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Why Is Water an Issue? How many water issues are there? Absurdities, Real Threats, Not-Yet Threats, and Promises What can the World do? What should Germany do?

Why Is Water an Issue?

The UN Secretary General asks, in a year end broadcast, if the next wars will be water wars. "Water is the 21st Century Gold" avers a Middle Eastern research group. We see TV images of draught where rains fail, water tables drop and then crops wither, roots die, lands erode and soil blows away. Germany experiences unprecedented flooding. We know that more and more rivers – major rivers – dry up before they reach the sea, and fertile lands are ruined by salt. And we know that somehow connected to this is the daily reality of 6 thousand water related deaths, and of 2 ½ *billion* people suffering the indignities of being without sanitation facilities, and fully half that number suffering the health and livelihood effects of not having access to clean water.

What is going on? Doesn't it still rain? How do these issues fit together?

Here is the world of water in brief. The world is mostly made of water. But within this watery world, only 2.5% of world's water is fresh water, with less than 1% available for use. We draw down about fully 56% of that 1% of water that is actually *accessible* to us. Water use sextupled when population doubled since the 1960's (ie added 3 billion); what will be the situation in 2050 when we add the next 2-3 billion? Sextupling isn't possible – we're already over the half way mark.[1]
There are many many water issues, but let's conceptualize two. They are intertwined but quite separate, and understanding the complexities of the world of water will be helped by seeing these as two issues, differently managed with different actors, different management tools, susceptible to different forces.

Water resources comprise the totality of rainfall, rivers, lakes, aquifers, and groundwater. These resources are central to food security, to the health of the environment, to our enjoyment of nature, to energy production, to transport – (especially in this country) and often to our national conceptions of ourselves. Water resources are managed – or should be – by public policy: by Finance and Trade Ministers through tariff policies, by Natural resource ministries and agricultural ministries, by environmental regulations such as the European Framework Directive, by resource inventories and surveys, monitoring, trying to integrate the various uses made of water by various parts of society. Determinants of who gets what relate to the relative political power of the agricultural sector, the mining sector, the energy producers, the environmentalists.

The Global Water Partnership[2] which I Chair, provides a global support network for those working within countries and regions to change water resource use, and promote better resource management.

[1] Shiklomanov, 1997 in The UN World Water Development Report: Water For People, Water For Life, World Water Assessment Programme, UNESCO Publishing 2003
[2] www.gwpforum.org

Most of the MDGs, or Millenium Development Goals - reduced malnutrition, decreasing the number of those in poverty, improving the environment - will not be reached without improved water *resource* management. The Johannesburg Earth Summit passed a specific directive calling for all countries rich and poor, water scarce and water plentiful to develop integrated water resources management and water efficiency plans[3] by 2005. IWRM is an approach "which promotes the coordinated development and management of water, land and related resources in order to maximize the resultant economic and social welfare in an equitable manner without comprising sustainability of vital ecosystems."[4]

The aspect of water that is most immediate to all of us is *Water supply* – or *drinking water supply* – takes but a small part of water use, generally about 7 or 8%. Water supply, often with sanitation and water treatment, is managed by municipal managers, water engineers, sanitation specialists. The decisions about who gets water supply, or who gets sanitation, are primarily about financial and policy priority decisions.

There is a lot of international attention here too, in fact more attention than is given to water resource issues. The "water" Millennium Development Goals pledge to reduce by half by 2015 *the proportion* of people that do not have access to safe water. The Johannesburg Earth Summit added a similar target for sanitation. These goals imply ambitious if not impossible enterprise. In the 3500 days remaining till 2015, every day about 290,000 people would have to gain access to clean water and over 500,000 to sanitation for these goals to be met. Some countries – China, India, South Africa are on track to meet these,[5] in the poorest, this is not going to happen under anything like current conditions. And most of the other MDGs – child survival, girl's education, slum improvement depend on progress in drinking water supply and sanitation. I was a member

