

## **Governance and Water Management in Asia: What do we need to Learn?**

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Water resource issues are increasingly perceived to constrain development, to contribute to impoverishment and to threaten the sustainability of economic activity and of ecological integrity. The reliability of water resource availability, in terms of both quality and quantity, is deteriorating and water resource parameters are changing rapidly in many parts of Asia. But the challenge in managing water resources is mainly one of governance. Many of the issues around water have to do with who decides, what factors are considered and by what process decisions are made. What do we need to learn about governance, decision-making and water resource management? In October 2003 the International Development Research Centre convened a meeting of regional experts in New Delhi to discuss the research agenda for water resource management in Asia. This paper reports on those discussions.

There are several thematic issues that cut across all research efforts in this field. While interdisciplinary work is critical to sound research and policy on water issues, there continues to be a gap between natural and social sciences and researchers are typically not rewarded for venturing outside their own discipline. Throughout the water sector, decision-making is plagued by inadequate data and lack of access to the data that is available. There was a sense that a broader range of tools for policy implementation is needed and that orthodox water management policy tools lack sensitivity to diverse political context. Given the difficult issues involved, policy change will require building capacity and robust, well-documented pilot successes.

There are also some key topics of learning that deserve closer attention to inform development decision-making. In many cases in developing countries, water rights are often poorly defined, or informal. Furthermore, differences in water resource rights may be systematically biased by gender, ethnicity or caste. There is a question as to what is the appropriate scale to adopt in addressing water management issues. We need to seek opportunities to elaborate and test innovative governance processes in the water sector and to examine success and failures of decentralization and privatization.

As with other areas of applied research for development, there is also a need for researchers to have a better understanding of the processes of decision-making and governance to better focus and target their research questions. As water resource managers seek to ensure the representation of different interests and values in the decision-making process, they need to recognize the challenges. "Social auditors" play an important role, but it is a role, which has many weaknesses in public contestation of water issues. An iterative adaptive learning model was suggested to enable action yet also respond both to accumulated lessons, and to the dynamic context of water management.



## Forces Behind Accepting / Rejecting Water Pricing

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The world at large recognizes the adverse impact of water scarcity on global development. Water scarcity is the result of the expanding gap between the ever-rising demand for water and the water endowment. On the one hand, the rise in demand is due to the drastic increase in the world irrigated area from about 350 million acres in 1961 to 670 million acres in the year 2000 (FAOSTAT 2004), economic growth, industrial expansion, and energy water consumption. On the other hand, the water endowment was used to be determined by natural climate variations. But, the “intensive anthropogenic change of the hydrologic cycle of rivers and lakes” makes water resources also affected by man’s activities (UNESCO 2002).

Sincere efforts are being exerted to ameliorate the impact of water deficit. Scores of international and regional meetings are being held (Text Box 1), new organizations are coming into existence, a huge flow of literature is being articulated, and tens of projects are being carried out worldwide.

### ***Text Box 1: A list of main water-related events took place over the last decades.***

In 1960, the UN Coordination and Advisory Council set up an inter-agency sub-committee for freshwater resources. 1977, the first international water conference was held in Mar de Plata, Argentina where the International Water Resource Board was established. 1980, the International Drinking Water and Sanitation Decade started. The year 1992 witnessed several events. The second international water conference was held in Dublin where the principles on sustainable water management were set out; followed by the Earth Summit in Rio which supported the Dublin Principles; then, the Helsinki Convention set restrictions on contamination of transboundary water courses. In 1994, the Ministerial Conference on Drinking Water and Environmental Sanitation was held. In 1995, the World Water Council was established. In 1996, the International Conference on Water Policy held in Cranfield University, UK. 1997, the UN General Assembly identified the management of drinking water, sanitation and freshwater as critical issues. In the same year, the First World Water Forum was held in Marrakech and the World Water Vision and Framework for Action Process were initiated. The year 1998 was also full of water-related events: The UN Department of Economic and Social Affairs Expert Group met at Harare, Zimbabwe to discuss the strategic approaches to freshwater management, the International Conference on Water and Sustainable Development was held in Paris, the Sixth UN Commission on Sustainable Development assessed strategic approaches to freshwater management, the EU forum was held in Strasbourg to look at water as a source of citizenship and regional peace, the World Commission on Water was initiated as an umbrella organization for the World Water Council and Global Water Partnership, and the Stockholm Water Symposium was held. In December 2001, the International Conference on Freshwater was held in Bonn. The year 2002 witnessed the 2<sup>nd</sup> World Water Forum in The Hague and the World Summit on Sustainable Development in Johannesburg. In 2003, the 3<sup>rd</sup> World Water Forum is held in Kyoto.

Unfortunately, international efforts failed to reach a unified approach concerning how to deal with water scarcity. For instance, a report on the outcome of the World Water Council (WWC) forum in the Hague (attended by a broad diversity of stakeholders) states:

*“The second forum infused the whole spectrum of participants with the notion that water is everybody’s business and not the exclusive business*

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*of governments and water professionals. Much less agreement was obtained on the model that should replace this government monopoly.”*  
(Guerquin et al. 2003; p. xxiii)

Despite the lack of complete agreement, a majority of professionals believes that the problem lies in the illogic of the water management model followed in many parts of the world. Developing countries believe that water is a social resource. Hence, water should: (a) be exclusively managed by a government institution to assure its availability, and (b) be supplied free of charge or heavily subsidized. This school of management is termed the “social paradigm”.

The social paradigm seems as if it were designed to boost its use and consumption!! On the contrary, when water deficit is expanding every day worldwide, the target of water resource management should be to induce water rationalization and conservation. To achieve such target, water has to be managed as an economic resource (Guerquin et al. 2003, Morris 1996, Lundqvist and Clausen 1994). In that, water should have a price that reflects its opportunity cost and, in addition, a suitable market scheme to allow trading water among users within the one sector and among sectors (termed the “economic paradigm”).

This paper looks into the factors affecting the decision to shift from the social to the economic paradigm. Section 1 argues that the economic paradigm will evolve along with the development of the whole society. Section 2 discusses the argument behind the social paradigm and the response to it. Section 3 points out that covering for water scarcity by importing virtual water from the international market is not a reliable solution. Section 4 concludes that adopting the economic paradigm is strongly recommended to counteract water scarcity. Yet, in the light of the success and failure stories of many countries, adaptation should be carefully designed.

### **1. Water Pricing is a Matter of Evolution**

Professor Tony Allan of the School of Oriental & African Studies (SOAS), University of London identifies five paradigms of water management that employed over the past 150 years (Allan 2000). The first paradigm belongs to the pre-modern communities. Of the main features of that era are small population, limited technology, poor organizational capacity and central allocation of water resources. The second paradigm started evolving during the 1950s and the 1960s. Industrial modernity, hydraulic mission, development of organizational capacity, expanding engineering capabilities, and progress in water sciences are the deriving forces behind the birth of that paradigm. The third paradigm is the ‘green reflexive’ paradigm emerged as a result of the surge in environmental awareness. A reduction in the allocation of water to agriculture and more for environmental needs is main features of this paradigm. Additionally, the world started perceiving the limitation of the water endowment in meeting the growing demand. The fourth paradigm is the ‘economic reflexive’ paradigm. Industrial and agriculture water uses are guided by economic criteria in the North. However, the South rejected the idea of water as an economic resource and continued looking at it as a social one. The fifth, and most recent, paradigm is the ‘inclusive politics and institutional reflexive’ paradigm.

The model suggests that the evolution of water management is concomitant to the development of different disciplines in the economy. It is an integrated part of political, economic, scientific, educational, and institutional development. Nevertheless, understanding the argument underlying the social paradigm (presented in the following section) helps the evolution of water management.

## **2. Is Water “Social” Or “Economic” Resource?**

Of the controversies in the arena of water management is the preference of the social paradigm over the economic paradigm. This attitude is based on a number of debatable elements.

First, a focal point in the social paradigm argument is that water is too important for life. True, yet heavily abused in justifying the supply of scarce water free of charge and in the public top-dictated management of all water resources operations (collection, storage, distribution, and allocation).

A more precise statement is that the human right to water entitles everyone to sufficient, safe, acceptable, physically accessible, and affordable water for personal and domestic uses. The advantage of this statement is that it limits an individual's water security to the basic needs only; not the whole water endowment. Here, “sufficient” is estimated by the World Health Organization (WHO) at 20 liter/caput/day (WHO 2003). If basic water needs is secured to everyone --a remarkable achievement by itself--, then the rest of the water endowment can be managed economically.

The social paradigm has failed to stand to its own slogan. In the developing world, there is 1.5 billion people lack adequate clean water. By 2025, this number is expected to reach 2.7-3.3 billion or roughly one third the world population (Gardiner 2000)! Specific examples include Eritrea where only 7% of the people get clean water, Cambodia 13%, Mozambique 32%, and Paraguay 39% (Bosch et al. 2002).

Worse still, water distribution is biased against the poor. In Ecuador, 75 percent of the households among the poorest fifth lack piped water, compared with 12 percent among the richest fifth. In Sao Paulo, Brazil, per-capita water of 9 percent of the people living in the richest areas is five times that of the 41 percent living in the poorest areas. In Accra, Ghana, water consumption per capita among the one-third of people living in the richest areas is three times higher than that among those living in the poorest areas (Bosch et al. 2002).

Even when the poor gain some access to water, they pay for it more than what the rich pay! In seventeen developing countries in Asia, Africa, and Latin America, the poor pay private water vendors a tariff, which is 5-100 per cent more than that of the public source, which is not available to them (Bathia and Falkenmark 1993). When water is too dear to the poor, they often cut back on their basic personal and hygiene requirements. Even more, they might substitute it by contaminated water. It is estimated that 10 percent of the total burden of disease in developing countries is attributed to the use of contaminated water and inadequate supply (Bosch et al. 2002).

Second, another misleading statement is that water is a free gift of Mother Nature, so why pay for it.

No doubt, water is free where it falls. There is no knowledge of any charge for rain falling on a farm or any other establishment. Yet, to provide water in the right quantity, with the suitable quality, and on time, heavy investments are required to build structural works necessary to collect, store, and distribute water. Beside investments, considerable funds are essential for proper system operation and maintenance (O&M).

Governments suffer the burden of public debts and lack of liquidity. They will not be able to provide adequate funds for O&M of an irrigation-drainage system. Evidently, the lack of suitable O&M fund speeds up the deterioration of existing structures, undermines its efficiency, and harm distribution equity. The lessons learnt in fifteen Asian countries tell us to

let the users pay for O&M of the system in proportion to the benefit they derive (Easter 1990 and Small 1990).

The same parable is found in a different context. In Egypt, conveyance losses are very high because of unauthorized outlets, excessive cross-sections, the practice of day-light irrigation in a twenty-four-hour delivery system, over-irrigation, mismatch of supply and demand, and blockage of weeds, debris, and tree roots (El-Hessy and El-Kady 1995). In this situation, farmers are waiting for the government to pay the cost of working out those problems. The untold story is that in a free-of-charge delivery system, overcoming those problems cost farmers far greater than the value of the wasted water!

The harmful effect of free water on distributive equity is explained by means of two cases: one from Asia and the other from Egypt. In Southeast Asia, high water withdrawal for paddy irrigation by head farmers reduces the availability of water to tail farmers (Seckler 1986). To overcome similar problems in Egypt, the government imposes zoning and area restrictions on the cultivation of rice. Still, farmers are used to violate those restrictions, pay the penalty, and, at the end, make sizable profit. To be sure, the average rice area cultivated in violation of the restrictions exceeded 250 thousand acres/year during the period 1989-93 (El-Hessy and El-Kady 1995). So, privileged farmers can exploit the social paradigm at the account of disadvantaged farmers.

Better water management can bring about a change in users' behavioural attitudes towards rationalization and conservation. Modern techniques play a significant role in that respect. Regulated-deficit irrigation, partial root zone drying, and subsurface drip irrigation can achieve substantial water savings and reduce farming costs with little or no impact on the quality and quantity of yield (FAO 2000-c).<sup>2</sup> Yet, if water is free of charge, then why would a user take the burden and the risk of adopting new practices to rationalize or conserve water? In order to improve history-long practices, the cost of production should be directly related to the quantity of water withdrawal. This can be achieved if a user is charged proportional to water withdrawals.

Third, water, by its very nature, possesses a set of characteristics that renders it not directly marketable (Young 1996, Morris 1996 and Dinar et al. 1997). Of those characteristics is that water is fugitive (flows from a place to another, evaporates, and seeps). This feature makes it difficult to establish property rights -- a main pillar of market transactions.

Creative solutions and suitable institutional arrangements have been innovated to introduce water markets. Property rights are redefined in the context of water resources. It does not mean the usual exclusive ownership. It is confined to the "claim over a stream of benefits" during a specific time period and backed by a sanctioning enforcement (Bromley 1991 and Meinzen-Dick et al. 2004).

Beside property rights, a water industry can conveniently be divided into a number of vertically integrated layers. One simple division distinguishes four main layers: (1) production of physical water from the environment (collection or extraction, storage, and management of related structures), (2) transmission of the bulk of water to a region, (3) distribution, and (4) retailing (sales, and billing). Entry to and exit from a layer depends on its attributes especially sunk cost. Higher sunk cost inhibits market entry (Wills-Johnson 2003). Higher sunk cost renders a layer a natural monopoly, which is best handled by the public. Layers with lower or no sunk cost can be opened for the market. This is so because it requires huge investments

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<sup>2</sup> Regulated-deficit irrigation allows mild stress by applying water below maximum levels. This practice has been applied successfully in winter wheat in the North China Plain, peach and pear trees in southeastern Australia, and in India. Partial root zone drying subjects one-half of the root system to a dry phase while the other half is irrigated (FAO 2000-c).

to enter the market and entails heavy losses to exit. Normally, sunk cost gets higher as we move towards production (layer 1) and gets lower as we move towards retailing.

Fourth, the social paradigm is in direct conflict with the norms inherited from communist and social political regimes.

Indeed, the difference in the attributes of various layers of a water industry opens the door for the social and the economic paradigms to coexist in one hydraulic system (Affeltranger and Otte 2003). The economic paradigm does not have to replace the government nor public institutions completely. On the one hand, public institutions, are needed in order to invest in and to manage the layers of the water industry characterized by heavy sunk cost. The government is needed to back up communal institutions, and to make sure that enough water is provided to people. On the other hand, communal and private institutions should make sure that provided water is duly paid for.

Both the social values and the economic criteria can be considered side by side when reallocating water from low to high value uses (Chalker of Wallasey, 1996). Yet, simultaneous application of economic criteria and social objectives cannot be achieved by a central authority. It requires a high degree of decentralization, participation of stakeholders, and collective action where all players are included.

Unfortunately, empowering the people to manage a vital resource as water is generally perceived as a direct threat to the power of authoritarian regimes (Ostrom 2004). This belief is a principal obstacle to the evolution of the management of water resources. So, governments go around improving management to counteract water scarcity by importing virtual water from the international markets (Allan 1996). However, the following section demonstrates that this “silent” solution is not sustainable.

### ***3. Importing Virtual Water Conceals Water Shortage***

Trends of the international market strongly suggest that water-shortage countries might not be able to import virtual water in the future. Food security projection tends to be pessimistic. The World Food Security Report estimates the number of undernourished people in the world at 840 million of which 95% live in developing countries. Numbers of children under the age of five years who die annually as a result of hunger are estimated at six millions. Furthermore, the target of the 1996 World Food Summit to halve the 1990-92 numbers of chronically undernourished people by 2015 is not likely to be met (FAO 2002-a). Likewise, IFPRI (the International Food Policy Research Institute) analyzed the effect of 14 production scenarios on food security over the next three decades. The study concludes that food security could severely worsen if policy and investment commitments from national governments and international donors weaken further (Rosegrant et al. 2002). In much the same way, another study expects 20-40% drop in per capita grain by 2050 (Kindall and Pimentel 1994).

Continuously growing population, rising income, and slowing agriculture production are main factors behind the bleak view. In 1950, the world population was 2.5 billion, exceeded 6 billion in 2000 and expected to reach 8-11 billion by 2050 according to the low, medium, and high projections (UN 2003). The level of income is expected to grow at 2.3 and 2.9% per annum during the periods 1997/99-2015 and 2015-2030; respectively. Together, population growth and increase in income will raise demand for agriculture products at 1.6 and 1.4% per annum, food cereals at 1.2 and 0.9%, and feed cereals at 1.9 and 1.5% during the periods 1997/99-2015 and 2015-2030; in order (FAO 2002-b). The slow down in the projection of demand for cereals emanates from the decline in the annual rate of increase in the world demand during the past three decades. The decline is due to shifts in human diet and animal feed and reaching saturation in cereals consumption in some northern communities.

A glimpse of hope comes from the possibility of raising food production by boosting crop yield, crop intensification through shortening fallow periods, improving resource management, and bringing new land into production. Genetically modified crops, though have not been widely accepted yet, has great potentialities for food production (Paarlberg 2001 and Pinstrup-Anderson and Schioler 2001).

Apart from production, the international markets generally alleviate hunger. But, it is open for poor countries as long as they are able to pay. Poor countries suffer meager purchasing power because of: (a) their modest domestic production base, (b) limited capability to generate export proceeding, and (c) expected rise in food prices as developed countries comply with the Agreement on Agriculture (part of the Uruguay Round) to eliminate price support and protection to agriculture products. Under such unfavorable circumstances, the ability of poor countries to buy their food needs from the international market will diminish. In other words, the policy of importing international virtual water is not reliable. Already, poor countries are just able to import less than 10 percent of their food needs compared with more than 25 percent in more food-secure countries (FAO 2004 and Scott 2003).

Reliance on food aid has unfavorable long-run impact. Hardly, aid recipients have any degree of control over aid policy formation or maneuvering against powerful lobbying. Furthermore, donated or cheap food creates dependency and diverts consumer preferences away from local production (World Food Council 1984). Moreover, local production might fail to compete with imported cheaper grain. As a result, farmers may move away from the production of basic food.

### **Conclusion**

Arid and semi-arid zone countries are suffering mounting water shortage or stress. Top-dictated free water allocation on the ground that it is a social resource is a luxury those countries cannot afford any more. Improving water management is indispensable solution. Prudent management would check that water is allocated where the willingness to pay by users is not less than its representative opportunity cost. This can be achieved by allowing gradual vertical integration among state, community, private and market transactions. It is *via* those institutions that competition among sectors and among users within the one sector can be settled. However, proposed institutions have to be carefully designed. Recorded experience (e.g. CPI 2004) presents success stories as well as tragedies.

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# **The Politics of Multi-Stakeholder Partnerships for Water and Sanitation: The Significance and Worth of the World Summit Type Two Partnerships.**

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## ***Abstract***

At the World Summit on Sustainable Development (WSSD) in 2002, governments set targets to halve the number of people worldwide without access to a clean water supply and adequate sanitation by 2015. Alongside the formal intergovernmental (Type One) agreements was the advent of a new kind of initiative to help implement the agreed goals: multi-stakeholder, Type Two Partnerships (TTPs). This paper presents the preliminary findings of ongoing research on TTPs, focusing in particular on the UK based Partners for Water and Sanitation (PAWS) and the EU Water for Life Initiative (EUWI).

## ***Preliminary Findings***

Documentary analysis and semi-structured interviews with partnership members reveal the following preliminary findings:

- 1- Multi-stakeholder partnerships are not a panacea and should not be initiated simply because current thinking counsels that it is fashionable to do so or because it is politically opportune. Often they are not 'true' partnerships and they can prove to be unwieldy, politically problematic, expensive, slow to progress, and inappropriate.
- 2- Whilst the expertise and skills of the private sector and civil society may be of great value, neither can replace government, whose commitment and capacity is vital. A related danger to be considered with TTPs is that, if they are not in harmony with indigenous government, they may inadvertently set up an alternate power base in partner countries.
- 3- The role that the international private water sector can play in achieving the WSSD targets should not be overstated but their expertise and skills should prove helpful. On the other hand, indigenous or domestic private water sector players may be able to make a more valuable contribution towards meeting the goals.
- 4- Civil society participation has been established as a precursor to successful water and sanitation reform. However, it is not clear that in African partner countries, civil society stakeholders are substantially engaged with partnership projects in all cases. This may relate to the chosen function or role a partnership assumes, and it is also because the local infrastructure does not always exist for their participation
- 5- TTPs have the potential to be an important mechanism through which to achieve the WSSD goals, but only if they are seen as valuable by governments in developing countries. Without indigent government action, TTPs will make little impact in directly reducing the numbers of people lacking adequate water and sanitation.

## ***1. The Problem And The Type Two Solution***

Over a billion people worldwide lack access to safe water and more than double that figure have no access to adequate sanitation. At the World Summit on Sustainable Development (WSSD), held in Johannesburg in 2002, governments set targets to halve the number of people worldwide without access to a clean water supply and adequate sanitation by 2015 (United Nations 2003). Alongside the formal intergovernmental (Type One) agreements was the advent of a new kind of initiative to help implement the agreed goals: Type Two partnerships (TTPs).

Awareness of the need for stakeholder involvement in sustainable development, and in turn water and sanitation provision, has been steadily growing. Hemmati & Whitfield suggest that whilst sustainable development has been “established as an overarching concept in intergovernmental processes, [it] is not something that governments and agencies can achieve on their own. It takes the contribution of all stakeholders and their individual and collective actions to bring about the changes required” (Hemmati & Whitfield 2003a, 3). No longer, it seems, are social equity, environmental, and economic concerns purely to be managed by governments; other ‘stakeholders’ must play their part and share in these responsibilities. In “developed and developing countries alike, the state is being compelled to redefine its role in social and economic activity – to reduce it, reorient it, reconfigure it” (United Nations Development Programme 1997, 7). Thus TTPs can be viewed as one mechanism for ensuring that actors other than governments are involved in development processes, and in the governance of water and sanitation.

TTPs take a multi-stakeholder approach, incorporating many actors including governments, intergovernmental bodies, civil society, and the private sector. TTPs may therefore be indicative of a shift away from reliance purely on governments to provide water and sanitation services, towards a more inclusive approach incorporating other actors and assigning them a certain level of responsibility. This could signal a change in orthodoxy regarding attitudes towards how water and sanitation provision should be governed and thus it is important that more is understood about the roles different stakeholders can play in achieving the WSSD targets, and the political implications of TTPs. As Jonathon Lash, President of the World Resource Institute notes,

*“the WSSD will be remembered not for the treaties, the commitments, or the declarations it produced, but for the first stirrings of a new way of governing the global commons – the beginnings of a shift from the stiff formal waltz of traditional diplomacy to the jazzier dance of improvisational solution-oriented partnerships”* (Lash quoted in World Resources Institute 2002).

