Proceedings
WWC Publication No.1

Proceedings of the Workshop on Water and Politics:

Understanding the Role of Politics in Water Management

Marseille, 26-27 February 2004

Edited by the World Water Council

World Water Council
4th World Water Forum

IUCN
The World Conservation Union

The views and opinions of workshop participants that are presented herein do not necessarily reflect those of their respective departments, agencies, or institutions nor those of the World Water Council. They may not be used for advertising or product endorsement purposes. The World Water Council does not endorse or recommend any commercial products, processes or services.

Copyright © World Water Council, 2004

ISBN: 92-95017-09-9

Price: 10 Euros

To order: wwc@worldwatercouncil.org

This report can be cited as follows:

World Water Council. 2004. Proceedings of the Workshop on Water and Politics: Understanding the Role of Politics in Water Management, Marseille, February 26-27, 2004.

Proceedings of the Workshop on Water and Politics: *Understanding the Role of Politics in Water Management*

Marseille, 26-27 February 2004

Edited by the World Water Council

This workshop was organised by the World Water Council and the World Conservation Union with the Support of the Water Supply Group of Marseille.

This programme on water and politics is part of the WWC contribution to the Dialogue on Water, Food and Environment.

Preface

The way water and politics interact is critical for decisions on and implementation of water reforms. Politics, defined here as the process through which relations of power are constituted, negotiated and reproduced, is indeed in the background of all public decisions and action. Although obvious to water practitioners, this political component has not received sufficient attention so far. On the contrary, the international discourse often exerts a strong depoliticising effect by focusing on neutral concepts, which avoid controversies being developed and properly addressed. That is why the World Water Council has initiated, in partnership with IUCN, a "Water and Politics" programme that aims to raise awareness of the importance of political issues in water reforms and to identify how politics can be a tool for the water community.

In the framework of this project, pilot activities have been launched in some countries or basins to identify the institutional and political power structures and to facilitate discussion between local technical and political people. Selected dialogue areas are located in Mexico (Costa de Chiapas), Tanzania/Kenya Pangani River Basin, Volta River in Ghana and Burkina Faso and the Mekong River Basin (Thailand, Cambodia, Laos).

To share the outcome of these activities and to receive input on further action, a workshop was organized on 26-27 February in Marseille, in partnership with IUCN and the Water Supply Group of Marseille, which hosted the event.

The objectives of the workshop were to help to further develop the project on Water and Politics by identifying priority areas to be investigated and priority action. Fifty participants from 21 countries and from a wide array of backgrounds discussed the following questions: (i) what can we learn from political science that can help our understanding of the implementation of water reforms? (ii) How could this knowledge be useful to those in charge of preparing these reforms? (iii) Which are the most critical issues that could benefit from this programme? (iv) What specific actions could be initiated by the Council in this field?

Water, which is essential for life and development, is present in most sectors such as energy, health, industry, etc and does not constitute a sector in itself. This makes water highly political and consequently, only elected officers have the legitimacy to take the important decisions related to its management. It is essential to take account of national and local political processes and power structures if effective local action for improved water use and service provision is to be obtained. Therefore it is necessary to facilitate the dialogues between the water community and politicians at all levels, but especially at the local one, to enhance the understanding on the one hand of the role of politics by the water community and on the other hand of the role of water in development by decision-makers.

The World Water Council included in its work programmes components on water and politics taking into account the suggestions of the workshop that there is a need for 1) enhancing mutual understanding and co-operation between water professionals and politicians and 2) for a better understanding of politics and power structures at the local level. In its programme on the strengthening and empowerment of local stakeholders, the Council has already committed itself to working on a better articulation between the water actors, the other sectors, the local authorities and the political world. The programme on water and politics is also linked to the overarching theme of the 4th World Water Forum "Local actions for a global challenge".

More information to be followed on http://www.worldwatercouncil.org.

Acknowledgements

The World Water Council would like to express its gratitude to all who contributed to the preparation, implementation and synthesis of the workshop. First of all to the Scientific Committee for their kind support in having reviewed and selected the presentations and for having supervised its content: Bernard Barraqué from the Laboratoire Technique, Territoire et Société – École Nationale des Ponts et Chaussées, Jerry Delli Priscoli from the U.S. Army Corps of Engineers and President of the Committee on Institutions and Governance of the World Water Council, Brett Orlando from the World Conservation Union and Anthony Turton from the African Water Issues Research Unit and the GIBB-SERA Chair in IWRM at the Council for Industrial and Scientific Research of the University of Pretoria.

We would like to give special thanks to the Water Supply Group of Marseille in the person of its President and Chief Executive Officer, Loïc Fauchon, also Vice-President of the World Water Council, for having hosted the event and provided all the necessary equipment. Thanks to Sandrine Serres, Bénédicte Williamson and all the staff of the Water Suppy Group of Marseille who contributed to the success of the event.

Many thanks to the staff and interns of the World Water Council, who helped to prepare the workshop and organised workshop logistics, presenters, venue, administration and communications or who helped in the editing of these proceedings: Sonia Briki, Frédérique Chartrand, Colin Herron, Marie Lagier, Aude De Montesquiou, Stéphanie Porro, Carine Sirou and Françoise Touchard. Many thanks also to William Cosgrove, President of the World Water Council, and Daniel Zimmer, Executive Director, and Ger Bergkamp for their support and involvement during the workshop and its preparatory work.

Finally, no workshop would be a success without well-prepared, committed and knowledgeable speakers and participants. We are very grateful to them for their clear, concise and thoughtful presentations and for their interventions during the discussions.

Table of Contents

Preface ……ii
Acknowledgements……iii
Table of Contents……...v
Workshop Contributions……1

A Few Theorical Elements on Legal Institutional and Sociological Issues in Waters & Politics*, Bernard Barraqué*……...……..3

Bridging the Gaps Between Technical and Political: Training Senior Water Managers what they need to know about Conflict Management, Consensus Building and Participation*,Jerry Delli Priscoli*……...……...……..…5

Water, Wine, Vinegar, Blood: on Politics, Participation, Violence and Conflict over the Hydrosocial Contract, *Jeroen Warner*……....……..7

The Emergence of Sustainable and Participatory Development in Dams. Lessons from Political Science Research, *Stéphane La Branche*……19

Packaging Polices as a Vehicle for Reforming the Water Sector: the Case of the Californian drought and the Central Valley Project Improvement Act, *Itay Fischhendler and David Ziberman*..……...……31

"Liable but not Guilty": The Political Use of Circumstances in a River Basin Council (Mexico), *Eric Mollard and Sergio Vargas Velázquez*..…….39

An Assessment of Strategic Issues in the Policy Field Relating to Water Resource Management in Southern Africa, *Anthony Turton*..……...51

Contending Approaches to Water Disputes in Transboundary Rivers: What can International Relations Discipline Offer?, *Ayşegül Kibaroğlu*……71

Dam Debates Challenging French River-Basin Participatory Planning: A "Negociated Public Action" Perspective, *Sophie Allain*…….……..83

Political Structure and 'Dam' Conflicts: Comparing Cases in Southeast Asia, *Ashok Swain and Ang Ming Chee*…….……..……..95

Governance and Water Management in Asia: What do we need to Learn?*,Stephen Tyler*……..……..115

Forces Behind Accepting / Rejecting Water princing, *Raouf F. Khouzam*……117

The Politics of Multi-Stakeholder Partnerships for Water and Sanitation: The Significance and Worth of the World Summit Type Two Partnerships, *Amy Stewart*……..…….…….125

The Politics of Water in the Mekong Region: the Case of Yunnan Hydropower Expansion, *John Dore and Yu Xiaogang*……...……145

"The Importance of the Ecoregiòn Sierra-Costa of Chiapas and the Water and Nature Iniciative in The Tacana Volcano with the UICN", *Froilán Esquinca Cano*……..…157

Towards Good Water Governance in Tanzania: Lessons and Desired Action, *Raphael Burra and Peter Kangwa*……..……163

Water Politics in the Volta Basin – Defusing Conflict, Risks and Promoting Bilateral Cooperation trough Informed Dialogue and Negotiations, *Kwame Odame-Ababio*…….165

Introducing Political Issues in the Debate on Water Resources Planning in Tunisia: a Necessity for the Implementation of Water Demand Management Policies,*Sébastien Treyer*…….……171

The Silent Revolution of Groundwater Intensive use and its Influence in Spain, *Juan Mª Fornés, África de la Hera and M. Ramón Llamas*……...…….183

Parliamentarians Role In Water Management: Water And Politics In the South Caucasus, *Anna Gekht*……..……197

Le niveau pertinent pour la gestion des services d'eau et d'assainissement, *René Coulomb*…….201

Is Water Policy Responding To Rural Preferences? A Choice Experiment Of Household Water Priorities In South Africa, *Hope R.A and Garrod G.D*…..……207

Hydropolitics: An Overview With Special Focus on the Frakka Barrage, *Mohammad Ehteshamul Hoque*……..…..……219

Thousand years of Hydraulic Civilization Some sociotechnical aspects of water management, *H.A.H Jayanesa and John S. Selker*……...225

Paradigmatic Change in the Indonesian Irrigation Development in Disarray, *Mochammad Maksum*……...……239

Unbundling 'Lack of Access' to Water in Rural India, *Nayanika Mathur*……249

Water and Related Energy Politcs in the Syrdarya Basin: Current Challenges and Future Prospects, *Anatoliy Sorokin, Larisa Averina and Bakhtiyor Mukhamadiev* …….257

Appendix 1: What should be next? – Ideas and suggestions……..……..265
Appendix 2: Programme….……...……..269
Appendix 3: List of Participants……..273

Workshop Contributions

A few theoretical elements on legal institutional and sociological issues in Water & Politics

Bernard Barraqué, LATTS-ENPC

Abstract

If we are going to develop a better understanding of this topic, which covers legal institutional as well as socio-economic issues, we need to improve the theoretical dimension to give an intellectual framework to the numerous case studies presented.

I would like to contribute first by recalling the evolution of water rights and institutions in Europe, where there are indeed growing common features beyond the initial double diversity (centralised vs subsidiary countries, and Roman vs Common law). Second, I intend to recall a few specificities of environmental policies, which in turn may explain why new approaches like the *advocacy coalitions* (Paul Sabatier) were developed. Lastly, I would like to insist on the present weakness of the analysis of urban water services conflicts in terms of sociology. Here again, the specific history of Europe, with the “municipalism” should not be forgotten.

Bridging the Gaps between Technical and Political: Training Senior Water Managers what they need to know about Conflict Management, Consensus Building and Participation

Jerry Delli Priscoli, U.S. Army Corps of Engineers

Abstract

The world has changed for water resources managers, planners and decision-makers. Today, especially in the context of new demands for Integrated Water Resources Management (IWRM), water managers and planners often work in teams involving multiple disciplines and not just engineering and associated technical fields. Increasingly they work in multi-agency teams, which involve a variety of public, NGO and private sponsors. Today's water managers and decision-makers must consult with a broader range of stakeholders, publics, and NGOs, locally, regionally and often internationally. And, they must do all this while operating in a world of increasing demands on water.

Technical excellence remains necessary for creating sustainable water management decisions – perhaps even more necessary then ever. However, it is not sufficient. People all over the world need technical engineering competence more then ever. However, the ability to put that competence in service of those who need it depends, in many cases, on changing the relationship between the experts and those whom they are serving. This course aims at helping to build, to modify or to create such new functional relationships.

This new water resources decision-making environment requires at least two sets of skills. First, it requires excellent and broad technical skills, which reach across disciplines to consider alternatives that in the past were often not evaluated. In addition, today's water decisions often rest on a scientific basis that is itself incomplete. This sometimes means that water decision-makers must first get agreement on what studies need to be conducted and, data collected, to ensure that decisions are based on science, not rhetoric. As a result, water planners and managers need a breadth of technical knowledge that goes beyond the traditional excellence in engineering.

Second, water planners and managers need another set of skills – the skills of designing and conducting processes that draw together partners, stakeholders and publics, resulting in decisions that enjoy broad cross sectoral and often transboundary, public support. The era where water planners and managers decide-announce-defend is rapidly disappearing. In this new era, water management is done <u>with</u> (as opposed to being done "for" or "to") potentially affected agencies, public and private organizations, individuals and others.