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(a) Develop and implement national/regional strategies, plans and programmes with regard to integrated river basin, watershed and groundwater management, and introduce measures to improve the efficiency of water infrastructure to reduce losses and increase recycling of water

(b) Employ the full range of policy instruments, including regulation, monitoring, voluntary measures, market and information-based tools, land-use management and cost recovery of water services, without cost recovery objectives becoming a barrier to access to safe water by poor people, and adopt an integrated water basin approach

(c) Improve the efficient use of water resources and promote their allocation among competing uses in a way that gives priority to the satisfaction of basic human needs and balances requirement of preserving or restoring ecosystems and their functions, in particular in fragile environments, with human domestic, industrial and agriculture needs, including safeguarding the drinking water quality

(d) Develop programmes for mitigating the effects of extreme water-related events

(e) Support the diffusion of technology and capacity-building for non-conventional water resources and conservation technologies, to developing countries and regions facing water scarcity conditions or subject to drought and desertification, through technical and financial support and capacity-building

(f) Support wherever appropriate, efforts and programmes for energy-efficient, sustainable and cost-effective desalination of seawater, water recycling and water harvesting from coastal fogs in developing countries, through such measures as technological, technical and financial assistance and other modalities

(g) Facilitate the establishment of public-private partnerships and other forms of partnership that give priority to the needs of the poor, within stable and transparent national regulatory frameworks provided by the Governments, while respecting local conditions, involving all concerned stakeholders, and monitoring the performance and improving accountability of public institutions and private companies

[4] Global Water Partnership, TAC paper #4, Integrated Water Resource Management

[5] Human Development Report, UNDP, 2003

of the Task Force that spent two years looking at Drinking Water and Sanitation; I am also a member of at the Secretary Generals group looking at follow up.

The two are related: bad water treatment pollutes drinking water supplies. But, for example, whether the citizens of a country have adequate drinking water is much more closely related to the income level of that society than simple water availability. This is logical. In an increasingly urban world, water supply is related to costly urban infrastructure which must be financed. Poorest countries have the greatest challenge, even those with ample water supplies.

Both of these have changed a great deal in the last decades is the following:

- ✓ Huge population increase has reduced the absolute amount available *per person* for these purposes.

- ✓ Humankind has invented about 100,000 chemicals to help us with food and industry and daily life; we also use the streams and rivers around us dispose of these and agricultural and human waste products. Ninety percent of the South's waste water goes untreated into the streams and oceans with consequences for the downstream and the reefs and coastal regions. Ergo, there is less water available for each of us, and often it is polluted - occasionally to the point where it cannot be used, often to the point where it causes illness.

- ✓ The impact is not just on humans – About one quarter of the fresh water fish species are endangered. Fully 50% of the global wetlands disappeared in the 20th century.[6] Mangrove swamps are being pulled out. Aquifer levels are falling, not everywhere, but in far too many places.

So – this combination of population growth, pollution, increasing per person use means that there are about 450 million people in 29 countries facing water shortage, and by 2025 about 2.7 billion or 1/3 of the expected world population will live in regions facing severe water scarcity.[7]

Because of the enormous temporal and special variability in water, this hits some areas much harder than others. This means that some parts of India receive 90% of their water in five days of rain, perhaps spread over two intervals a year. If they cannot store this water they will lose it – and have no more for months to come. Add to add even more complexity, 263 of the world's river basins are shared by two or more nations, and about 40% of the global population lives in these shared basins..

The impact on people's lives and livelihoods depends on who they are and where they are. Poor people suffer most when water is unavailable, they suffer in particular from the absence or poor working of municipal services and poor people suffer disproportionately from the health impacts of dangerous or low water quality and quantity.