In the Johannesburg Plan of Implementation the UN Commission on Sustainable Development (CSD) was designated as the nucleus for discussion on TTPs. It will be holding its 12<sup>th</sup> meeting in April this year where the progress that TTPs have made will be reviewed. In May 2003, at its 11<sup>th</sup> Session (CSD-11), the CSD agreed “to a set criteria and guidelines for partnerships within the context of the WSSD process and its follow-up, and stressed that partnerships should be developed and implemented in accordance with these which take into account the Bali Guiding Principles” (United Nations Division for Sustainable Development 2003). The Bali Guiding Principles were decided upon at a preparatory meeting for the WSSD and they assert that “Partnerships for sustainable development are specific commitments by various partners intended to contribute to and reinforce the implementation of the outcomes of the intergovernmental negotiations of the WSSD” (Kara & Quarless 2002). These partnerships are intended to be self-governing, voluntary in nature, transparent and open, self-reporting and self-monitoring, and they are supposed to have an international impact (Kara & Quarless 2002). At present, of the partnerships which have been deemed to fulfil the Guiding Principles, 17 have been clustered under the heading ‘Freshwater’, and there are many other partnerships whose work is significantly linked to this issue.

Whilst work being done by TTPs for water and sanitation does not exclusively concentrate on the African continent, the EU reports that “Water problems are most acute in Africa where it is estimated that 300 million people are affected by water shortages” (European Union 2002, 1). Accordingly, Sub-Saharan Africa has provided the focus for this research and in particular investigation has centred on two TTPs working (or potentially working) in this area – the UK government led Partners for Water and Sanitation (PAWS) and the European Union led ‘Water for Life’ Initiative (EUWI). The findings presented in this paper have been established

through undertaking substantial documentary analysis and through conducting semi-structured interviews with nine individuals who represent private sector organisations, government, and civil society groups in both PAWS and the EUWI.

### *1.1 Paws*

“In March 2001, in a speech to the World Wildlife Fund, the [UK] Prime Minister [Tony Blair] announced five initiatives for WSSD” one of which was to be on water (the additional emphasis on sanitation was decided upon at a later date by partners in PAWS) (Partners for Water and Sanitation 2003a). The Prime Minister “called on Chief Executive Officers of private companies...leaders of non-Governmental organisations (NGOs) and Government to work together” and thus PAWS was born (Partners for Water and Sanitation 2003a). The Department of Environment, Food and Rural Affairs (DEFRA) is the main governmental department involved, providing a secretariat for the partnership and co-ordinating communication between partners. Civil society organisations involved include WaterAid, Tearfund and UNISON, and the majority of UK private sector water companies are members, as well as some engineering and consultancy firms (see Annex I for full details of partners). The focus of PAWS’ work is on the often neglected area of “secondary towns and peri-urban areas in Africa” and the stated objectives of the partnership include the desire to “Demonstrate effectiveness of multi-stakeholder engagement...Deliver tangible and sustainable benefits that make an acknowledged and verifiable difference at the local community level...[and] Promote best practice and develop guidelines for effective and sustainable tri-sector partnering” (Partners for Water and Sanitation 2003a). Furthermore, the “emphasis of partner involvement is on capacity building to ensure the sustainability of projects and ensure that they could be replicated” (Partners for Water and Sanitation 2003a).

PAWS is working with three partner countries in Africa; Nigeria, South Africa and Uganda. In Nigeria work has progressed little, mainly because of governance issues within Nigeria surrounding “Federal and State elections” and because of the “development of a National Economic Empowerment Development Strategy (NEEDS), [which is] being undertaken at Federal Government level for completion in mid 2004 and intended to filter down to State level later in the year” (Partners for Water and Sanitation 2004b). In Uganda, a decision had been made by government there to involve the private sector in water and sanitation provision and PAWS is assisting with regulatory aspects (Peacock 2003a, 1). In November 2004 Ugandan ministers, senior officials and other stakeholders visited the UK to learn about different aspects of regulation from UK partners. In South Africa PAWS has made most progress. PAWS has worked with national government to create a customer care charter model, although this has been hindered somewhat because of lack of capacity within South African national government (Peacock 2003a, 1). PAWS has also been working closely with four municipalities and programmes are planned “although [again] there are political and organisational hurdles” (Peacock 2003a, 1). PAWS have also been running a series of seminars in various South African municipalities.

### *1.2 EUWI*

The EU launched the EU Water Initiative: ‘Water For Life’ at Johannesburg with “political support from the European Commission and the 15 Member States” drawing together “government, civil society, private sector and others to help achieve the water-related goals, with “Initial demand...articulated by the representatives from both Africa and the NIS [newly independent states] countries...[and] full political support from the respective governments and other stakeholder partners, in these regions” (European Union 2002, 2). Inaugural partners included NGOs such as Public Services International (although they may have now withdrawn) and WaterAid, as well as three of the biggest international water companies, Suez, Vivendi (whose water business is now called Veolia), and Thames Water (now RWE Thames) (see Annex II for full details of initial partners). Its stated objectives include the wish

to “Reinforce political will and commitment to action...Make water governance effective and build institutional capacity...centred on the principles of integrated water resources management...Improve co-ordination and co-operation...[and] Increase the efficiency of existing EU aid flows” (European Union 2002, 4).

Initially, there were to be 5 working groups which were: “[1.] the African water supply and sanitation component...[2.] the African IWRM [integrated water resources management]/Transboundary component...[3.] the NIS [newly independent states] component [now called the Eastern European and Central Asian (EECA) component] ...[4. the] Working group for development of the financial strategy...[and 5. the] Working group for the research component” (European Union 2002, 11). However, this is no longer the structure of the EUWI, because as one interviewee said, “as each country has taken on the presidency [of the European Commission], they’ve launched new components according to their colonial interests. So the Spanish and Portuguese presidency has launched the Latin American component, Greece launched the Mediterranean component...”, further complicating the initiative (Interviewee 4 2003) Progress has been very slow and whilst the financial component has apparently done some valuable work, the other groups have made little progress. The design phase of the initiative was supposed to be completed by the World Water Forum in March 2003 after which implementation could begin, but the partnership is still in its development phase and the Africa water supply and sanitation component has not even identified specific African partner countries as yet.

## **2. Research Questions**

The focus of this study has been driven by a number of research questions, which include the following:

### 1. Why are TTPs being initiated?

The need for stakeholder involvement in sustainable development, and more specifically in water and sanitation, has been established, and ‘partnership’ has become a fashionable organisational mode in the international development arena (as it has elsewhere). At Johannesburg there were strong political motivations behind many TTP formations and this study highlights the fact that some of the initiatives registered as TTPs at the WSSD may be failing in to operate as ‘true’ partnerships. Furthermore, it is important that practitioners, politicians, and other stakeholders recognise the fact that partnership is not always the most appropriate organisational form to achieve certain goals.

### 2. How much do TTPs differ from, and give added value to, ‘Type One’ governmental efforts to achieve the WSSD goals?

This leads to questions around the nature of the initiatives, requiring us to examine their aims, objectives, practices and functions. It seems the role of government is vital to the success of TTPs because they require political commitment and endorsement. However, this paper will argue that TTPs for water and sanitation may be dominated by governmental actors, rely so heavily on northern government funding, and focus so much on southern government capacity building, that they are little more than extensions of ‘Type One’ agreements. Leading on from this we must also consider the question:

### 3. How well do TTPs complement existing programmes and structures?

This study highlights the need for co-operation between TTPs and existing development efforts and urges caution over undermining indigenous governmental strategies. At the end of the day, the WSSD targets will only be met if southern governments prioritise water and

sanitation themselves. This research also seeks to look at the role certain stakeholder groups can, and are playing in TTPs by asking the following two questions:

4. Should private water and sanitation companies have a 'stake' in TTPs?
5. Do TTPs fulfil their potential to give African civil society more of a voice in decisions that affect them?

It has been suggested that TTPs are just a neoliberal tool being used to further the privatisation objectives of the international private sector and institutions like the World Bank because TTPs may prove to be a mechanism whereby the international private sector can expand in the developing world more easily. This study suggests that this is not likely to be the case in the short-term, although TTPs will aid the international private sectors understanding of how they can work in the developing world, and may also benefit them in reputational terms. This should not however preclude them from being involved in TTPs because ultimately the WSSD goals are so challenging that all forms of knowledge and expertise need to be embraced. However, their contribution can only be a small one and it may be that domestic private companies in the developing world will have more of an impact.

The established orthodoxy now contends that civil society must be involved in water and sanitation governance in order for it to be successful. TTPs have been trumpeted as a mode of operation that can facilitate this and give African communities a say in decision-making, which affects them, but we must wonder if this is being realised in practical terms. It is maintained in this study that TTPs potential in this respect is not necessarily being fulfilled but this relates to the fact that locally, within African countries, the infrastructure and capacity may not exist to facilitate their participation. Their involvement is also affected by what role the partnership is playing and what it hopes to achieve.

Finally this research tries to address the following:

6. How valuable will TTPs be in terms of achieving the overall targets of the WSSD?

The argument put forward is that essentially TTPs may make a valuable contribution to meeting the WSSD goals but it will be a relatively small one because they are unlikely to directly reduce the number of people without adequate water and sanitation in any substantial manner.

### **3. Emerging Themes**

#### **3.1 Type Two Partnerships as 'True' Partnerships**

##### **3.1.1 The Partnership Approach**

It is difficult to pinpoint a precise meaning for the word 'partnership' but Lister identifies it as "a working relationship that is characterized by a shared sense of purpose, mutual respect and the willingness to negotiate" (Lister quoted by Crawford 2003, 142). This is a point Brinkerhoff picks up on when she argues that the principle which defines 'partnership' is that of mutuality which "can be distinguished as horizontal (as opposed to hierarchical) coordination and accountability and as equality in decision making, as opposed to domination by one or more partners" (Brinkerhoff 2002, 325). The 'partnership' concept "has been associated with the terms collaboration, participation...mutuality and citizen involvement" and essentially the term has strong connotations of collective responsibility and shared returns, be they beneficial or detrimental (Gallant, Beaulieu & Carnevale 2002, 150).

It has been suggested that partnerships ought to be established only to achieve goals, which cannot be realised by any single party acting alone (Wilson & Charlton 1997, 10). Furthermore, Robinson proposes that “In a true partnership, the partners’ do not simply cooperate on a project as separate entities. They join together to form a new type of organisation in which all parties participate in identifying needs and developing solutions” (Robinson 1999, 3). Common objectives are important in partnership formation but they are not enough to bind a partnership and must be supplemented by “trust, respect, ownership and equality” (Hemmati 2002, 55).

The strength of the TTP approach, as identified by one interviewee, is that “it brings in a whole range of different experiences...in a constructive way” (Interviewee 2 2003) Yet, while ‘partnership’ in its purest form indicates a sense of inclusivity, mutuality, unity and collaboration, we should also be aware that the use of such a concept can be excessive and that partnerships are not always appropriate in every situation. As interviewees have expressed it: in fact “partnership is a word that has become very fashionable”; “the term partnership is grossly overused”; “declaring that everything needs to be a partnership...demeans the word which is already as debased as it possibly can be”; and “Type Two Partnerships [may] have captured a name without an underlying methodology and ideology” (Interviewee 4 2003; Interviewee 3 2003; Interviewee 3 2003; Interviewee 1 2003).

It has been argued that some partnerships, which were registered at Johannesburg as TTPs were artificial, created for publicity reasons. As Ed Mitchell of RWE Thames comments, “partnerships that are formed just to get registered so that people have got things to talk about at big meetings never last” (Mitchell 2003, 19). It has been suggested that both the EUWI and PAWS were initiated because of a perceived political need to show support for the UN TTP approach, and because the UK government and the European Commission both wished to have “an initiative to talk about at Johannesburg” (Mitchell 2003, 5). In the EU Margot Wolstrom, the European Environmental Commissioner, pushed for the conception of the EUWI and it is generally perceived by PAWS members that PAWS is a UK government initiative “driven from a Prime Minister mandate” (Interviewee 4 2003, Interviewee 3 2003). However, this political impetus may have resulted in the hasty creation of TTPs, whose objectives may not be suited to a partnership mode of operation, and which can result in a costly waste of time and resources (both financial and temporal), doing little to help achieve the WSSD goals. Fundamentally, partnerships are “expensive, and time consuming, and a valuable, but context specific solution”, they are not a universal panacea (Interviewee 1 2003).

### 3.1.2 North/South Partnerships?

In development circles it is recognised that for northern donor countries to prescribe the priorities and strategies that southern countries must assume is patronising and is little more than an extension of colonialism. Therefore, if TTPs are to be a valuable mechanism they must be driven by the wants and needs identified by developing countries. Mitchell (who attended the WSSD as a member of the UK government delegation because at the time he was working for DEFRA) identifies one major shortcoming in the advent of TTPs, in the fact that developing countries have limited capacity at meetings such as the WSSD, hence “they have to be very, very focused about what they’re going to engage on” (Mitchell 2003, 13). He adds that “one of the slight disappointments at Johannesburg about Type Twos was whenever we sat down to discuss them, representation from developing countries was relatively much weaker than from northern countries and northern civil society groups” (Mitchell 2003, 13).

According to one interviewee this may be inevitable because “TTPs have to be self selecting, so it’s always going to be those who can be involved and have the capacity [that] are the ones involved” resulting in initiatives which are “northern based rather than being driven by



the south” (Interviewee 4 2003). Another interviewee highlighted this point with the example of PAWS, questioning “whether there’s still a perception that it is a north/south partnership or whether it’s a northern partnership working in the south” because when the partnership was initiated, southern partners were not involved, they were only identified later (Interviewee 3 2003). As Hemmati & Whitfield argue, “Potential partners without adequate resources will inevitably find it difficult to initiate partnerships that reflect their needs and concerns” (Hemmati & Whitfield 2003). There is little which can be done to alter the fact that TTPs are self-selecting by their very nature and will therefore be more likely to be instigated by northern actors than those based in the south. Nevertheless, partnerships must try to overcome this difficulty and work closely with partners in the south, as PAWS has tried to do, in order that they can have any constructive and worthwhile impact. As Mitchell espouses about PAWS, “What will ensure its longevity is if the demand and response from South Africa, and Uganda, and Nigeria is that this really adds value, that what municipalities are crying out for is kind of PAWS...I think going from that kind of slightly supply led approach to a very demand led approach is what would give it wings” (Mitchell 2003, 6).

### 3.1.3 PAWS

PAWS is perceived to be a much more successful partnership than the EUWI, and its objectives much more suited to a multi-stakeholder approach. However, it does not escape criticism. For some members, PAWS “is quite genuinely a partnership...[with] openness and transparency, and joint decision making” and whilst the UK government takes the lead, it is not “in a way that is unacceptable” (Interviewee 4 2003). For others though, it is not a partnership “it is a committee” with no firm governance structure and where meetings continue to be conducted in civil service offices, around boardroom style tables, led by an agenda prepared by the UK government, and chaired by civil servants (Interviewee 1 2003; Interviewee 3 2003).

Moreover, it seems that there are many ‘partners’ who have had very little involvement in PAWS and describe themselves as ‘sleeping partners’ or partners with a ‘watching brief’. According to one interviewee, “in a partnership there shouldn’t be sleeping partners. They can be stakeholders, they can be observers...but in a partnership there shouldn’t be sleeping partners...so if there are sleeping partners then we need to change the name” (Interviewee 3 2003). In fact, only a relatively small group of ‘partners’ are active in PAWS, and it is likely that more meaningful partnerships are forming around PAWSs three country programmes, with the groups actively engaged in these projects forming closer partnership relationships with each other.

Critics have claimed that PAWS could have been structured “in a way that would create greater equity or equality between the partners...[and] which [would have] allowed for rotation [of the chair] and greater integration into the governance [structures]”, and that this deficiency may have had an impact on how involved members became (Interviewee 3 2003). The UK government is seen to dominate the initiative, which has led to differing understandings of how well the PAWS initiative operates as a partnership. Whilst most partners are not overly concerned about this at present (because the initiative is making progress in Africa), it does raise concerns for the future. Originally it was understood that whilst the UK government would provide initial funding for PAWSs work, including a secretariat to support it, eventually the partnership would become self-sufficient and “have a life of its own” (Mitchell 2003, 5). In reality that hasn’t happened and it is widely held that if government funding and DEFRA support was withdrawn, the partnership would cease to exist in a recognisable form, although some of their programmes could continue if DFID felt that was appropriate. If the partnership “still needs government stimulus to keep it going...[then it] therefore probably isn’t achieving what a partnership, what a really great partnership should achieve” (Mitchell 2003, 6).

The reason why PAWS has not moved beyond being essentially a government run initiative is because it has not managed to create a feeling of ownership amongst the majority of partners. This in turn is because the incentives for their involvement have not been powerful enough. However, all partners do have equal opportunity to assist wherever they feel they can and even those members of the partnership who raise equality or governance problems would probably agree with one interviewee, that whilst PAWS has “faltered in terms of its partnership mechanisms at times...it has done a lot better than most” TTPs or multi-stakeholder partnerships (Interviewee 1 2003). After all, as another interviewee notes, completely equal partnerships do not exist anywhere: “it’s wishful thinking and there’s always an imbalance of power” (Interviewee 3 2003).

#### 3.1.4 The EUWI

The EUWI in its present form seems, unfortunately, to illustrate many of the arguments put forward in section 3.1.1. “It was launched with such fanfare at Johannesburg, and there was such political capital put into it” but it is not clear that it was “well thought out in the first place [and]...people managed to get the political bit wound up before thinking through exactly what it was all about” (Mitchell 2003, 17-18). In essence, it is not certain that the EUWI needed to be a multi-stakeholder partnership or that this approach was appropriate (Interviewee 3 2003)

All partners in the EUWI participate (or not as the case may be, because many original NGO partners, including Public Services International, now have limited or no involvement with the initiative due to its perceived failings) in what is called the Multi-Stakeholder Forum. According to EU plans, this was to be “The main body to develop the EU Water Initiative [led] by the European Commission” and “The working groups [were to] report to the Multi-Stakeholder Forum” (European Union 2002, 10). However, as it stands, no one seems clear as to what status this forum has and it does not appear to be a decision making body. As one interviewee said of the EUWI, “there is still, after two years, no structure, no decision making process, no governance, nothing” and no clear objectives or aims have been defined, with the partnership still in its design phase (Interviewee 4 2003).

Moreover, there are grave transparency issues because EU member states hold their own meetings behind closed doors with stakeholders unaware of proceedings and the decisions that are made. Indeed, things are agreed to in the Multi-Stakeholder Forum “which are then contradicted by member states meetings” (Interviewee 4 2004). Les Peacock of DEFRA argues that “It has lost its identity. It started off as a sort of multi-stakeholder partnership but it’s virtually reverted to just governments” (Peacock 2003, 24). Mitchell adds that “It’s a partnership between countries, between governments” not a multi-stakeholder partnership at all (Mitchell 2003, 17).

A multi-stakeholder partnership was perhaps not the most appropriate organisational form to deal with the issues that the EUWI seeks to address. Interviewees on the whole suggested that the current aim of the EUWI is to improve the co-ordination of EU member states existing water aid programmes. As the EUs working document about the EUWI states, “The initiative seeks to make the most of available funds and to increase the effectiveness of existing and future aid flows” (European Union 2002, 4). EU member states are finding it almost impossible to achieve any consensus between themselves because they all already have their own very well established approaches to aid, which diverge greatly. For example, “DFID wants to do budget support, they don’t want to do sector projects, the French just don’t do budget support, they want to have projects” (Interviewee 1 2003). The EU member states are thus not in a position to engage stakeholders in any meaningful way because they have so many unresolved issues between themselves. Member states need to reach some consensus between themselves before the initiative can move forward. Only when this has been accomplished, and clarification has been given as to the exact goals of the initiative, can the role of stakeholders be determined. Even then it is unlikely they can ever be partners

in the true sense of the word when the EUWI is an initiative that is about the harmonisation of government aid programmes.

Nonetheless, whilst it is in no way clear that a multi-stakeholder partnership is needed to achieve the objective or objectives of the EUWI, this is not to say that stakeholder involvement should not be considered. Stakeholders would almost definitely add value to the project and as one partner representative said, it doesn't have to be a multi-stakeholder partnership "it could be...a series of consultations or something less cumbersome" (Interviewee 3 2003).

### 3.1.5 Leadership

There are arguments to suggest that the leadership which the government-provided secretariat of PAWS gives to the initiative is what the EU initiative lacks and is one reason why it is stalling. One interviewee suggests that "nobody seems to be taking the leadership role that is needed to push it [the EUWI] forward and make sure something happens" (Interviewee 4 2003). Peacock adds that "Although the commission has provided a secretariat for the initiative, it doesn't really take it forward, it hasn't got a clear view because there are so many countries involved" (Peacock 2003a, 23). This links to an issue raised by many interviewees, that whilst multi-stakeholder partnerships offer many benefits, "the more bodies that you've got involved, the more the process is likely to be fairly slow" because co-ordination is more difficult (Interviewee 2 2003). Of course, there is a sense in which leadership undermines partnership. But what we must realise is that "successful partnerships take a long time to develop", they are not spontaneous creations and one organisation may be needed to initiate this process, bring some focus to it, co-ordinate partner decision-making with some level of authority, and drive the initiative forward in the first instance (Calder 2002, 9). Given time, partnerships of a 'truer' nature may emerge but in most cases there should be a defined cut-off point after which progress is reassessed, and if the 'partnership' is not functioning as it should, then consideration should be given as to whether it should continue in its current modal form.

## 3.2 *Role of Government*

### 3.2.1 Role of Donor Governments

The UK government's role in PAWS has been vital in securing the political endorsement and commitment from partner governments in Africa to PAWS work and the prioritisation of water and sanitation. One interview participant maintains that "the great benefit of PAWS is that you have got a government (the UK government) actually working on that political commitment because otherwise it's actually quite difficult...it's very difficult for NGOs, it's even more difficult for the private sector probably" (Interviewee 2 2003). Politically, the role of donor governments is essential if the WSSD targets are to be met. Nevertheless, involvement in TTPs does not negate donor governments obligations to continue and advance their own aid programmes, and their work to meet the targets in other ways.

