, which imports its raw water at a price, keeps the leakage rate of its delivery system to 7%, advises Kondaker Azharul Haq of the Dhaka Water Supply and Sewerage Authority. The loss in

"Wasted water is our largest, cheapest water resource."

– Saul Arlosoroff, Mekoroth-National Water Corp.

neighbouring Kuala Lumpur, which does not pay for its raw water, is 45%. Unfortunately, Kuala Lumpur is much closer to the norm: Haq's own organisation cannot account for 40% of the water it pumps into its system. Yet the savings potential of urban water systems is modest in comparison with that of industry and agriculture. Industry consumes twice as much water as domestic users, agriculture seven times as much. Statistically, a 15% saving in the agricultural sector would supply all our homes, all our cities. Such savings are not unrealistic. First, most irrigation today is enormously wasteful, and this waste could be reduced using available, affordable technology. Why isn't it done? Because the changes would cost money, wasting water which costs little or nothing is perceived to be "good management." It will remain so until the price structure and enforcement mechanisms change.

At the Rüschlikon conference, the problem of collecting revenue from urban water systems was a hotter topic than the comparatively esoteric issue of resource pricing. Much water, as mentioned above, simply leaks into the ground; but area residents also tap the system illegally and pirate the water; and often there are no meters, or only collective meters for blocks of consumers. In developing countries, billing and collection systems are rudimentary or ineffective, and large consumers with political connections often resist paying.

"Water pricing may not be a solution, but it is a very important tool."

– Lubiao Zhang, Chinese Academy of Agricultural Sciences

Pricing is primarily a political question, and only partly an economic one, maintains Fritz Brugger of Helvetas. Echoing many others at the conference, he stressed that access to water is a human right, and that pricing must apply only to water above the "lifeline." Jim Lamb, representing Severn Trent, advised that some urban poor already pay 3–4% of their incomes for water. A broadly accepted rule of thumb states that expenditures on water and sanitation should not exceed 5% of household income. Yet, metering, measuring and billing should not begin too far above the "lifeline" if people are to respect water. The alternative would be high wastage, a heavier burden on resources, and slim chances of steering demand and consumption towards sustainability.

Arguably, the pricing model is a litmus test of how well a water system has managed the sustainability challenge. A truly successful model must be comprehensive, workable, and equitable:

- A *comprehensive* model generates sufficient revenue to manage and protect the environment in which the water originates; it involves the upstream stakeholders whose water is so often co-opted by urban areas.
- A *workable* model produces sufficient revenue to support the delivery infrastructure and supply clients reliably with a quality product; clients respect the arrangement to the extent that they do not waste water, and pay for what they use.
- An *equitable* model recognises the value of the individual (and perhaps also the value of good public health and social harmony in the community). Those in need receive sufficient water to cover their basic needs, at an affordable price and without stigma.

In other words, a successful pricing model would bridge the gap between our social ideals, the environment, and the market. It would bring these three forces into the same coordinate system – that of price; of *equitable, real-cost payment for the benefits received.* It would furnish a pragmatic basis for cooperation between all stakeholders.

How do we get there? Any such model requires an advanced level of governance in order to succeed: the model itself is a complex governance tool: we will address good governance in the next section. Yet even such a simple thing as a slogan could be an aid in achieving the necessary consensus. Everyone is familiar with the *polluter pays* principle. Why? These two words say nothing profound or clever, but somehow, the two ps seem to help in winning even complex arguments: you just wag a finger and say, "Ah, but you're forgetting: *the polluter pays.*"

A similar slogan might foster awareness here. The next time you argue that water, which is so precious, should not be underpriced, look straight at your interlocutor and say, "Of course you realise... the *consumer covers the cost!*"

Governance

Can good governance overcome Murphy?

You have seen it dozens of times. A good plan just didn't work. People turned their eyes and their palms heavenwards in frustration, and muttered: "Murphy's law!" (The Brits may have said "Sod's law," but the meaning was the same: "Anything that *can* go wrong, *will* go wrong.")

In some circles that has now changed. Today, what people mutter is: "Bad governance!" All humour aside, this is a hopeful development.

Sod/Murphy could only tell us to hope for the best, but plan for the worst. It didn't tell us which "worst" to plan for. Governance, in contrast, is a concept that embraces all the actors and aspects involved in the social process of decision-making. And we have recognised that certain principles – we'll call them principles of *good* governance – support overall success. Perhaps most importantly, we have passed from the descriptive stage to the normative stage. This means that we can now analyse and influence the forces and interactions impacting a process; and that in this way we can increase considerably the chance of a favourable outcome.

"The issue is not aid, not technical support. The knowledge is there. It is governance which is the key issue."