This paper outlines these skills. They are the skills which will help water resources decisions makers avert conflict, deal with water conflict should it arise, use water decisions as a venue for dialog when others are closed to parties locked in various types of non water conflicts. They include how to:

- Identify the characteristics of effective participatory, consensus building and conflict management processes
- Design and facilitate multi disciplinary teams, as needed in IWRM, a variety of interactive workshops and large and small meetings.
- Identify behaviors that escalate conflict during a dispute with other agencies, stakeholders, or the public – and identify behaviors that halt this escalation
- Select appropriate techniques for a participatory process
- Design basin wide organizations and frameworks for action.

- Implement participatory programs
- Understand and use new techniques of facilitation, communication
- Interest based negotiations and consensus building.
- Understand and identify stakeholders
- Articulate why design participatory programs
- Others

The paper discusses most effective methods for training senior mangers in these skills. Such training should be designed to teach skills, as well as concepts. When learning a skill, it isn't enough just to "know about" the skill. Skills have to be practiced, preferably in conditions that replicate the circumstances under which the skill will be used. For this reason, the general sequence for each skill taught should be: (1) brief presentation; (2) a class activity or team exercise in which you apply the skill; and (3) a class discussion or debriefing to focus in on key issues or important things that were learned from the activity.

This means that the training is interactive, and the active participation of mangers itself becomes an essential part of your learning. For example, each team exercise can become another opportunity to learn more about working in teams. All skills require practice – and the more you practice them the better you will get. Training can provide the basics of each skill. But in reality it gets the senior manger started and helps them to reinforce the skills learned with regular practice on the job.

Large organizations need a strategy for delivering such training. The most effective method is to bring the training to working teams who are actually engaged in field. In this way field problems are solved using new skills and the training occurs in real time among those who actually work together. Increasingly the traditional methods of selected individuals taking time from the actual work team to take a course alone, is ineffective and expensive method to internalizing such skills. In addition, such training can be effective tools in broader overall organizational change strategies.

Water, Wine, Vinegar, Blood: on Politics, Participation, Violence and conflict over the Hydrosocial Contract[1]

Jeroen Warner, Wageningen University

Abstract

While 'water wars' are not as rife as predicted in the 1990s, the world is currently facing a spate of conflicts over water, most famously the case of Cochabamba, Bolivia. The article argues to see them not as conflicts over the resource itself, but over the terms of engagement between state and society.
The emerging Hydro-Social Contract Theory (HMSC) can be helpful in describing such crises, usefully connects the interaction with society with the interaction with natural resources. It highlights the crossroads between conflictive and cooperative junctures in social relations.

In terms of the HSCT, recent conflicts over privatisation and infrastructural projects seem to highlight crises of the Lockeian contract. This article suggests that dissenting voices demand the serious consideration of a third type of hydrosocial contract – the Rousseauian hydrosocial contract.

Introduction: Water politics, water wars?

The interest in politics and conflict seems to be on the rise in the water sector. The fact that the World Water Council organised a workshop in Marseille late February on the theme, bears witness to this awareness. In the water world, *water politics* is often seen as a nuisance, if a fascinating one. This is implicit when J. Anthony Allan (1997) praises virtual water as a solution that still works *without* politics, while Mollinga (2001) sees politics as a constitutive aspect of every-day life, which has the potential for empowering marginalized groups once they have learned how to work the system. More than anyone Mollinga has stressed the 'essentially contested' and hence political nature of water.

Concomitantly, *water conflict* started to considerable attraction to scholars and journalists, if not always with great sophistication, in the 1990s. While clearly competition (contest) for resources is not necessarily conflict-ridden, and conflict does not have to be violent. Such niceties however were lost in the debate on water wars dominating the close of the 20th century since Starr and Stoll (1990) sounded the alarm in *Foreign Policy*. In those days, political leaders, notably in the Middle East, repeatedly claimed that water would be a cause for war (a casus belli), and prominent international spokesmen such as GWP's Ismail Serageldin were (apparently mis-) quoted as saying the next war would be about water, not oil.

Aaron Wolf (1995) and others have made a strong case that there is scant evidence to back the water wars thesis up. As a result the debate on water wars reached the consensus that water wars *between* states are not as likely to happen as people thought. In this contribution I shall argue that the debate ignores other types of conflict, which on the one hand are highly localised, on the other hand have a clear link with global actors and players. One such conflict erupted at a time when the 1990s debate on water wars seemed to end on a positive

[1] This paper was presented on the kind invitation of the World Water Council, during a meeting on ' Water and Politics' in Marseilles, February 2004. The conceptual framework expands on ideas first expressed in an AWIRU paper (Warner 2000). This paper follows up from the SOAS Water Issues paper no. 67 (Warner 2004). It has enormously benefited from inspiring discussions with Hans van der Veen, Mark Zeitoun and Rocio Bustamante, to whom I extend my deepest gratitude.

note – the uprising against the privatisation of water services in Cochabamba, Bolivia. While the media label 'war' turned out to be rather exaggerated: Gleditsch puts the minimum at 25 casualties – in Cochabamba, one person was killed) it reminded the world that locally a lot of incidental violence takes place.

Also, the stand-off had powerful repercussions throughout the world as a display of fierce resistance to privatisation and a state's ham-fisted handling of it. I will advance the case that what Neumann (1998) has called the 'violisation' (in Figure 1: the fifth stage) of this conflict resulted from clashing perspectives of what is proper governance between public (Bolivia), private (Aguas de Tunari) and civil-society (the *Coordenadora*) – which will be described in terms of (hydro)social contract theory (Meissner & Turton 2003). I will sketch three hydrosocial cosmologies (or rationalities). The bias of these three perspectives provides different answers to the key question of political science – 'cui bono' (good for whom?).

Violent water conflict: a conceptualisation

The allocation and management of water easily becomes politicised when fundamentally different views of water are at stake (Donahue and Johnson 1998). When they are contested, external interventions (projects) can become 'battlegrounds' (if usually not the violent kind) between different perspectives that are negotiated or fought before they are implemented. Because project initiators often do not realise that there is question of contest over wider issues – even if the projects are in themselves innovative, user-oriented and participatory, see Warner (forthcoming) - the fact that social actors will avail themselves of information and devise strategies to resist or renegotiate their interest comes as a surprise to them (Long 2001).

In the case of Cochabamba, the conflict over water took shape in the context of a dispute over rights, and in a wider sense over resource governance and control. Conflict happens when two or more parties want the same thing, and use *power* to get it (Frey 1993). This dynamic can, but does not have to, take the form of politicisation and even violence. The five states (or stages) of conflict outlined here can be an analytical tool. To help understand the transition of politicisation to 'violisation', this article proposes to see politics and war as different nodes on a *continuum* of conflict. We can identify five stages along the continuum of conflict (Fig. 1 below). [2] Because of the preoccupation with 'water wars', the section below will expound on the 'violisation' stage.

[2] As Mouffe (1994) reminds us, the term 'politics' at root encompasses two meanings - that of "*polemos'* (war) and that of "*polis*" (city-state). We are also reminded of the famous dictum by Clausewicz, army general under Bismarck: 'war is the continuation of politics by other means'. As Neumann (1998) explains: 'If (…) the political is a question of who gets what when, then war becomes one of a number of mechanisms by means of which a certain distribution can be realised (...) 'The waging of war, however, adds something more to the speech act of declaring war, and the crucial thing added is the use of force - that is, a violisation of politics'.

Non-politicised ↑ ↓ Politicised ↑ ↓ Securitised ↑ ↓ Opportunitised ↑ ↓ Violised	'the state doesn't deal with the issue and it is not in any other way made an issue of public debate and decision' (Neumann, 1998). It is a "non-issue" to the actors involved
	'the issue is part of public policy, requiring government decision and resource allocation (or some other form of communal governance)' (Neumann, 1998)
	'the issue is an existential threat requiring emergency measures and justifying actions outside the normal bounds of political procedure' (Neumann, 1998)
	the issue offers such a chance to improve a situation that it justifies actions outside the normal bounds of political procedure {Warner 2004)
	the issue has escalated in intensity to the point that violence is employed and the normal conventions violated; violisation = the process whereby an already securitised issue such as identity becomes a *casus belli* over which blood must run' (Neumann 1998)

Fig. 1 Five stages of conflict

Three perspectives of 'violisation'

The most famous narrative of how conflict becomes violent is the Malthusian 'water wars' thesis, claiming scarcity will lead to competition, a scramble for resources resulting in violent conflict. An interesting variety of the realist 'dog-eat-dog' perspective is violence created by abundance rather than scarcity (Gleditsch 1998). The availability of an abundance of resources in a locality attracts gold diggers like honey to the bees, and in so doing can spark violent competition between those 'bees'. While there are some examples of 'honey-pot' violence, for example over diamonds (Duffield 2000) - I have called this 'opportunitisation', Fig. 1 (see Warner 2004)– the imperative that the prize should be taken by any means. No such violent examples are found yet in the water sector, though it can be argued (Warner 2004) that development states make water development into a national security issue thus legitimising extraordinary measures such as curfew, state of emergency, that have the logic of war.

Against this Malthusian perspective, so-called *Cornucopians* maintain that there is no real water scarcity – it is a matter of distribution and efficiency, and tapping underused social resources.
Ohlsson and Turton's (1999) social resources, pointed at an important, and underrated factor putting scarcity into perspective. Ohlsson and Turton suggest that social institutional capacities (Homer Dixon's 'social ingenuity') – in my own shorthand: one's 'water IQ'.
Given a sufficient availability of such resources, an adaptive process would ensue. Allan has pointed at the redistributive capacity of the international trade system – very usefully highlighting the role of the highly interdependent global political economy.
The search as to what it is that may relate scarcity and violence is still on. The present contribution surmises a third, critical political-economy perspective, which points at a view of 'violisation' that mainstream analysis is not so attuned to: structural violence. This view shares the Realist idea that scarcity can be induced by resource capture (Homer Dixon 1994) but they see this capture as an example of the structural iniquities in the current world system rather than one possible use of power - a structural bias against the poor and the

disenfranchised. Water pollution, inequitable ownership to some critical scholars is evidence of 'structural violence' (Shiva 2001), a term originally framed by John Galtung to refer to any constraint on human potential due to economic and political structures http://www.psych.ubc.ca/~dleighton/svintro.html). Manifestations of this violence, in this perspective, are the building of big dams and ongoing privatisation – in which the state colludes with international capital and panders to US-led donors in what they term the 'neo-liberal Washington consensus'. Such iniquities are not solved by improving literacy rates and hospital beds. In this perspective, the water essentially belongs to humankind as its common heritage, it is a human right, and can be delivered but not owned by the public or private sector. The struggle to eliminate this structural violence may bring about outbursts of incidental violence.

This view of 'violisation' seems important in that the past decades have seen no international water wars, but a great deal of virulent, sometimes violent controversy over dams, channels and privatisations, supported and spurred by NGOs, who have become increasingly adept at playing the international field, blowing up seemingly minor local controversies (Shell's Brent Spar platform, Bangladesh's Compartmentalisation Pilot project, Turkey's Ilisu Dam, and indeed Cochabamba) into international political scandals. In this respect the need for large infusions of private capital has proven an Achilles heel for dam projects.

Box 1

Three theories of resource stress

1. Malthusians:
    a. Scarcity leads to war
    b. The "honey pot" of abundant resources may be a focus for greed that the honey pot argument. A surfeit of resources (resource curse) elicits a scramble of gold diggers.
2. Cornucopians: Scarcity leads to adaptation.
3. (Anti-)Globalists: Scarcity is the consequence of the structural violence of an inequitable global system.

Controversies over privatisations and big dams are usually considered to be about the water itself (first-order conflict), and in so doing engage the market, the political sector or coercive means as conflict resolving mechanisms. It is important to understand that conflict over water is very often a flashpoint for a bigger conflict, bringing to a head wider disputes (a good example is the Euphrates dispute, Warner 2004).