### 3.2.2 Role of Indigenous Governments

Some observers contend that "the presence of partnerships encourages a retreat from the public sector" and can lead to a shift, negation, or dispersal of responsibility away from the state (Torjman 1999, 14). This could mean that TTPs are being "used by governments to relinquish the burden or responsibility for implementation [and for water and sanitation delivery] and place it entirely on the shoulders of the 'partners'" (Gardiner 2002a, 5). However, while the fear that TTPs may lead to a dispersal of responsibility away from the state is a reasonable one, in reality it may be largely unfounded because while involving stakeholders in water and sanitation governance or delivery may change the responsibilities

of states, it does not have to imply a relinquishing of obligations. Indeed it must not, because as interviewees remarked, “the primary responsibility for getting water and sanitation to their people, belongs to elected authorities”, although how this is achieved is up to them (Mitchell 2003, 12). If the state is not to be the deliverer of such services itself, then at the very least it must “set up a regulatory framework that protects the interests of customers and the environment, and [its role must be] to help put in place systems which are transparent and equitable” (Nowak 2003, 6). Fundamentally, civil society and the private sector can provide valuable input, in terms of skills, expertise and knowledge, but neither can replace the role that indigenous governments must play in water and sanitation governance and delivery. After all “The voluntary sector can never replace a strong public sector” and how will the lot of the poor improve if governments role is usurped by a profit orientated private sector (Torjman 1999, 9)?

### *3.3 Co-ordination between Existing Structures and TTPs*

#### 3.3.1 Coherence between established Development Programmes and TTPs

An issue which became apparent through discussion with partner members is that in both PAWS and the EUWI there has been a degree of confusion, if not tension, between the governmental department or supranational administrative department, recognised as the lead partner of the partnership, and the equivalent department usually responsible for international development work.

The secretariat for PAWS is provided by DEFRA, essentially because DEFRA has the mandate for sustainable development on a national and international level. Alongside this, it also has experience of water issues in terms of the fact that it was responsible for the Drinking Water Inspectorate, part of the UK regulatory system. However, it is DFID that has the regular mandate to deal with international development work, including that of water and sanitation programmes or projects. This has led to some friction between DFID and PAWS especially within South Africa because there DFID have “defined programmes, [and] complex relationships that have already been negotiated” which has led to PAWS being seen “as adding more complexity to an already complex situation” one interviewee suspects that at least initially, PAWS “was not welcomed and...DFID South Africa were unhelpful” (Interviewee 1 2003).

Furthermore, there are also strains and pressures between departments over funding matters. One partner member suggested that the government funding for PAWS comes out of DFID’s budget because DEFRA cannot justify spending their own money on it (Interviewee 1 2003). In fact “DEFRA pays for communication and coordination and provides a dedicated secretariat and DFID funds travel and subsistence for non-governmental partners”, but to a degree PAWS is still “dependent on DFID for prioritising money [and]...Why should DFID want to prioritise money on this” when it is detached from their existing programmes (Peacock 2004a; Interviewee 1 2003)? According to one interviewee, the EUWI suffers from similar co-ordination troubles because “it was initiated by DG Environment...it’s DG Environment that has the lead but it’s DG Development that has the money...And because DG development didn’t own it [from the beginning]...they’ve not been particularly co-operative with it” (Interviewee 4 2003).

#### 3.3.2 TTPs as Alternative Power Bases in Developing Countries

Lack of co-ordination raises another fear that if TTPs do not work harmoniously with indigenous governments they may inadvertently set up alternative power bases. In developing countries, governmental commitment to water and sanitation provision is vital, and government prioritisation in national development plans and budgeting strategies is necessary if the WSSD goals are to be met. “UK government analysis [has shown that

outside agencies coming and]...putting lots of projects down on the ground and supporting the sector or projects exclusively has not done anything to create sustainability...of the sector”(Interviewee 1 2003). One interview respondent gave the example of Zambia where eighty percent of water programmes receive their funding from external sources such as the German Development agencies. This undermines the role of the Minister of Water because it “sets up different levels and types of authority” (Interviewee 1 2003). It was suggested by the same interviewee that the US ‘Water for the Poor’ TTP has been setting up sector projects and has thereby been disempowering and by-passing government (Interviewee 1, 2003).

The PAWS initiative however, has recognised the need for co-operation with, and political endorsement from the governments of its partner countries, both at national and local level. Les Peacock of the PAWS secretariat pointed out that this impacts on all their work and as an example explained that Nigeria is currently completing its National Economic Empowerment and Development Strategy (NEEDS) and it would be unhelpful for PAWS to pilot a project which contradicted this strategy. As a result, the partnership may well wait until the strategy is complete later this year and “then see whether...[they] could pilot a project out there, based on how they [Nigerian government] want it” (Peacock 2003a, 2). However, PAWS has essentially remained a partnership between the various UK stakeholder partners and African governments, rather than being a multi-stakeholder partnership in both the UK and partner countries. Thus whilst PAWS does not undermine indigenous government, it has also done little to empower other indigenous stakeholders (although it can be argued that this is the responsibility of partner governments), and it has not been involved in delivery projects, rather it has been essentially concerned with capacity building at various governmental levels.

What the above discussion has emphasised most strongly is that rather than supersede African governments, TTPs which are largely based outside of Africa but which are working in Africa, must work with partner governments and fully embrace the realisation that without strong government and sustained commitment from African states, (at a national, regional, and local level) you cannot have good governance of water and sanitation and you cannot achieve the WSSD targets. Securing political endorsement and co-operation can be a slow and somewhat arduous feat owing to a lack of capacity in African countries and “political and organisational hurdles” but however difficult a task it may be to co-ordinate with African governments, it is of fundamental importance (Peacock 2003a, 1).

### *3.4 Role of the Private Sector*

#### *3.4.1 Role of the International Private Sector*

In the past large financial institutions like the World Bank and the IMF have frequently made privatisation of water and sanitation supply a conditionality of loans and they have routinely included it in structural adjustment programmes in a belief that the only way water and sanitation issues can be tackled is by bringing in the expertise and financial investment and efficiency of the international private sector (Cook 1997, Barlow 2003, Anti Imperialist League 2001, Biersteker 1992, Haque 1996, Hall, Bayliss & Lobina 2002, Jackson & Price 1994, Kirkpatrick 2002, Pitelis & Clark 1993). Recognition of this alleged global privatisation agenda has led to fears that TTPs may aid the expansion of the international private sector into new water markets, which may not benefit the poor because providing services to them is not profitable. Whilst most, if not all, TTPs for water and sanitation maintain that their agenda is not one of privatisation, critics argue that TTPs give the “ultimate seal-of-approval to corporate lobby groups and...will open up the way for privatisation” (Corporate Europe Observatory 2002, 2).

The EUWI lends some credence to these arguments because the initiative makes no secret of its faith in the private sector and more specifically its faith in its own water companies,

without which it believes the targets agreed at the WSSD cannot be achieved (European Commission 2003). Moreover, it has been argued that the EUWI seeks “to use official development assistance to encourage private funding – thus northern taxes will pay for corporate profits from developing countries” (Engelberts 2003). As Friedrich Barth, an EU water specialist, states, “the private sector will not go into a country where there is a risk...the initiative, possibly with the help of official development assistance, could provide guarantees to cover some of the risk” (Barth cited in United Nations Department of Economic and Social Affairs 2002). One interviewee further illuminated this point when they alluded to the fact that the “trade unions pulled out [of the EUWI] a while ago...[because] they think it’s a private sector ploy” (Interviewee 4 2003, 15).

However, whilst the international private sector does eventually expect some commercial return from their involvement in TTPs because they operate as profit making businesses, this is not to say that their involvement is motivated by a desire to introduce blanket privatisation in the developing world. Indeed, their outlook seems somewhat out of kilter with that of the EU and other proponents of the international private sector as a major part of the solution to the world’s water woes. TTPs are not likely to lead to any major expansion of the international water sector in terms of large utility contracts, in the near future, because the international water companies do not wish to develop in such a manner at present, as it is simply not commercially viable to do so. Essentially, as Ed Mitchell, of RWE Thames asserts,

the sort of first world model of water, private sector involvement in water and sanitation, doesn’t work in the developing world, and the main reason it doesn’t work is because it’s based around concessions where you spend a lot of money up front in dollars or pounds or whatever and you get your money back in user fees over say 80 years in local currency...So in order to make that work you’ve got to have incredible political and economic stability because if you get any fluctuations in exchange rate, you’re stuffed basically (Mitchell 2003, 9).

In January 2003 “Suez announced that it was withdrawing from ventures in developing countries, partly because several major contracts had been a disaster and the risk of investing in poor countries was too great” (Vidal 2003). Furthermore, “Saur – the third biggest water firm – has in the past two years withdrawn from a contract in Mozambique while Vivendi, the second biggest player in the world, has expressed concern about the financial viability of servicing the poor in developing countries” (Mathiason 2003).

Fundamentally, in the present climate the international private water sector is retreating from the role it once perceived it was able to have in the developing world because as one interviewee said,

the sort of large scale 30 year lease or concession contracts that the international private sector were thinking about...- they just don’t work in Africa and therefore the role that the private sector might play is much more like contractors providing services on tariffs. So it’s more contractors providing fee based work rather than managing assets from which they derive profit” (Interviewee 1 2003).

Another participant added that “what they’re trying to do is expand in different ways, they’re not looking for big contracts. They’re looking for service contracts...[and] much more on the consulting side than they are on running a water utility. They’re looking for much more short-term type engagements in the developing world” (Interviewee 3 2003). Therefore, TTPs are a means for the international private sector water companies to assess and learn about how they can work in Africa in ways other than large-scale utility management contracts. Mitchell informs us that RWE Thames’s involvement in PAWS is one part of their overall strategy “to

explore all sorts of ideas, with all sorts of partners...around how one can sensibly do business in the developing world” (Mitchell 2003, 2). As one interviewee argued, the private sector in PAWS are looking to gain intelligence and more experience in Africa so that when the time comes they can make a profit there” (Interviewee 4 2003).

In the long-term the international private sector probably still judge that it may be possible to have large utility contracts in Africa because there is a potential market there if it can be made less risky for them to engage in it. In some ways their involvement in TTPs may be part of their attempt to commercially position themselves for when, and if, market opportunities present themselves because they can be seen to be involved in what are perceived to be largely altruistic projects. As Sue Nowak of Water UK said, “there’s a big, big market, or there should be at some stage and it’s about being there at the right point, and having the right profile to take advantage of it” (Nowak 2003, 11). For example, Richard Waller of the consultancy firm Mouchel Parkman argues that in South Africa, private sector motivations for involvement in PAWS may come down to the fact that “the unions are so strong there and so anti private sector that they [the international water companies] need to be scoring brownie points and demonstrating corporate social responsibility” (Waller 2003, 7)

Furthermore, PAWS has established a document entitled ‘Rules of Engagement for Partners’ Participation in Projects in South Africa’. These rules state that “Partners agree that they or any subsidiary or associate will not participate in or engage in a tender process for any commercial activity within the ‘Project Municipality’ for a period of two years after the end of the PAWS project within that ‘Project Municipality’” in order that the partnership cannot be accused of being a Trojan horse for privatisation (Partners for Water and Sanitation 2003b). As a result, Waller points out that “in South Africa certain water companies [within PAWS] have said ‘well we won’t work...[in a particular municipality] because we want to carry on business [there], but if we work in the next municipality we’ll develop experience and credibility in Africa’, which will enable them to grow their business elsewhere in Africa” so indirectly it can enhance their business opportunities in Africa (Waller 2003, 5).

One might argue that in terms of meeting the WSSD goals there is no necessity for the international private sector to work in Africa. Indeed there are highly persuasive arguments that the “potential [of the international private sector] in relation to delivering international WSS [water and sanitation supply] targets has been exaggerated...[and] Using public finance to boost international private sector investment is not necessarily the best way to serve the interests of poor people” (Terry & Calaguas 2003, 7). The debate over private sector involvement in water and sanitation provision, especially in the developing world, has raged for a long time and the arguments are too lengthy to discuss here. Essentially though, as one interviewee argued, the WSSD goals “are so demanding and they’re so huge that we’ve somehow got to harness every bit of energy and skill that we can find” including that of the international private sector (Interviewee 2 2003). While full scale privatisation of the world’s water and sanitation services may not be welcomed, the international private sector can have a role to play in helping meet the WSSD goals, but as one respondent put it, “I don’t think we should overplay how big a role” (Interviewee 4 2003).

#### 3.4.2 Role of Domestic Private Sector

Whilst the role that the international private sector can play in meeting the WSSD targets is likely to be minimal, as one interviewee suggested, “the domestic private sector is probably quite different...they are now filling a major gap that is left by government” (Interviewee 4 2003). This is because small-scale private vendors often sell water to the poor because governments have failed to provide water for these people. Nonetheless, whilst these vendors may be filling a gap in provision it is not in a way that is necessarily pro-poor because the prices customers pay tend to be far higher than those charged for the piped municipal supply which governments will not connect them to. “For example, piped water in

the United Republic of Tanzania costs on average US\$ 0.1 per litre compared to US\$ 0.6 per litre for water bought from a water vendor” (IIED cited in World Health Organization 2003, 23). If government does not have the capacity to provide water and sanitation itself to these people, then it must ensure that private vendors are regulated and that government provides a framework within which the private sector must work. Richard Waller further argues that:

Where you’ve had poor governance and government running services badly then the mechanism to make a change is substantially the private sector...[but] we’ve got to move away from these international water operators and use the indigenous private sector (with outside support where it’s necessary) because they’re used to the problems of working with the currency...working with local people, so it’s not a risk to them, it’s their normal business” (Waller 2003, 11)

Whether one agrees with this argument depends on one’s position on the role of private companies in water and sanitation provision. But at the end of the day, if domestic private water companies are already filling a gap left by government, then their resources and knowledge and experience should at least be harnessed in some manner and their participation encouraged in TTPs.

### *3.5 Role of Indigenous Civil Society*

It is now generally agreed that top-down management led by either the state or the private sector is not, on its own, a solution to water and sanitation supply problems. There is now international support for the participation of civil society in water and sanitation supply decision-making and since the UN’s International Conference on Water and Environment, held in Dublin in 1992, “the principal of subsidiarity has been advocated, where management of public water supply, irrigation and water resources should occur at the lowest appropriate level...enhancing [the] role of local authorities, industries, NGOs and individual citizens” (Gardiner 2002b). At the 6<sup>th</sup> meeting of the CSD “it was agreed that governments need to formulate goals for involving communities in water management” (Gardiner 2001, 284). It is therefore now “accepted that a ‘social infrastructure’ is needed to complement physical inputs to ensure greater efficiency and sustainability” (Caplan & Payne 2000). Without the input of civil society in decision-making processes, all efforts may be wasted because the outcomes may not be appropriate to community needs, or sustainable, and without the support of civil society water management can become unworkable.

Evidently multi-stakeholder processes “allow for groups un- or under-represented in formal governance structures to have their say in policy making (Hemmati 2002, 23). Therefore, TTPs, with their stakeholder approach, could be seen as reflective of a “perceived need for a more inclusive, effective manner for addressing the urgent sustainability issues of our time” (UNED Forum 2002). In theory TTPs have the potential to allow communities to have a true voice in decision-making, and play a decisive role in their own development, acting as a check on the role played by governments and the private sector.

However, as one interviewee noted, “Like partnership, civil society has become a fashionable phrase” which can mean that whilst practitioners like to uphold the virtues of civil society involvement, they do little in real terms integrate them in to decision-making processes (Interviewee 4 2003). TTPs, whilst having the theoretical potential to empower indigenous African civil society, are not necessarily fulfilling this promise. This is partly because in developing countries it can be very difficult to engage civil society. As one interviewee suggested, “the problem is capacity and whether civil society...has the capacity to interact in a way that is responsible, as apolitical as it can be, and whether they have the wherewithal to do what is expected of them in terms of multi-stakeholder engagement...And by and large the capacity is not there” in Africa and it takes a very long time to establish (Interviewee 3



2003). Sue Nowak further added that in Africa “people who represent unions, [and who] represent non-governmental organisations perhaps don’t have such a strong voice” in comparison with civil society groups in the developed world (Nowak 2003, 4-5).

Furthermore, when a TTP is initiated in a northern country, and its partners are mainly made up of northern organisations, it is difficult to integrate southern civil society. As we’ve heard, PAWS has become very much a partnership between various UK stakeholders (led by the UK government) and African governments. Richard Waller argues that PAWS has not “established any sense of partnership in the true sense of working with indigenous countries with tripartite equivalents” (Waller 2003, 10). Les Peacock explains of PAWS that whilst “what we’re trying to do...when we get involved with the partner countries, is to encourage them to have a similar base of government, private sector, and NGOs” this has not necessarily occurred (Peacock 2003a, 14). Some interviewees felt that one of the benefits of involving UK based NGOs like WaterAid and Tearfund was that they could assist in achieving indigenous community participation in PAWS. Unfortunately both organisations only have the capacity to assist in countries where they have existing programmes and neither organisation operates in South Africa where PAWS has concentrated most of its efforts so far.

Nevertheless, one interview respondent argued that “PAWS can’t be expected to be the liaison point for all different actors in South Africa, [Uganda or Nigeria], that’s not its function” (Interviewee 3 2003). Most interviewees seemed convinced that PAWS’ main function is not direct delivery but capacity building. The level of necessity for African civil society participation in PAWS’s work depends on the objectives of PAWS. While it may have initially aspired to be project based with a delivery function (in terms of addressing the design and development of new water supply systems) its actual role has centred on facilitation and capacity building at various governmental levels. For example, PAWS has been running a seminar programme in South Africa looking at “Managing Organisational Change...and...Customer Care and Cost Recovery”, and it organised a visit to the UK from Ugandans, in November 2003, so that the partnership could offer guidance on regulatory systems (Peacock 2003b). At this level, PAWS has a limited need to involve African stakeholders. It is argued that within this scenario at least, African governments must be responsible for engaging stakeholders in their own countries.

#### **4. Conclusion**

TTPs face many challenges and their worth is essentially yet to be proven. This paper highlights only some of the concerns surrounding them as a mechanism for water and sanitation reform and does not seek closure on the issues it raises. Rather its purpose is to emphasise certain matters that require further consideration and point out issues that could impact on the overall value of TTPs. Fundamentally, practitioners, politicians, and water stakeholders alike must realise, that whilst currently partnerships have been in vogue, they are not always the most appropriate organisational mode to accomplish specific reforms or achieve certain goals. Thus they should not be implemented simply because current thinking counsels that it is fashionable to do so or because it is politically opportune.

Furthermore, the badge ‘Type Two’ may not have been bestowed on initiatives, which are actually realising the new, innovative mode of implementation for water and sanitation reform that was originally implied when they were conceived. Rather the label may have been seen as politically valuable and used to launch initiatives that were not suited to partnership, or which are little more than extensions of ‘Type One’ commitments in the fact that they rely heavily on funding from northern governments and have so far concentrated their efforts on existing aid programmes (as the EUWI has) or capacity building for southern governments (as PAWS has done). This is not to suggest that these functions and objectives are not important but it highlights the fact that TTPs may not be delivering as much as was expected of them.

This paper concurs with the current orthodoxy that stakeholders must be involved in water and sanitation reform but it stresses the continued importance of governments, and ultimately responsibility for providing water and sanitation still lies with them. The private sector can contribute to water and sanitation reform but in the developing world indigenous private sector companies are likely to be of more importance than the international private sector. Research also suggests that the role of African civil society in TTPs needs to be carefully considered. If TTPs tend to be northern based and concentrate on working with southern governments then there is perhaps not such a strong notion that indigenous civil society needs to be engaged. However, if TTPs undertake more project-based delivery work then they will have to address the fact that it is difficult to involve indigenous civil society in many places and it will require, time, patience, and commitment.

One of the strongest realisations gained from this study is the significance of the role African governments (from national to local level) must play in successful TTPs and worthwhile water and sanitation reform more generally. TTPs must achieve close relationships with partner country governments and make a conscious effort not to undermine domestic strategies or dictate best practice. Without commitment and endorsement from African governments TTPs will play a minimal role in meeting the WSSD goals. Indeed, TTPs are only going to significantly contribute to achieving the WSSD targets if their work can be replicated on a wider scale, which will rely on African governments' enthusiasm for what TTPs can supply. As far as interview respondents were concerned, there seemed to be a general feeling that in terms of meeting the WSSD goals, "partnerships aren't going to play that significant a role", and "In practical terms, none of the partnerships formed have actually delivered much on the ground" (Interviewee 4 2003). This however is perhaps because TTPs are concentrating their efforts so heavily on southern government capacity instead of on practical projects, and perhaps what is required is for there to be some sort of balance struck between these partnership functions.

Essentially, TTPs can have a role to play in meeting the goals, but it may well be a minimal one. As Peacock says, "I'm under no illusions about TTPs. They can help, they can be useful in building relationships, [and] capacity, but there are so many people without water and sanitation that...there's got to be a lot of money put in and it's got to be organised by the developing countries" (Peacock 2003a, 27). In other words, the achievement of the WSSD targets will only be made possible if donor governments and agencies commit substantial amounts of money, and if developing countries themselves prioritise water and sanitation provision.

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## ***Annex I***

### ***Members of Partners For Water And Sanitation***

(Adapted from Partners for Water and Sanitation 2003c)

Anglian Water  
Babtie Group  
Biwater  
Bristol Water  
British Water  
Building Partnerships for Development  
Chartered Institution of Water and  
Environmental Management  
UK Department for Environment,  
Food and Rural Affairs  
UK Department of International Development  
UK Foreign and Commonwealth Office  
UK Department of Trade and Industry  
Folkestone and Dover Water  
Game 6 Ltd  
Halcrow  
Halliburton  
Institution of Civil Engineers  
Intermediate Technology Development Group  
International Water Association  
Kelda Group  
Nicholson Graham and Jones  
Nigerian Government  
Northumbrian Water  
Parkman Group  
Severn Trent  
South African Government  
Southern Water  
South East Water  
South Staffordshire  
South West Water  
Tearfund  
Thames Water  
Ugandan Government  
UNISON  
WaterAid  
Water UK  
WS Atkins  
WTI Training Group  
WWF

**Annex II**  
**Initial Partners of The EU Water For Life Initiative**  
(European Union 2002, i)

**European Commission**

Member States of the European Union  
Governments of the NIS countries  
African Governments

Green Cross International  
WWF  
Tearfund  
Water Aid  
ICLEI  
Public Services International  
Global Water Partnership  
Global Nature Fund  
European Environmental Bureau  
Ramsar  
UNEP UCC-Water  
OECD  
UN-ECE  
The International Secretariat for water  
BPD Water and Sanitation  
Protos Water Powers People  
International Network of Basin Organizations INBO  
EUREAU  
Northumbrian Water  
Suez  
Thames Water Vivendi

# The Politics of Water in the Mekong Region: the Case of Yunnan Hydropower Expansion

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## **Abstract**

Conflicts over water in the Mekong Region exist and others are looming, over many, often-connected issues, such as: growth in water and energy demand, interference with natural flows via dams, timing of dam releases for energy or irrigated production, diversions, altered sediment and nutrient loads, and changes to rivers to ease navigation. This paper provides a brief update on what is happening in Yunnan with hydropower development – looking at the Salween and Mekong rivers – within the wider context of China’s changing political economy.