It would in fact be difficult to exaggerate the impact that the lack of clean has on the lives of the poor. Close to half the population of the developing world suffering at any one time suffer from diarrhea, ascarids, guinea work, hookworm, and shistosomiasis. (A well designed water system reduces the incidence of shistosomiasis by close to 80%).[8] There are 4 *billion* cases of diarrhea yearly which cause 2.2 million deaths. Fully 6 million are blind from trachoma – a disease which could be largely prevented if there were enough water to wash the face, and if the

[6] Kirsten Schuyt and Luke Brander, Living Waters: Conserving the Source of life: The Economic Values of the World's Wetlands, World Wide Fund for Nature, Gland Amsterdam 2004
[7] IWMI – International Institute of Water Management, Colombo, Sri Lanka
[8] UN Millennium Project on Water – Interim report: see www.unmillenniumproject.org/documents/tf7interim.pdf.

habit of doing so could be taught and learned. The naturally occurring arsenic in Asian groundwater has diminished quality of life for hundreds of thousands of the millions who lived because they no longer faced cholera.[9]

Cholera means both loss of life but also loss of livelihood. The losses to Chile from fruit and vegetable export earnings after their 1990s cholera scare took years to recover from, and cost infinitely more than would have improved water systems. Poor water impoverishes the poor in other ways. About 73 million working days are lost in India to problems associated with poor water quality and the health impact, with $600m lost in paying treatment costs and in the cost of lost production. A staggering 40 *billion* working hours in Africa are lost to carrying water. This is women's work and if women cannot do it their daughters will come out of school and fetch water. [10]

The per person count is what counts. If we look at one of the most unstable areas of the world, we see a truly disquieting water picture. In the Middle East and North Africa region the population doubled from 1970-2001. In 1960 there were 3,500 cubic meters per capita available to be used for all purposes – food, industry, personal use – for all residents; by 2025 that will be down to 600 cubic meters per person, or a *six* fold decrease. Irrigated agriculture uses a hefty 85% of the water in the region. This part of the world is now 60% urban. The scarcity will intensify for agriculturalists and urban alike. The Arabian Peninsula, Jordan, Palestine, Israel and Libya consume more water than annual renewable supply, with Egypt, Sudan, Morocco, Tunisia and Syria – close behind. Jordanians have but 163 cu m per person per year, Yemen 133. How will prosperity – or peace – come in these circumstances?

Absurdities, Real Threats, Not-Yet Threats, and Promises

Absurdities

By common consent, the problems of water are problems of water management. There are a great number of absurdities in the way we use water world wide –they also show where there is potential for change.

First, some water resource issues:

- Australia and Ethiopia and Western USA all have about the same rainfall and climate but where the USA and Australia have around 5000 m3 per head of water storage capacity, Ethiopia has only 50 m3, and Africa and the Middle East as a whole only 1000 m3.[11] Each USA citizen has fully 100 times as much stored for him or her vis a vis each Ethiopian. So how can Ethiopia grow more food, offer conditions under which industry might be established and meet peoples needs for water.[12]
- China has about 50% of its agriculture under irrigation – with as much as 70% of that water lost to wasteful methods.
- In China it takes 25-50 tons of water to produce a ton of steel – Germany, Japan and US take 5 tons of water to make 1 ton of steel
- The Aswan high dam is built in where summer temperatures reach 44 degrees C. Were it further upstream, the evaporation losses would be cut substantially.
- Saudi Arabia uses fossil water (is laid down eons ago, not replenishable) for agriculture.
- India and China between them probably pump about twice the Nile River's worth of water *more than rainfall will replenish* from underground sources for irrigated agriculture – often the electricity and the water are both free. Household consumption:

[9] UN Millenium Project
[10] Millenium Water Task Force
[11] World Bank estimates
[12] World Bank estimates

- In North American we dam rivers to store water, pipe it, filter it, add chemicals to it, preserve its purity and then flush more than a third of it down the toilet. (about 8% worldwide)

Now, some drinking water supply and sanitation absurdities:

- Mexico is chronically water short, but the average per person daily consumption in Mexico City is double that of Berlin
- Again in Mexico 1/3 of water lost to leaking pipes and faulty systems; the city is sinking, and a lake is being drained to feed this inefficient system
- Still in Mexico City, only 70% get bills; only half that number pays them. So there are no funds to pay for the repairs to pipes and systems.
- The poor pay more for water and use less, often to the detriment of their own health.