– Gourisankar Ghosh, Water Supply and Sanitation Collaborative Council

UN ESCAP[1] defines governance as "the process of decision-making and the process by which decisions are implemented (or not implemented)." It goes on to say that good governance "assures that corruption is minimised, the views of minorities are taken into account and that the voices of the most vulnerable in society are heard in decision-making. It is also responsive to the present and future needs of society." UN ESCAP also lists eight major characteristics of good governance: it is *"participatory, consensus-orientated, accountable, transparent, responsive, effective and efficient, equitable and inclusive, and follows the just rule of law."*

Of course, even the best governance is not a final answer: *no* answer is final. Yet just how far we still are from implementing even this partial solution is shown by a drama currently unfolding, not in an underdeveloped country with weak governance traditions and severely challenged resources, but in a developed European representative democracy. At stake is the state of the environment – and of the people who inhabit it – in broad regions of Spain (see text box overleaf).

1 United Nations Economic and Social Commission for Asia and the Pacific "What Is Good Governance?", available at http://www.unescap.org/huset/gg/governance.htm

Spain's National Hydrological Plan

The Spanish government recently hammered its *Plan Hidrológico Nacional* (PHN) through parliament despite intense popular opposition: hundreds of thousands took to the streets, and demonstrations continue. The plan will pipe 1.05 billion cubic metres of water per year from the River Ebro in northern Spain to coastal Mediterranean areas in the southeastern part of the country. Over 100 new dams will capture the water, and 1000 km of pipelines and aqueducts will take it to its destinations further south.

The Spanish Environment Ministry estimates the plan's cost at EUR 4.2 billion; financial support of EUR 1.25 billion is expected from the EU. The transferred water – apart from 190 million cubic metres allocated to urban Barcelona – is earmarked for intense irrigation, or for development along the coast: hotels, vacation homes, amusement parks, golf courses.

Critics consider the plan an environmental tragedy that will impact the entire Ebro basin both socio-economically and culturally. The dams will flood many valleys in the north, while further downstream, parts of Aragon that have too little water even now will desertify still further. On the lower course of the river, the reduced flow will allow salt water from the sea to penetrate further inland, impacting the delta's rich rice fields and changing the ecological balance of its wetlands. Much wildlife, including rare, protected species, will lose its habitat.

Politicians are marketing the plan as an expression of Spanish unity. Its critics believe that it will divide Spain's territory into two regions: that of the winners and that of the losers. They also see it as a project designed by and for the construction industry. It was no coincidence, they say, that the Environment Minister announced its passage by parliament from the headquarters of the Federation of Public Works Employers.

Yet the most exasperating aspect of the NHP is its "Why?" Barcelona does not need the additional water: it rethought its strategy prior to the Olympic Games. Along the coast to the south, other, less disruptive measures would supply the need: principally, more efficient irrigation, as well as water treatment and reclamation (raw sewage is currently discharged into the sea).

It is generally thought that the plan's budget is wildly optimistic, and that the real price of the water it delivers will be double the projected figure or more. Yet no one doubts that the water will be cheap: a government subsidy for unsustainable development along Spain's southeastern coast. Taxpayers will make up the shortfall; but residents of the plundered Ebro will bear a much heavier burden. Criticism falls on deaf ears. Says Environment Minister Jaume Matas: "Decisions about the plan lie with the Spanish government, the only one competent in this field."

Below, we will consider the eight principles of good governance as outlined in the UN ESCAP paper, in light of Spain's *Plan Hidrológico Nacional* (PHN). The goal is not so much to criticise the PHN as to demonstrate those eight principles by negative example; and to show how, by structuring future plans and solutions according to these principles, it may be possible to avoid some of the errors and pitfalls which the Spanish plan has fallen into. We will start with one of the most fundamental good governance concepts, that of...

Participation. In today's world, participation is seldom direct but is usually exercised through representatives. As the PHN shows, however, such representatives do not always guarantee that the rights of all citizens are respected. Often, it is the rights of minorities that are infringed upon; here, it would seem, at least, that powerful, moneyed interests have seized control of the decision-making process, and are imposing their will on the inhabitants of a large but relatively poor region. It is easy to see why those wielding power may try to exclude participation ("interference") by other groups. Those who are excluded must often actively claim a participating role – this takes perseverance and courage. Other factors aiding inclusion are expertise, access to information and the ability to organise. In our example, a sizeable protest has been organised and will probably continue: before the EU, before the judicial courts, and before the court of public opinion. This activity may eventually lead to a positive outcome, or at least to modifications in the PHN.

"Women are the pivot of rural life."

- Saul Arlosoroff, Mekoroth-National Water Corp.