This article highlights the special case where the conflict concerns the rules of engagement (second-order conflict) - procedures, discretionary powers, property relations. The call on customary rights in Cochabamba (*usos y costumbres)* suggests that the property rights, procedures and even identities (as peasants, as indigenous irrigators) are fundamentally at stake, reflecting an unease with what was seen as the 'sell-out' (privatisation) of various sectors: electricity, trains, water. This suggests a *second-order* conflict, about the just-ness (legitimacy) of rights, procedures, (mis) management for allocating water. The most fundamental conflict, which could be termed third-order conflict, concerns the systemic legitimacy of the political process – brief, state-society relations.
This requires us to look more deeply into the role of the state and its relation to society.

Second-order conflicts, states and (hydro) social contracts

The Westphalian state is held to have the legitimate monopoly on the means of violence and destruction. It has other means at its disposal – such as the educational system, to inculcate loyalty – but ultimately, the means of violence are its key power resource. As the legal representative of a country, a state can present itself as pars *pro toto* – the security of the

state is the security of all – and thus paint itself as a disinterested peacekeeping party. However, in sometimes glaring instances, the state is often seen to act as a stakeholder in its own right with parochial self-interest treating water as a political good (Johnson and Donahue 1998). Considering the state as a potentially self-interested actor rather than a neutral arbiter opens up the possibility that states do not always provide their citizens with good security deals. The noted historical sociologist Charles Tilly's (1990) intriguing account of state formation may guide or at least provoke us here. Tilly notes that Westphalian states have not always been around, tend to reuslt form quiteviolent processes, and (as evidenced by the implosion of the USSR) are not sure of their continued existence. To survive, states make protection deals (contracts) with their citizens. These contracts are not necessarily of the genteel kind – they may be concluded under duress.[3] States procure legitimacy from their citizens in a range of ways, from coercion to consensus-building, but always on the basis of some kind of security provision. Citizens on their part procure security from the state for dear tax money, with no certainty of durable protection. The state will only tolerate alternative suppliers of security when the security issues are minor; when, not, they prefer to have potential competitors in their pocket. This gives states a power-driven rationality.

This puts into perspective the developing ideas on the hydrosocial contract (Turton and Ohlsson 2000, Meissner and Turton 2003; Warner 2000). Hydro-Social Contract Theory (HSCT) usefully connects the interaction with society with the interaction with natural resources. It postulates that after a period of abundance in which supply vatsly outstrips demand, in times of crisis in water availability necessitate the (re)negotiation of 'contracts' between state and society. This contract requires a state to become 'Hobbesian', characterised by a hydraulic mission, geared at the maximum deployment of manpower and means for the development of all water resources within reach.

Social-contract theories hold that a legitimate state is one that is, has been, or perhaps might be the object of an agreement among parties, explaining why citizens accept the state's monopoly on the means of coercion. Hobbesian states take final responsibility for security provision in all aspects – economic, social and physical, with a strong state that appropriates many, national-interest issues – a 'development' state first and foremost and dams, pipelines, hydro-power installations become militarised - it incites a commitment to an 'hydraulic imperative' internally, and will try and protect its trading and development drive against competitors. This has consequences for state behaviour in times of scarcity. When facing basin closure they will reallocate water resources by decree rather than a spontaneous or guided process of adaptation. When conflict arises, they will intervene. This is the *Hobbesian-Malthusian* connection.

Many states are no longer guided by the hydraulic imperative. Two simultaneous processes bring this change on: resource stress and the limits to state power. As a result of the trend to outsource and privatise security functions, civil society capacities are increasingly called on in contributing to its own security provision (e.g. in the domain of water: flood proofing and flood warnings). This has changed the traditional 'security contract' in complex ways.

Ohlsson and Turton (2000) surmise that increasing resource stress is bound to spark a reflective process (environmental consciousness) that brings a transformation into a Lockeian type of state. It brings in environmental watchdogs (NGOs) and calls for participation and dialogue with interest groups. In addition, it is attempted to rationalise water consumption by introducing pricing mechanisms, thus bringing in the private sector to perform governance tasks. This is reflected in the current emphasis on trilateral partnerships between public, private and civil-society actors, thereby increasing the number of players in the equation.

[3] Tilly (1990) argues they take the form of protection rackets, styled after mafia practices of requesting protection money to clear your shop from the attacks of rivalling hoodlums. Part of this protection racket is that your shop is at risk of being arsoned every now and then, showing you that your protectors mean business. Conspiracy theorists would argue that a recent private-sector example of a global protection racket was the Millennium bug.

Brief, as Ohlsson and Turton see it, the increasing costs of such a supply-side strategy again precipitate a second crisis, which may lead to migration, opposition, unrest and civil disobedience. Here (often societal) pressures force the state to make a transition to a phase of 'reflexive modernisation'.

Lockeian states take a hands-off approach to force and intervention. They are facilitators rather than directors, their security commitment is a minimum programme of protecting private property. The Lockeian concept of security relegates security provision to the military sector, the rest is up to the private sector and civil society. The idea is that as trade and interdependencies expands, the military sector will have less and less to do. It regards as a transitory phenomenon that many states are still the Hobbesian kind and that resource conflict at times turns violent. Market forces and social consciousness would also imply a more 'rational', way of managing resources geared at allocative efficency. Inthis tradition, Turton and Ohlsson's (2000) model sketches an optimistic broad-brush development of states from water supply (Hobbesian hydraulic mission) to demand (Lockeian resource efficiency) management in response to a need to adapt to resource stress. The belief that stress can be 'solved', an thus avert wars, may be called the *Lockeian-Cornucopian* approach to water wars.

While the above sequence is not deterministic, and seems biased to countries in semi-arid regions, the HSCT certainly appears to 'hold water' as a heuristic for countries in transition like India, Mexico, Turkey and South Africa, where a more 'trilateral' approach to water management is growing.

However, in the eyes of radical observers, contracts can go bad, too. The world is currently facing a spate of contested interventions in the water sector, some in developed countries (Spain), most in developing countries with 'weak states'[4]. Such states will more easily resort to violence to make up for their legitimacy deficit, and rely on foreign aid rather than a domestic tax base for inratsructural projects (FAP in Bangladesh, Arun in Nepal are other examples).

The perceived reasons for this crisis go beyond the territory of the country under scrutiny. A critical international political economy (IPE) perspective – bringing the theory back to its intellectual source – highlights that states take different positions in the international system ((van der Pijl 1992; Warner 2000). Indeed, whether a state comes out as the Hobbesian or Lockeian kind is not only dependent on domestic factors and on the dominant philosophies in international aid and credit institutions (Biersteker 1992).

This 'micro-macro link' can be quite urgent - because states need money, they are quite happy to rely on international aid rather than a domestic tax base. Kleptocratic state systems commonly view infrastructural projects as a way of cream off a percentage (*bakshish*) at times inviting the suspicion that the actual intended social benefits of water projects take a backseat to kickbacks. Because of the deficiency in systemic legitimacy, intended beneficiaries easily perceive such projects, however well-intended by their initiators, as interference from outside. Weak states tend to respond to any opposition to water development projects with violence giving them a pseudo-Hobbesian sheen, but without the legitimacy.

External dependency also makes them highly amenable to external conditionalities that bring in fresh funds, even conditions that require them to change the hdyrosocial contract with their citizens.

[4] Weak states are states that do not have or have failed to create a domestic political and societal consensus of sufficient strength to eliminate the slarhge-scale use of force as a major and continuing element in the doemstic political life o fthe nation' (Buzan 1991: 99).

In the 1990s the international governance system was strongly oriented at restructuring states in the South away from Hobbesian providership (Biersteker 1992) advocating 'good governance' (Lockeian) practices such as decentralisation, privatisation and participation. This required the rationalisation of the state and a changing hydrosocial contract. In most states this would mean the curtailment of a collossal state - in Bolivian terms, the model rather meant an expansion into areas the state had never bothered with. Such change, when perceived as 'imposed', has been resisted vehemently in several countries, in struggles championed by international NGOs.

In a water context, privatisation of water is anathema to what may be called the Rousseauian social contract (cf. Rousseau 1762). Arguing that government should see to the rights and equality of everyone, Jean-Jacques Rousseau, the original social contract theorist, has been seen as a forefather of the French and American revolutions – with the crucial difference that he dismissed the notion of private property. In a water context, the view of water as common heritage of mankind as advocated by the high-profile Group of Lisbon (Petrella 1998), which advocates a 'global contract'. It is also reflected in the Cochabamba Declaration drawn up by the protest coalition in 2000 (Box 2) is a modern interpretation of the Rousseauian hydrosocial contract. For Rousseau, government and morality were strongly bound up with each other. If a state ceased to be moral, it lost its legitimacy.

This third, *Rousseauian-(anti-)Globalist* perspective of water wars, then, sees the Cochabamba conflict as a resistance to (that is, the violent renegotiation of) a new hydrosocial contract, the terms of which had been set in negotiation with interbnational rather than locla players. Not only was there an absence of prior consultation of one of the contracting parties (the citizens), these latter felt 'robbed' of traditional rights. The ensuing 'contract' thus seemed to display traits of a bad protection racket – a state that offers little protection but takes your belongings without asking (Homer-Dixon's 'resource capture'). Indeed anti-globalists are acutely aware that the social contract can be annulled. In this sense Locke and Rousseau think alike: '(W)henever the legislators endeavour to take away or destroy the property of the people (…) they put themselves into a state of war with the people, who are therefore absolved from any further obedience' (Locke 1690).

The below section will describe in more detail the dispute over Cochabamba's water supply, which at first indeed seemed to be a *first-order* conflict (a struggle about they water itself) but rapidly expanded into a *second-order* conflict about the rules and procedures, and who makes the rules: the hydrosocial contract (Warner 2000).

Box 2: Rousseauian thinking in Bolivia

From the Cochabamba Declaration: (October 2000)

1) Water belongs to the earth and all species and is sacred to life, therefore, the world's water must be conserved, reclaimed and protected for all future generations and its natural patterns respected.

2) Water is a fundamental human right and a public trust to be guarded by all levels of government, therefore, it should not be commodified, privatized or traded for commercial purposes. These rights must be enshrined at all levels of government. In particular, an international treaty must ensure these principles are incontrovertable.

3) Water is best protected by local communities and citizens who must be respected as equal partners with governments in the protection and regulation of water. Peoples of the earth are the only vehicle to promote earth democracy and save water.

Politicisation and violisation of water conflict in Cochabamba

The social contract between Bolivia's society and the state was already shaky. Indeed, When Bolivia shed military dictatorship in 1982, the country was in disarray; ever since, public service provision has been poor and corruption rife. Banzer's Bolivia (in his autocratic era as well as his democratically elected comeback) was never a model of 'good governance'. Peña Cazas (1997) shows up the elemental interwovenness of politics and big bucks, with many of the trappings of a kleptocracy (Assies 2001).

The unease came to ahead around the provision of potable water to Cochabamba, the sprawling capital of Cercado province, which together with Quillacollo province, forms Bolivia's 'Central Valley'. It has a chronic shortage of water and water quality is appalling. To improve water provision for Cochabamba city, the military dictatorship established the state-run utility SEMAPA [5] in the mid-1970s by. SEMAPA however had to contend with rapid population growth (from 75,000 in 1950 to half a million at present), partly due to an inflow of workers in decommissioned tin mines in 1985 and to dry spells in the 1980s (Assies 2001). Despite SEMAPA's efforts, citizens of the city of Cochabamba continue to suffer diarrhoea and worse because of the polluted water. UNESCO observed in 2000 that the city 'has no more than five hours of water a day, and only 40 percent of farmers in the surrounding area have access to clean water' (http://www.unesco.org/courier/2000_12/uk/planet2.htm)[6].

In addition, recurring droughts compelled SEMAPA to look elsehwere for fresh sources of water for its customers, producing enduring conflict with irrigators in the Central Valley. After the drought of 1976, for example, irrigators claimed SAMAPA's ten new 120m wells in rural Vinto undercut their own wells (Assies 2001, Bidaseca 2004) and in 1992 local governments joined forces with protesters when SEMAPA again intended to drill wells in the region. Subsequent years saw further conflicts between town and country, worsened when it turned out that the costly, internationally funded water well projects were underperforming.