## **Introduction**

Whilst it may be true to say that “*to a certain extent, all regions are imagined*” (Hettne and Soderbaum 1998), the Mekong ‘region’ is increasingly becoming a reality. The Mekong Region encompasses the territory, ecosystems, people, economies and politics of Cambodia, Lao PDR, Myanmar, Thailand, Vietnam, and China’s Yunnan Province (Mingsarn Kaosa-ard and Dore 2003).

The major river basins of the region are the Salween, Mekong and Yangtze.<sup>1</sup> Their principal rivers arise in Tibet before roaring in a southerly direction. Each of the three is filled by both snow melt in their upper reaches and monsoonal rains. The Salween and the Mekong are international rivers. Due to a fortuitous – for China – geological formation, the Yangtze changes course before leaving Chinese territory, heading northeast and eventually wending its way eastwards thru the heart of China, becoming its most famous artery. The Irrawaddy, Chao Phraya, Pearl and Red are shorter rivers, which originate below the snowline, thus, their flow is wholly determined by the monsoon climate which prevails over most of the region. There are also many coastal river basins, some of which are quite large, and all of which are an important part of the countries in which they are located (Thomas 2002:27). In addition to the main rivers and tributaries, there are countless sub-basins (or watersheds or catchments) – dams and aquifers which collectively comprise the visible and accessible freshwater ‘life source’ or ‘resource’.

Conflicts over water in the Mekong Region exist and others are looming, over many, often-connected issues, such as: growth in water and energy demand, interference with natural flows via dams, timing of dam releases for energy or irrigated production, diversions, altered sediment and nutrient loads, and changes to rivers to ease navigation. These are already and will further impact on predominantly the rural poor and their livelihoods, via changes to: hydrology including erosion; ecology including fisheries and aquaculture; land-based food production, cultural traditions and economies. Local communities, governments, civil society organisations (local, national, regional and international), business interests, donors and international agencies each claim to be ‘stakeholders’. Negotiation platforms that can cope with and adapt to this complexity and dynamism across time and spatial scales are not easily created or maintained.

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<sup>1</sup> The Chinese names for the main rivers are Nu (Salween), Lancang (Mekong) and Jinsha (Yangtze).

This brief paper cannot deal with all of the many issues and circumstances. We choose here to present the case of Yunnan hydropower expansion.

Energy sector reforms in China have unleashed an explosion in power industry development proposals across the country. Nation-wide there is an intention to almost **double hydropower capacity by 2010**. The reforms have led to a nation-wide surge in competition between corporate generators to secure actual and potential power-producing 'assets', and nowhere are dam builders aspirations' greater than in the south-west, especially Yunnan Province. In the past Yunnan has been seen as a peripheral province – both geographically and socio-politically. However, in terms of both the Mekong Region and China, Yunnan is increasingly important.

### ***Hydropower and Energy Policy***

Substantial hydropower expansion is part of national planning and Yunnan's role is key. One industry source claims that "*China has planned to construct over 50 large and super large hydropower stations in the next 20 years*" (Alexanders Oil and Gas Connections 2003). A deputy-director of the State Power Corporation, Chen Dongping, is reported as saying that China intends to spend nearly USD 40 billion by 2010 to double its hydroelectric capacity (China Economic Review 2002). This would involve increasing capacity to 150,000 MW by constructing the equivalent of another four Three Gorges dams. Hydropower has long been a component of China's energy strategy and the new surge should be seen as an up-scaling rather than as a new policy emphasis.

Key drivers for Yunnan hydropower expansion include the push for and direction of economic growth, China's associated energy security concerns, the Western Region Development Strategy and a political environment in which energy entrepreneurs have strong incentives to push ahead with expansion plans.

Key drivers of Chinese government energy policy are the **domestic demand** estimates of key organisations such as the State Reform and Development Commission (SRDC). The SRDC's Energy Research Institute (SRDC-ERI) has released analysis in 2003 of three different scenarios. Coal demand is forecast to rise to somewhere between 2.1 to 2.9 billion tonnes per annum with the upper limit almost twice the current production capacity.<sup>2</sup> Oil demand is predicted to rise to 450 million tonnes of oil equivalent. Natural gas consumption is forecast to increase 5-fold current levels, rising to 160 billion m<sup>3</sup> (China People's Daily Online 2003a). Domestic energy demand is entwined with energy imports and exports. Imports are mostly oil, and more recently gas. Exports are mostly coal, but have an increasing hydropower component. In addition, **energy security** for China, as for all other countries, remains an important influence on national policy (for still-relevant discussions see, Medlock and Soligo 1999, Gao Shixian 2000, Stares 2000). The point being made is that not all of the planned increases in energy production are to meet domestic demand.

Given its significance as a policy driver to those concerned about energy security and continued economic growth, it is important that the demand projections data is independently interrogated. The data are based on assumptions which need to be more widely scrutinised. For example, does the data reflect the successful implementation of any **demand management policy measures**, or the development or wider adoption of **new technologies**?<sup>3</sup> It is important to clarify whether demand estimates are unnecessarily 'high'

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<sup>2</sup> About 80% of China's known coal reserves are buried in the north and northwest (Jia Mulan 2003).

<sup>3</sup> The evocatively named 'Power to the People'(Vaitheeswaran 2003) provides an inspiring analysis of the impending 'energy revolution'. The author argues that promising new technologies, such as fuel cells and microturbines, will lead the way to a revolution in micropower – putting small clean power plants close to homes and factories – which will rapidly displace grids which deliver power from big plants to often distant consumers. This recent addition to the literature, builds on other work which reports on promising progress with new energy



and being used as justification to permit headlong expansion of energy production, perhaps with an over-emphasis on soon to be surpassed technology.

Box 1: Energy demand management options for China<sup>4</sup>

1. Imposing environmental taxes on dirty fuels
2. Further promoting electricity time-of-use tariffs
3. Reforming 2-tiered pricing system for natural gas
4. Further regulation, upgrading and/or closure of inefficient power plants and coal mines
5. Promotion of clean coal technologies
6. Using advanced, combined-cycle technology in power generation
7. Promoting co-generation
8. Promoting renewable energy resources and technologies (including wind, geothermal and solar)
9. Promoting energy conservation
10. Encouraging more research and development in the energy industry
11. Phasing out hidden subsidies

Evident is the importance of the Western Region to this proposed rapid and vast expansion of China's energy production. In short, "*Rising demand for energy is a very significant factor in the economic development of the PRC, especially the Western Region*" (ADB 2002:147). The Western Region is intended to become an increasingly significant energy **supplier**.

Energy exports from the Western Region to the Eastern Region are projected to **quadruple** between 2000-2020, with coal accounting for 91% of the increase. Electricity will be a much smaller, but still significant, component of the exports. The dual objectives of the Western Region Development Strategy are '**development**' (of the West) and '**transfer**' (to the East). An example of what is proposed is that authorities intend to be transmitting 8 GW of power per annum from Yunnan to Guangdong by 2015, derived from both coal-fired plants and hydropower from various sites.

The planned energy production and transfer from West to East is significant. Already one quarter of China's energy derived from coal and half from natural gas comes from the Western Region. These proportions are to be increased as policy makers search for the energy believed required to sustain China's (primarily eastern and coastal) economic growth.

It is within this context that Yunnan hydropower production is being **pushed** along by national policy makers, local authorities, designers, construction groups, lenders and business entrepreneurs. The province already provides about 10% of China's hydropower but exploitable reserves are considered to be ten times larger than current generation. If this potential is exploited, Yunnan could eventually supply closer to 20% of national hydropower production, to be fed into national or regional grids. In summary, China's economic reforms, coupled with the development/transfer priority being attached to the Western Region, have catalysed a substantial increase in the dam building aspirations of 'developers' in southwest China. This is being enabled by wide-ranging reforms to the power industry, to which we now turn.

### ***China's energy industry reforms***

China's energy industry reforms are the result of the government policy put in place to foster competition and marketisation, via corporatisation which, especially for the power generation companies, is almost indistinguishable from privatisation. The formation of the State Power

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technologies for developing countries (for example, see Forsyth 1999).

<sup>4</sup> The demand management suggestions for China policy makers (Box 1) are taken from an ADB report which overviews the Western Region Development Strategy (ADB 2002).

Corporation (SPC) was the first main step. With registered capital of USD 20 billion, it was a giant monopoly, one of the 100 largest businesses in the world. By 2000 it was working as a consulting company in more than 40 countries. At the time its breakup was announced in late 2002, SPC had in the vicinity of 2 million employees, and 'owned' 46% of the nation's electricity generation and 90% of the electricity supply assets (Alexanders Oil and Gas Connections 2003)

The start of the SPC reorganisation has involved separation of SPC's **actual and potential** (such as the Salween river) generation and distribution assets and designation of 11 enterprises to 'acquire' these assets. The next step involves creating a competitive market, which includes pooling and pricing reforms, plus grid creation. To keep oversight of the reform process, the State Electricity Regulation Commission (SERC) has been formed, responsible for making proposals on power price; and issuing and managing power service licenses.

Since the major energy industry reforms were announced late 2002 there has been a stampede by the 'big 5 + 1' – not forgetting the Three Gorges development group – to secure their assets, principally coal-related, and move to develop their new assets, including 'rivers for hydro' in various types of partnership with local authorities. In the words of Business Weekly "*newly established power conglomerates are scrambling to construct generating plants across China*" (2003). Entrepreneurial dam developers are in **hot competition**. For example: Huadian, Guodian, Datang and China Power Investment Company have, in partnership with Hong Kong's CLP Power Asia Limited, announced new investment of USD 4.89 billion to build thermal and hydropower plants in the southern China region of Guangxi (China Daily 2003b).

Why the current scramble? The past increases in energy demand and projections for further huge requirements are acknowledged. State policy support and sector reform has also been mentioned. But, the rush into hydropower is also being fuelled by the relative ease with which many social and environmental costs can be externalised from 'return on investment' equations, and the competitive need for companies – in the new business operating environment – to retain market share and steadily expand generating capacity.<sup>5</sup> Whilst some in government, such as the Chairman of the State Electricity Regulation Commission (SERC) are reported as having "*hinted that the government is considering slowing down the building boom in power plants*" and noting that government should have a clearer overall plan for power plant construction (China People's Daily Online 2003c), thus far there is no evidence of either. The authority of the SERC is limited to promoting market competition, endeavouring to ensure transparency and supervising service licenses. Decision-making about electricity prices and approving construction and expansion of power plants remains with the State Reform and Development Commission (SRDC).

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<sup>5</sup> The economic argument of analysts Guotai Junan Securities Co (discussed in Business Weekly 2003), and others, is that as electricity price drops generating capacity must increase if company profits are to remain stable. In an example they worked through, for a 3.55% price drop, based on an average national tariff of 3.4 US cents per kilowatt hour, generating capacity needs to increase 5% to maintain profit-levels.

## Box 2: China energy industry reforms: recent milestones

1996		Electric Power Law passed which required reforms, including the creation of separated power producers and retailers in a competitive market. The law also stipulated that power prices should reflect all production costs, profit, tax and contribute to transmission costs and situations where some subsidy may be necessary to ensure supply. Part of the rationale was to ensure that the industry would become attractive to non-State investors.
1997	16-Jan	Establishment of State Power Corporation (SPC) to represent the State as owner of government-owned assets. This occurred around the same time as the passage of the Electricity Law and the abolition of the Ministry of Electric Power, dividing its functions between existing agencies.
2002	11-Apr	Announcement by what is now the State Reform and Development Commission (SRDC) of next phase of energy industry reforms.
2002	29-Dec	<p>End of SPC monopoly with announcement that SPC assets are to be acquired/transferred to 5 independent electricity generating, 2 transmission &amp; 4 consultant/construction companies. The impending creation of an industry regulator was also signalled. Not all energy assets were included in this restructure.</p> <p><i>Power generation companies:</i></p> <p>&gt; Huaneng, Datang, Huadian, Guodian, China Power Investment Company</p> <p><i>Distribution (grid) companies:</i></p> <ul style="list-style-type: none"> <li>▪ State Power Grid Company which controls the operation of 5 regional power grid companies in the North, Northeast, East, Central and Northwest.</li> </ul> <p>State Power Grid Company was also authorised to oversee the orderly transfer of 500 power plants under the management of provincial power corporations as part of the reform commitment to separate generation from distribution (see below).</p> <ul style="list-style-type: none"> <li>▪ Southern Power Grid Company which controls the operation of the 'Southern Power Grid' formerly controlled by SPC, plus the formerly Province-controlled Guangxi, Guizhou, Yunnan, Hainan and Guangdong grids.</li> </ul> <p>Between 2011 and 2030, Southern Power Grid is prioritising hydropower development on the Salween, Mekong, Jinsha,Wu; and aiming to expand connections with surrounding grids (eg. China's central and north, also the proposed Mekong Region grid).</p> <p><i>Consultant/construction companies:</i></p> <ul style="list-style-type: none"> <li>▪ Hydraulic Power Designing Institute</li> <li>▪ Electric Power Designing Institute</li> <li>▪ China Water Conservancy &amp; Hydropower Construction Group</li> <li>▪ China Gezhouba Group</li> </ul> <p><i>Regulator:</i></p> <ul style="list-style-type: none"> <li>▪ State Electricity Regulatory Commission (SERC).</li> </ul>
2003	31-Jul	SERC announces its intention to create 6 competitive regional power markets across China within 3 years in the East, North, Northeast, Central, Northwest and South.
	3-Sep	<i>Example:</i> Signing of MoU to transfer power plants in Jiangsu Province to Guodian.
	19-Sep	<i>Example:</i> Connection of the north and central China power grids (now world's largest). The grid spans 4600 km across 14 provinces and municipalities, with a combined installed capacity of 140 million kilowatts.
	23-Sep	<i>Example:</i> Signing of MoU to transfer to State shares to Huaneng in 13 power plants (total capacity 4,640 MW). Huaneng becomes major shareholder in 12 of the 13.

Sources: (China Daily 2002, Alexanders Oil and Gas Connections 2003, China Daily 2003a, China People's Daily Online 2003b, 2003c, 2003d, Freshfields Bruckhaus Deringer 2003, Xinhua News Agency 2003).

### **Hydropower status**

It is the Salween river dams which are the most controversial both within and outside of China. Salween decision making is happening now. The Mekong dams are already being built. Our scope, in this very brief paper is restricted to the Salween and Mekong rivers.

These are only a part of the Yunnan transformation, which must also be seen as part of the larger Chinese picture.

### *Salween*

The future of the Salween River remains in the balance. In the last months of 2003 and early 2004 much more information has filtered into the public domain outlining the extensive hydropower development proposed for the Chinese section of this river which – upper, lower and middle – extends for 2,018 km. Broader civil society – beyond the usual, officials, business operatives and ‘experts’ – have become very involved.

There are advanced plans for a cascade of up to 13 dams<sup>6</sup> on the middle and lower Chinese reaches which, if built, would profoundly alter this presently undammed, near to pristine river. Some supporters of the dams are focused on local development needs, which they hope the dams will assist. Others are focused more on the energy production and income potential for other people and places. Opponents of the dam are doubtful about the need for such radical development and fear the irreversible changes which a cascade will have on the current, mostly undeveloped area. There are many different ‘positions’ in the debate. The total installed capacity of these dams would be 23,320 MW. There are also three dams being promoted for the river, downstream of China. The Ta Sang site is within Myanmar and the other two are planned for further downstream where the Salween forms the border between Myanmar and Thailand (For a review featuring concerns, see Rajesh 2003).<sup>7</sup>

The chief promoter of the proposed Salween River development in Yunnan is the **China Huadian Corporation**, a wholly State-owned enterprise, and the controlling shareholder of the Hong Kong stock exchange listed Huadian Power International Corporation Limited. It is one of the ‘big 5’ power generation companies receiving ‘assets’ from 2003 onwards, which were previously ‘owned’ by the State Power Corporation (SPC). The ‘right to develop’ the Salween River is seen by Huadian as one of the transferred assets now in their ‘**portfolio**’.

### *Mekong*

The Mekong river flows for nearly 800 km in Tibet before entering Yunnan where it flows for another 1,247 km. The Mekong cascade is a mega-project designed to take advantage of an 800 metre drop over a 750 kilometre river section in the middle and lower sections of the Yunnan stretch (Plinston and He Daming 1999). For dam builders this part of the river has been described as a “*rich, rare hydropower mine for its prominent natural advantages in abundant and well-distributed runoff, large drops and less flooding losses of the reservoirs*” (ICOLD 2001).

The cascade is no longer speculation, but rather a fact. Regardless of whether all eight (8) proposed dams are built, Manwan and Dachoashan are already constructed, Xiaowan is under construction and Jinghong is soon to commence. Proponents argue that the dams have the potential to offer limited flood control, more assured dry-season flows, increased navigation options, reduced saline intrusion and create extra irrigation opportunities for downstream countries like Thailand. In addition to the rapidly expanding grid system within

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<sup>6</sup> The Bing Zhong Luo component of the cascade does not actually involve a ‘dam’, being designed as run-of-river, hence there is no iSalweenndation area.

<sup>7</sup> During October 2003, the Electricity Generating Authority of Thailand (EGAT) was told by the Thai Ministry of Energy to suspend talks on this delicate subject until after the APEC show had exited Bangkok (Watcharapong Thongrungrung 2003). However, EGAT confirmed in November 2003 that it is prepared to finance the entire project, although it would prefer to explore some form of partnership with the Myanmar and China governments (Nareerat Wiriyapong 2003).

China, the electricity produced will be able to enter the Mekong Region electricity grid.<sup>8</sup> A particularly sanguine view is that “*upstream development of hydropower will not sharpen the conflict of multi-objective competitive uses and will give benefits to downstream for the development of irrigation, navigation, and hydropower, and for flooding control*” (Plinston and He Daming 1999).

The naïve conclusion that the cascade will not ‘sharpen the conflict’ between upstream and downstream users is completely wrong. For example, there is significant tension in the first months of 2004 in northern Thailand river-dependent communities who are concerned at the very low flow in the river, and apparent fluctuations. There is a drought and so natural flows are low, but the Thais are also unsure as to what effect the river flow is being altered by China’s upstream dam managers. More information exchange is essential if crossborder understanding and trust is to be built.

**Huaneng** is the dominant actor, having been granted the majority of the development rights on the Mekong, and the upper and middle reaches of the Jinsha. Manwan and Dachoashan are already being operated by Huaneng. Xiaowan will also be under Huaneng’s management.

Whilst the hydropower potential is unquestioned, there are huge concerns about the impacts of the dams on riverine ecosystems and local livelihoods (Roberts 2001, IRN 2002). There are major worries about altering the natural regime of the river in a way which will increase flow fluctuations, increase average downstream dry-season flows and decrease the normal flow downstream of nutritious sediments crucial for fisheries and agriculture production. When the cascade is completed, it has been suggested that dry season flows may increase downstream by up to 90% at Chiang Saen, 80% in Luang Prabang, 70% in Vientiane and more than 1600 km from the cascade, 40% at Mukdahan. Predicting impacts in a complex system is difficult, but obviously this will flood large reaches of rapids, integral to fisheries and radically alter the normal regime of seasonally flooded forests (Blake 2001, TERRA 2002).

Large amounts of sediment will be trapped by the new dams, depriving the lower Mekong of its normal load. Negative impacts may also include increased downstream erosion, serious disturbance to fisheries ecology and the devastation of annual river bank gardening enterprises. Those who stand to lose out include millions of people downstream – mostly beyond the Chinese border – reliant on fishing and river bank farming.

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<sup>8</sup> At the Phnom Penh 2002 GMS leaders’ summit Mekong Region governments signed an inter-government agreement which paves the way for regional power trading. This should also be considered within the context of the so-called ASEAN grid being promoted by the Electricity Generating Authority of Thailand (EGAT).

### Box 3: Fish and Cambodia's Tonle Sap

There is a rich diversity of fish in the Mekong system. Whilst the taxonomy is still being sorted out, most experts agreeing there are more than 1,000 freshwater species. Fisheries are vital to the livelihoods of most of the 12 million rural households in the lower Mekong (MRC 2003). Current estimates are that almost 2 million tonnes are harvested each year from the Mekong/Mekong fishery – 1.75 million tonnes from the 'capture fisheries' valued at USD 1.45 billion, plus another 250,000 tonnes from aquaculture (MRC 2002). It is assumed the cascade will harm the fishery due to the new flow regime, migration disruption, temperature and sediment load changes. The Tonle Sap – Great Lake (TS-GL) area includes the largest freshwater lake in South East Asia. The functioning of this unique hydrological and ecological system is critical to the fisheries and rice fields production – and therefore the livelihoods and economy – of Cambodia and southern Vietnam. The area also has other ecological values which are deemed to be of national, regional and international importance.

What might be the impact of the Mekong dams on the Tonle Sap fishery?

The Mekong/Mekong provides 70% of the sediment load received by the TS-GL. The closure of the Manwan dam in 1993 halved the sediment load in the Mekong river water at Chiang Saen in northern Thailand. It is uncertain as to the extent to which sediment loads will be further reduced when Xiaowan and others in the cascade are completed, and how far downstream these effects will be measured. The relationship between source of sediment and nutrient availability is also unclear. However, the researchers producing this data are convinced of the threat. They summarise: "*regional developments utilising the Mekong water, such as extensive damming of tributaries and the main river (in China), as well as irrigation, may lead to lower downstream flood levels and extensive trapping of sediments, and thereby have a negative effect on the fertility of the Tonle Sap system, which appears to depend on high flood levels with a high sediment load*" (Sarkkula et al. 2003:45).

### Issues

Particular dam projects in Yunnan appear to have taken on a life of their own, well beyond the visions/strategies emanating directly from the Beijing or Yunnan governments. The momentum now acquired makes it difficult to modify the development agenda, partly because government is now 'less empowered' and/or compromised by its linkages with private investment. The lines between public and private have become extremely **blurred**, whether via formal or informal public-private partnerships. New forces for development are pushing projects, such as: international financiers and the increasingly empowered natural-assets rich 'State-controlled' power companies. The political economy has **shifted**. Formal State policy and planning may no longer be the key driver as capitalist forces have been substantially unleashed. In such a situation, the regulatory role played by State and civil society becomes critical.