Real Threats

Let's again start on the water resources side:

- *Food security*. Water scarcity is a threat to food security. Although only 17% of agriculture is irrigated, this irrigated land accounts for more than 40% of all agricultural production, and it accounts for about 80% of all the water we humans use. With both upsides and downsides, we have fed an additional 3 billion people since the mid point of the last century through *intensifiying* agricultural production, primarily through Green Revolution techniques and substantially but not uniquely through irrigation. Had this not been done, the burgeoning world would have fed itself by *extensive* means, ie clearing more forests, more tropical lands, denuding more hillsides. And much of the world's water supply to agriculture is under threat.

- Irrigation investments declined continuously since 1980 and have in any case virtually not touched Africa. There is a combination of relevant factors: agricultural water storage involves dams, now rarely financed by concessional funding sources; past projects are perceived to have performed poorly (there are hardly ever water charges or budget appropriations to keep the systems in good working order); irrigation projects are more costly than education or social projects; irrigation investments were crowded out by lending in structural adjustment in 1980s and later focus on environment; irrigation investments became less attractive with declining international food prices.[13] These declines help the urban poor, but not the rural poor who have to make money to buy anything, including food. Some 70% of the poor are still rural.

- *Floods and disasters*. Hotter air holds more water than cold air. As temperatures rise, more water accumulates. Rain becomes torrential, in more places, more often. It is not imaginary that there are more named Hurricanes – there are. Climate variability is having an enormous impact on water management and will do so even more in the future. Flood damage claims since 1950 have risen from $39.6 to $607 US billion[14] with the curve still climbing sharply. There are recent painful memories in this country. Loss of lives in flooding has dramatically *decreased* in the industrialized world as early warning measures and long term disaster prevention measures take hold – helped by skyrocketing insurance premiums. Loss of lives has however *increased* dramatically in the developing world as burgeoning populations build in floodplains, and less than well organized societies try to cope with a stream of weather events increasing in frequency and violence in the tropical regions.

[13] IMWI
[14] United Nations, International Committee on Climate Prediction, ICCP

- *Population increase* is the biggest threat to water security. Although population *growth* rates have decreased dramatically, the human race will increase by another 2 to 2.5 billion before population levels stabilize. With higher levels of development come higher demands on water – for energy, for food, for personal use. Water use increased by a factor of 6 when the world's population doubled, by adding 3 billion since the mid point of the last century.

Not-Yet Threats

▪*Water wars*.[15] It is absolutely the case that two Middle Eastern cities armed themselves and went to war directly over water. But it was 4500 years ago and in the years since, the participants have often been edgy, but actual violence only ensues on the local level. In 1980, armies were mobilized. Shots have been fired: Egypt, Ethiopia, Sudan – Jordan in 60s. Landmines have been put down in Uzbekistan, and a dam blown up in Oregon. But generally and amazingly, nations have found more to cooperate about with water than to fight over. The reality is a fairly rich tradition of Transboundary Cooperation with India continuing to pay Pakistan for the costs of building and operating dams which Pakistan continued to build and operate – right through several periods of Indo-Pakistan hostilities. The Mekong River treaty held, with some difficulties, right through the Vietnam War. The Jordan River treaty is more observed than it is violated, though it is violated.