It is important to realise that the Cochabamba water war was set in a context where the government so far had taken almost no formal control of the water sector. Unlike the 'hydraulic missions' of semi-arid regions, a semblance of state control of the water sector is recent in Bolivia. Water management has traditionally been carried out and governed by local patterns of traditional rights, with a tacit understanding of non-intervention on the part of the state.

Somewhat paradoxically, then, in order to be a model student of structural adjustment, Bolivia's state had to become *more* rather than less assertive in the water sector. The Bolivian state indeed was an 'early adjuster' and enthusiastic participant in the spate of privatisations in the developing world of the late 1980s and 1990s: it sold off its mines, airlines, railways and electricity sector, and its plans to divest itself of its phone system only foundered because no bidders came forward. The privatisation of Cochabamba's water in 1999, then, surprised nobody, but the way this was done is more controversial: a package deal of water management contract, hydroelectricity generation, and a complex tunnel. In fact there is a strong feeling that the privatisation scheme was designed as a window of opportunity to revive a long-standing scheme, the Misicuni tunnel project to augment the supply of Cochabamba's water, a project that had laid dormant as a complex, highly problematic project.

---

[5] SEMAPA = *Servicio Municipal de Agua Potable y Alcantarillado*; Municipal Potable Water and Sanitation Service.

[6] At the time of tendering, most of the poorest neighborhoods were not hooked up to the network, so that state subsidies to the water utility mainly benefited industries and middle-class neighborhoods; the poor paid far more for water of dubious purity from trucks and handcarts, or relying on independent systems.

Started in 1998 and finished in 2001, the very difficult 19.3 km Misicuni tunnel is a 45-year dream (http://www.tunnelbuilder.com/bolivia.htm) of bringing water from the 4-5,000 m high Cordillera over a mountain ridge to the Cochabamba Valley, at 2500 m. The $300 million deal involved a 40-year concession, a $130 million dollar dam (to store rainy-season water) and a $62 million tunnel as well as water purification plants and sewage farms.
The eventual deal involved three elements:

3) 1 privatisation of the Cochabamba water system
4) 2 building the Misicuni project
5) 3 paying off past debts

Aguas de Tunari, an American-Spanish-Bolivian joint venture formed only a few weeks prior, with a majority share for Bechtel/International Water, was the only bidder to come forward. Worries about the feasibility and profitability of the project reduced the project to Misicuni-*lite*: the quantity of potable water was halved to 1200 l/s, irrigation water reduced from 1400 to 500 l/s, and electricity generation halved to 150 GWh/year (Assies 2001). Moreover, water prices were allowed to go up drastically. Tariffs were raised threefold to help complete the dam and tunnel project, guarantee a 15-17% profitability and pay off past debts.

In principle, neighbouring municipal authorities were happy to see the Misicuni tunnel go ahead, as it would put an end to the dispute with SEMAPA over drilling. Moreover, the secrecy with which the deal was conducted instileld suspicion in an already wary civil society. As they learnt of the deal, the citizens of the Central Valley felt they had to shoulder the costs of a megalomanic project, a project that also took away their water rights.

The high-quality water the Misicunoi aqueduct was to carry to Cochabamba-city was already claimed as customary rights by the irrigators of the Cochabamba valley. From now on they would have to obtain licences for their wells, diversion channels and other water infrastructure. This made the issue an incendiary one very quickly. In terms of the five stages of conflict (Fig. 1) taking to the streets was still a (dramatic) form of politicisation. By actually taking siege of the city, taking it away from state control, the protesters 'securitised' the issue, that is, legitimising an illegal move on the grounds of a 'life and death' argument. Both the protesters and the government responded in ways outside the normal rules of political engagement: protesters took siege of the city, blocking all entryways, while the state shored up all normal liberaties under the state of stage of emergency was pronounced by President Hugo Banzer in April 2000. However, a boundary was soon to be crossed into the territory of 'violisation'.

At the start of 2000 an unusual urban-rural alliance including peasants, industrial workers, environmentalists joined by street kids, the Coordinadora de la Defensa de Agua y de Vida, shut the city down for four days. The government swiftly promised to reverse the price hikes. When this reversal proved slow in coming, the Coordinadora staged a march in February, which was answerd with teargas and gunfire blinding two young men and injuring 175 protesters. In April, peasant organisations (FEDECOR) joined the urban protest when they saw communal rights threatened by the privatisation of rural water systems. The state of siege was pronounced and protest leaders were arrested. However, when footage of an army captain was seen firing into the crowd, killing a young protester, these images provoked international outrage and drew responses from NGOs as far afield as Australia and Canada (www.blueplanet.com). The cause for Misicuni was lost there and then, and soon the government declared the privatisation process void. Bechtel/International Water left the country later that year[7], as a new water law leaning more on social rather than financial

[7] In November 2001 the Bechtel Corporation launched Round Two in the Cochabamba water war, filing a demand of $25 million against Bolivia in a trade court operated by the World Bank. Bechtel's aim, it claims, is simply to get back what they invested. It went through the ICSID trade court under a 1992 Bilateral Investment Treaty (BIT) between the Netherlands Holland and Bolivia. This was possible as in late November of 2000 Bechtel had created new holding companies in Holland.

principles was drawn up, though it may take years to take effect. SEMAPA was reinstanted as water supplier, now supplemented with representatives from the Coordinadora. Bewilderingly, the next year SEMAPA, which had always run deficits, reported it was now a profitable organisation – casuing the gvoernment to doubt the credibility of this sudden change in performance of its own utility (Assies 2001).

These structurally unresolved hydrosocoal issues are important to keep in mind when looking at participatory solutions. Recent decades have seen the rise of participation in the water sector, most spectacularly in the Indian state of Andhra Pradesh where some 10,000 WUAs were created at a stroke (Moench 2001). Multi-stakeholder participation (MSP) in fora, platforms, dialogues and partnerships and is currently on the rise as an exciting democratic innovation. MSP takes participation a step beyond WUAs, which are usually farmer-dominated, to include represntative from national and/or local governments, domestic use, fisheries, industry, energy, tourism concerned (Steins and Edwards 1998).

Usually multi-stakeholder platforms tend to be promoted by NGOs, universities and donor organisations as a way of giving a democratic voice to stakeholders, managing conflict and decentralising water management (Warner and Moreyra, forthcoming). A novel development in this participatory wave is that the Inter-American Development Bank, shocked by the images of the Cochabamba water war, made multi-stakeholder participation a *conditionality* for new loans to Bolivia. Such a national platform was duly created: CONIAG (the Inter-Institutional Water Council). CONIAG was established as a 'space for dialogue and agreement between the government and the economic and social organisations to fine-tune the current legal, institutional and technical framework on water-related issues, so as to tidy up and regulate the administration of the water resources (CONIAG 2002), to gather information and design in interatcion with the users – a conummately 'Lockeian' approach. However, despite its appealing acronym, CONIAG failed to turn water into wine – it has met several times but no results of note have so far been forthcoming, while new and similar conflicts over water and, of late gas exports to Chile (September 2003), broke out. So far the establishment of CONIAG could not be expected to be much more than a symbolic gesture to obtain loans, not change anything about the underlying acrid conflict [8].

Conclusion

This article has proposed two orders, three perspectives, and a 'ladder' of five stages of conflict to put some order in the conceptualisation on 'water wars'. Each of the three perspectives is a rationale for engaging in conflict, and as such can contribute to our understanding of conflicts. The Malthusians understand about scarcity and power play, but should be puzzled by the fact that some of the most explosive international issues concern river basins that are *not* water stressed - the Euphrates Tigris being a prime example. The infectious optimism of the Cornucopians shows that the scope for redistribution of water resources through technical, institutional or economic change is much wider than previously believed, but does not account for the continuation of explosive situations.
The discussion of the anti-Globalist perspective has added a structural element to the debate, which is an important dynamic in many recent, media-grabbing conflicts. It seems useful to conceive of three ideals of hydrosocial contract currently living side by side and clashing at times.

The present contribution has highlighted a class of violent conflict that is not so often analysed. Still, the Cochabamba 'water war' can be explained in the context of a wider conflict over the social contract, i.e. the division of responsibilities between public, private and civil society. Like the social contract, the business contract was handled rather carelessly (opportunistically), and the participatory 'solution' has not solved anything so far.

[8] I am indebted to Rocio Bustamante for this information

The sad upshot of the episode is that Cochabamba still has poor water and sanitation services, and that violence is still ongoing – most recently over gas exports to Chile (a conflict that claimed many more victims than the 'water war' despite somehow not deemed worthy the label 'war' by the international media). Despite efforts to start a consultative process between key stakeholders, an opportunity to turn water into wine still results in a brew the colour of blood and the taste of vinegar. The Cochabamba Water War of 2000, then, saw the 'violisation' of an ongoing privatisation issue. The article suggests that the terms of the social contract need to be carefully negotiated by governments before making a radical change when a window of opportunity opens.

References

Allan, J. Anthony, 'Virtual water' (1997): a long term solution for water short Middle Eastern economies?' SOAS/KCL Water Issues Group, Occasional Paper No. 3, **http://www2.soas.ac.uk/Geography/WaterIssues/OccasionalPapers/#trade**

Assies, Willem (2001), "David vs. Goliat en Cochabamba: los derechos del agua, el neoliberalismo y la renovación de la propuesta social en Bolivia", *Revista T´inkazos*, No. 8. La Paz: Fundación Pieb (Programa de Investigación Estratégica en Bolivia), pp: 106-131.

Bidaseca, Karina (forthcoming), 'La lucha por no silenciar el río y por recuperar el control del agua. Resistencias locales y globales en Narmada y Cochabamba', in Jeroen Warner and Alejandra Moreyra (eds.), *Conflictos y Participacion. Uso Multiple del Agua,* Montevideo: Nordan.

Buzan, Barry (1991) *People, States and Fear*, Longman, 3rd edition.

'The Cochabamba Declaration', December 8, 2000.

Cohen, M. D., March, J. G., & Olsen, J. (1972). A garbage can theory of organizational choice. *Administrative science quarterly*, 17, 1-25.

CONIAG, Action Plan, 2002

Donahue, John, and Barbara Johnson (1998), *Water, Culture, & Power: Local Struggles in a Global Context* (Washington, D.C.: Island Press).

Duffield, Mark (2000), The Emerging Development-Security Complex. In Paul Collins (ed.), Applying Public Administration in Development: Guideposts to the Future. London: John Wiley and Sons, pp. 359-372.

Finnegan, William (2002). 'Leasing the Rain', The New Yorker, http://www.newyorker.com/fact/content/?020408fa_FACT1, 18 April 2002.

Frey, Frederick W. (1993), "The Political Context of Conflict and Cooperation Over International River Basins", Water International, 18 (1), 54-68

Gleditsch, Nils Petter (1998), Armed Conflict and the Emvironment: A Critqieu of the Literature' *Journal of Peace Research*, 35 (3): 381-400

Homer-Dixon, Thomas F., 1994, "Environmental Scarcities and Violent Conflict: Evidence from Cases", *International Security*, 19 1) (Summer): 5-40.

Locke, John (1690), The Second Treatise of Civil Government http://www.constitution.org/jl/2ndtreat.htm.

Meisner, Richard and Anthony R. Turton (2003), The hydrosocial contract theory and the Lesotho Highlands Water Project, Water Policy, 5(2), 115-126.

Moench, M., Caspari, E. & Dixit, A., (eds). (1999). *Rethinking the mosaic: investigations into local water management*. Kathmandu, Nepal Water Conservation Foundation and the Institute for Social and Environmental Transition.

Mollinga, Peter P. (2001) Powerful tools - tools of power. A selective overview of the water and politics literature with a critique of rational choice theory and an example from South India, *Futures* 33 (8), pp. 733-752.

Mouffe, Chantal, 'For a politics of democratic identity', paper given at the *Globalization and Cultural differentiation* seminar. March 19-20, 1999, MACBA'-CCCB http://www.macba.es/antagonismos/english/09_04.html.