Investment driven by competition, supported by easily accessible finance and almost free access to public land and water assets may not yield 'net' public benefit (regardless of how it is defined). It would seem that there is a **dangerous brew** of unrestrained competition policy, confusion about the regulatory role of the State, freely available investment funds and easy access to rivers that could lead to unnecessary and irreversible damage to ecosystems, natural and cultural heritage and local livelihoods. Many within China and downstream countries are concerned about this current headlong pursuit of hydropower development. Other values are being discussed, other decision making processes suggested, and the sensibility of hyper-competition between energy business giants is being challenged. Several key questions require revisiting:<sup>9</sup>

*What type of development is preferred?* This strikes at the heart of development directions – the 'conventional' economic development of modernity, or more sustainability-oriented conceptions where different values are prized? Whilst pursuing economic growth for job creation and poverty reduction is still paramount, the 'New and Scientific Concept of Development' being actively promoted by President Hu Jintao explicitly acknowledges other

<sup>9</sup> The first three were triggered by and adapted from similar questions posed by a journalist (China Power News 2004).

goals – human development, more efficient resource use and less pollution (China Daily 2004). Within this new context a review of national energy policy, including the hydropower component, would be appropriate.

*How are development goals to be achieved?* This is about modalities and roles which should be taken by the State, business and general citizens. The current phenomenon where capitalist entities are assuming monopoly control over State-owned natural resources requires review. More detailed analysis is required of the impacts of China's energy reform policies and the related surge for substantial Yunnan hydropower expansion. There seem to be many risks associated with these recent policy changes. There are serious concerns about the impact of the policies which have led to the current competition between the 'big 5 + 1'. It is not simply a case of healthy competition between business competitors within a framework which guarantees overall public benefit. Water resources are being monopolised by large companies via partnerships being negotiated with various national and local authorities. The wisdom of policy which permits this degree of influence by profit-driven entities is now being challenged.

*How are decisions about setting and striving for these goals to be made?* This is about the concept of governance. When thinking about the directions taken by society, the governance processes by which we deal with conflict are what really matter. Are they adequate?

*How are transboundary impacts to be genuinely considered and negotiated?* Cross border social and environmental impacts in downstream Myanmar, Lao PDR, Thailand, Cambodia and Vietnam have yet to be factored into China's plans. Crossborder cooperation protocols for dam operation will be necessary for ecological damage to be minimised. Inevitably this would require energy production to be less than the pure economic optimum. How will this be negotiated?

## **Conclusion**

Hydropower development is a sensitive issue, not just in China, but throughout the Mekong Region. Numerous projects have become the subject of national, and in some cases regional and international controversies. Examples include: Vietnam's Se San, Sre Pok and Son La dams; Lao PDR's Theun Hinboun and Nam Theun 2 dams; Thailand's Pak Mun dam; the Yunnan dams, and those further downstream on the Salween into Myanmar.

Water governance – if taking a broad view – refers to the multi-layered negotiation, decision-making, management and monitoring of water and water-related issues, involving interplay between many individuals and formal or informal institutions. Water governance should be inherently inter-disciplinary. Perspectives from social and physical sciences, government and civil societies all have a place.

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## **“The Importance of the Ecoregion Sierra-Costa of Chiapas and the Water and Nature Initiative in The Tacana Volcano with the UICN”.**

Biol. Froilán Esquinca Cano, Presidente de la Sociedad de Historia Natural del Soconusco, México.

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### ***Executive summary of the project***

The project, looks for to implement actions that are framed in the Water Initiative and Nature of the UICN in a typical zone of the coast of the Pacific of Central America that due to its problems of little availability of water, poverty and deterioration of its earth, represents an important potential for the planning and the handling of shared river basins, in where the high part of the river basins of the Rivers Suchiate and Coatán is in Guatemala and the greater extension of the average parts and low of these is located in Mexico.

The socioeconomic context of the project at national level presents/displays important resistances between both countries. Mexico, with a surface of around 2 million Km<sup>2</sup> constitutes doceava economy of the world with a population of 97.4 million inhabitants projected to year 2050 of 140 million. It is considered between the twelve countries of greater biodiversity of the world, counts on great wealth in metals like silver, nickel and cadmium and is the third petroleum reserve of the world with an approximated production of 3000 daily barrels. For year 1998 the GIP promoted to U.S. \$415,000 million. As far as the index of human development the poverty occupies place 54 of 173 countries registered In spite of these conditions has been increased significantly.

Around a 54% of the occupied population it subsists with income equivalent to two minimum wages or less, 14.8% of the population live in houses with earth floor. Guatemala with an extension of 109,000 Km<sup>2</sup>, 12 million inhabitants of who 60% are rural. 53% of the population subsist less with of U.S. \$ 2.00 newspapers being one of the higher rates of poverty of Central America in where the inequality demonstrates in that 20% of the population concentrate more of 60% of the national entrance and only 4% have access to the secondary education. It occupies the Index of Human Development more under Latin America (place 120 of 173 of the world).

Mexico by its geographic conformation presents/displays great diversity of unique ecological conditions in the world which gives like result a great ground wealth, florística diversity and of vegetal communities in where they emphasize a great amount of goods and services offered by the ecosystems, which are themselves threatened by the disparity of the regional economic development, increasing impoverishment of the field and the lack of a balanced strategy of regional development.

The great challenges are the earth degradation, the loss and contamination of water-bearing mantles caused by the changes in the Earth use, the expansion of the farming border with clearing practices and burn and destroy illegal. Despite all it, an increasing conscience by all those environmental problems appears, which is demonstrated in the propositive presence of numerous ecological groups, governmental and nongovernmental organizations worried about the problematic one.

As far as the hydric resources in Mexico the dispersion, the sectorialidad, retrazo normative, the limitations of budget, the absence of integration of policies and the lack of participation and transparency have caused an important increase in the vulnerability of these. From the environmental perspective, Guatemala presents/displays great variety of grounds and subtropical climates that provide to the country a high diversity to him of tropical landscapes

and that confers an enormous potential to him for the forest development, farming tourist fishing boat and. The country in addition has important fresh water bodies like lakes, lagoons and rivers of important volumes that they confer an important potential to him of social, economic and tourist development. The deforestation is the activity of greater risk by its effects like the ground erosion, the contamination by agroquímicos, the rain diminution, the loss of biodiversity and the degradation of the hydric resources.

As far as the hydric resources it is possible to be mentioned that the dispersion and institutional disintegration, the lack of information, inadequate norm and lack of fulfillment of the existing one, little budget and the vulnerability to extreme events are main the causes of problematic the existing one. In the zone of the project the river basins of the Rivers Suchiate, Coatán Cahoacán and Cosalapa include 3,160 a total area of km<sup>2</sup>. The river basin of the Suchiate has 1,400 Km<sup>2</sup> of which 76% are in Guatemalan territory including the zones high and average of the river basin. The shared river basin of the Coatán River has 910 Km<sup>2</sup> with a 30% of its extension in Mexican territory. The river basins of the rivers Cosalapa and Cahoacán are located in their totality in Mexican territory with a 860 extension of Km<sup>2</sup>. The Zones of life of the area of the project are: Very Humid forest and Humid Montano Under Subtropical in the high river basin, Tropical Very Humid Forest in the average river basin and the river basin low Humid Forest and Subtropical Dry forest. The zone has an average of Maxima elevation of 4,200 msnm of Tacaná Volcano. The use of the natural resources is restricted in both territories to the handling of local communal forests with some projects of reforestation and communal breeding grounds. The firewood is used like power plant extracted of private and municipal areas. In Guatemala the water is used for domestic uses and of irrigation on small Mexico scale it uses a 54% of superficial waters in the district of Suchiate-Cacahotán irrigation, 26% in human consumption and a 10% in agro-industrial activities

In the average part of the river basin, the main sources of water contamination are the sugar talents, the oil extraction and the benefits of coffee added to the ground contamination and the poisoning of workers by agroquímicos and the ground erosion. In the part it lowers the conflicts by the use of natural resources are derived from the demand of water at the dry time, whereas in the rainy one floods appear. La falta de un buen manejo de los recursos hídricos y de tierras ha tenido impactos negativos en los humedales y lagunas costeras ubicadas en el litoral pacífico. The project is justified amply given to the degradation and deforestation of the river basins which causes the erosion, the deterioration of forests and the areas of charge. The extreme poverty also causes in general a disordered use and irrational of the resources, which together with the lack of policies and integral plans of handling of river basins, little or no communitarian organization, deficiency of coordination between governmental and nongovernmental instances, administrative insufficiencies of the ground resources and waters among others, causes that he is excellent the development and implementation of the project to contribute to revert the problematic one of the zone.

In spite of all those conditions so critics, exist a great political will and interest of support to the actions of the project. Through participation factories and it consults the Mayorships of Guatemala and the City councils of Mexico have demonstrated to their interest and commitment as much at level of country as at binational level. The commitment has become explicit by means of the letter of undertaking subscription made public in binational events of highest relevance.

The project has been formulated with a logical frame, a global objective and six specific objectives with realistic activities formulated clearly in congruente and integrated form in a strategy of concrete execution.

**Goal of the project is:**

“Optimizar the benefits that offer the fresh water, grounds and the ecosystems associated to the populations of the area of influence of the project whereas their intrinsic values are conserved and recovered “.

**The objective is:**

“To start up a process for the integrated handling of the hydric resources, grounds and ecosystems associate”

Between its specific objectives in the project one sets out the consolidation of mechanisms for the coordination and handling of the hydric resource with integral approach, to count on information that allows the planning of integral handling of river basins, to design and to operate a strategy of awareness and diffusion of the information, to establish and to operate alliances strategic for the implementation of plans of short handling in, the medium and long term and to start up cases pilot on identified high-priority aspects in the plans of handling among others.

The execution strategy counts on two phases of work, one of insertion of twelve months of duration and another one of execution with a duration of three years, both with a total duration of four years. In both countries the structures of local governments of the area for the institutionalization of the programs will be fortified which will give autosostenibilidad to the programs. Concrete products are identified in the Plan of Work of the project to obtain from the process as they are it: a program of qualification in management of river basins, a plan of integral handling of river basins, an analysis of situation detailed of each one of the river basins, the establishment of an electronic data base, a strategy of communication and diffusion, the identification of cases pilot, a system of compilation of lessons learned among others.

Also important processes like technical attendance to the Council of River basins of the Coast of Chiapas, establishment of a mechanism of coordination of river basins in Guatemala and the formulation of criteria of selection of cases are identified pilot among others. The project has a management structure that already counts on the technical support of the UICN and their members, executed by enabled technical personnel who will act according to the plan of existing work.

It is important to notice that one of the main components of the project is to make specific counterparts through sinergias with different organizations from local level, state and federal. These sinergias will allow to define new projects and activities with their respective counterparts for years 2004-2007 (and further on to guarantee the sustentabilidad of the objectives of the project). The 2004 following ones can be mentioned like some in the potential agreements for the year.

- Secretary of Tourism, Chiapas Delegation: Eco-tourist development in the community of Chiquihuites, Municipality of Union Juárez
- FIRCO: projects of renewable energy and micro-companies in diverse City councils
- Secretary of Social Development, Chiapas (SEDESOL): projects of eco-tourism and communitarian development
- Commission National Forest (CONAFOR): potential of work in payment by environmental services water-forest and reforestation.
- National commission of the Water (CNA): Integration of the Committees of River basin within the Coatán, Cahoacán, Cosalapa and Suchiate
- Natural Secretary of Evironmental, Resources and Fisch (SEMARNAT): Programs of Qualification through the CECADESU.

### **Components of the project;**

1. Estudios and investigations
2. Capacitación
3. Difusión of information
4. Proyectos pilot
5. Operaciones

During the first year of the project diverse projects will be identified pilot to fill specific necessities of communities selected within the area of the project. These will be centered specially in innovating activities of sustainable development that allow to incorporate the work of the communities for the improvement of their quality of life. Some examples of these projects can be: activities to improve the quality of the water, projects trims in the organic production, alternative for the development of activities of ecoturismo, improvement of small and medium systems of irrigation, protection of water sources and incentives to make the irrigation, among other activities.

During the first year of the project they were defined, with the local participation through factories and activities of qualification, the mechanism for the selection of sites as well as for the selection of projects. Nevertheless, during the elaboration of the complete proposal of the project diverse Municipal City councils have been identified along with some potential projects pilot to implement themselves additionally.

Also, it is considered to monitorean the advance of the projects pilot with the purpose of defining the convenience of establishing fondo revolvente, with the purpose of guaranteeing its permanence in the time. Every year new initiatives within the frame of the integrated handling of the hydric resources with approach of ecosystems will be identified.

### **Projects pilot**

Reconversion of pools for washing of coffee in center of production of fish on the part of the women of the Ejido the Progress, Municipality of Cacaohatán.

- *It will be contributed to the improvement in the quality of life of the families who live in the average part of the river basin of the Cahoacán river and to offer an alternative to the loss of the prices of the coffee. For this acuicultura activities will be promoted using the existing infrastructure for the washing of the coffee (which is left at the moment).*

Communitarian diagnoses of microriver basins in the communities the Eagle and Hot Water in the river basin of the Cahoacán River, Municipality of Cacaohatán, Chiapas.

- *It is tried, in coordination with the municipal communities and authorities in the high river basin, its conservation and the generation of productive options. These diagnoses will be carried out of form coordinated with FIRCO.*

Propagation of flowers and tropical foliage of the region by women of Cacaohatán, Chiapas.

- *With this project it is wanted to develop to a breeding ground for the propagation of flowers and tropical foliage of the region and to specially generate productive options*

*to the women of the Municipality of Cacahoatán. This will be carried out by means of the formalization of a communitarian cooperative. The project will allow two important results: to offer answer options that already have asked for the women of the community and to reduce to the impact of the extraction of flowers and foliages of the wooded zones. These actions will be made with the area of farming promotion of the Municipality.*

Reforestation with “rambután” (*Naphelium lappaceunm L.*) as an alternative for the conservation of the water taking of the Manuel Lazos community, Municipality of Small Tuxtla, Chiapas

- *Ten hectares in the margins of the water taking of the Manuel community will be reforested Bows in the average part of the river basin of the Cahoacán, of such form that makes sure the water supply to the community and an economic benefit with the advantage of rambutan to a medium term (the production can be obtained between 7 and 10 years).*

Improvement of the quality of the water of the spring of the Cosalapa River in the Municipality Izapa Extension, Municipality of Small Tuxtla, Chiapas

- *A diagnosis of the physical training conditionses and hidrológicas of the affluent of the river Cosalapa by means of works of restoration and protection of the ecosystems of the area will be carried out. One will count on the support of the Municipality of Small Tuxtla and the Laboratory of Geographic Information of the Institute of Natural History and Ecology of Chiapas (IHNYE).*

Ecoturismo for the conservation of the protected area of Tacaná Volcano in the Chiquihuites Community, Municipality of Juárez Union.

- *Eco-tourist activities will be implemented that allow the conservation of the high part of the river basin of the River Suchiate and Cahoacán. For this one will become jumbled to the community through a communitarian cooperative that will handle the tourist services that will offer. This project will be made in coordination with the City council of Juárez Union and the Delegation of Tourism in the Soconusco.*

Reforestation with maderables species for the restoration of the River basin of the Cosalapa River in the Candlemas Community, Municipality of Metapa de Domínguez, Chiapas.

- *10 hectares in the margins of the Cosalapa River will be reforested with maderables species for the protection of productive territories of the community and in the long term to offer an economic alternative by means of the forest advantage.*

Communitarian diagnoses of microriver basins in the high and low river basin of the Coatán River. Municipality of Tapachula, Chiapas.

- *In coordination with the municipal communities and authorities in the high and low river basin, activities for their conservation will be made and the generation of productive options. These diagnoses will be carried out of form coordinated with FIRCO. The communities beneficiaries are: Chespal and community the Victory in the high part; The Herons and Town halls in the low part.*

Communitarian diagnosis of the microriver basin Chiquihuites, Juárez Union, Chiapas.

In coordination with the municipal communities and authorities in the high river basin, activities for their conservation will be made and the generation of productive options. These diagnoses will be carried out of form coordinated with FIRCO

Cleaning of the high river basin of the Cahoacán River in the Ejido Cuatimoc, Municipality of Cacaohatán, Chiapas, in coordination with the Indigenous Society Mayan Ik'.

- One will become jumbled to the population in directed actions the cleaning of the river, for which one will coordinate with the Municipality and the Secretariat of Tourism. The cleaning will allow to make the river attractive so that in a future tourist activities in the ejido one can be executed. The settlers and settlers of the area have showed an interest very marked towards this type of activities like option to improve their income.



# Towards Good Water Governance in Tanzania: Lessons and Desired Action

By Raphael Burra<sup>1</sup> and Peter Kangwa<sup>2</sup>

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## **Abstract**

From both the political and the institutional contexts, Tanzania's water sector development has been significantly affected by the drastic changes, that the state underwent since independence in 1961. Soon after independence, land and water resources were brought under state control, and in a bid to popularize the socialist ideology, a number of services, including *water*, were earmarked as a right that has to be offered 'free'. Since then, several weak points in the various levels of institutional arrangements that governed water sector continued to emerge.

In the late 1980s and early 1990s, sweeping reforms were instituted under the internal and global pressure: *privatization, liberalization, decentralization*. For the water sector, this led to the launching of a new water policy, which accommodate different roles, including those of non-state actors. In the new setting the managerial approach envisages the state as a regulator, thereby creating an enabling environment for non-state actors and empowering local communities to effectively participate. Within the sector reforms in Tanzania, however, the major challenge has remained to be that of addressing the growing conflicts and contests over water resource.

The dialogue on water process in which PAMOJA is involved resulted from the realization of need for a governance approach, embracing both formal; and informal interests in addressing the situation. Through the collaborative project of PAMOJA, Pangani basin Water Office (PBWO) and IUCN, an attempt has been made to understand the nature of the problem, and to promote dialogue as a tool for bridging the divergent views between the different stakeholders. This paper will present the main lessons gained from the project so far and to pinpoint areas that require further action and a renewed political will and support.

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# **Water Politics in the Volta Basin – Defusing Conflict, Risks and Promoting Bilateral Cooperation through Informed Dialogue and Negotiations**

by  
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## ***Abstract***

The Volta River Basin in West Africa, which covers six nations (Benin, Burkina Faso, Côte d'Ivoire, Ghana, Mali, and Togo), is the ninth largest river basin in Sub-Saharan Africa. Poverty and increasing population pressure have led to extensive exploitation of the natural resource base of the basin. Competition over water could become a source of tension - and even conflict, especially between Burkina Faso and Ghana, which together share 85% of the total basin area. On the other hand, the vital nature of freshwater could also be a powerful incentive for co-operation and benefit sharing.

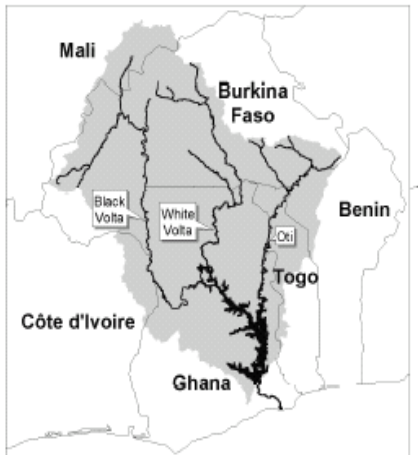
However, mechanisms and institutions to manage disputes over, and spearhead prudent and sustainable utilisation of the water resources in the basin, are absent. Currently, the Volta Basin remains one of the few trans-boundary river basins in Africa with no formal institutional arrangements for managing its water resources. There are also no legal provisions for co-operation among the riparian countries for integrated multipurpose development and management of the shared water resources.

This paper gives an overview of the main competing water demands in Burkina Faso and Ghana that could be potential causes of conflicts. It concludes by highlighting the initiatives being taken to promote bilateral co-operation to ensure 'good water governance'.

## ***Introduction***

The Volta River Basin covers an estimated area of 400,000 km<sup>2</sup> of the sub-humid to semi-arid West-African savannah zone, and is the ninth largest basin in Sub-Sahara Africa. The basin stretches from approximately latitude 5° 45' N in Ghana to latitude 14° N in Mali. The widest stretch spans between longitudes 5°W and 2°E along 11° N parallel, and becomes narrowest towards the coast of the Gulf of Guinea. (Fig.1).

Figure 1: Map of Volta Basin



The six West-African countries that share the Volta Basin are Benin, Burkina Faso, Côte d'Ivoire, Mali, Ghana and Togo. Nearly 85% of the basin's total area lies within Burkina Faso and Ghana, and the remaining 15% is shared among the other four riparian states.

The average annual rainfall varies from 1250 mm around Lake Volta to 600 mm in the Sahel zone of northern Burkina Faso. The annual mean temperatures vary from about 27°C to 30°C, and the daily temperatures can be as high as 44° C, whereas night temperatures can be as low as 15° C (*GEF-Volta TDA, 2002*).

The total population within the basin is estimated to be 14 million, with a growth rate of about 2.5% per year. The riparian countries of the Volta River Basin are some of the poorest in the world and have underdeveloped economies. According to the World Development Report 2000/2001, all of the Volta River Basin countries are considered to be in the low-income category (GNP per capita of US\$ 755 or less).

### ***Water Resources of the Basin***

The major sub-basins of the Volta include: Black Volta (147,000 km<sup>2</sup>), White Volta (106,000 km<sup>2</sup>), Oti (72,000 km<sup>2</sup>) and Lower Volta, including Lake Volta (73,000 km<sup>2</sup>).

The Black Volta originates in Mali as Sourou River and is joined by River Mouhoun in Burkina Faso before entering Ghana. The mean annual flow of the Black Volta at Bamboi in Ghana is about 200 m<sup>3</sup>/s of which some 42% originates from outside Ghana.

The White Volta with an estimated annual flow of 300 m<sup>3</sup>/s begins as the Nakanbé River in Burkina Faso. Other tributaries, the Red Volta (referred to as Nazinon in Burkina Faso) and Sissili also originate from Burkina Faso. About 36% of the White Volta's flow originates in Burkina Faso.