A study of the last 50 years shows that 2/3 of all events involving water issues between two or more states have in fact been cooperative, with acute violence being rare. Where there is violence, the water issue is usually as subset of other difficult issues. USA intelligence reports suggest that shortages have often stimulated cooperative arrangements for sharing scarcity. [16] As countries come up against tighter and tighter limits, conflict may increase. Wolff's Axiom says that "the likelihood of conflict rises as the rate of change within the basin exceeds the institutional capacity to change"[17]. In other words, the strong linkages, history, technical capacity and managerial competence of the Canada/USA International Joint Commission suggest that it will help our two countries to find solutions to new challenges such as deformed fish, zebra mussels, declining Great Lakes Water levels. In the Aral Sea, given the weak linkages between the regional countries, it is much less likely that solutions will emerge easily.

Water related violence very much exists in the world of today but the most intense conflicts are intrastate, intercommunity, intervillage. Pastoralists and planters do come to blows. The poor are at the bottom – and when we wonder about water and violence, we should think of the women at the well who resort to blows to maintain their position in the line up – day after day after day "I have become a warrior for water", says one woman with pride and resignation.[18] But it is unlikely that we will be as drawn to their bitter daily conflict as we will to those where armies line up and command camera attention.

The international community tried to forestall tensions over shared waters. The Nile River Treaty tries to create a win-win situation through finding agreement on and financing for an impressive range of development projects for all of the countries in the region. The price tag is very steep but wars would undoubtedly cost more on all measurement scales.

The new transboundary issues will be complex. They are unlikely to be about water availability alone. There are rich mixes of issues that will plague the 260 shared river basin countries: water dumping in times of flood risk; existence of toxic dumps near water sources; inadequate

[15] Aaron Wolf, in WATER 21, Febuary 2003; Dept of Geosciences, Oregon State University
[16] US National Intelligence Council – Global Trends 2015
[17] Aaron Wolf.
[18] *Voices from the Poor*, Video, shown to UN Committee on Sustainable Development, April 2004

industrial protection; salinity and agricultural wastes in the stream; building dams and infrastructure without consultation. Climate variability will add to the complexity of this mix.

Promises

Let's start on the Drinking Water and Sanitation side:

Desalinization becomes a more and more interesting option for some, given that sea water comprises 97% of the earth's water. Some 12,500 desalinization plants now dot the planet, with 2/3 of these in the Middle East, and fully one quarter in Saudi Arabia. New plants are being built in Florida, California, and the Caribbean. A new generation is low-cost, small-scale, individual water lifting and application devices. Only 1% of water use is accounted for by desalinated water, but the number is growing. [19]

Membranes, offer promises for water remediation. Why not re-circulate all of the gray water in an apartment building – indeed if the membrane is good enough – why not re-circulate all of the water? Why not build whole neighbourhoods on this principle – why have huge water mains and sewer mains if the processing can be done locally by membrane?

Demand Management. Anywhere there is metering, demand drops. In California – Pacific Institute "Waste Not, Want Not" estimates that up to one-third of California's current urban water use -- more than 2.3 million acre-feet -- can be saved using existing technology. And at least 85% of this savings (over 2 million acre-feet) can be saved at costs below what it will cost to tap into new sources of supply and without the social, environmental, and economic impacts that any major water project will bring. [20] Composting toilets reduce the demand for water, as do innovative pit latrines for communities of modest means.[21] Separating feces and urine allows these to be treated as resources.

***Policy** Change.* All of these technical fixes have their place, but the real imperative if for changes in policy – for both water resource management and water supply. In looking at water supply and sanitation, two dozen experts working for two years under the Millennium Task Force Umbrella were unanimous that the water and sanitation target, "*to cut in half, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation,"* will not be reached unless:

1. There is a ***deliberate*** commitment by ***donors*** to increase and refocus their development assistance and to target sufficient aid to the ***poorest low-income countries***.

2. There is a ***deliberate*** commitment by governments of ***middle-income countries*** that are not aid-dependent to reallocate their resources such that they target funding to the ***unserved poor***.

3. There are ***deliberate*** activities to create support and ownership for water supply and sanitation initiatives among both women and men ***in poor communities***.

4. There is a ***deliberate*** recognition that basic sanitation in particular requires ***an approach that centers on community mobilization*** and ***actions that support and encourage that mobilization***.