Participation also means considering the gender issue, especially where water is concerned. Women are the family members largely responsible for carrying out water-related tasks: child rearing, cooking, washing, cleaning and, in many less-developed contexts, fetching water. The performance of these time-consuming tasks, in combination with women's underprivileged social or cultural position in many societies, tends to inhibit or even exclude their participation. In addition, even the simplest management tasks are frequently a male preserve: in such contexts, males often insist upon managing a resource that they may understand less well than women, and in which they may have less interest. The result is inefficiency. For Jim Lamb, representing Severn Trent, the matter is clear: "Involvement of women in water management" is one of seven principles which he suggests as the major tenets of best practice. As a water project, the PHN may even be somewhat unusual in that it shows no obvious gender bias.

Consensus. Social groups that are consensus-orientated do not usually decide for or against plans and projects proposed from the *outside*. The various actors – and these may be quite numerous – will consider a problem and *mediate* a solution that, ideally, should reflect the best interests of the community. Ideally too, a consensus-driven decision process will favour the development of a broad, long-term perspective that includes the question of sustainability and how best to achieve it. The actors will recognise that future generations are silent stakeholders that have rights as well.

"Unless the public is involved in this kind of debate we will see more such idiotic pipelines!"

- Claude Martin, WWF International

To bring the PHN decision process into line with good governance, it would be necessary to liberate it from vested interests and decisions made behind closed doors. Such "informal" decision-makers – "kitchen cabinets", lobbies, etc. without political mandate or legitimacy – are often also corrupt. Whether this applies to Spain is unclear; but in other countries, at least, corruption is a very real barrier to transparency. Very little mediation took place in the PHN approval process. However, some details were in fact modified to comply with EU environmental protection rules. This was done with a view to obtaining EU funding – a clear demonstration of the plan's dynamics: where necessary, concessions are made in order to loosen purse strings, but consensus for the sake of social equity is not taken seriously.

Transparent decisions are those made according to rules and regulations, in a reasonable manner, and on the basis of the best information available. People affected by the decisions should have free access to the information on which a decision is based, as well as to any relevant laws and regulations. Transparency also requires an honest effort to present such information in comprehensible form: "alibi" information – page after page of small-print legal text, for example, or public notice that a proposed plan is available for inspection at a certain time and place – cannot be considered transparent in the information age.
In the present case, Spain's Environment Ministry commissioned over 100 hydrological

and ecological studies – and then kept the results to itself. We can only speculate as to why the information was not made public; or if it was indeed this information that prompted Environment Minister Matas to whip the law through parliament, as he put it, *"por cojones"* (loosely translated: "at all costs"). In any event, the process is not transparent.

Effective and efficient processes meet the needs of the community while making the best use of resources. Ideally, this includes sustainable use of natural resources and protection of the environment.

"The southeastern coast doesn't need water. If they *treated* their wastewater instead of discharging it straight into the Mediterranean, nobody would ever dream of pirating the Ebro!"

– Alexander Zehnder, Swiss Federal Institute for Environmental Science and Technology

Indications are that the PHN will be neither effective nor efficient. A similar project completed in the Franco era has not performed satisfactorily. The PHN will actively contribute to the ecological demise of a river basin already in difficulty (the volume of water carried by the Ebro is in a long-term decline, even without the PHN). The plan goes against EU guidelines, which favour sustainability and advocate developing each river basin as a separate entity. The PHN has ignored alternative plans that would produce the desired result through less disruptive, more economical measures. If one is seeking effectiveness and efficiency, one must look elsewhere.

Accountable systems of governance hold decision-makers responsible for their actions. Accountability and consensus are two sides of the same coin: where decisions are made in consultation with all stakeholders, the question of accountability is less likely to be an issue. Factors that favour accountability are transparency and an independent judiciary.
The information revolution also fosters accountability by facilitating access to many kinds of data that, historically, have been difficult or impossible to obtain.

Accountability suffers under schemes like the PHN, where policy is set, decisions are made, contracts are awarded and performance is judged by a relatively closed group with no formally defined, transparent system of checks and balances. Such a system is usually accountable only to itself, meaning that it is not accountable at all. Not subject to audit or control, its participants present their activities to the public as they see fit – usually in as favourable a light as possible. Although a measure of accountability may be provided by the courts, including the court of public opinion, neither the courts nor public opinion are very efficient or reliable as institutions of governance: though vital as extreme remedies, their judgements are slow, and may well become effective years after the damage has been done.

Responsive. Responsive governments must respond to the concerns or needs of community members within a reasonable time frame. Response *time* might be considered a *qualitative* measure of how good a particular system of governance is, with response *effectiveness* being the corresponding quantitative measure. This factor is applicable more to up-and-running systems than to projects such as the PHN, which is still in its initial phase.

Rule of law means that fair laws are applied fairly and impartially by an independent judiciary power, and enforced by an impartial and incorruptible police. One goal must be the protection of human rights and the rights of minorities.