The Oti River begins in the Atakora hills in Benin at an altitude of about 600 m and flows to Ghana through Togo. Due to its regularization by the Kompienga Dam in the Burkina Faso part of its catchment, the Oti River has a steady flow with an annual average flow between 100 to 300 m<sup>3</sup>/s, which occasionally can reach more than 500 m<sup>3</sup>/s.

## Drivers of tension in the basin

### Competing water demands

The Volta river system has been targeted both in Ghana and in Burkina Faso to address national development needs. Throughout the Volta River Basin, dams and reservoirs have been created in order to mobilise water for agricultural, industrial, and electricity-generating purposes.

Ghana, which is more urbanised, has sought economic development through its industrial and mining sectors. Water is used mainly to generate hydropower to fuel industrial growth. The damming of the Volta River at Akosombo in 1964 has created one of the largest man-made lakes in the world, covering an area of approximately 8,500 km<sup>2</sup>. In 1982, a smaller dam was built at Kpong, downstream of Akosombo. Together these two dams have an installed capacity of 1,060 MW, providing nearly 95% of Ghana's total electricity needs. Water demand for the two dams for power generation is approximately 37.8 billion m<sup>3</sup> (GEF-Volta TDA, 2002). In an average year, 56% of the water flowing to the Akosombo Reservoir comes from the White and Black Volta and 44% from the Oti river, all of which as stated above originate from outside Ghana. It is likely that a third dam for hydropower purposes will be built in the Bui gorge of the Black Volta in step with the demand for electricity in Ghana, which continues to rise.

Upstream Burkina Faso is not economically and industrially as developed as Ghana. It is one of the least urbanised countries in the world, and 90% of the population is active in the agricultural sector. Irrigation is generally seen as necessary to achieve sustained higher levels of agricultural production. By 1991, more than one thousand village dams had been built in Burkina Faso, mainly for cattle and drinking water purposes (Sally, 1997). Presently, many dams are built or converted to function also as reservoirs for irrigation water. These activities will affect water availability downstream but the impact is difficult to quantify given the diffuse nature of the irrigation development. Anxiety exists in urban Ghana concerning irrigation upstream of Lake Volta in general and in Burkina Faso in particular (Gyau-Boakye & Tumbulto, 2000).

While both Ghana and Burkina Faso forecast increased demand for water over the next decades, the trends in water use pattern among the countries are quite different. For example, there has been a rapid expansion of land area under irrigation in the last 15 years in Burkina Faso of nearly ten times, whereas Ghana only experienced a doubling of the irrigated area (Andreini et al, 2002). Fig. 2 shows the irrigation development in Burkina Faso and Ghana (FAO, 2000).

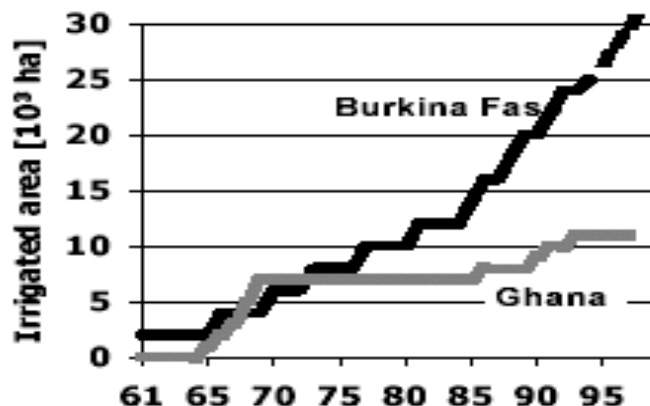


Figure 2: Trends in irrigation development in Ghana and Burkina Faso

Burkina Faso, the upstream, agriculturally-oriented country hopes to develop the country's irrigation potential, while Ghana, downstream, aims to develop further the use of hydropower, e.g. through the construction of the Bui Dam as mentioned above. The trends in water use patterns can potentially generate conflict if the resources are not managed in an integrated fashion.

### **Water scarcity**

Although the average annual precipitation seems rather stable over the past decades, the river flows given in total runoff per year seem in average over the past twenty years to be lower than the previous decades. To illustrate this, Fig. 3 shows the fluctuations of the water level of Lake Volta and the annual rainfall over the basin covering a forty-year period.

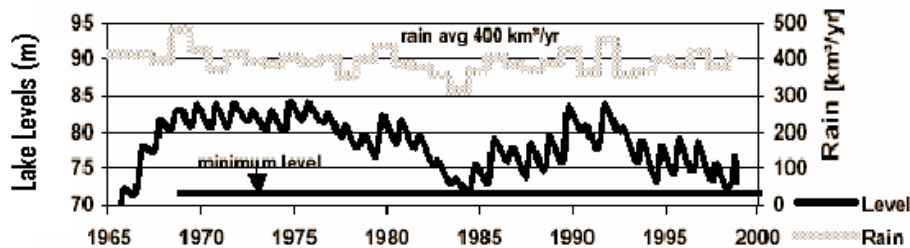


Figure 3: Lake Volta water levels (1965 – 1999)

In the early 1980s, a severe drought hit Ghana, lowering the water below minimum operating level of the Akosombo Dam. The lake level dropped again below the minimum in 1998, causing major power outages in Ghana. This gave rise to various speculations about the causes of the low level of water inflows to the Akosombo Dam. One view was that Burkina Faso had unduly increased water withdrawals in the upper basin through dam building and irrigation development. With the basin population projected to increase by as much as 80% over the next 25 years (*GEF-Volta TDA, 2002*), water resources are going to become even scarcer and pressure on water will intensify.

In addition to water withdrawals, other potential sources of misconception and tensions, include: (a) water releases from dams in Burkina Faso (particularly the Bagre Dam) that may cause flooding in Northern Ghana; and (b) water weeds proliferation and migration along the river system as well as perceived signs of increased water pollution

### **Initiatives towards promoting cooperation**

From the foregoing, it is clear that agreements on the use of the water resources of the basin will be essential to preventing conflicts. Some earlier interventions initiated to promote cooperation between Burkina Faso and Ghana, include:

- the short-lived Volta Basin Water Resources Management Initiative that was launched in 1996 by international donors to improve dialogue and communication between Burkina Faso and Ghana on Volta-related issues;
- More recently (January 2002), government technical experts from the two countries met in Ouagadougou under the auspices of the West-African Technical Advisory Committee of the Global Water Partnership (GWP/WATAC) to "operationalise the IWRM concept".
- the GEF Volta Project that between 2000 and 2002 conducted a series of consultations and carried out a transboundary diagnostic analysis (TDA) of the Volta Basin. Recommendations from the study are yet to be implemented. The project,

entitled “Addressing Transboundary Concerns in the Volta River Basin and its Downstream Coastal Area” is targeting the entire Volta basin and involves the six riparian countries.

- The West Africa Interim Secretariat for IWRM (SISCOA-GIRE) has also organized a series of meetings and developed a West Africa action plan with a Volta component. In July 2002, SISCOA organised a regional IWRM workshop in Accra at which a recommendation for the establishment of a Volta Basin Technical Committee (VBTC) was made. One of the proposed mandates of the VBTC is to work toward the establishment of a structure for the management of the Volta Basin.
- From a research perspective, the ongoing GLOWA-Volta Project, currently being implemented by the Centre for Development Research (ZEF) of the University of Bonn and funded by the German Government is active in the field and has already conducted valuable studies. This project could serve as a vital source of scientific information and facilitate decision-making for water allocation.

### ***Enabling environment for promoting cooperation***

Burkina Faso and Ghana have put in place regulatory tools for sound management of water resources in their respective countries. In Ghana the Water Resources Act of 1996 established the Water Resources Commission and charged it with the mandate to regulate and manage the country’s water resources, and to coordinate activities within the water sector. In Burkina Faso, a new Water Framework Law (*Loi d'orientation sur l'eau*) was adopted in February 2001. In both countries, the legal and institutional frameworks for the management of water resources promote integrated basin management, equitable access to water, water for nature (environmental flow), and international cooperation.

With support from the Danish International Development Assistance (Danida), Ghana’s Water Resources Commission (WRC) and Burkina Faso’s Direction Générale de l’Inventaire des Ressources Hydrauliques (DGIRH) are piloting the introduction of IWRM principles and collaborative initiatives across their common border using the decentralised local government structures, which are in place in the respective sub-basins of the White Volta River (Nakambe river in Burkina Faso).

### ***Way Forward Towards Preventing Conflicts***

If the situation, as highlighted in this paper, is allowed to continue unabated with Burkina Faso and Ghana increasingly competing for the water resources of the Volta Basin, a realistic risk exists for potential conflicts to evolve eventually. Therefore, it is high on the political agenda to prioritize programmes and actions aimed at introducing proper integrated water governance principles and structures at basin level.

One important instrument towards this aim is the preparation of a project entitled Improving Water Governance in the Volta River Basin, which is scheduled to commence during the first half of 2004 (*IUCN-BRAO/GWP-WAWP, 2003*). The project responds to a request made by the Ghana-Burkina Joint Commission for Cooperation to engage in consultations on the Volta River.

The project will focus on a strengthened bilateral cooperation between Ghana and Burkina Faso, and will build on and reinforce the efforts underway in these two countries particularly concerning (a) implementation of national water policies that incorporate the IWRM principles; and (b) facilitation of inter-basin efforts in planning, development and management of the internationally-shared water resources of the Volta Basin. The project is supported by the West Africa Regional office of IUCN (*IUCN-BRAO*) and the West Africa Water Partnership of Global Water Partnership (*GWP-WAWP*), and will be carried out in collaboration with WRC (Ghana) and DGIRH (Burkina Faso).

If successfully implemented, the project will offer a good basis for reaching an agreement for the equitable and sustainable management of the vital lifeline, which the Volta River represents for the entire population of the basin.

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# **Introducing Political Issues in the Debate on Water Resources Planning in Tunisia : a Necessity for the Implementation of Water Demand Management Policies**

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## **Abstract**

Water demand management in the Mediterranean is used as an example of the importance of political issues for water policies. A case study on Tunisia is presented to illustrate how political issues have to be reintroduced in water resources planning. The intervention in Tunisia followed a futures research approach, based on the critical analysis of the water management strategy in Tunisia in 2000 and reconstructing alternative scenarios to 2030 at the national and regional scale, aiming to serve as arguments in the debate. The interpretation of the results leads to the identification of five main political features of future water policies : (1) change in power relation between the state and the water users, (2) change in the power balance between the state and the socio-professional organisations, and (3) between the state and local authorities; (4) necessary transparency of political decision of allocation of the limited water resources at the national scale, and (5) importance of the weight of international agencies on national policy options. The possible outcomes of this intervention for Tunisia are linked to the strategic use that can be made of the results by various stakeholders, in order to open the water planning debate to a broader set of policy options, to political issues, and to other stakeholders than the hydraulic administration. For other contexts, the analysis on Tunisia may also be used to open the water planning debate, and to learn collectively from the Tunisian experience. But it is also important to state that for every necessary national water policy transition, an intervention for change is necessary in the water planning debate, and may have to come from the outside, as a mediation between internationally discussed models and national specificity.

Keywords: water demand management, water resources planning, planning debate, strategy, politics, power, futures research

## ***Water demand management in the Mediterranean as an example of the importance of political issues for water policies***

In many Mediterranean countries, because of the limited amount of additional natural water resources to be mobilised in the future, the policy transition from water supply development towards water demand management is becoming an urgent necessity, as stated by the Blue Plan for the Mediterranean Commission for Sustainable Development (see, for example, the recommendations issued at the Fiuggi Forum, October 2002, [Blue Plan, 2003]).

But the successive planning exercises at the national or regional scales often remain limited to technical options (see for example [POLAGWAT, 2001] for critical analyses of planning scenarios in Portugal, Spain, Italy, Turkey, Israel and Egypt). The administrations in charge of water planning thus often restrict the range of future water policies that they envision to

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implement to a combination of supply side management (developing new resources, interconnecting reservoirs, developing desalination) and end-use efficiency efforts (reducing losses in transport and in water use at the end of the pipe).

Politically more difficult issues concerning changes in allocative efficiency<sup>2</sup> are left behind: when it comes to discussing the water that in a near future may have to be taken from agricultural users and reallocated to other users, the engineers in charge of water resources planning in public agencies simply evacuate political issues by talking of "problems of political will" or "problems of acceptability", that would have to be dealt with in other arenas. But future obstacles to the necessary future demand management policies and measures will in many cases be of political nature, and can not be separated from technical issues.

To really tackle such obstacles, it is necessary to reintroduce political dimensions in the technical planning exercises where future policy issues should be debated. For this purpose a strategic intervention for change in the debate is needed, in order to open it to political issues and to a diversity of stakeholders . This is what we intend to illustrate with a case study on Tunisia. We also intend to use the case of demand management policies in the Mediterranean as an illustration of the importance of political obstacles to the elaboration and implementation of water policies that are at the same time efficient, relevant and legitimate for their specific contexts.

### ***A case study on Tunisia: political issues and water resources planning***

#### *Context of the intervention*

This paper is based on an intervention in the national Tunisian water resources planning debate, executed for the Blue Plan and the Tunisian ministry of the environment between 1999 and 2002 (the report of this intervention can be consulted under [Treyer, 2002]). In the framework of the Mediterranean Commission for Sustainable Development, Tunisian officials<sup>3</sup> gave their agreement and their very helpful assistance to a critical study of water demand management policies in Tunisia, in order to serve as a basis for discussion of "good practices" or "success stories" in the forum on water policies organised by the Blue Plan at the Mediterranean scale.

#### *Approach and methods*

The general approach of the intervention was based on the critical use of futures research concepts<sup>4</sup> to open a discussion on the official planning scenario within the Tunisian administrative sphere. During the first step, the "business as usual" assumptions underlying the official planning scenario were submitted to the critical analysis of their plausibility, consistency, and epistemological statute (as an example : does the projection of future irrigated area belong to the category of "projects" or of "deterministic trends" ?). This critical analysis enabled a variety of alternative assumptions for every variable to emerge during the discussions with the administration. Some political issues, particularly the political characteristic of some future choices and alternatives were already raised in this early phase. Based on these materials (the multiplicity of possible assumptions on future evolutions of the water management system), six scenarios (three national scenarios and three regional ones on the governorate of Sfax) were reconstructed as particular combinations among the many

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<sup>2</sup> We borrow this distinction between « end use efficiency » and « allocative efficiency » from Allan, quoted by Turton and Ohlsson, 1999.

<sup>3</sup> The author wishes to express his gratitude to Mr Mohammed Ennabli, former Minister of the Environment in Tunisia, and to Mr Abdelkader Hamdane, General Director of Rural Engineering at the Ministry of Agriculture of Tunisia for the interest and assistance that they dedicated to this study.

<sup>4</sup> Using basic considerations of « futures studies » methodology (« prospective », in french) as criteria for the evaluation of the quality of a scenario. These criteria were taken from Jouvenel, 1964.

possible futures, each one and the whole set of scenarios being selected as relevant arguments for further discussion in the planning debate with the administration. These scenarios were also designed as outputs of the whole intervention, to provide a basis, as transparent as possible, to initiate discussion with other stakeholders. Here again, political issues appeared to be of uttermost importance as driving forces for changes.

We present here some of the results of this intervention, to exemplify the methodology followed and illustrate what the outputs are<sup>5</sup>. We will then discuss the interpretation of results concerning political issues that emerged during the two phases.

### *Critical analysis of the water management strategy in Tunisia in 2000*

The water management context in Tunisia is dominated by the semi-aridity to aridity of the climate, and by the irregular distribution of water resources over space and time. For these reasons, Tunisian water policies have been dominated for a long time by the priority given to water resources mobilisation. It led to a situation in the 1990ies (and still prevailing) where the majority of natural freshwater resources has already been mobilised, and is exploited for water supply through an interconnection network at the scale of the whole country. During the 1990ies, water strategy statements (Economie d'eau 2000 [DG-EGTH, 1995], Eau 21 [Khanfir et al, 1998], Etude du secteur de l'eau [DGRE, 1999]) took into account an approaching "saturation" of the mobilisation of available natural freshwater resources [Mamou et Kassah, 2000]. This diagnosis led to following general strategy orientations:

1. continue to increase water supply as much as possible,
2. control demand,
3. develop programmes for interregional solidarity,
4. start a reflection on the share of water resources between sectors and between regions.

But their counterparts in terms of practical implementation were more limited :

- a) achieve complete manageability of water resources, thanks to the completing of the interconnection network,
- b) put the stress on water savings sector by sector (which means "end-use" efficiency),
- c) no implementation of allocative efficiency improvements is foreseen.

The "optimal valorisation" of the water resources for the year 2010 (in "Economie d'eau 2000", the most reliable and quantified projection exercise [DG EGTH 1995]) was planned region by region, by trying to find in each regional case the least costly supply solution to balance the growth in water demand extrapolated to 2010 from the past trends ; the only alternative solution envisioned was to reduce the losses in the water uses, but the trend in the activity of water uses (demography, industrial activity, irrigated area) was not questioned, which means that the allocative efficiency question was not dealt with.

This water strategy in Tunisia from 1995-2000 to 2010 raises two types of questions:

- what happens after 2010, if demand continues growing ? will technical supply side and end use efficiency solutions be enough again in 2010 to balance water demand and water supply ?
- why procrastinate and temporarily avoid difficult questions and choices about sharing the limited water resources between sectors and regions ? would it not have been better to

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<sup>5</sup> A more accurate presentation of the methodology can be found in Treyer, 2000, and Treyer, 2002; generalisation to other contexts can also be consulted in POLAGWAT, 2001.

anticipate already today the drastic changes in terms of allocative efficiency that could become necessary by 2010 ?

These are the kind of questions that were asked during the critical analysis phase. This interview round with representatives of the administration was structured around the validity and legitimacy of the assumptions underlying the projections of trends in water demand. For various variables like per capita domestic water demand or agricultural water use in public irrigated schemes, the discussions led to the identification of possible alternative evolutions to the projected trend that was taken as baseline in the planning documents. The multiplicity of possible assumptions on each variable can be considered as one intermediary result of the intervention. Already at this stage, political issues emerged, corresponding to political decisions and choices between possible alternatives.

The following table illustrates on some examples of variables the minimal set of assumption (extrapolation of past trend or possible intervention by public actors) that resulted, for each variable, from the discussion.

Table 1: Examples of variables and associated processes of evolution for which the inquiry led to identify (at least) two possible assumptions on future evolution.

<b>Variable and process</b>	<b>Past trend, extrapolated</b>	<b>Possible intervention</b>
<i>Development of desalination</i>	Slow development and diffusion, nearly restricted to private investment (tourism)	Strong subsidised development for domestic, industrial, municipal uses and for tourism
<i>Treated wastewater reuse diffusion</i>	Slow development and diffusion of wastewater reuse	Strong development of wastewater reuse, based on voluntary public mobilisation (on the Israeli model)
<i>Evolution of agricultural water use in private irrigated schemes</i>	Growth of water use in private irrigated schemes, causing further overexploitation of aquifers	Overexploitation of aquifers by private farmers is stopped
<i>Evolution of agricultural water use in public irrigated schemes</i>	The total volume allocated to public irrigated schemes grows, the proportion of this volume really being used by farmers also slowly grows (the remaining volume can play as a buffer).	Water use in public irrigated schemes is rationalised : the total volume allocated is limited to the 2000 allocation, but the proportion of it really being used is brought to 100%.
<i>Evolution of per capita water demand for domestic uses</i>	Per capita demand for domestic uses reaches European standards, in line with the growth of the standard of living	An alternative model is found for domestic per capita water demand, disconnecting economic growth and water consumption, relying on cultural habits
<i>Growth of water use for tourism</i>	Water use for tourism remains a marginal proportion of water for municipal uses	New models of tourism are developed, even more water consuming, causing more than tenfold growth in water use for tourism
<i>Changes in the national water management model</i>	No change: a national centralised public agency is responsible of domestic water supply and distribution	The state decentralises water services to local authorities

*Constructing three national and three regional scenarios for 2030, aiming to serve as arguments in the planning debate.*

Based on the materials illustrated in Table 1, three national scenarios were constructed as particular re-combinations of assumptions on the future of each variable. See Table 2 for an

example of the combinations chosen for the variables of Table 1. At the scale of the governorate of Sfax, three regional scenarios were also constructed, based on similar methodologies.

Table 2: Three national scenarios recombining possible assumptions on future evolutions

<b>Variable and process</b>	<b>National scenario 1: Total water management</b>	<b>National scenario 2: General mobilisation for water</b>	<b>National scenario 3: Exogenous decentralisation</b>
Development of desalination	<b>Intervention</b>	Continued past trend	<b>Intervention</b>
Treated wastewater reuse diffusion	<b>Intervention</b>	<b>Intervention</b>	Continued past trend
Evolution of agricultural water use in private irrigated schemes	Continued past trend	<b>Intervention</b>	Continued past trend
Evolution of agricultural water use in public irrigated schemes	<b>Intervention</b>	<b>Intervention</b>	Continued past trend
Evolution of per capita water demand for domestic uses	Continued past trend	<b>Intervention</b>	<b>Intervention</b>
Growth of water use for tourism	<b>Intervention</b>	Continued past trend	Continued past trend
Changes in the national water management model	Continued past trend	<b>Intervention</b>	<b>Intervention</b>

In practical terms, what is every one of these six scenarios made of ? Each scenario relies first on a transparent combination of assumptions, all taken from the critical discussion. Each assumption is quantified in terms of water amounts (withdrawals, resources, losses...) and the water balance from 2000 to 2030 is calculated for each combination of assumptions: this calculation offers a consistency check for the scenario, revealing possible future problems of water supply under the assumptions of the scenario.

Based on this structure, each scenario then consists of a particular storyline, its “plot”, linking together the various assumptions and making their coherence explicit. An extended narrative gives substance to the scenario, but a summary and a title are also useful to communicate it rapidly.

Political issues were reintroduced thanks to the narratives in the scenarios : political factors and power relationships were necessary elements for the consistency of the story (for example, when the water balance indicates that water demand reaches the maximum amount of water made available, then further reallocation decisions become necessary, at the national or regional scale, or conflicts on access to water may arise). Political issues were also intentionally introduced in the scenarios, because every single scenario, constructed as a counter-scenario to the technical planning scenario, represents a particular argument for expanding the discussion in the planning debate to essential political problems. To illustrate how these scenarios can serve this purpose, we rapidly present the plots of the six scenarios.

#### 1) Three national scenarios

- a) “Total water management” is the technical, administrative and centralised, “business as usual” water management scenario: it was designed in order to illustrate that, for consistency reasons, political problems can emerge from this scenario when it comes to re-allocation decisions.
- b) “General mobilisation for water” was designed in order to test the assumption, common among technical specialists in the administration, that the solution to water

problems may come from innovative, alternative and traditional water technologies: this scenario leads to the conclusion that such purely technical solutions necessitate the mobilisation of the population all over the country which means a completely different land use planning approach and an important decentralisation of decision power.