Neumann, B. Iver, (1998) ' Identity and the Outbreak of War', International Journal of Peace Studies 3(1): 7-23.

Peña Cazas, Waldo (1997): Teoria y práctica de la corrupción en Bolivia y el mundo, Cochabamba: Serrano.

Petrella, Riccardo (1998), Le manifeste de l'Eau Pour un contrat mondial, Brussels: Labor

Rousseau, Jean-Jacques (1762), The Social Contract or Principles of Political Right. (translated from the French by G. D. H. Cole) http://www.constitution.org/jjr/socon.htm

Shiva, Vandana (2002), Water Wars. Privatization, Pollution, and, Profit. South End Press.

Starr, Joyce, 'Water Wars. Profit', *Foreign Policy*, Spring 1991, pp. 17-36.

Steins, Nathalie A., and Victoria M. Edwards (1998) "Platforms for Collective Action in Multiple-Use CPRs", Paper Presented at "Crossing Boundaries," the seventh annual conference of the International Association for the Study of Common Property, Vancouver, British Columbia, Canada, June 10-14, 1998. http://www.indiana.edu/~iascp/abstracts/612.html

Tilly, Charles (1990), Coercion, Capital, and European States, AD 990-1992. Cambridge, MA: Blackwell.

Turton, Anthony R. and Ohlsson, L. (2000) Water Scarcity and Social Stability: Towards a Deeper Understanding of the Key Concepts Needed to Manage Water Scarcity in Developing Countries. SOAS Water Issues Study Group Occasional Paper 17. University of London, London.

Warner, Jeroen (2000), 'Integrated management requires an integrated society. Towards a new hydrosocial contract for the 21st century', AWIRU Occasional Paper, http://www.up.ac.za/academic/libarts/polsci/awiru/papers-jeroenwarner.html

Warner, Jeroen (2004) 'Mind the GAP? Working with Buzan: the Ilisu Dam as a security issue' SOAS/King's College London Water Issues Paper No. 67.

Warner, Jeroen and Alejandra Moreyra (forthcoming), 'Introducción: Participación para solucionar conflictos por el agua: sueño, pesadilla o espejismo?' in Jeroen Warner and Alejandra Moreyra (eds.), *Conflictos y Participación. Uso Multiple del Agua,* Montevideo: Nordan.

Wolf, A. T. (1995) Hydropolitics along the Jordan River: Scarce Water and its Impact on the Arab-Israeli Conflict. Tokyo: United Nations University Press.

The Emergence of Sustainable and Participatory Development in Dams. Lessons from Political Science Research.

Stéphane La Branche, Associate researcher, Environmental and Energy Policy Department, Grenoble, France.

1. Introduction [1]

This paper offers some conclusions and research recommendations arising from a ten-year theoretical and empirical research programme, by focusing on the results of three specific researches representing a significant part of the sustainable development field. The first was undertaken in 1999, on the impact of a sustainable and participatory development (SPD) project on the traditional values, beliefs and power relations in three small Ghanaian communities.[2] The aim was to understand the process by which international norms are internalised by individual actors at the local level in a non-Western cultural setting. One of the theoretical aim was to develop a power relation analytical framework that can take into account both local and international level phenomena.

The second, to be concluded in July 2004, is an extensive literature review on the field of participation in the environment in France.[3] Our project also includes a comparison with Quebec, as well as an international component, with over two hundred articles, books and institutional reports reviewed. The aim is to offer a portrait of the notions and theoretical frameworks used by research since the 70s in France: what are the main concepts and issues analysed? More significantly, we also found important questions that were **not** asked by research, of which three are highly significant:

1) Research has not really looked into the issue of potential conflicts between environmentalism and democracy. Are democratic procedures necessarily ecological? There are cases of civil society refusing ecologically-friendly energy-producing methods (a French community rallied against electric windmills) or a 'green' tax (the case of Switzerland, in a national referendum?[4] This is a critical issue for decision-makers: how is a decision to be made when a choice must be made between the wishes of a population as expressed through a participatory procedure and an ecologically-sound project, while both are requirements of SPD?

2) Research often assumes that norms and beliefs go hand in hand, yet they are different. More problematic still, we do not understand how an international norm can be transformed into an individual belief, nor do we understand the role of individual beliefs in the creation of international norms and, more generally, regimes. This is directly related to the issue of SPD's legitimacy.

3) What are the philosophical, historical and cultural origins of SPD? Does it differ from conventional development (i.e., modernity, rationality, economistic, directive, large-scale, etc.), or as a French author argued, is SPD the same old box with a different packaging?[5] If it does differ, is the emergence of SPD as a new regime the sign of a change in thinking? Indeed, multidisciplinary, relational, multi-level thought,

[1] My sincere thanks to the French Institute of Energy and Hydro 21 (the European centre for sustainable development in hydraulic energy) for financing the research on dams.
[2] La Branche, 2002a. I apologise for the numerous self-references, but the goal of this article is to propose a coherent framework by which to address some of the issues raised in different researches whose details have been published elsewhere.
[3] With Warin, 2003, undertaken for the French Ministry of Ecology and Sustainable Development.
[4] Audetat et al, 2004.
[5] Latouche, 1994.

necessary to understand environmental issues, and dams are a perfect example of this, may well reflect deeper changes in our recognition of problems and the solutions we bring to them.

These issues drive my current, third, research on SPD in dams, this article's main theme. Thus, while this research is theoretically oriented, it also includes strong empirical and comparative components (between France, Quebec, Turkey and later on, Ghana and China). As a way of getting at some of these questions, I will first offer a few conclusions drawn from three political science disciplines: International Relations research on SPD, French and Quebec research on participation in environmental policies, and regime theory. I will focus on some common threads among these researches, rather than on differences, threads that indicate weaknesses in SPD theory, research and practice. I end with a few suggestions for an analytical framework able to provide both theoretical and empirical answers in the field of dams.

2. Regime theory and SPD in dams.

Of all IR theories, regime's theory explains best the process by which norms may become a relatively well coordinated set of rules and norms supported by institutions and procedures, i.e., a regime. However, even *it* fails to explain how and why legal or political norms become legitimate to actors, or in other words, how these norms transform themselves into individual level beliefs or contrarily, how legitimate rules become illegitimate, a process that is often caused by actors' strategies and pressures. This would explain why the approach cannot answer its own basic question: why and how does a regime emerge, persist and end?

The aim of the current research on dams is to understand the process by which imposed international SPD norms are transformed into individual beliefs and, inversely, to understand the strategies by which individuals attempt to a new development regime. While the report of the World Commission on Dams[6] offers some thoughts on some of these issues, arguing for the integration of SPD norms into all phases of a project, the report did not address some fundamental problems related to SPD, such as its efficiency, a potential conflict between environmentalism and democracy[7], or its potential negative social and cultural impact on local communities and culture. Indeed, one needs to ask the following question: Is SPD really the total answer to problems caused by conventional development, as its proponents tend to argue or does SPD just perpetuate the sins of his forefathers?[8] These two positions seem, indeed, more determined by researchers' ideology than by careful, methodologically and theoretically based research.

A research in Ghana indicates that SPD's results are mitigated. While highly positive in terms of physical health, access to clean water, and in some social aspects (women have stopped fighting over water), it has had a deep impact on some cultural values and power relations, such as a loss of legitimacy for the chief's councils and elders (but an increase for the chief's), and a loss of traditional moral beliefs and ethics.[9] The point is not to dismiss SPD, but it is clear that we are far from understanding the expected effects of SPD, and even less its unexpected impact. Yet, it is becoming the dominant regime in matters of national and international development everywhere on the planet. How did this occur in a context where large-scale non-participatory development was dominant for so many years? This is directly related to several as-of-yet unresolved issues at the very heart of regime theory: how is a regime created? How and why does it persist? Why does it end? The hypothesis here is that in the final analysis, *the persistence through time of a regime*

[6] World Commission on Dams, 2000.
[7] Sabelli, 1995.
[8] Latouche, op. cit., only dealt with the theoretical issue of modernity's characteristics, such as an exacerbated individualism, binary rationality and a pervasive economism, not offering any empirical data for his arguments.
[9] La Branche, 2003c.

depends on the actors' perception of its legitimacy [10]*, which is directly related to the issue of trust between actors.* This hypothesis is not as easy to operationalise as it may seem at first sight, and this, for several reasons, both theoretical and empirical. Indeed, whichever the type of regime theory one looks at (liberal, neorealist or, to a lesser degree, constructivist), the researcher is faced with several issues (s)he is most likely to be uncomfortable with when formulating this type of hypothesis.

Firstly, there is the issue of ***multilevel analyses***. Indeed, the hypothesis implies that individual-level beliefs may have an influence and a role to play in international relations, in a field still dominated by the neorealist view that States - and grudgingly, a few IGOs, such as the IMF or the World Bank - are the only legitimate and significant actors of the international system. This is related to the global political and ideological context: since the end of the cold war, the field seems to have developed a type of theoretical allergy against attempts at developing multi-level analyses of international phenomena. Yet, this cannot be avoided any longer, because of the very nature of the problems raised by dams and SPD: environmental issues are inherently multidisciplinary; they involve different types of actors, as well as the physical and natural world, animals, people, technology, etc.

Secondly, there is the problem of ***values***. IR theory is very wary of psychological factors [11] and does not, on the whole, have the tools to integrate it into its analysis, which partly explains why even constructivist regime's theory, even though it has no problem recognising the significance of values and individuals in IR, still suffers from a serious lack of empirical research to demonstrate its valuable points, as does postmodernism.[12] This reticence by IR theory at engaging in multi-level analyses and at integrating values in its analysis explains why so few have attempted to deal with ***the issue of legitimacy***. Yet, if one is to open new avenues of research in the fields of sustainable development and water, and find solutions, then it is necessary to engage in this type of theoretically-grounded empirical research. Indeed, such a re-conceptualisation of the notion of legitimacy allows us to go beyond the limited coercive explanation of power as a force that allows an actor to force others to obey him-her, a view at the heart of most regime theories, and even more generally, political science. This view is faulty because, among other reasons, it cannot account for the fact that non-hegemonic actors' *strategies* played an essential role in the emergence of the SPD regime.

This differs markedly from the political science's dominant approaches, whether liberal, systemist, realist or Marxist who all share a similar vision of power, as if it were a good someone possesses or not or as if it were a force an actor can use to influence or impose his/her will on others. Strangely for a discipline that has power as its core issue, even political scientists who focus on power have not really developed the concept beyond the domination approach. Dahl[13] saw power as a tool that an actor can use against another in order to *force* the second actor to act in certain specific ways. A few years later, Barach and Baratz[14] went further by putting the actors in a larger context whereby an actor can *limit* the choice of others and influence their decisions by structuring an agenda. One should note, however, that for these authors, if there is consensus between actors, no power is involved, *power existing solely in conflict*[15], which is wholly inadequate, as research on power relations between actors in environmental negociations show[16]. Lukes attempted to go beyond by not limiting himself to the 'visible' aspects of power: the most efficient form of power is the ability to

[10] La Branche, 2003b.
[11] Rosoux, 2001.
[12] La Branche, 2003d.
[13] Dahl, 1957.
[14] Barach and Baratz, 1962.
[15] Interestingly, one should note that this is the way much of the literature on water has dealt with the issue.
[16] Amy, 1983, 1987.

change the preference of others in order to increase one's advantage[17]. Unfortunately, Lukes does not explain why actor 'Y' lets his/her preference be changed by 'X'. Moreover, there is an implication that 'X' has an advantage that allows him-her to change 'Y''s preference when all actors are in the same position. Much more recently, Hay also criticized Lukes in these terms. While Hay attempted to offer a 'positive' vision of power in which actors can attempt to influence the general context, *a field of possibility of action*[18], he failed to develop his idea. Common to these approaches is that knowledge is seen as a way to increase one's power: knowledge is power, which is freedom of action and *ergo*, greater influence. But, as Foucault argued, knowledge and power do not necessarily lead to greater freedom of action or influence. Most useful here is to present his idea of internalisation. It should be noted here that while Foucault does not offer a complete answer to the power issue, yet, he does offer an interesting base from which can pursue further this type of research.