[19] www.globalwaterintel.com/Management%20Reports/desalination.htm
[20] Pacific Institute www.pacinst.org
[21] Sulabh Institute, Delhi

Let's look at some of the water resource promises.

More water. The time honoured solution to water problems has been to increase supply, in build dams, extend the pipelines, and pump more out of the aquifer. China is busy moving part of the Yangtze River to the North, and India is talking very seriously about joining its rivers in a national grid. The Red-Dead Sea Connector talks go on throughout the Middle East atrocities.

So the supply side process continues, with its serious consequences for rivers, aquifers, and displaced populations. Many unnecessary dams have been built, with benefits to be sure but a great deal of ancillary damage for the simple reason that it is a lot more politically rewarding (and in many countries a major source of corruption income) for Governments to supply more water than to attempt to reduce the demand of their populations.

As of two years ago, there were 47,655 large dams in the world and about 800,000 small dams.[22] Interesting, they are almost all in the medium to rich countries. Anti dam protesters in the industrialized world, through their pressure on industrialized state governments and international financial intuitions, have ensured that IFIs no longer fund dams. As a result even needed water storage capacity has not increased in the poorest countries. [23] Middle class countries such as Turkey, Iran, China and many others have gone on building dams using other resources. The poorest cannot finance with their own resources, and therefore do not have the storage they need. No countries with variable rainfall have become prosperous without being able to store water. There is almost no storage capacity in the poorest countries, almost all of which have highly variable rainfall patterns. Unless this changes, they will stay poor.

Nanotechnology. If engineered microbes can eat oil in oil spills, and might be designed to transform arsenic to less harmful compounds, why not engineer them through nanotechnology to take on the heavy metals in our waste water (and then use bulrushes to purify the organic wastes, a delightful mixture of high tech and low tech!)

Better Science for Water for Food. For the first time in world history, water demand for nonagricultural uses is growing more rapidly in absolute terms than water demand for agriculture. [24] The task is to 'reinvent irrigation for the 21st century'. There is, for example, a wide technology gap between *required* irrigation practices for wheat, barley, corn, cotton, sugar beet, potatoes and tomatoes and *actual* water application in most areas. Improved water use efficiency means high potential water savings. The 'free ride' we have had while we have depleted groundwater resources is coming to its inevitable end.

The objective must be that each cubic meter of water should be applied at right time – efficiency comes by applying even small amount of water to alleviate severe moisture stress during most sensitive stages of crop growth and seed filling – applying before stress peak plants yield potential.

New technology can and will help in this process. There are many new and exciting techniques we can use to help us make water go further

- Watershed modeling,
- Integrating simulation techniques with GIS projections
- Maps graphs for natural resource impact

[22] World Commission on Dams – WCD 2001
[23] World Bank Water Week 2004; waterweek_2004@worldbank.org;
[24] Mark Rosegrant and others, Global Water Outlook to 2025: Averting an Impending Crisis(2002), by the International Food Policy Research Institute (IFPRI) and the International Water Management Institute (IWMI)

- Daily temperature data, soil and land management data collected from meteorological data,
- Satellite imagery,
- Surface flow processes, erosion, nutrient transport, grazing effects, yields.

The evidence that these techniques can work is provided in compelling figures. I have the honour and pleasure of being the Chair of the Board of ICARDA, the International Center for *Agriculture in Dryland Areas.* It has special expertise in the area most likely to be most affected by climate change. Look at some of their findings:

- A 50% decrease in irrigation water use in the ICARDA area wheat irrigation gives only 10 – 20% loss in cereal production
- Winter sowing of cereals reduces water needs – lentil and chickpea yields are doubled if they are planted earlier to catch the Mediterranean rain
- Water harvesting yields small and big miracles – in India and around the world
- New drought tolerant cultivars offer huge potential for improved yield in dry conditions
- Improved forage crops – it is estimated that if 70% of the 30 m hectares of land left fallow in West Asia and North Africa every year could be sown to forage legumes, that this would produce enough feed for 80 million sheep, and could increase by 1.4 m tones the nitrogen fixed.[25]

Saltwater and Wastewater Agriculture. We can also find "new" water for food if we redirect research priorities and put in place effective regulatory frameworks.