The PHN is already being directly impacted by legal decisions. The Itoiz dam, a precursor to the PHN which is now to be used in conjunction with the plan, has been the subject of an eleven-year court battle. In the most recent development (11 April, 2002), Spain's supreme court threw out an appeal by Navarre's regional government, preventing it from filling the

Itoiz reservoir. Navarre, however, maintains that another tribunal, the constitutional court, should have the final word in the matter: two years ago, this constitutional court ruled in favour of the dam. Navarre has said further that it will commence filling anyway, but has not done so at this writing. Litigation continues. Time will tell what role the Spanish judiciary will play in shaping the country's governance. A delicate balancing act will be necessary between the needs of the country as a whole and the needs of the individual regions.

An equitable and inclusive community is one in which all members feel that they have a stake; in which they do not feel isolated or marginalised. It is a community in which all actors feel that they receive a reasonably fair share of the benefits that the society has to offer. This quality is closely connected with a community's well-being: there is a "buy-in" by members who feel that they have something to contribute, and something to gain. This may well be the best single measure of good governance.

"If you can't build good governance from the bottom up, it will not function at the end of the day."

– Ernst Brugger, Brugger and Partners

It is here that the PHN may prove most destructive. The basin of the Ebro is roughly 86,000 km² in area, and the plan will change the face of the land that the people of the Ebro call home: subtly in some places, radically in others. Whether their section is flooded, or desertified, or impacted by encroaching salt water, the PHN will affect each inhabitant's quality of life. Though the changes may not be dramatic or tragic for many, they will be there; and with them will come an awareness that these changes were imposed against their will by powerful members of the community, to favour other powerful members of the community – and that this was done despite viable alternative means for attaining the same goals. Bad governance may induce long-term strains in the social fabric that are difficult to reverse.

What will drive governance in the direction of "good?" Why should we believe that good governance will happen at all? With good governance, like best practice, it is easier to define general principles than to find concrete examples; and it is easier to find examples of bad governance than good. Corruption, the abuse of power, egotism: these have always plagued governments and governance in the past. They still do today. Why should this change?

The answer is twofold: first, our world – and the water problem – are *changing qualitatively* (this is examined more closely in the "Wicked water" section). It is becoming more and more difficult to cope with these qualitative changes using the exclusive and narrowly based decision-making process that we now call "bad governance." As "bad governance" solutions increasingly prove unsustainable, the realisation is growing that its underlying principles are simplistic and short-sighted. Good governance, on the other hand, will be able to approach the goal of sustainability ever more closely because it favours participation and views a problem much more comprehensively.

Quite simply, good governance produces better results, a greater chance of success. This is independent of any moral, ethical or charitable considerations. And *resources follow results*. This is the second reason why good governance will ultimately prevail. Under bad governance, players often attempted to deploy their resources at the centre of power – whatever form this power took. It was argued that this strategy, though unsavoury at times, was necessary if anything was to be accomplished. The argument has proved to be a fallacy: relatively little was accomplished. The current tendency, therefore, is to place resources where the chances of success are the most favourable.

Governance is not new... and yet it is. In one sense, governance is as old as government itself; yet the concept of governance as the conscious attempt by a decision-making body to

optimise its activities and safeguard against its errors is relatively recent. Initially, it was governments that applied it – grudgingly, to gain the grudging assent of the electorate to be governed. Now, in a very recent development (roughly the last decade), it has expanded to businesses, organisations and projects, where it is used enthusiastically, not only as a tool for improving performance and credibility but also as a tool for *investor relations*.

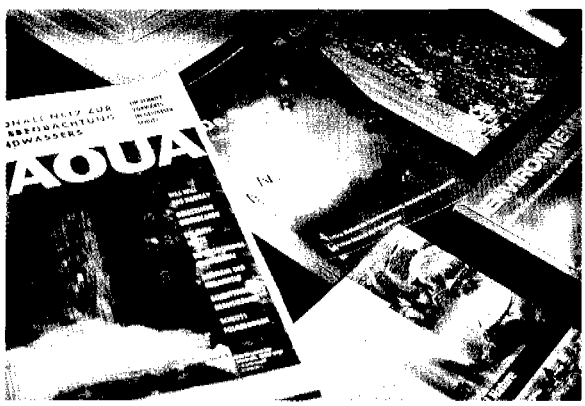
"Look!" the project managers say, "We've considered the problem from all angles – economic, social, environmental – so our solution will work. And it can be implemented with less resistance, because we include all stakeholders. Our bylaws are engineered so that no one person or group can take unfair advantage; and our system of reporting means that you, the investor or donor, will receive a true and just accounting of what is going on."

"The private sector can only become involved if the right enabling environment is created...This means a reasonable degree of good governance for water management."