For Foucault, power is not something one possesses or loses nor is it coercion. Rather, power is a relationship between actors that produces ways of thinking, knowledges and truths, which lead to *individual and social* practices. Knowledge transmits and disseminates the effects of power[19], while "truth" is a status given to certain knowledge by power. Truth is 'understood as a system of ordered procedures (...). "Truth" is linked in a circular relation with systems of power, which produce and sustain it (...). "A regime of truth" [20]. The relation between truth, knowledge and power explains why power does not only prevent; it *produces* relations, knowledge and truth. An important point is that the production of truth means that not all knowledge has the status of truth. Subjugated truths are those knowledges that have been defined as illegitimate, made unaccepted and unacceptable by the regime of discourse (i.e., those sets of knowledge which 'dominate' in a field), and which are accompanied by subjugated practices[21]. It is from these that resistance and alternatives arise. Power, thus structures, encourages and also produces specific ways of thinking, behaving as well as constructing one's identity and social reality. As argued by Keeley, these notions offer a framework, yet to be completed and refined, by which we can explain behavioural changes caused by the internalisation of new norms[22]. It becomes possible to better understand the dynamics by which legitimacy is constructed, and hence, the basis of a regime's capacity at persisting through time, at promoting certain values and behaviours beyond its formal limits and hence, at gathering support. The conclusion here is that coercion and domination are not the only forces, and, actually may not *even be the most significant* in a regime's construction, persistence and demise. Legitimacy and the process of (de) legitimation hence become fundamental to theory since, without actors' beliefs, one can only talk of an imposition of rules, a process that is highly likely to engender opposition and resistance, and in the long run, cannot sustain a regime's viability, and still less its legitimacy. Let us add as well that regime theory tends to focus on *stable behaviour*, while change and instability remain largely ignored[23]. This is one of this research's contributions to the field as it concentrates on the process of change, which a foucauldian approach to regime theory can integrate.

My research on the construction of an SPD regime in the field of dams addresses these issues directly. The general research questions are the following: how does a specific discourse such as conventional development change status, going from being legitimate, i.e., seen as true, valid and good, to being seen as less legitimate? How and why has SPD become more legitimate? What are actors' role and strategies in this process? Then, how are SPD norms transmitted to the local level (thanks in large part to international organisations) and transformed into beliefs and values? Clearly, a change in regime is taking place: the 90s

[17] Lukes, 1974.
[18] Hay, 1997, p.50.
[19] Foucault, p. 69, 1980.
[20] Ibid, 1980, p.133.
[21] Ibid, 1980, p. 81-82.
[22] Keeley, 1990.
[23] Berman, 2001, p.234.

have seen the widespread emergence of participatory procedures, rules, norms and laws at both the national and international levels in all types of projects, be they local or large infrastructures. Yet, most explanations of this process remain rather descriptive, saying that it did occur but not explaining how. Large infrastructure projects such as dams did not escape this trend as indicated by the World commission on Dams' Report and by the World Bank's introduction of ecological and participatory norms in its structural adjustment programmes in the early 90s (only to go further in its 1997 Report, by incorporating these norms into its notion of good governance).

3. The issue of legitimacy and the internalisation of international norms.

To pursue this type for research, and better understand legitimacy, one needs to distinguish norms from values. For the sake of this research, a norm is a rule or an institutional culture *imposed* by an actor on others who then follow it *because they must*, usually for fear of retaliation, cost, scandal or fines. A value is *a belief* by actors that a norm, behaviour or an idea is 'good', 'true', and thus, that it *should* be obeyed because of its intrinsic worth. Hence, a value is directly related to legitimacy. The SPD regime's emergence and increasing importance in international development would thus depend on the actors' dissemination and internalisation (the processes by which a norm is transformed into belief at the individual level) of these norms, i.e., on its legitimacy. This argument allows us to tackle several unresolved issues in regime theory, such as why some regimes emerge or persist without a hegemonic power, which is SPD's case. Whether in France or in the field of international development, the increase in participatory procedures comes from pressures put on decision-makers by civil society and local NGOs of all types. In France, some of the key actors were university researchers and a few high placed administrators working mainly in three ministries; agriculture, public works and environment. These actors were able to promote SPD through projects, calls for research and financing. They were influenced by social scientists working on protest movements and by local and national groups refusing the imposition of nuclear power plants, railways and dams. In other words, individual and non-scientific actors played a key role in the elaboration of a new national-level development regime and in its institutionalisation as a legitimate way to engage in public policy, which raises the issue of the notion of "epistemic community".

The notion seems to, at first sight, offer an already well-elaborated approach to non-State actors. However, it remains flawed because it only includes *scientists, experts and intellectuals*. Yet, we know that non-scientific actors have an influence through political, economic and moral pressure. Hence, the epistemic community approach cannot take into account the increasing importance of global civil society, nor a deep trend in domestic and international politics: decisions are increasingly based not on scientific expertise and data but *on political acceptability*. This would, in part, contribute to explaining the dramatic increase in participatory procedures in the last ten years. In addition, a survey shows that scientific evidence has played only a minor role in international environmental agreements since the Stockholm conference of 1972[24]. Another example of non-scientific actors' influence can be drawn from Canada. Lepage points out that the divergent interests of small communities blocked an ecologically and technically-sound water-management project[25]. One should also note that the French population refuses GMOs, no matter scientific evidence: they simply 'do not want it on their territory', the Nimby effect. Lastly, decolonisation was driven as much by changes in economic modes of production in the colonial powers as it was by a change in values and ideas regarding legitimate power and human rights[26]. The implication of these different points is fundamental: the most stable form of a regime, of *'governance without*

[24] Zürn, 1998, pp. 617-649.
[25] Lepage 2003.
[26] Jackson, 1993.

government', would be based not on the imposition of rules but on the internalisation of these rules, and hence, their transformation into individual beliefs.

These different examples highlight my argument regarding the necessity of theoretically and empirically addressing the issue of legitimacy in order to explain regime change. While, obviously, not all actors are significant, one cannot presume without analysis that some are significant while others are not. All actors are *potentially* significant -even terrorists who, while they may not be 'legitimate', have a significant impact on international politics. This implies that researchers need to, before engaging in analysis, determine which actors play a role and what type of role they play.

4. Measuring the process of dissemination and internalisation of SPD norms in dams.

The major problem for regime theory, and for the research on SPD in dams, in addressing the issue of legitimacy is to show that rules and norms have a power and an influence *of their own*[27]. This is related to another problem: existing approaches tend to remain on the theoretical level, not offering much empirical data. This also applies to constructivism, even though it is best armed conceptually to get at this essential question since it allows us to integrate non-state actors as significant elements in the process by which a regime is created, persists and ends.

The theoretical development of the notion of legitimacy remains sorely lacking even in political science partly because the view that legitimacy can only come from the State is still dominant. However, some researchers have addressed this issue. For Hurrel, a regime is based on its legitimacy, which comes from a shared sense of belonging to a community, whose rules serve as a link between actors and institutions[28]. There is, however, a problem of level of abstraction with this definition in that, institutions and rules cannot be the origin of legitimacy; *they can only be its object*. Legitimacy can only rest, fundamentally, on individual beliefs, whether scientifically 'true' or not. As Hurd argued, it is a relational quality between actors, defined by their perceptions of an institution or a rule. A norm becomes, at the institutional level, a rule, and it can then influence behaviour and contribute to the actors' definition of interest[29]. This has considerable import for constructing an empirical research on regimes. It implies that one has to get at individual values and strategies, for example, through participant observation, interviews and organisational analysis. What are the strategies and actors' behaviours that contribute to the rise of the SPD regime, with its specific norms, in the field of dams? This has implications for the notion of actor.

The actor conceptualised actor is not merely a victim forced into accepting the rules of the game. Obviously, different actors play different roles, but more importantly, the same actor may play different roles within the social, political, and economic relations (s)he dealing with in attempting to achieve his-her goals. In addition, his-her strategies and degree of success in either promoting certain norms and values as well as resisting them also differ. What is important here is to understand the process by which the status of two different types of development has changed, and the actors' strategies in this process. Why are actors who once resisted conventional development practices now gaining the upper hand? Inversely, how and why have these once dominant actors modified their stance in order to attempt to counter the strategies of actors now in a better position for promoting SPD? The very change in status of these actors shows that the idea of a dominant actor forcing his-her will over dominated actors is lacking. While this discussion deserves further elaboration, the point is that a re-conceptualisation of the notion of legitimacy implies changes with regards to how we define - and thus analyse - who the significant actors are in the international system.

[27] Hurrel, 1993.
[28] Hurrel, 1993.
[29] Hurd, 1999.

The field research's goal is to produce empirical data offering a better understanding of actors' strategies in the dissemination and the internalisation of SPD norms in dams. I will thus develop further the type of field methodology used in my 1999 field research in Ghana, which showed that values associated to individualism, equality and rationality carried by SPD projects at the local and individual levels caused changes in traditional cultural values, behaviours and power relations, between elders and youths, men and women, chief's councils and population[30]. It also showed that by associating themselves to the project, chiefs were able to improve their own legitimacy and status. The question is now whether the emergence of the SPD regime leads to a new, improved status for NGOs and other institutions that promote it relative to other actors (governments, IGOs, other NGOs, etc). This certainly was the case for the Canadian international development agency working in Ghana, relative to national NGOs as well as most other governmental development agencies, and most significantly, relative to the Ghana government itself, the Canadian agency acting as the top advisor to the president in the elaboration of a national water strategy.

The research on dams will attempt to determine whether this is also the case with pro-SPD NGOs in the various institutions involved in the dam's project. What was their influence on the dam's type, size, functions, on compensations offered to affected groups, on ecological and on the social measures incorporated in the project's phases? Then, a more critical issue will be addressed: are these interests incorporated into the decision-making process because of coercive measures such as international agreements and national laws, because of NGOs' pressures or because these actors believe in the 'rightness' of this type of decision-making process? The field research will thus first draw a portrait of the actors' characteristics: position, objectives, strategies, arguments and beliefs related to the environment and participation, social representations. Then it will attempt to understand the role of individual values, beliefs and strategies in the emergence of the SPD regime as well as the very relative demise of the conventional development regime, understanding that this is an-going never-finished process and that both types of development co-exist, at times competing and at other times cooperating. In the long run, the aim will be to evaluate the degree of success of actors' strategies, project by project, by seeing whether they succeeded in having SPD norms integrated into the decision-making process and then, evaluating whether or not their interests and demands were actually implemented, and to what degree.

A basic issue remains, one that is daunting by its apparent complexity and its « fuzziness », yet fundamental to this research: how are we to recognise a norm from a belief, i.e., when a norm has been internalised and thus, transformed into a belief? Without answering this question, one cannot address the fundamental issues raised here. Several possibilities exist. Berman suggests analysing cases where sanctions do not exist even though specific and persistent behaviours continue to take place[31]. While useful, this does not seem sufficient nor wholly realistic, as there are always either explicit or implicit sanctions: the Nimby effect and real or potential sanctions are always present, such as fines and fear of scandals. One can also attempt to see if the actor is ready to accept setbacks in his-her career, spend some of his-her own money or time in his-her efforts at promoting SPD norms and values (this is the case of some of the actors we interviewed in our research on SPD in France, and in another, on expertise and democracy in France). If an actor does follow SPD principles without having to or if (s)he does so in an institution that does not promote it, then chances are that his behaviours will have emerged from individual beliefs. We can also take the example of a regime that exists without the presence of a hegemonic power, or a regime created by non-hegemonic actors, which is the SPD's case.

[30] La Branche, 2002b.
[31] Berman, 2001.