- Water harvesting
- Brackish water
- Treated effluent – the issue here is how much treatment? This has to be one of the most exciting potential areas for "finding" water with each 100 cu meter increase in a city results in 70 cu meter waste water production; the hazard is that industrial and biological wastes are often mixed, toxins and heavy metals in the admixture.

Rainwater Harvesting. The old techniques are being rediscovered and reapplied to yield more water for topical use. Eaves-troughs are collecting water from schools and public buildings to provide water for community use. Families are collecting rainwater – all over India, but also in Germany. Tanks are being rebuilt and watersheds refurbished in the process; rivulets are flowing in formerly denuded landscapes.[26] Communities are putting water back into the subsoil and aquifer by conscious channeling of rainwater. Global satellites may help us to do this on a global basis.

Reallocation. Some of the real answers will have to come through allocation decisions. Pragmatic but sometimes difficult steps can lead to dramatic consequences

- Jordan – a 5% transfer from agricultural use would increase domestic supplies by 15%
- Morocco – where 92% of water is used for agriculture, a 5% diversion would effectively double the supplies in domestic sector
- The San Diego and Imperial Valley accord sees the municipality pay for water that allows investment in improved irrigation facilities. The water used in Imperial Valley agricultural use would provide for domestic use for 12 million people
- Costa de Hermosilla in Mexico – proposals to improve agricultural use pattern could avoid need for desalination plant (100 km from coastline)

[25] ICARDA, Aleppo Syria.

[26] The Global Rainwater Harvesting Collective, The Barefoot College, SWRC, Tilonia, Madangunj, Rajasthan, India, : grwhc@sancharnet.in

What can the World do?

Water cannot be created; it can only be managed. And water is local, quintessentially so, unlike energy or food commodities which travel through trade. There is an almost compete paucity of international law on the subject of water governance; the single UN treaty which took 30 years to negotiate[27] will probably never come into force. In these circumstances, what should be the global role on water management?

If by common consent, there is enough water – *just* enough in many areas, but probably enough, can't we just improve management? A brief glimpse at traditional water management precepts will signal some of the issues. How do we manage water now, or, how did we get into these difficulties?

- There is usually no Ministry of Water, and there is no single UN water organization to set global standards for water management. There are sectoral standards, of course.
- Governments see their principal role as delivering water to their citizens.
- "Water should be no cost/low cost" is tenet of many who advocate that water is a Human Right insist that it must be free (the relevant UN resolution says 'affordable')[28]. While subsidy is essential to protect the poor, paying enough to keep the system going is essential in countries with no tax base, few government revenues and other priorities for aid Euros.
- Water governance/expertise are organized sectorally.
- Jurisdiction: rivers, lakes, groundwater doesn't respect national boundaries;

Things are changing and there are new ways of looking at water governance. More rather than less governance is needed for this ultimate public good. The following water management functions must therefore stay in public hands:

- Allocating water
- Deciding on, protecting the environmental share
- Establishing water law
- Setting regulatory framework
- Managing inspection functions
- Ensuring data collection, retention and distribution
- Managing public debate on issues
- Managing communication on water issues.
- Getting some of the corruption out of the water sector[29].
- Ensuring subsidy for poorest population

There is huge controversy over whether the actual *delivery* of water services – water supply, sanitation, irrigation systems, canal management et al, public sector water management should be a public or private responsibility. The Dutch, Canadians, Swedes and others have exemplary publicly managed systems. In other countries Governments exercise their responsibilities through contracting with the private sector to perform specified roles. In some developing countries with long years of poor performance (often for reasons beyond the control of utility operators), the private sector might better address some of the non performance issues: leaks, needed investment, lack of billing. This is hotly contested by those who believe that the profits and water should not be associated.