– Jim Lamb, representing Severn Trent

Other things being equal, such projects will attract greater resources, whether ODA (official development assistance), private sector investment or government funding. This sets two virtuous circles into motion: the *micro* circle, where the more effective projects attract more resources, further enhancing their effectiveness; and the *macro* circle, where one successful good governance project sparks imitators, strengthening in turn the good governance model overall.

But is the good governance model perfect in the context of water management? Its greatest strength and weakness is that it virtually necessitates participation by the private sector. Though the model offers a way for a government to go beyond its habitual constraints by devolving water services to a private operator, any degree of private involvement may be vigorously opposed by those who consider water to be a social good. We will consider the issue of participation and partnership arrangements in the next section.



Participation and partnership models

We can do anything.

We have realised projects that are astounding in their scale and sophistication: pyramids, cathedrals, dams. We have implemented systems remarkable for their complexity and extent: the postal system, for example, where we put a piece of paper in a box, and it is delivered, within a few days, to virtually anyone on earth.

What motivates us? Spectacular achievements usually come from some great outpouring of fervour, either religious or national. In contrast, daily wonders such as reliable mail delivery are the expression of carefully nurtured political will; or there are profits to be made. This is the way it is with water. We do spectacular things by way of enthusiasm; for the mundane things, incentives are required.

This is because we are often unwilling or unable to satisfy many of our needs personally, including our need for water. Instead of trekking 5–10 km every day to fetch what we need – and many of us must still do that – most of us employ someone else's back or brain to deliver the water to us. In doing so, we avail ourselves of a *service*, which, in the vast majority of cases, we must pay for. The service provider thus receives an *incentive*, and may even decide to base a livelihood (or a career) on providing that service reliably and well. But obviously, where services are not sufficiently compensated, they become moribund and eventually fail.

The aim of the preceding paragraphs is not to insult the reader's intelligence, but to restate some of the basic facts that many public water projects have long ignored in trying to supply water without sufficient regard for cost recovery. Such an approach is not sustainable. Many influential organisations, the World Bank and the IMF among them, have recognised this, and have now come to favour participation and partnership models as the most promising way of meeting the water challenge. Under these models, both government and the private sector join to provide an effective, transparent, accountable and sustainable water service that will best meet the specific needs of the client.

"Private sector efficiency and its financial resources are needed to meet the needs of water security."

– Khalid Mohtadullah, GWP

Indeed, two factors militate for including the private sector in water delivery services. On the practical side, there is the stark truth that many governments – national, regional or municipal – have been unable or only marginally able to provide their constituents with water. These governments do not have the credibility they need to attract resources – or the resources they need to be credible. In such cases, participation by the private sector can fulfil a dual role, providing the necessary expertise, and functioning as a repository of trust for resource providers, whether public or private.

A more theoretical reason for including the private sector is that it is difficult to make monolithic governmental organisations transparently accountable. As transparency and accountability are two of the major tenets of good governance, some separation of powers is generally necessary if checks and balances are to be effective.

Yet despite the trend towards delegating some responsibility for water management to the private sector, few would suggest that government abdicate its water mandate completely. The outright privatisation of water utilities is rare (notable exception: the UK under Thatcher) and is generally not considered a sustainable approach. There is a feeling that government still represents political legitimacy: and that as such, it should at most delegate its responsibility to a private sector company, not give it up entirely – and function as that company's contract partner; and also that the government should remain trustee of water resources and the environment, and guardian of its constituents' interests, specifically with regard to water quality and pricing.

"There was genuine concern expressed that the private sector is only interested in profit maximisation and that they have so much market power they will always be able to outgun the government regulators."

– Al Fry, World Business Council for Sustainable Development

How are such participation and partnership models set up? The multitude of possible configurations reflects the endless variety of local situations with respect to water, and the different combinations of services needed. Each tailor-made model is generally defined by a contract which is normally awarded after a call for tender. The contract may cover one or more services:

- drinking water production
- drinking water distribution
- wastewater collection
- wastewater treatment.

For each of the above services, the participation or partnership arrangement may cover one or all of the associated activities, or any combination:

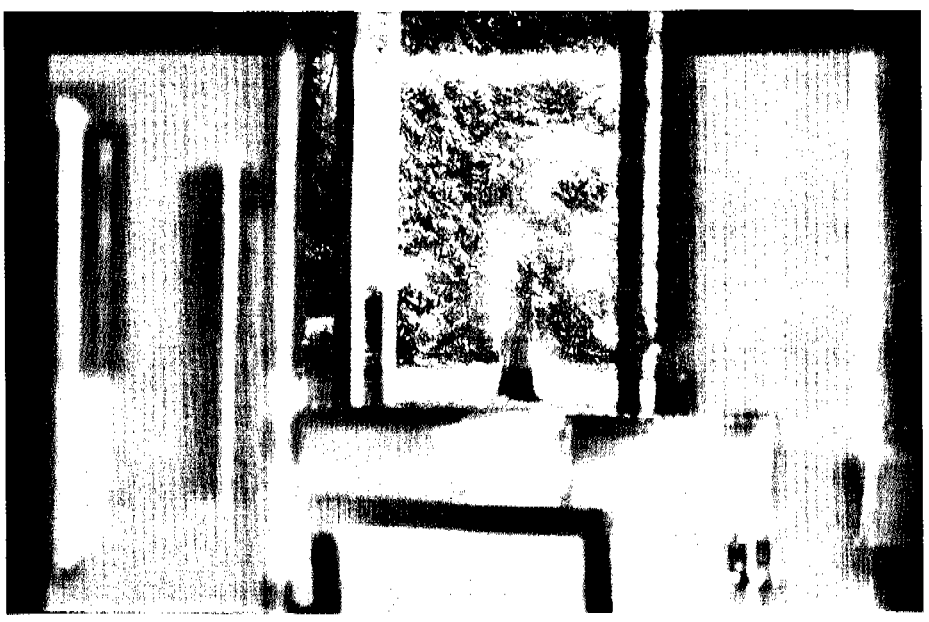
- technical operation
- administration, including billing
- system renewal, and
- system upgrade/extension

The situation is made even more complex by the fact that the service area covered by most agreements will include different neighbourhoods with various settlement types

and densities. The service mix, as well as the methods and techniques used in providing them, may differ from one neighbourhood to the next. System extension may be required in one area, while ageing infrastructure might be a problem in another. Neighbourhoods may be prosperous or impoverished, densely or sparsely populated.

For any given service package, the overall responsibility delegated to the private operator is a function, first, of the amount of financing provided by the private company, and second, of the term of the contract. The form of contract will differ accordingly:

- *Concessions* and "build – operate – transfer" (B.O.T.) arrangements are the most comprehensive forms of contract, under which a private company is responsible for operating and extending the infrastructure over a period of normally 20 to 30 years. Under the former, the company bills the consumer directly for services; in the latter, billing is to the contracting authority.
- An *affermage* (lease) agreement, similar to an operation and maintenance (O&M) contract, will run from 10 to 25 years. Here, emphasis is on the operation of an existing system, not the financing and implementation of an extension programme. Again, billing is to the consumer and to the contracting authority, respectively.
- *Management support contracts*, as the name implies, cover clearly defined tasks. The level of company financing is lower, and the term of contract is shorter.



The reality of providing water to a large number of people, whether urban, peri-urban or rural, is an enormously complex task barely hinted at in the schematic description above; so complex, in fact, that facts become hazy and "truth" becomes a quaint and impractical notion. Was a price hike justified? A target met? Has efficiency improved? Customer satisfaction? "Some problems are so complex," says Laurence J. Peter, noted organisation theorist and author, "that you have to be highly intelligent and well informed just to be undecided about them." With water, only two ultimate yardsticks matter: to provide lifeline water as the right of every person now living; and to ensure sustainability as the birthright of every person yet unborn.

"If we lose the 'super goal' – the human focus – everything is meaningless."

– Gourisankar Ghosh, Water Supply and Sanitation Collaborative Council

There will never be a shortage of critics. Some are manipulative, using unfair criticism to alter the system to their benefit. Some are emotional: customers after a rate increase, for example. There are also "natural" opponents: ideological foes of private enterprise and of the "natural" monopoly exercised by a water concessionaire (unlike telephone services or even electricity utilities, there is seldom direct competition among water suppliers). And some opponents are quite simply right, their criticisms well founded.
All are stakeholders.

Private companies would be well advised not to exploit their situation: reality has a way of avenging itself on winners – particularly when all the others are losers. Nor is it enough to aim for the "win-win situation" that is the goal aspired to in countless management handbooks. Here, the minimum acceptable result is "win-win-win": a favourable result for each component of the "triple bottom line" of sustainable development: community, economy, environment.

"Ultimately, it comes down to political will."

– Al Fry, World Business Council for Sustainable Development

No slogan or buzzword, such as "participation", "partnership", "good governance" or "best practice", can provide a recipe for success. The only guarantee, if there is one, is to be found in a clear-eyed view of reality by both contracting partners; in strength and expertise on both sides of the bargaining table; in hard-headed and ably applied contractual safeguards such as independent regulatory bodies, standards and benchmarking; and in constant and conscious attempts at communication with all stakeholders. This, of course, is the ideal situation. There are others.

A major concession contract must be considered a test of corporate virility; it can easily become a demonstration of managerial foolhardiness. The expiry of a 20-year contractual obligation lies far beyond the horizon of every planning parameter: economic, financial, technological, social; and in fact, the track record amassed to date by these arrangements is mixed.