Addressing these issues will allow us to evaluate how far SPD norms have disseminated, to what type of actors and how deeply they have been internalised. This, in turn, has very real implications for decision-makers who are trying to implement measures linked to the Kyoto protocol. In the absence of internalised environmental norms, on what basis is the decision-maker to decide? Where are coercive, motivational or punitive measures best applied? For which type of ecologically damaging behaviour and related to which type of political and environmental goals? Which actor should be targeted with which type of measure? How can trust and water-based interdependencies be built between actors, between countries and between sectors? Finally, evaluating SPD itself will, in turn, allow us to improve it where possible, find other methods where necessary and better still, determine where a combination of conventional development and SPD practices is best suited. Indeed, it might be wise not to reject conventional development entirely, even though it tends to be highly directive and not participatory. We forget too often that participation is not always efficient, that it may even be counter-productive in terms of achieving environmental goals[32]. Which leads us to our last, deeply political and controversial, yet essential, question: how is one to choose between democracy and ecology when sustainability and participation are in opposition?

References

Adler E. "The Emergence of Cooperation: National Epistemic Communities and the International Evolution of the Idea of Nuclear Arms Control". *International Organization* (*I .O.)*, vol.46, no.1, 1992.

Douglas J. Amy. « The Politics of Environmental Mediation ». *Ecology Law Quarterly*, vol.11, no.1, 1983. Pp.1-19; *The Politics of Environmental Mediation*. NY, Columbia Univ. Press, 1987.

Audetat M., Joseph C., Kaufmann A., Leresche J.-Ph. "Usages et limites de l'expertise scientifique dans la négociation des risques climatiques et biotechnologiques". L. Dumoulin, C. Robert, S. La

Branche, Warin P. (eds). *Les Usages politiques de l'expertise*. PUG, 2004.

Barach P. and M.S. Baratz. "Two Faces of Power", *American Political Science Review, no.* 56, 1962. Pp.947-52.

Berman S. "Ideas, Norms, and Culture in Political Analysis". *Comparative Politics*, vol.33, no.2, 2001.

Bloom W. Personal Identity, National Identity and International Relations. Cambridge Univ. Press. 1990.

Bodon V. La modernité au village. Tignes, Savines, Ubaye. La submersion de communes rurales au nom de l'intérêt général 1920-1970. PUG, Grenoble. 2003.

Breitmeier H. and Wolf K.D. "Analysing Regime Consequences: Conceptual Outlines and Environmental Explorations". In V. Rittberger (ed.) 1993.

Brian K. *The economics of hydroelectric power*. London : Edward Elgar Publishing, 2003.

FIVE ARTICLES PUBLISHED IN Les Cahiers du GERMES, Environnement, conflits, participation.

No.2, 1979. Association du GERMES and Min. de l'Equipement :

- Nicolon A. "Quelques thèmes de réflexions et de recherche suggérés par les conflits liés à

l'environnement". Pp. 9-18 ; and "L'avenir des modes de gestion d'environnement : analyse

de l'opposition à un site nucléaire. Le cas du Blayais". Pp.59-80.

- Ranelli P. "Les conflits au niveau d'un bassin hydrographique". Pp.81-112.

- Bidou D. "Participation des usagers à la gestion de l'environnement". Pp.185-202.

-Tenière-Buchot P.F. "Débats publics et choix décisionnels : le problème de la participation à la politique de l'environnement". Pp.203-212.

TWO ARTICLES PUBLISHED IN: *Les Cahiers du GERMES. Les politiques de l'environnement face à la crise*. TOME III, Association du GERMES and Min. de l'Equipement. no.11, déc. 1985 :

[32] Lepage, Gauthier, Champagne, 2003.

- Mattout P., Metayer G. “Evaluation d’une procédure de participation régionale sur un projet technologique majeur. Le cas de la commission locale d’information sur la centrale de Civaux”. Pp.429-438.

- MacGilchrist R., Olivry D. “L’utilité sociale de la participation : vers un pragmatisme social. Exemple du Projet de Barrage de Saint-Geniez--d’Olt”. Pp.469-487.

Caubet C.G. “L'impact des grands barrages”. *Ecologie et politique*, no.2, 2002.

- “Un tribunal de l'eau en Amérique centrale”. *Ecologie et politique*, no.24, 2002.

Dahl, R.A. “The Concept of Power”, *Behavioral Science*, no.2, 1957. Pp. 201-205.

Faucheux S. and Nicolaï I. “Les firmes face au développement soutenable : changements technologiques et gouvernance au sein de la dynamique industrielle”. *Revue d’économie industrielle*, vol.83, 127-146. 2000.

Finnemore M. “Norms, Culture, and Power Politics: Insight from Sociology’s Institutionalism”». *I.O.*, vol.50, no.2, 1996.

Finnemore M., Sikkink K. “International Norm Dynamics and Political Change”. *I.O.*, vol.52, no.4, Pp.887-917. 1998.

Formiga Johnson R.M.. “La nouvelle politique de l'eau au Brésil : forces et enjeux d'une transformation vers une gestion intégrée”. *Revue Tiers Monde*, no. 166, 2001.

Foucault M.. Surveiller et punir : la naissance de la prison. Gallimard, Paris. 1993.

- *Power/Knowledge*. Harvester, Brighton. 1980.

- *L’archéologie du savoir*. Gallimard, Paris. 1976.

Franck T. *The Power of Legitimacy Among Nations*. NY, Oxford University Press. 1990.

Gagnon L., Klimpt J-E., Seelos K.. “Comparing Recommendations from the World Commission on Dams and the IEA on Hydropower”. *Energy Policy*, no. 30, pp.1299-1304.

Gurowtiz A.. “Mobilizing International Norms. Domestic Actors, Immigrants, and the Japanese State”. *World Politics*, Vol.51, No.3, avril 1999.

Haas P.. “Epistemic Communities and the Dynamics of International Environmental Co-operation”. In Rittberger (éd), pp.168-201.

Hasenclaver A., P. Mayer, V. Rittberger. *Theories of International Regimes*. Cambridge university press. 1997.

Haufler V.. “Crossing the Boundary between Public and Private: International Regimes and Non-State Actors”. In V. Rittberger (ed.), 1993.

Hay C.. “Divided by a Common Language: Political Theory and the Concept of Power”. *Politics*, vol.17, no.1, 1997. Pp.45-52.

Heggelund G. M. *The decision-making process for the Three Gorges Project Resettlement in China*. Doctoral thesis, Fridtjof Nansen Institute, University of Oslo, 2002.

Hurd I. “Legitimacy and Authority in International Politics”. *I.O.*, vol.53, no.2. 1999.

Hurrel A.. “International Society and the Study of Regimes. A Reflective Approach”. In Rittberger (ed.), 1993.

Jackson R. “The Weight of Ideas in Decolonization: Normative Change in International Relations”. In J. Goldstein, R. Keohane (eds.). *Ideas and Foreign Policy: Beliefs, Institutions and Political Change*. Cornell univ. Press, Ithaca. 1993.

Jönsson C. “Cognitive Factors in Explaining Regime Dynamics”. In V. Rittberger (ed.) 1993.

Katzenstein P. (ed). The Culture of National Security: Norms and Identity in World Politics. NY, Columbia University Pres. 1996.

Keeley J. “Toward a Foucauldian Analysis of International Regimes”. *I.O.,* vol.44, no.1, 1990.

Kollman K.. Prakash A. “Green by Choice? Cross-National Variations in Firms’ responses to EMS-Based environmental Regimes”. *World Politics*, vol.53, no.3, 2001.

Krasner S. “Structural Causes and Regimes Consequences: Regimes as Intervening Variables”. In Krasner (ed.), *International Regimes.* Ithaca, NY. 1983.

La Branche S. *Mondialisation et terrorisme identitaire*. L'Harmattan, Paris. 2003a. 284 p.

"La transformation des normes de participation et de durabilité en values ? Réflexions pour la théorie des regimes". *Revue Études Internationales*, vol.34, no.4. 2003b.

"Vers une évaluation du développement durable appliquée aux aménagements hydrauliques". *Revue Énergie*, special issue, no. 546. Pp.305-309. 2003c.

"Rex can bite: A Review of Postmodernism in I.R. (1989-2000)". *The Review of International Affairs*, vol.3, no.1. Pp.63-78. 2003d.

"Westernization of Political Legitimacy in Ghana through NGOs". *The Review of International Affairs*, vol.2, no.1. Pp.80-99. 2002a.

"Les effets de la mondialisation sur les relations de pouvoir à Nkwanta and Kasei". *Afrique Politique*. Pp.285-299. 2002b.

With Warin P. "La participation du public : questions, réponses et absences. Rapport intermédiaire", Ministry of ecology and sustainable development, France. 2003. 96 p.

Laïdi Z., "Mondialisation et démocratie" *Politique Étrangère*, 1999-2000.

Latouche D. *Les dangers du marché planétaire*. Presses des sciences politiques, Paris. 1998.

- "Développement durable : un concept alibi". *Tiers monde*, vol.35, no.137. 1994.

Lepage L. **"**Les controverses environnementales sont plutôt culturelles que scientifiques". In *Les sciences sociales de l'environnement. Analyses et pratiques*. B. Dumas, C. Raymond and J-G. Vaillancourt (eds). Pp.133-147. 2002.

- Gauthier M., Champagne P., "Le projet de restauration du fleuve St-Laurent : de l'approche technocratique à l'implication des communautés riveraines", *Sociologies pratiques*, no.2 2003.

Le Prestre P. "Facteurs de progrès en coopération internationale pour l'environnement : essai en marge d'études récentes". *Etudes internationales*, vol. XXII, no.1, 1991.

- Ecopolitique internationale. Guérin, 1997.

Lukes S., *Power: A Radical View*. London: Macmillann, 1974.

Macgilchrist R. "Les jeux de participation dans les grands projets hydrauliques". *Cahiers du Germes*, no.12, 1987.

Martin-Amouroux J-M. *L'Economie mondiale de l'énergie.* La Découverte, 1990.

McCully P. Silenced Rivers. The ecology and politics of large dams. London: Zed Books, 2001.

Ménard C. "Enjeux d'eau : la dimension institutionnelle". *Revue Tiers Monde*, no. 166, 2001.

Mermet L. "La négociation". In J. de Montgolfier and J.-M. Natali. *Le patrimoine du futur. Approches pour une gestion patrimoniale des ressources naturelles*. Economica, Paris. 1987.

Meublat G. "La gestion partagée des fleuves à long terme de l'eau en Tunisie". *Revue Tiers Monde*, no. 166, 2001.

Morsel H. Des barrages, des usines et des hommes. Grenoble : PUG, 2002.

Müller H. "The Internalization of Principles, Norms, and Rules by Governments: The Case of Security Regimes". In V. Rittberger (ed.) 1993.

Nelson G. "Internationalising Economic and Environmental Policy: Transnational NGO Networks and the World Bank's Expanding Influence". *Millennium*, vol.25, no.3. 1996.

Risse-Kappen T. (ed.). Bringing Transnational Relations Back In - Non-State Actors, Domestic Structures and International Institutions. Cambridge University. 1995.

Rittberger V. (ed.). *Regime Theory and International Relations*. Clarendon Paperbacks, Oxford. 1993.

Roseneau J. "Les processus de la mondialisation : retombées significatives, échanges impalpables and symbolique subtile". *Revue études internationales,* vol.24, no.3, 1993.

Rosenau J., Czempiel O. Governance Without Government: Order and Change in World Politics. Cambridge Univ. Press. 1992.

Rosoux V.-B. Les usages de la mémoire dans les relations internationales. Bruylant, Bruxelles. 2001.

Sabelli F. *Ecologie contre nature. Développement et politiques d'ingérence*. Presses universitaires de France-IUED, Paris. 1995.

Simard L. Conflits d'environnement et participation : le cas des lignes THT en France and au Québec. Thèse de sociologie, IEP de Paris. 2003.

Suliman A. (ed.). *Ecology, Politics and Violent Conflict*. London: Zed Books. 1999.

Tenière-Buchot P.F. "Débats publics et choix décisionnels : le problème de la participation à la politique de l'environnement". *Cahiers du Germes,* no.2, 1979. Pp.203-212.

Theys J. "Gouvernance environnementale : entre innovation et impuissance ". *European seminar on democratic governance*, Florence, 2000.

Varaschin D. *Tignes, la naissance d'un géant*. Artois Presses, Arras. 2001.