- c) "Exogenous decentralisation" is the scenario resulting from international agencies compelling Tunisia to adopt an internationally accepted model based on decentralisation and some privatisation of water services: if Tunisia decides to adopt the model but with a lot of reluctance, this possible scenario also leads to management problems, if control over the local and privatised water services is not organised in anticipation and for overall national coherence.

2) Three regional scenarios on the Sfax region were added to the national ones, to test the consistency between regional development projects, water resources planning, and the role of national and regional politics in this field.

- a) "Aménagement du territoire": the continuation of former land use planning policies and regional development projects without taking into account water resources limitation leads to a local water scarcity crisis having feedback impacts on regional development
- b) "Développement spontané": the absence of land use planning leads to a water crisis accelerating regional development problems
- c) "Expérience pilote": one local development project and a state driven one have conflicting interactions over the limited regional water resources.

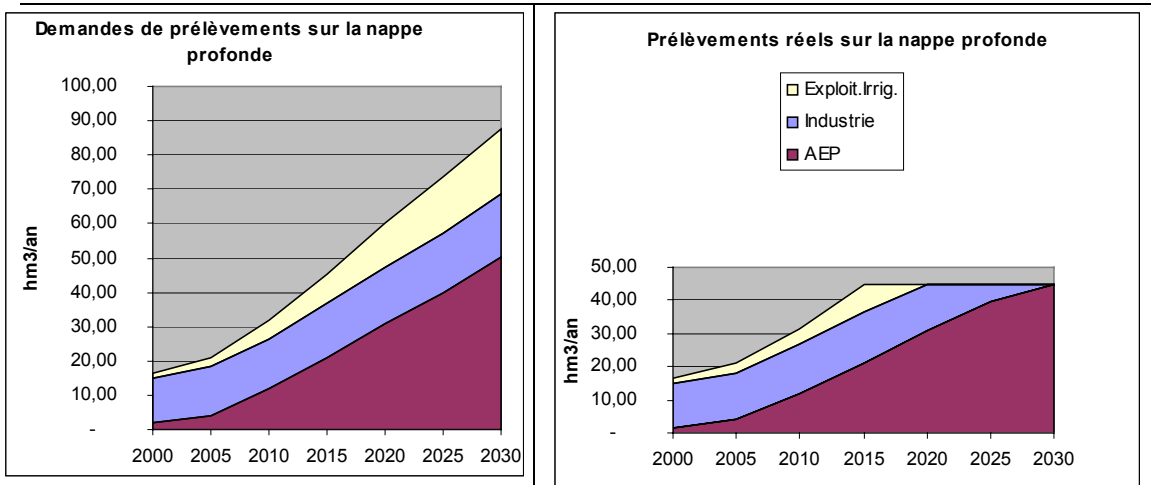
For further illustration of how the scenarios are constructed, see Box 1.

Box 1: Scenario representations : examples on the regional scenarios for the Sfax governorate (from [Treyer, 2002])

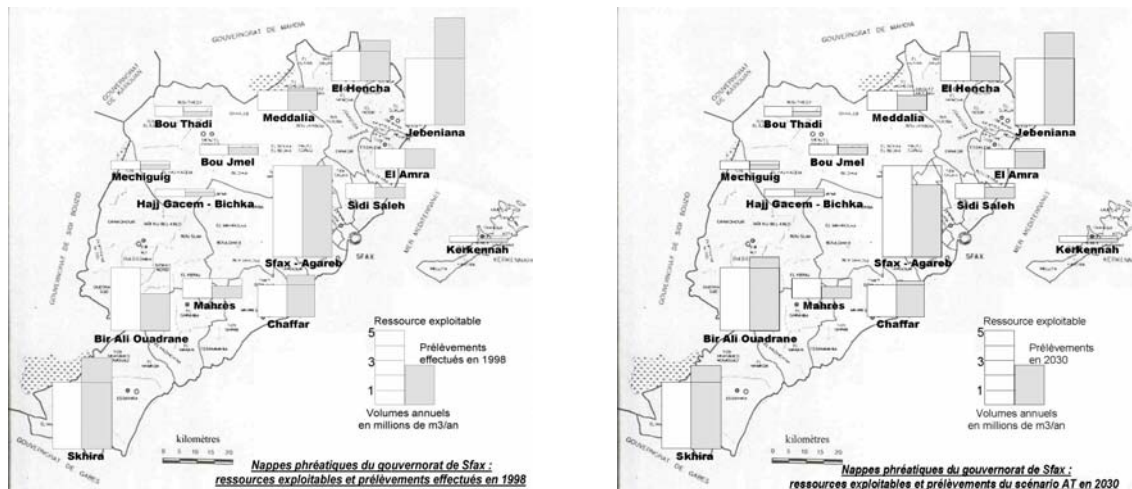
Storyline: scenario "Développement spontané", a brief summary.

« The city of Sfax continues growing without implementation of land use planning policies. Because of water scarcity and of the euro mediterranean free trade zone, agricultural employment in the region decreases drastically. Sfax must incorporate this new population and labour force, which accelerates water supply problems in the city. Thanks to its political weight at the national scale, the city manages to have a bigger allocation from the national water resources network, but national solidarity and national water resources sharing becomes a problematic political issue. »

Quantification: withdrawals on the deep aquifer of the Sfax region, “Aménagement du territoire” scenario: projected demands per sector to 2030 and their limited really possible withdrawals (due to the limit of extraction).



Cartographic representation: “Aménagement du territoire” scenario, withdrawals from shallow aquifers in 2000 and 2030, each time compared to the exploitation limit of each aquifer.



*Interpretation of the results: what political issues do these scenarios bring into the debate?*

Thanks to the precautions taken in the approach, the 6 scenarios can be linked back to the technical planning scenario they had emerged from, and this made a discussion on political issues for water management acceptable and legitimate with the representatives of the hydraulic administration. The scenarios also provided a first organised framework for such discussion. We propose to list here the five main political issues that could be introduced in the technical planning debate, and that also obviously are particularly important for the implementation of sound water policies.

The first and major political feature revealed through the scenario analysis goes back to the balance of power between the state and the water users. The history of hydropolitics in the Maghreb, as described by Perennès, 1993 is very explicit about the power that the post-independence administration and its engineers could gain over single or traditional collective

water users by developing important hydraulic works for increasing water supply. Local water users accepted to give their right to access the resources to the state, because the state guaranteed free regular water supply thanks to its network. This is a very common feature of supply driven water policies all over the world (see the model proposed by [Turton and Ohlsson, 1999], for example). End use efficiency efforts are not problematic for such a balance of power, because the state remains responsible for reductions of transport losses and can subsidise the changes in irrigation technology. But improving allocative efficiency implies putting into question again the contract between the state and the water users : free and on-demand access to the water supply network can not anymore be guaranteed. The political cost of such a change in water management can be considered too important by the state. For such reasons, development of irrigated area may be politically irreversible. "Political acceptability" of water demand management measures draws back to the history of hydraulic policies in the specific socio-political context of rural development in the Maghreb : the phrase stand for the necessary change in the power balance between the state and the water users, which cannot be debated separately from the identification of the technically and economically optimal solution to water scarcity problems.

The second political issue of importance is about possible reconfigurations of socio-political organisations that would be necessary for a desired change (for example the general mobilisation for water) or that could derive from an unavoidable change (due to water restrictions): the best example of such reconfigurations is, in most scenarios, the important role played by really empowered socio-professional organisations, particularly in the agricultural sector, whereas today they completely rely on administrative bodies for what concerns water provision. Autonomous professional organisations would be an important stakeholder in the water management system, and would play a leading role for linking development projects of their sector to water availability. Future water demand management policies will surely change the balance of power between the state and the socio-professional organisations of various sectors.

The third issue is about centralised or regional / local decision for development projects and for water resources management. The scenarios do not advocate for one of the two models. They raise questions of power between regional stakeholders, who have to be involved in managing the resources in their vicinity, and the national state, who has to manage the national interconnection network and to ensure national solidarity. Future water demand management policies will probably change the relationships between the state and local authorities.

The fourth issue is about possible future conflicts on the access to water resources between regions or within a region, between sectors: the state will have to decide how to share the national interconnected resources between users, and this decision of political essence, avoided until now, will have to be as transparent as possible. This would necessitate to organise in advance a planning forum and a public debate on the issue of future share of the resources.

The fifth and last feature is about the weight of international agencies exert on national water policy options: Tunisian officials often claim that the Tunisian situation has geographic and climatic, historical and cultural, and technical specificity for which management models developed at the international scale are not relevant and not efficient. The recommendations issued by international organisations and their interventions for more participation or privatisation can sometimes be put aside as international interference in national issues. But Tunisia already is in a process of negotiation of future national policy options with donors and international organisations, with the European Union also for the negotiation of the free trade agreement. So the future of water management also depends on political powers that are outside national boundaries.



*Possible outcomes of the intervention for Tunisia: potential strategic use of the scenarios by various stakeholders.*

The scenario analysis leads to the identification of five possible or necessary changes in power relations in the future. What is the conclusion for water policies in Tunisia? How will this analysis be used and be useful for improving water policies and water management in Tunisia? We have three different answers, all in the general perspective of the strategic use of the scenarios by a particular stakeholder.

First of all, the Ministry of agriculture, in charge of water resources, irrigation, and hydraulic policies, and who is the administration at risk to have to reduce its power in the future, can use this analysis in a very strategic way, trying to anticipate such political changes in order to minimise power losses. It could use the scenario analysis in order to improve its communication and general strategy. But one of the results of the analysis is that transparency in allocation decision will be necessary, which means that the strategic advice to the Ministry of agriculture is to open public debate on future allocation of the limited water resources, which would be a positive outcome for all stakeholders.

The study and intervention was realised with the support of this ministry of agriculture, but it the general approach was not exclusive strategic advice of this ministry. The Tunisian ministry of environment was also involved and interested in the study, and intended to make strategic use of the scenarios developed in order to open inter-ministerial discussion, to raise water resources preservation issues. This discussion among administrative stakeholders would already probably have led to the identification of more appropriate water policies than the purely economic and technical planning process. The ministry of the environment probably also could have tried to use this scenario analysis to enhance its power and enlarge its territory with respect to water (its competencies were until then limited to water quality issues). But the power and autonomy of a ministry of environment is often risky, and in 2002, it was integrated in the ministry of agriculture. So the impact of the study may be restricted to the discussions within one single ministry.

Third type of stakeholders potentially interested, the non governmental organisations on environmental or development issues may want to use the scenarios to open the discussion with the technicians. But the civil society in Tunisia suffers from important weaknesses (Ravenel, 2002). It is not very probable that the scenarios on their own may help some NGO overcome these weaknesses and problems. Nevertheless, at the regional scale, an environmental organisation was interested in having an expert from outside presenting these alternative futures to the governor, in order to launch local debate. This was not possible until now.

This intervention may help to open the national planning debate from its technical limitation within the ministry of agriculture and water, to a broader set of policy options, to political issues, and to other stakeholders. With this description of an intervention on Tunisia, we intend to underline the importance of reintroducing political and strategic issues in the technical water planning debate in this particular case. But what lessons can be drawn from this case study for other contexts?

### ***Lessons for other contexts***

For other countries with similar arid to semi-arid conditions, the analysis on Tunisia can be useful in two ways. First, some stakeholder in another country may use the Tunisian narratives as a parable to open the water planning debate, introducing political choices and power issues without directly tackling potential national political conflicts. But more collectively, in contexts where the planning debate is opened to a variety of stakeholders for political discussion, the Tunisian example may be useful to underline the political obstacles to

effective water demand management policies : the five main political features of the water policy context in Tunisia are general enough to have interesting analogies in other contexts; they may not always be as apparent as they already are in Tunisia. Such exchanges of experiences are facilitated by already existing initiatives like the Water demand management forum of IDRC (International Development Research Centre – Canada) and the forum on water policies organised by the Blue Plan for the Mediterranean Commission on Sustainable Development.

For each national context, an important feature related to the necessary water policy transition emerges from this intervention on Tunisia: an intervention for change in the water resources planning debate appears necessary; and because the national power balance is often conservative, this intervention in and on the planning debate may have to come from the outside. But international experts can be suspected to convey models of organisation of water management that may be irrelevant for the national specificity of water resources and uses in the particular country, and to be the expression of the power of international agencies on national policy choices. For the sake of improving national water policies in a legitimate and relevant way, the strategic intervention in the national water planning debate therefore has to play the mediator between international experts, models and forums and national stakeholders. The mediated dialogue has to be anchored in the technical characteristics of the national planning scenario, in order to take into account the national specificity. But the discussion has then to be opened to policy changes and to unavoidable political changes, and to a variety of stakeholders.

### **Conclusion**

A main feature of the international debate on water is that water policy transitions are necessary in many countries. Policy transitions suppose a strategic intervention in order that changes may occur. In a context where policy changes is very linked to political change, this strategic intervention is not only interfering with power relations, but it is really focussing on changes in power balances. In such a case, the normative point of view of the intervention must be very explicit: who are we the strategic advisor of? is a completely symmetric and collective prescription or advice possible ? Are general recommendations free of strategic intentions of one particular stakeholder? In particular, can international bodies make a neutral recommendation for change on political balances, being themselves one of the stakeholders involved?

These questions are conclusive perspectives emerging from the case study on Tunisia, and the answers to these questions cannot be drawn from this case. But one normative recommendation may be accepted as general enough to be shared by the variety of international and national stakeholders: opening dialogues on the future of national water resources management to the variety of international and national stakeholders is a way to improve the legitimacy and relevance of the national policy changes that will be necessary, and where political issues will play an important role.

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# The Silent Revolution of Groundwater Intensive use and its Influence in Spain

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## **Abstract**

In the last half-century in most semiarid or arid developed and developing countries, many aquifers have become intensively used. This means that the hydrogeological conditions may have changed, with groundwater storage being modified significantly. This intensive use has been performed mainly by millions of modest farmers with scarce public or governmental planning. This silent revolution has been market driven. The cost of groundwater abstraction is usually a small fraction of the value of the irrigated crop obtained. The benefits have been clear and important in most cases. In poor countries groundwater development have provided reliable drinking water supply and increased food security through irrigation, and consequently groundwater as become a relevant means to eradicate poverty. The impact of this groundwater development in developed countries is also significant but not yet well recognised. But sometimes, there are associated other negative effects. These sometimes have been utilised by certain lobbies in expanding the *hydromyth* of the unreliability (or fragility) of groundwater development, in order to continue the promotion of construction of large hydraulic infrastructures.

In Spain, groundwater irrigation accounts for more than 50% of the total economic value of irrigated agricultural production, while it only consumes about 20% of the total volume of water. In spite of its benefits, groundwater has not been a significant part of Spanish water policy.

Key words: Water policy, groundwater, intensive use, groundwater irrigation, benefit, ethical issues, hydromyths, groundwater silent revolution.

## **Introduction**

Intensive use of groundwater is a recent phenomenon, less than half a century old in most places. This situation has occurred mainly in arid and semiarid countries, in some coastal zones and near to a few megacities. In most cases, almost all groundwater abstracted is used for irrigation.

This groundwater development has produced great socio-economic benefits, mainly in developing countries. It has provided cheap drinking water that has helped to improve public health. The new irrigated lands have contributed to eradicate, or at least mitigate, malnourishment among those living in poverty. Millions of modest farmers with scarce public or governmental planning, assessment, financing and control have mainly performed this groundwater intense development. In most countries the corresponding public water or irrigation agencies have been mainly devoted to design, build and operate large surface water irrigation systems.

In some regions groundwater abstraction has caused different kinds of problems. Most of these problems could be avoided or mitigated if the corresponding government agencies had been more active in assessing and controlling groundwater use by farmers. On the other hand, surface water officials have frequently exaggerated such problems. This has created a

pervasive *hydromyth* on the fragility of groundwater as a resource. The more serious problem of uncontrolled groundwater abstraction is usually quality degradation due to saline groundwater intrusion from the ocean or from other naturally saline groundwater. Rarely groundwater quality degradation is related to its abstraction for economic uses but to land use changes that do not take into account their impact on underlying aquifers. Other problems may be excessive drawdown of the groundwater levels, land subsidence, reduction of springs and baseflows or degradation of groundwater dependent ecosystems.

Because of ignorance, or vested interests, or more frequently because of the low credibility of the water official warnings about the potential overexploitation threats, most farmers are not reducing their groundwater abstraction. They only consider the short-term benefits because these are tangible and have significantly contributed to their socio-economic improvement. There are practically no documented cases where intensive groundwater abstraction from medium or large size aquifers has caused serious social or economic problems similar to those caused by soil-waterlogging and salinization due to poorly designed surface water irrigation systems or by the people displaced or ousted by the construction of large dams. Intensive use of groundwater has really been a kind of silent revolution because it has been carried out without noise by millions of modest farmers, with scarce help from the conventional governmental agencies, except the subsidies for electric energy in some regions, mainly in India.

### ***Intensive use of groundwater and the Silent Revolution***

Groundwater is an important source of potable drinking water. Worldwide 50% of municipal water supplies come from groundwater. In some regions the proportion is much higher. In general, groundwater is particularly important as a source of drinking water for rural and dispersed population. 70% of all groundwater withdrawals worldwide are used for irrigation, particularly in arid or semi-arid regions. Irrigation with groundwater has been crucial to increase food production at a greater rate than population growth.

Groundwater had been traditionally used by tapping springs and diverting river base-flow, and in minor quantities by direct abstraction through wells and horizontal galleries, especially in arid and semiarid regions. The situation changed recently, about 150 years ago, when the scientific basis for understanding groundwater occurrence and flow was established, and more so when, half a century ago, drilling machinery and well pumps were made easily available. At the moment, a deep well can be drilled and installed in just in a few days or weeks. Thousands of drilling rigs of varied sizes and requirements are available (Custodio and Llamas, 2003).

This is a revolution, still largely ignored by many decision-makers, water engineers and the media, who are not fully aware of this development. It could also be that they have decided to ignore this revolution because of vested interests in large water projects, mostly surface water ones, which often are economically more expensive and that may have serious social and ecological impacts. Private farmers with their own funds have mostly driven the groundwater revolution. They pay the direct full cost of groundwater abstraction, even if in some cases they may benefit from some subsidies, like tax reductions or reduced energy supply cost (Custodio and Llamas, 2003).

Large groundwater abstractions usually modify the hydrological cycle in a significant way. It affects springs and river base-flow, usually increases the recharge, water table depth, piezometric levels, groundwater storage, groundwater-dependent wetlands, groundwater quality, river-aquifer relations and even land surface subsidence. The fact that groundwater development is affecting significantly these aquifer water conditions is termed *intensive use* (Custodio and Llamas, 2003).

### ***Benefits of groundwater use***

Groundwater offers unique opportunities for human development in poor areas (Shah, Molden, Sakthivadivel & Seckler, 2000). The benefits of groundwater use can be summarised as easy accessibility, great areal distribution, progressive development, low capital intensity, relative low cost, ease of available technology, widespread use by a large number of users, generally great resilience to droughts, and the general good chemical and bacteriological quality of water.

Groundwater use may also have important ecological indirect benefits when its use means new, large and expensive hydraulic infrastructures are no longer needed. These infrastructures stress countries' economies and might seriously damage the natural river regime and can create serious social problems from displaced people (World Commission on Dams, 2000). Groundwater projects demand: a shorter timeframe implementation; smaller investments; and therefore, are less prone to bribery and corruption.

Irrigated agriculture using groundwater is often much more efficient than irrigation using surface water. This is mainly because groundwater irrigation farmers typically assume all abstraction costs (financial, maintenance and operation) and produce high value crops because they have a greater security in their investment, as groundwater usually is not affected by droughts. A study done for Andalusia (Spain) shows economic productivity of groundwater irrigation is five times greater than irrigation using surface water, and generates more than three times the employment per m<sup>3</sup> used (Hernández-Mora, Llamas & Martínez Cortina, 2001); in other words, significantly more crops and jobs per drop.

Other potential benefit of groundwater development is the increase in net recharge in those aquifers that, under natural conditions, have the phreatic surface close to the land surface. The drawdown of the water table can result in a decrease in evapotranspiration, an increase in recharge from precipitation that would be rejected under natural conditions, and an increase in indirect recharge from surface water bodies (Llamas and Custodio, 2003).

### ***Importance of groundwater as a means to eradicate poverty***

The International Water Conference in Bonn (German Federal Government, 2001) pointed out that the necessary investment in order to provide a basic water supply and water treatment systems in developing countries (whose population is about 1,000 million people) will amount to about US\$ 20,000 million in the next ten years. Developing countries should contribute half of this quantity, while soft loans and donations should complete the total amount.

This overall figure, which might appear high, adds up to merely US\$ 10 per person each year. There is a similar number of people in developed countries whose yearly rent per capita is over US\$ 10,000 (EU, USA and Japan). In other words, if each of these people in developed countries were able to donate US\$ 10 a year, the problem of lack of drinking water would be solved in just one decade. This yearly donation would constitute less than one per thousand the average income, less than the amount people in these countries spend on pet food or ice cream (Llamas, 2002).

A number of reasons suggest that new drinking water supplies and irrigation systems in poor countries must be mainly based upon groundwater resources. Firstly, groundwater infrastructures are often cheaper than the equivalent surface water infrastructures. Secondly, groundwater related investments can be more easily scaled in time while yielding results almost from the start; instead, hydraulic works based on surface water resources rarely take less than 20 or 30 years to be fully-functional. Thirdly, groundwater-based supply and irrigation systems are usually smaller, thus allowing for a more progressive participation from

potential beneficiaries. Experience in fact shows that in many countries, take India as the more spectacular example, the government began three or four decades ago building a modest quantity of irrigation wells. However, the new technology was soon learned by local farmers, who developed new wells at their own expense and at a much higher pace than the government. It must be noted, though, that this higher rate can at times be excessive, and must be regulated by the government in order to ensure a sustainable and equitable exploitation of groundwater resources (Llamas, 2002).

Groundwater-based irrigation systems present a high degree of safety against draught periods. As a consequence, modest farmers that frequently became ruined due to prolonged draught periods, have become a rare sight in these areas. Another positive consequence of this capability associated with groundwater is the fact that farmers have the possibility of investing in newer and improved technologies, thus obtaining more efficient harvest returns. In some places, poor farmers have been able to send their children to university, thus setting off a slow social change towards the arising of an educated middle class (Moench, 2003).