[27] Agreement on The Non Navigable Use of Water et al, UN
[28] ECOSOC - 2002
[29] Transparency International

It must be a public decision what the private sector does. Elements of public policy such as subsidies to the poor for energy or water pricing, enforcement of specified environmental flows, waste water quality et al depends on the stipulations in the contract with the public authority. A great deal of contention surrounds the desirability of the private sector being involved in water service delivery. The focus on this issue has in fact tended to exclude public examination on the adequacy of the role played by public authorities on the above listed urgent water policy issues.

What can Germany do?

Germans are of course involved in their own national and local water management, and have strong views on European water management issues. Germany has a history of major investments in water management. Some factors might draw you toward even greater involvement: the concern to reduce tensions in areas of particular difficulty; the wish to improve livelihoods threatened by water shortage inter alia to reduce out-migration toward your borders; general concern to preserve the regional public good of clean rivers in order to protect environmental resources; and most of all desire to support poverty reduction which underlies the development assistance programme.

The main problem is that while one can also offer pipes and reservoirs, moving beyond these into the factors that make systems sustainable is difficult. Dams, private investment in water, payment for water – all of these are difficult issues. Why would the German Government espouse the difficult side of these issues, which are vitally important in the developing world but have no direct impact on Germany – and indeed could be very divisive.

For example, if Germany is serious about fighting poverty, we have to recognize that *all* of those countries with variable rainfall patterns which have become prosperous have done so by storing water so that farmers and industries and cities will have water in rainy and dry season alike. Germany should take a long look at the policies and administrative provisions we have allowed to evolve in International Financial Institutions regarding stored water. Is it really reasonable to deny the poorest water storage through via procedures that make it virtually impossible for bankers and lenders to take on these projects?

Are we ready to take on the 'payment for water issue"? Providing potable water to the poor communities in the world is still a challenge for humanity. In most of the poor parts of the big cities, the poor are served by vendors and pay often ten times the price paid by those who are connected to a network. Subsidies, though essential, will never be big enough to cover the needed costs. Neither the rich in the developing world, especially farmers or industrialists, or many very active NGOs in the industrialized accept water pricing either: it is dismissed as 'commodification'. So systems continue to degrade and under perform. Whether the systems are private or public, they need funds to perform, to be maintained and to continue service delivery.

Agriculture is the biggest water using activity and is responsible for 70 to 80 % of a country's water consumption. It warrants careful attention. Billions are spent in subsidies to farmers throughout the world but they are allocated without any consideration to water problems, thus creating artificially a water crisis, which will manifest itself as a food security crisis. Do we care enough to become embroiled in this very difficult issue?

The water problem is as much a financial problem as a water problem. There is no solution to the water problem without some overhaul of the way agriculture is subsidized, water as an industrial or agricultural input is priced, local authorities are vested with the responsibility to provide water to their inhabitants and good managers and sustainable financial resources are allocated to them.

It is not simple, not at all. Moving to a conscious, transparent, publicly announced allocation of available water is a fraught process almost guaranteed to generate more enemies than friends for the party doing the allocating. The move toward charging for water services offers opposition parties an instant election issue. Managing across boundaries and agreeing to share the benefits of water, often between neighbours with centuries old traditions of mistrust is not easy. Current arrangements favour the powerful; who will speak for the weak? Who speaks for the environment? Irrigated-land agriculturalists in many countries have much more power than either the rural or urban poor. There are taboos against waste water re-use.

All of this changes every day. Every day, the population grows and the amount of water available per person decreases. Every week, somewhere in the world there are manifestations of climate variability which will have marked impact on water resources. Every month, pollution increases. Meetings are held to assess how best to intervene. And every morning, the women walk a little further to find water to keep their families alive.

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