But the public-private partnership model is workable. We can make it work.
We can do anything.

Wicked water

Our problem is that we don't understand the problem.

More of us than ever live on the earth today, and there will be yet more of us in future. We are living closer together and placing higher demands on our finite water resources. The engineering "fix", which gave reasonably satisfactory results in former times, no longer works. Our margin for error has diminished: we cannot allow ourselves to go on making mistakes.

The water problem has undergone a qualitative change. Things have definitely turned "wicked".[2] Wicked problems happen when they become so big – or the world becomes so small – that they collide with other problems; or they happen where change is so rapid that no satisfactory, long-term solution can emerge. Or both.

A "wicked" problem, according to E. Jeffrey Conklin and William Weil, is one meeting the following criteria:

- "The problem is an evolving set of interlocking issues and constraints. Indeed, there is no definitive statement of the problem. You don't understand the problem until you have developed a solution.
- "There are many stakeholders: people who care about or have something at stake in how the problem is resolved. This makes the problem-solving process fundamentally social. Getting the right answer is not as important as having stakeholders accept whatever solution emerges.
- "The constraints on the solution, such as limited resources and political ramifications, change over time. The constraints change, ultimately, because we live in a rapidly changing world. Operationally, they change because many are generated by the stakeholders, who come and go, change their minds, fail to communicate, or otherwise change the rules by which the problem must be solved.
- "Since there is no definitive Problem, there is no definitive Solution. The problem-solving process ends when you run out of time, money, energy, or some other resource, not when some perfect solution emerges."

These observations on the nature of wicked problems lead Conklin and Weil to some conclusions as to how they should be handled:

First of all, *wicked problems are non-linear*. It is simply not possible to solve them with the grand, phased strategy that works for "tame" problems: "gather data, analyse data, formulate solution, implement solution." Here, the human talent for simplification and abstract thinking can be a liability. Planners that neglect details – or stakeholders – will find their plans invalidated at some point by those very details or stakeholders (see text box overleaf).

2 **Wicked Problems: "Naming the Pain in Organisations" by**
E. Jeffrey Conklin and William Weil.
http//www.3m.com/meetingnetwork/readingroom/gdss_wicked.html

Gripping drama with a cast of thousands...

Stakeholder interaction around the water issue is very complex. To generate an appreciation for the many relationships and interrelationships involved, Jack Moss of Ondeo developed a learning aid – a series of PowerPoint slides – that he demonstrated in the lounge at the Rüschlikon conference. The picture it presents boggles the mind.

Mr Moss would call up one area – the government entity, let's say, that wants to provide water to its constituents – and demonstrate that this entity is not just a single, monolithic actor: there is the local administration, well organised or not, efficient or not. Then there is the mayor – politics comes in here. Then, higher up the line, there are the regulators, and the regional authorities, *and* the national authorities. Each of these, Mr Moss tells you, *each*, has its own tasks, interests, viewpoints, wishes, constraints, and so on: in short, its own agenda. Then, there is the political opposition which tries to make the incumbent government look bad, and the media that helps them do that.

As you contemplate this slide, the structure in all its complexity collapses into a single word ("Organiser"), then shrinks and recedes into a corner of the screen. The next areas – the service *consumers* and the service *providers* – are then successively presented for consideration. Each is as complex as the first; and each in turn collapses into a single word ("Customer", "Operator"), and recedes into the background.

"Are you worried yet?" asks Mr Moss. He then superimposes the service itself on the diagram, bringing it into relationship with the areas already presented. Arrows leap up, circles appear, overlapping sectors indicate further interrelationships, further complexities.

Finally, like a ripple on a pond, a ring appears and spreads to surround the entire diagram: "Community." Logical enough, you think. A second appears, also enclosing the whole diagram: "Economy." "I see you looking a little uneasy," remarks Mr Moss. "Just hold on." A third circle – green this time, "Environment" – expands to enclose... everything. "You may notice," he says, "that these last three circles give us the 'triple bottom line' of sustainable development."

"But wait!" Mr Moss continues. "Because this view is still false. It is static. In reality, all of this is constantly evolving through time; every element is dynamic. We shouldn't see a static picture, and not even a moving film, but *many* films viewed all together, through an ever shifting kaleidoscope!"

The laptop screen goes dark, the demonstration is over. goodbyes are said, hands are shaken. The full intricacy of the water problem begins to sink in.

We have trouble keeping more than three things in mind at once. We have difficulty cooperating. We prefer short-term gratification to long-term benefit. We can't remember where we put our keys. Water is a challenge, but the real challenge... is *us*.