### ***Problems in intensively developed aquifers***

Adams and MacDonald (1995), noted that, in general, overexploitation is only diagnosed *a posteriori*. They tried in their report and in other subsequent papers to present a method to analyse *a priori* the susceptibility of an aquifer to become stressed (or overexploited). They consider three main effects or indicators: a) decline in water levels; b) deterioration of water quality; and c) land subsidence. In this paper two other relevant effects have been considered: d) the hydrological interference with streams and lakes; e) the ecological impact on aquatic ecosystems fed by groundwater.

Before describing these five indicators, it is relevant to mention that these indicators are sometimes wrongly used. This is either because of lack of hydrogeological knowledge or because certain lobbies may have an interest in expanding the *hydromyth* of the unreliability (or fragility) of groundwater development possibly to promote the construction of large hydraulic works.

#### ***a) Groundwater-level depletion***

It has not been unusual –like it was in the Spanish 1985 Water Law– to define *overexploitation* as the situation when groundwater withdrawal exceeds or is close to the natural recharge of an aquifer. The observation of a trend of continuous significant decline of the levels in water wells during one or two decades is frequently considered as a clear indication of imbalance between abstraction and recharge. This is a simplistic approach that might be a long way from the real situation as it has been shown by several authors, mainly Bredehoeft, Papadopoulos and Cooper (1982), and Custodio (1992).

It is well known that natural recharge of an aquifer in semiarid and arid climates does not have a linear relationship with precipitation. In dry years recharge might be negligible or even negative due to evapotranspiration or evaporation from the water table. Significant recharge may only occur once every one or more decades. Therefore, the water table depletion trend during a long dry spell –when the recharge is almost nil and the pumping is high– might not be representative of a long-term situation.

Groundwater depletion caused by deep wells can cause the drying up of shallow wells or *khanats* (infiltration galleries) located in the area of influence of the deep wells. This may cause social problems in regions where many farmers can not afford to drill new wells or the Water Authorities are not able to demand the just compensation in water or money to the poor farmers. Moench (1999, 2003) and Burke and Moench (2000) describe some situations



of this type, in their books. A more serious situation can happen when the thickness of aquifer is small and the water table depletion practically dries up the saturated zone.

#### *b) Degradation of groundwater quality*

Groundwater abstraction can cause, directly or indirectly, changes in groundwater quality. The intrusion into a freshwater aquifer of low quality surface water or groundwater because of the change in the hydraulic gradient due to groundwater abstraction, is a frequent cause of quality degradation. Saline intrusion may be an important concern for the development of aquifers adjacent saline water bodies. This is a typical problem in many coastal regions of semiarid or arid regions. The relevance of the saline water intrusion not only depends on the amount of the abstraction, in relation to the natural groundwater recharge, but also on the well field location and design, and on the geometry and hydrogeological parameters of the pumped aquifer. In many cases, the existing problems are due to uncontrolled and unplanned groundwater development and not to excessive pumping. This is a well known fact since long time ago.

The degradation of groundwater quality may not be related at all to excessive abstraction of groundwater in relation to average natural recharge. Other causes may be responsible, such as return flow from surface water irrigation, leakage from urban sewers, infiltration ponds for wastewater, septic tanks, urban solid waste landfills, abandoned wells, mine tailings, and many other activities not related to groundwater development (Barraqué, 1997; Foster, Lawrence & Morris, 1998). Also a temporary situation, such as a serious drought, can contribute to the degradation of groundwater quality (López Geta and De la Orden, 2003).

One might think that the problem of groundwater quality degradation is mainly an issue in humid and industrialised regions. This does not seem to be the general situation. For instance, Salameh (1996) in his study of Jordan water resources says: "it is not water quantity, but its worsening quality that will bring us to our knees".

#### *c) Susceptibility to subsidence*

When an aquifer is pumped, the water pore pressure is decreased and the aquifer solid matrix undergoes a greater mechanical stress. This greater stress may produce compaction of the existing fine-grained sediments (aquitards) if the stress due to the decrease in water pore pressure is greater than the so-called *preconsolidation* stress. This situation has occurred in some aquifers formed by young sediments, such as those in Mexico City, Venice, Bangkok and others.

Caves and other types of empty spaces may exist under the water table in karstic aquifers. When the water table is naturally depleted the mechanical stability of the *roof* of such empty spaces may be lost and the roof of the cave collapses. This is a natural process that gives rise to the classical *dolines* and *poljes* in the karstic landscape. When the water table depletion or oscillation is increased by groundwater abstraction, the frequency of karstic collapses can be also increased. The accurate prediction of such collapses is not easy.

In both cases, the amount of subsidence or the probability of collapses is related to the decrease in pore water pressure, which is related to the amount of groundwater withdrawal. Nevertheless, the influence of other geotechnical factors may be more relevant than the amount of water abstracted in relation to the renewable groundwater resources of the aquifer.

#### *d) Interference with surface water*

Some anthropogenic activities may have a significant impact on the catchment hydrologic cycle, as was already stated by Theiss (1940) and Bredehoeft *et al.* (1982). For example in the Upper Guadiana catchment in Spain (Hernandez-Mora, Martínez Cortina & Fornés, 2003), a serious water table depletion (about 30–40 m) has decreased the evapotranspiration from the water table and wetlands between 100 and 200 Mm<sup>3</sup>/yr. This depletion has degraded several important wetlands but has increased significantly the renewable water resources that can be used for irrigation, which were estimated between 300 and 400 Mm<sup>3</sup>/yr under non-disturbed situation.

The artificial depletion of the water table can also change dramatically aquifer-streams relationship. *Gaining rivers* fed by aquifers may become dry except during storms or humid periods when they may become *losing rivers*, an important source of recharge to the aquifer. Nevertheless, this *new water budget* may present legal problems if the downstream water users have previous water rights (Sophocleous, 2000, 2003).

#### *e) Ecological impacts*

Ecological –real or pretended– impacts are becoming an important new constraint in groundwater development in some countries. These impacts are mainly caused by water table depletion. This can induce different effects such as: 1) decreasing or drying up of springs or low flow of streams; 2) diminution of soil humidity to an extent in which phreatophitic vegetation cannot survive; 3) changes in microclimates because of the decrease in evapotranspiration. In some cases, the ecological impact of such changes is obvious. For instance, if the water table that was previously at land surface and it is lowered by more than 10 meters during more than twenty years, it is obvious that the peatland or riparian forests that might exist on that aquifer are not going to survive. But if the water table is depleted only during one or two years and not more than one or two meters, probably it cannot be assured that the ecological impact will be irreversible. Quantitative and detailed studies on this type of problems are still rather scarce.

#### ***Ethical issues in groundwater use***

According to Llamas and Martínez Santos (in press), five ethical issues are considered relevant in trying to achieve sustainable or reasonable groundwater use:

##### *1) Perverse subsidies to surface water projects*

The hidden or open subsidies that have traditionally been a part of large hydraulic works projects for surface water irrigation, are probably the main cause of the pervasive neglect of groundwater problems among water managers and decision-makers. Surface water for irrigation is usually given almost free to the farmers; and its wasteful use is the general rule.

Progressive application of the *user pays* or *full cost recovery* principle would probably make most of the large hydraulic projects economically unsound. As a result, a more comprehensive look at water planning and management would be necessary and adequate attention to groundwater planning, control and management would probably follow.

##### *2) Public, private, or common groundwater ownership*

Some authors consider that the legal declaration of groundwater as a public domain is a *conditio sine qua non* to perform a sustainable or acceptable groundwater management. This assumption is far from evident. For many decades groundwater has been a public domain in a good number of countries. Nevertheless, sustainable groundwater management continues

to be a significant challenge in many of those countries. Highly centralised management of groundwater resources is not the solution but to promote solidarity in the use of groundwater as a *common good*. Groundwater management should be in the hands of the stakeholders of the aquifer, under the supervision of the corresponding Water Authority. The stakeholders' participation has to be promoted bottom-up and not top-down.

### *3) Lack of hydrogeological knowledge and/or education*

Adequate information is a prerequisite to succeed in groundwater management. It has to be a continuous process in which technology and education improve solidarity and participation to the stakeholders and a more efficient use of the resource. Fortunately, the modern communication systems can facilitate extraordinary the capacity to inform and educate the people.

### *4) Transparency in groundwater related data*

Good and reliable information is crucial to facilitate cooperation among aquifer stakeholders. All stakeholders should have easy access to good and reliable data on abstractions, water quality, aquifer water levels. Current information technology allows information to be made available to an unlimited number of users easily and economically. Nevertheless, in a good number of countries it will be necessary to change the traditional attitude of water agencies of not facilitating the easy access to water data to the general public.

### *5) The ethics of pumping non-renewable groundwater resources (groundwater mining)*

Some arid regions have very small amounts of renewable water resources but huge amounts of fresh groundwater reserves, like for example the existing reserves under most of the Sahara desert. In such situations, groundwater mining may be a reasonable action if various conditions are met: 1) the amount of groundwater reserves can be estimated with acceptable accuracy; 2) the rate of reserves depletion can be guaranteed for a long period, e.g. from 50 to 100 years; 3) the environmental impacts of such groundwater withdrawals are properly assessed and considered clearly less significant than the socio-economic benefits from groundwater mining; and 4) solutions are envisaged for the time when the groundwater is fully depleted. Selbourne (2000), chairman of the Water Resources Committee of the World Commission of the Ethics of Science seems to agree with this approach, that was already presented in a UNESCO Symposium in Tripoli in 1998 (Llamas, 1999).

## ***The role of groundwater in Spanish Water Policy***

The total annual volume of groundwater pumped in Spain grew from less than 2,000 Mm<sup>3</sup> in 1960 to about 6,000 Mm<sup>3</sup> in 2000. This groundwater development has been driven by thousands of individual users (especially farmers) as well as small municipalities, with scarce public planning or oversight. While groundwater use plays a major socio-economic role in some regions, it continues to play a minor role in Spanish national water policy (Martínez Cortina and Hernández-Mora, 2003). This situation does not correspond with Spain's significant hydrogeological potential. Table 1 presents data on the total volume of groundwater used in Spain in different sectors and its estimated economic value. The table does not include environmental or social benefits that have no direct monetary value. In spite of the clear limitations of the data presented, the magnitude of the economic contribution of groundwater is apparent.

Although not included in Table 1, the environmental value of groundwater is significant. Groundwater plays an important role in maintaining river base-flow in many regions and is the primary source of water for many wetland areas, most notably the Doñana or Tablas de

Daimiel National Parks. In a country with many arid and semi-arid regions, groundwater-supported aquatic ecosystems are key contributors to the country's great ecological richness.

Table 1. Groundwater use in Spain and rough economic valuation of this use

Use	Groundwater Used (Mm <sup>3</sup> / yr)	Percentage of total use supplied by background	Range of average values (€/m <sup>3</sup> )	Total economic value (10 <sup>6</sup> €)
Public water supply	1,000 – 1,500	~ 25 %	0.25 – 1.25	250 – 1,850
Irrigation	4,000 – 5,000	~ 20%	1.10 – 2.15	4,500 – 10,750
Industrial use	300 - 400	~ 5%	10	3,000 – 4,000
Bottled waters	4	100%	-	600
Total	5,500 – 6,500	15 – 20 %	-	8,500 – 17,000

Source: Martínez Cortina, L. & Hernández-Mora, N. (2003)

*a) The importance of groundwater for urban supply*

Roughly 13 million people use groundwater as their main source of drinking water. Groundwater is particularly important for public water supply in small municipalities and in island environments. In the Balearic and Canary Islands, more than 90% of the population is supplied with groundwater.

The total amount of groundwater used for domestic water supply in Spain fluctuates with varying climatic conditions, but it represents about 25% of the total volume of water used for public water supply in the country. The percentage is very low in comparison to other European countries, especially considering the great hydrogeological potential and the meteorological characteristics of Spain. In some cases, groundwater could play a major role in guaranteeing water supply to cities in times of drought (Martínez Cortina and Hernández-Mora, 2003).

Figure 1 shows that Spain has the lowest percentage of groundwater used for urban water supply, with the exception of Norway, which has very little aquifer potential. The lack of qualified personnel in groundwater hydrology in the Water Authorities and in the municipal governments with the responsibility of urban water supply, the tradition of publicly subsidised construction of surface water development projects in Spain, are two reasons that can help explain this situation. To this general situation also contributed the influence of the failure of groundwater to supply Madrid in the XIX Century, and the highly centralised Spanish Administration system (Llamas, 1985).

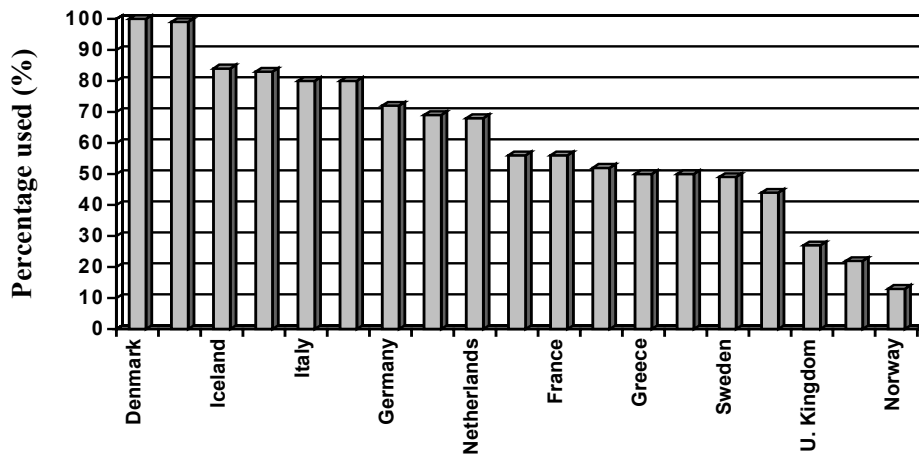


Figure 1. Percentage of groundwater used for public supply in different European countries  
Source: Llamas, Fornés, Hernández-Mora and Martínez Cortina, (2001). Data from EEA (1999).

*b) The importance of groundwater for irrigation*

In some regions (Castilla-La Mancha, Murcia, Valencia), groundwater is the primary source of water for irrigation. In the Balearic and Canary Islands, groundwater is practically the only available resource.

Table 2 shows that groundwater provides 20% of all water used for irrigation, and it irrigates almost 1 million ha, about 30% of the total irrigated area. That is, groundwater irrigation is significantly more efficient than surface water irrigation, using 4,700 m<sup>3</sup>/ha/yr and 8,200 m<sup>3</sup>/ha/yr, respectively.

Table 2. Water use for irrigation in Spain

Origin of water	Surface water	Groundwater	Mixed	Total
Irrigated areas (10 <sup>3</sup> ha)	2,250	950	150	3,350
Average volumes used (m <sup>3</sup> /ha/yr)	8,200	4,700	-	7,200
Total volume used (Mm <sup>3</sup> /yr)	20,000	4,500	-	24,500

Source: Llamas, Fornés, Hernández-Mora and Martínez Cortina, (2001).

The efficiency of groundwater is even higher than surface water in socioeconomic terms. Using data from the Irrigation Inventory for Andalusia, Llamas *et al.* (2001) show that, in this region, productivity of groundwater irrigation is over five times greater than irrigation using

surface water (in € per m<sup>3</sup> of water) and generates three times the employment per volume of water used (Table 3).

Table 3. Comparison of irrigation in Andalusia as a function of the origin of the water

Water source	Surface water	Groundwater	Total
Irrigated surface (10 <sup>3</sup> ha)	600	210	810
Total production (10 <sup>6</sup> €)	1,950	1,800	3,750
Average consumption at origin (m <sup>3</sup> /ha/yr)	7,400	4,000	6,500
Water productivity (€/m <sup>3</sup> )	0.42	2.16	0.72
Employment generated (EAJ/10 <sup>6</sup> m <sup>3</sup> )	17	58	25

EAJ: Equivalent annual job (work of a person full year: 2,200 h/yr).

Source: Martínez Cortina, Hernández-Mora and Llamas, (2002).

The productive advantage of groundwater irrigation is not only the result of more advantageous climatic conditions. Some of the reasons that explain this higher productivity are:

- The greater control and supply guarantee that groundwater provides, which in turn allows farmers to introduce more efficient irrigation techniques and more demanding and profitable crops. Groundwater plays a very important role as a buffer against droughts, avoiding the risk of losing investments. The availability of groundwater supplies allowed irrigation agriculture to survive during the 1991–1995 dry sequence, in regions like Andalusia (Corominas, 2001), or Valencia.
- The greater dynamism that has characterised the farmer that has sought out his own sources of water and bears the full costs of drilling, pumping and distribution.
- The fact that the higher financial costs farmers bear, motivate them to use water more efficiently and look for more profitable crops that will allow them to maximise their return on investments.

On the other hand, groundwater management in Spain is a complex task, and some aquifers mainly in the Southern Spain, are already considered overexploited, the most part of them located in the Segura river catchment. As a result of these facts, groundwater conflicts exist and concern to different sectors of society. One of these recent conflicts is the Ebro river transfer to Mediterranean regions of Spain. In this framework, it is important to clarify that the EU Water Framework Directive (WFD) does not require the preparation of a National Water Plan. This is only a requirement of the 1985 Spanish Water Act. The main goals of this National Plan are the approval of interbasin water transfers and the co-ordination among the different Basin Water Plans. The Law of the first National Water Plan was promulgated in July of 2001. Its main purpose has been to approve a water transfer of a little more than one cubic kilometre per year from the Ebro River in Northern Spain to the Mediterranean coastal regions (Figure 2). The main objective of this transfer is to eradicate the “overexploitation” of some aquifers. Although legally approved by the Parliaments, the Ebro water transfer has caused torrents of controversy not only in Spain, but also in the EU Commission and Parliament. There have been a great number of formal protests and lawsuits against that water transfer. Also several vociferous and numerous demonstrations (some of them with more than 200,000 participants) have taken place in different Spanish cities and also in Brussels. While most demonstrations were against the water transfer, at least one gigantic demonstration in Valencia was in favour.



Figure 2. Water transfer from the Ebro river

Who is against or in favour? Most political parties in the opposition before the last general elections (March 14, 2004) were against the transfer. They were joined by a good number of water resources experts, mainly acting through the so called Fundación Nueva Cultura del Agua (New Water Culture Foundation). Also two totally different groups are against the water transfer: the Aragon farmers who demand the building of a greater number of dams (always heavily subsidised with public funds); and the NGO "Platform for the Ebro Delta Defense". This is a small but very active group, which claims that the Ebro water transfer would increase the current problems for the survival of the delta region, home to about 200,000 people. These problems are related to upstream water diversion for irrigation as well as to the dramatic decrease in the river's suspended solids load due to the great number of large reservoirs built along its course.

Clearly in favour of water transfer are the farmers and developers of the Mediterranean region that are going to receive the strongly subsidised Ebro water, as well as the political party in power until the last elections and the larger construction companies.

The Spanish Government has asked to spend EU funds for the construction of the necessary engineering infrastructure for the water transfer, mainly an aqueduct over 1,000 kilometres long. Neither the Spanish nor the European debate has been settled yet and probably it will take a few years of negotiation and mediation before social conflicts of this type change from confrontation to co-operation. The debate is becoming more political than a technological discussion, both in Spain and in Brussels (Llamas, 2003a). Nevertheless, this transfer would be illegal from the WFD point of view, due to it had to be subjected to the full cost recovery principle.

Scientific reports and articles on this debate are abundant. Most of them up to now are against the water transfer. While most government representatives did not show a great interest in discussing the transfer in Spain, they did participate in debates in the EU Parliament and/or Commission, as these were related to the allocation of funds. However, up to now only two issues of central importance to both the feasibility of the proposed transfer and its environmental impact, have been discussed with EU Environmental Directorate General. In this regard, two questions arose from the report by Murphy (EU, 2003): 1) What

volume of water will the Ebro discharge into the sea when the project is implemented? 2) What volume of water is required in order to preserve the ecological and chemical equilibrium of both river and delta?

Some NGOs as well as certain bodies and organisations have shown a critical outlook on the answers provided to these two questions by the Spanish National Ministry of the Environment. Several groups mentioned in Murphy's report came forward with alternative models and predictions which, in the extreme cases, lead to the conclusion that there would be no water available for the proposed transfer.

The EU Environmental Directorate General did not make a clear judgement. It is interesting to observe that up to now, most of the discussions have been dedicated to some rather diffuse issues, like the climate change, land use impact on river flows or endangered species.

Perhaps the most surprising issue in this whole debate is that both of the contending parts are yet to identify the real source of the problem, that is, the chaotic situation of groundwater management in South-Eastern Spain (see Llamas, 2003b). The influence of the silent revolution of the intensive groundwater use in that region is a radical cause of the above-described conflicts.

### **Conclusions**

Groundwater development has significantly increased during the past fifty years in most semiarid or arid countries. This has been brought about by a large number of small developers, often with poor scientific or technological control by the responsible water Administration. In contrast, surface water projects developed during the same period (dams, canals...) are usually of larger scale and have been designed, financed and constructed by government agencies that normally manage or control the operation of irrigation or urban public water supply systems. Many groundwater managers have limited understanding and poor data on the current groundwater situation and its real value. These results in problems like the depletion of the water level in wells, decrease of well yields, water quality degradation, land subsidence or collapse, affection to streams and surface water bodies, and ecological impact to wetlands and gallery forests. Reports on these impacts are often exaggerated, resulting in the myth that groundwater is an unreliable and fragile resource that should only be developed if it is not possible to implement conventional large surface water projects.

Water governance in Spain, based in a long multiseccular experience, has many positive and interesting aspects that can be exported to other countries with similar conditions. But Spain's Water Policy is suffering due to the persistence of obsolete paradigms that dominate the minds of many water policy decision-makers. Some groups or lobbies are strongly entrenched into trying to maintain those old ideas. Social conflicts such as Ebro river transfer will probably take a few years of negotiation and mediation before being settled and the social situation changes from confrontation to co-operation.

The "silent revolution" described in this paper, has produced great benefits but has also caused some problems that might have been avoided or mitigated if the corresponding water authorities had become aware of the relevance of this new phenomenon. The solution of such problems will very rarely require the construction of the classical hydraulic infrastructures. It demands a great effort in education, participation, transparency and the creation of groundwater users associations.

It is hoped that the transparency and accountability linked to the democratic processes and facilitated by the new communication technology are going to allow new water management



paradigms to be accepted soon by the general public and by the water policy decision-makers.

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