Rather, an *opportunity-driven* approach is required. The problem-solver concentrates instinctively on the aspect – whether issue, stakeholder, constraint or assumption – that seems to offer, at that particular moment, the best opportunity for moving forward. This momentary approach may turn out to be a dead end; another opportunity may open up. If so, the problem-solver refocuses rather than becoming fixated on any one aspect:

"...you look for the opportunities for breakthroughs, synergies, connections, and allies. You drive for making decisions quickly, even before the team is ready, because you know that decisions and partial solutions will flush out new aspects of the problem... You use meetings as occasions for learning and building shared mental models. You welcome disagreement as a sign that your stakeholders are putting their cards on the table. You use technologies that support communication among the stakeholders, and you promote the value of capturing and sharing soft information, such as ideas, questions, problems, objections, opinions, assumptions, and constraints. You are also managing the production of whatever documents are defined as your interim and ultimate work products... Perhaps most importantly, you manage the scope of the problem. You determine which stakeholders to include in the process, and how to include them. You also choose which constraints to be ruled by, which to bend, and which to ignore... In this way, you can make conscious and responsible choices about the scope of the problem."

This way of working is messy, social, creative and chaotic, and the focus may change frequently in response to new knowledge, or to shifts in the problem or the way the problem is perceived. Many persons may be working on the same or similar problems, creating mutual interactions that are constantly changing the others' strategies. "In the opportunity-driven approach, however," say Conklin and Weil, "you pay as much attention to the learning that has occurred as to the elegance of your solution."

"Once you recognise that the most interesting problems in life cannot be solved definitively, you naturally shift your focus to the quality of the problem-solving process. What results is that you ultimately value learning over getting the right answer. Not only is this more satisfying; in our experience, it also produces better results."

Water is a "wicked" problem, and it will not be possible to achieve sustainability in water – or any similar area – in a final, conclusive way. New constraints and developments will always invalidate past projects, threaten future ones, and call our definition of sustainability itself into question. For the same reason, "best" practice and "good" governance will remain elusive. Bad examples will always be plentiful; positive examples will remain rare. The reason, however, is not that governance will always be bad, or practice worse, but rather that our knowledge – both of our surroundings and ourselves – will develop more rapidly than our ability to put it into practice.

This is good.

Conclusion

We are slow learners.

We appeared on the earth over two million years ago. It took us 1.996 million years to produce our first code of laws; it took another two thousand years to develop the idea of checks and balances in government – which we soon forgot, and had to rediscover eighteen centuries later. Lately, our learning curve has been climbing more steeply – but so has the "challenge curve." Some of these challenges are serious enough to threaten our continued survival – or at least the continued existence of human society as we know it. Water is one of these, environmental sustainability another, biodiversity perhaps a third.

We must force the learning pace.

Oddly enough, the greatest challenge, greatest problem and greatest mystery is that being which we should know best: ourselves. We haven't learned to cooperate. We haven't learned to see the whole problem beyond the partial aspect. We haven't learned to be charitable towards those who share the earth with us, or to be considerate of those who will follow us on it.

But today's "wicked" challenges demand that we learn all these things and more:

- to go beyond mega-projects, to engineer (and sustain) numerous modest solutions that, together, will add up to sustainability;
- to go beyond cronyism and corruption to engineer systems of governance that will bridle (or harness!) self-interest and ideology;
- to go beyond "next-election" politics (or despotic control) to engineer governments that derive their legitimacy from their people, and consistently foster their people's legitimate interests.

"Please become engaged!"

– Jack Moss, Ondeo

Of today's global challenges, water is arguably the easiest, for unlike climate change, we know a great deal about water. As participants at the Rüschlikon Conference on Sustainable Water Management stressed repeatedly, the main challenge lies within ourselves. Water, therefore, is an excellent training ground where, largely unhindered by factual uncertainty, we can develop and exercise the mindset – the talents, the skills, the ability to work collectively and politically – that will be even more crucial in handling other, more demanding challenges.

The water problem is not in our heads: it is real. But we must solve it in our *minds*.

About the authors

This *Rüschlikon report* marks the first time that Griff Anderson and Richard Hall have partnered on a writing assignment. Griff has been with Swiss Re since 1996; Richard joined in 2001. Both are members of Swiss Re Group Language Services in Zurich, where they edit, translate and write.

Richard: "Water has attracted many excellent writers: very informed, some very, very articulate. Not being specialists in the water sector, this assignment has been both challenging and exhilarating, and has given us insight into a new area of public concern."

Griff: "We tried to turn our outsider perspective to our advantage, to better inform those just becoming acquainted with the area, and – perhaps – make a small contribution of our own."

What happens to the world makes a big difference to a company like Swiss Re. Socially, politically, economically, and environmentally, everything has an impact on the global risk market. That's why Swiss Re created the Rüschlikon – Centre for Global Dialogue, as a place for enquiring minds to look ahead to the future.

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