Varone F. "Le choix des instruments de l'action publique; analyse comparée des politiques énergétiques en Europe et en Amérique du Nord". *Revue internationale de politique comparée*, vol.7, no.1, 2000.

Vaux H. J. Managing and resolving conflict in the use of water. An international perspective. Edward Elgar Publishing, London. 2003.

Vogler J. and Imber M.F.(eds). *The Environment and International Relations*. Routledge, London. 1996.

World Commission on Dams. Dams and Development A New Framework for Decision-Making. The Report of the World Commission on Dams. Earthscan, London. 2000.

Young D.R. "Alternative Models of Government-Nonprofit Sector Relations: Theoretical and International Perspectives". *Nonprofit and Voluntary Sector Quarterly*, vol.29, no.1, 2000.

Young O. "The Politics of International Regime Formation. Managing Natural Resources and the Environment". *I.O.*, vol. 43, no 3, 1989.

Zürn M. "The Rise of International Environmental Politics. A Review of Current Research". *World Politics,* vol.50, no.4, 1998.

Packaging Polices as a Vehicle for Reforming the Water Sector: the Case of the Californian Drought and the Central Valley Project Improvement Act

Itay Fischhendler[1]* and David Zilberman[2]

* corresponding author

Department of Geography. The Hebrew University of Jerusalem, Mount Scopus, Jerusalem 91905, Israel. Fax: 972-2-5883347; Tel: 972-2-5883346; E mail:fishi30@hotmail.com

College Of Natural Resources, Department Of Agricultural & Resource Economics, 207 Gianninil Hall #3310, University Of California
Berkeley, Ca. 94720-3310

Introduction

The need to adopt a sustainable water policy based upon environmental and economic factors is evident. These views are reinforced in the literature, and reflect the significant growth in demand for water (Allan, 1994; Wilhite, 1997; Sexton, 1990). However, closer observation reveals that when the water sector is reformed, the measures adopted deviated from predefined policies (Zilberman, 2002; Dinar, et al, 1999).

Water policy development, promulgation and advocacy do not occur in a vacuum. Rather they occur in the context of existing institutions, federal, state and local agencies and interest groups (Ingram, 1973). Hence, any water policy is likely to have some distributional implications that will result in both opposition and support from these various interested groups. The water policy literature has often highlighted the distribution of power between the interest groups as an explanatory factor for water policy choice (Rausser and Zusman, 1992; Brooks et al, 1998). Often the narrow interests of agricultural lobby groups override broader considerations in water policy development and implementation (Rausser and Zusman, 1992). As a result environmentally based water programs are blocked and water supply policies are adopted.

Fragmenting or splitting existing and traditional coalitions and replacing them with other coalitions (coalition breaking) has been suggested in order to change the distribution of political power and obtain environmental reform (Hajer, 1995; Maddock, 2004). Yet, little research exists that examines under what conditions existing coalitions can be fragmented and in what circumstances new coalitions can emerge in support of environmental reforms.

Of interest here is how policy packages (several policies negotiated together and unified into one piece of legislation) may have an effect of uniting divergent interest groups into a coalition with a common policy agenda, while at the same time fragmenting the existing alliances. By broadening the stakeholder base and consequently the political support environmental water reform may be more likely to occur.

The case study demonstrates how legislative packaging is established and works. The package enacted water market mechanisms, brought in tiered water pricing, developed a wildlife restoration fund and allocated water for the environment in California. All this was achieved by the Central Valley Project Improvement Act (CVPIA), which is also tied to a larger package (the Reclamation Project Authorization and Adjustment Act).

The paper first discusses the Californian case study itself. How a policy package was formed, it's use and misuse and its enactment is described. Section two identifies the conditions for successfully reforming the water sector through a packaging strategy.

The Central Valley Project in the 1980's

34.5 Million Acre Feet (MAF) of water consumed in California in normal years throughout the 1980's. About 20-25 percent of this water is provided through the Central Valley Project (CVP) built about 60 years ago. The CVP water and infrastructure is owned and operated by the Bureau of Reclamation. Ninth percent of CVP water in the 1980's went to agriculture. This water is delivered by the Bureau of Reclamation to more than 250 water irrigation districts under long-term 40 years renewable service contracts. Since the price of the water is set when the service contracts are signed and is based on ability of irrigators to pay, water is provided for agricultural use at less than the true cost (Whal. 1989). Furthermore, the Bureau did not clarify the conditions under which water transfers would occur between the CVP irrigation districts. Finally, supply to users beyond the CVP area, was prohibited this included water provided by the Metropolitan Water District (MWD) to the growing urban centers in southern California.

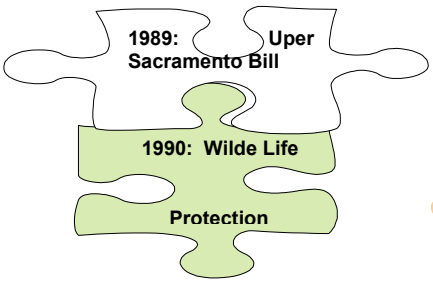
Environmentalists and urban representatives during the 70s and 80s proposed to reform the way CVP water is allocated. Many of these proposals sought to modify existing service contracts to allow them to be renewed for lesser quantities of water and shorter periods of time (Whal, 1989). Other proposals focused on the need to remove all barriers for voluntary water transfers including those outside the CVP jurisdiction.

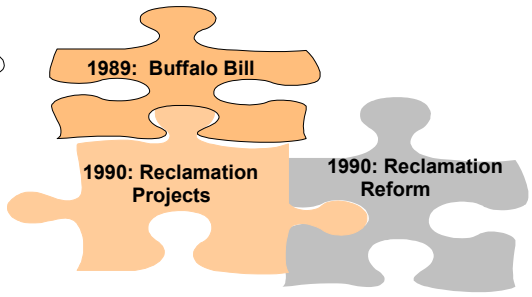
The need for to reform the Californian water sector became more urgent given the 1987 to 1992 drought. The drought had drastically reduced the base-flow in most of the Central Valley Rivers and adversely affected water quality in the Sacramento- San Joaquin Delta. Consequently, the California environmental and urban leaders called for a redistribution of water resources. Yet, the water-rights holders reluctant to endorse the establishment of such reforms. They feared of changing the existing legal system of water rights priorities.

The next section examines how a policy package was formed to reform the Californian water sector.

Reforming the CVP through Packaging
Building a policy package

Round 1: During 1990 a bill (H.R. 4700) to restore fish and wildlife in the CVP area was introduced by George Miller a congressman from California. His bill incorporated many of the provisions of a similar bill - the Upper Sacramento Wildlife Bill offered a year before **(fig.2a)**. Neither bills passed the house floor. At the same time, a Congressman from Wyoming introduced the Recreation Projects Bill (H.R 2567) that included the provisions of an old bill – the Buffalo Bill. Later in the year Miller attached H.R 2567 to 22 other bills, which would establish various reclamation projects in eight western states (Beard, 1995). Then Miller decided that the bill H.R 2567 would be packaged together with the Reclamation Reform bill, a bill aimed . Yet this reclamation projects package **(fig.2b)** died in the final moments of the 101st Congress.

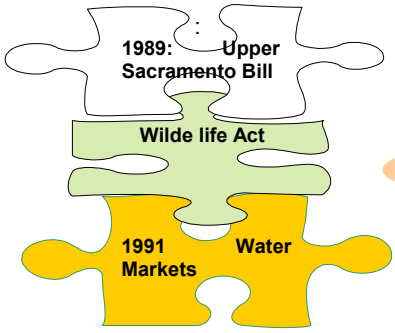


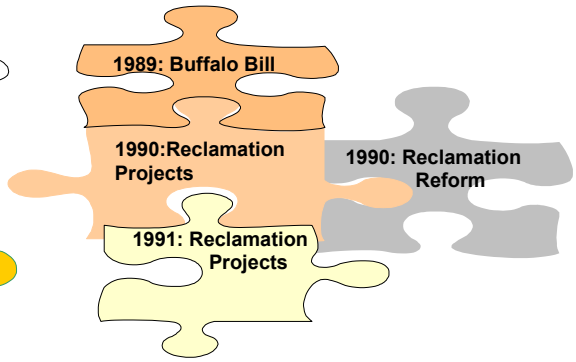


1990 CVP Wildlife Package (Fig 2a) 1990 Reclamation Projects package (Fig 2b)

Round 2: At the beginning of 1991 another version of the CVP wildlife bill was again reintroduced to the House by Miller, and to the Senate by Bill Bradley the Chairman of the Senate Subcommittee on Water and Power. Bradley's bill included water market terms as well as G. Miller's wildlife provisions. In response to the Miller and Bradley wildlife bills, the agricultural sector introduced their own environmental bills to the Senate and the House (S. 2016) (H.R. 3876) (Golb, 1996). Their bill included the same wildlife provisions in Miller's bill and allowed the Central Valley water to be sold including outside the CVP area **(fig 3a).** S. 2016 passed the senate without any amendments.

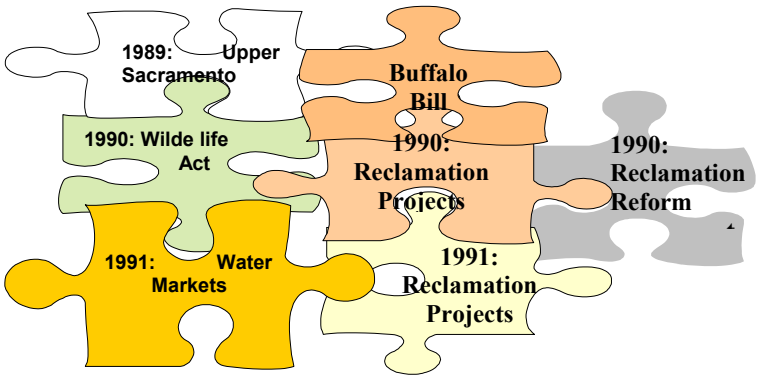
In 1991 the House again overwhelmingly approved the new version of H.R. 2567 (now called H.R 429). This bill included the same reclamation projects and the Reclamation Reform bill. Miller and his committee attached H.R 429 to 17 other separate bills, with the aim of initiating the construction of other Bureau of Reclamation water and land projects in the west directly affecting 12 states - **fig 3b**





CVP Wildlife Package 1991 (Fig 3a) 1991 Reclamation Projects package (Fig 3b)

Round 3: In 1991 while the Central Valley and the reclamation projects packages were discussed separately by both the Miller and Bradley committees, Miller and Bradley decided to pack the two bills together (Beard, 1995). On November 199, Miller brought the Reclamation Projects Bill before the House to be amended, and to include some of the major components of his Central Valley bill. As a result, from the end of 1991 the CVP wildlife package (now called the Central Valley Project Improvement Act) became Title 34 of H.R. 429. - **fig 4**. H.R. 429 passed the Senate on April 10, 1992.



1991: Unified Package (Fig.4)

The next section traces the rationale behind the packaging maneuvers

Why packaging

Building a sectorial coalition

Since Miller was concerned with the third party impact of water transfer on the environment his 1990 wildlife bill did not include water transfer provisions (Beard, 1995). His bill was not endorsed by many of the environmental groups, which wanted the bill to include water transfer provisions and new contract renew provisions. Including these elements they believed will raise the support of the urban sector in their wildlife as they will be able to buy the CVP water. The environmental sector was especially seeking the MWD support that they assume is crucial for passing the bill (Graff, 1994). Indeed, as suspected by the environmental sector, the Miller bill was in fact stopped short of a house floor vote by CVP agricultural interests (Somach, 1998).

A year later George Miller realized that unless he built a coalition behind the legislation it would not move forward. So Miller and Bradley had several meetings with MWD representatives to fully explain their needs, with the aim of building an alliance between the environmental and the urban sectors.

At the same time the urban sector looked to expand their water resources. The urban sector recognized that since there was a strong objection by the environmental sector to any new water construction the solution therefore was tapping the CVP water through water markets (Boronkay, 1997). Yet, early meetings between MWD and the agricultural sector aimed at initiating water markets only resulted in a deadlock (Boronkay, 1997). The urban sector understood that to increase urban water supply, the wildlife act initiative would have to include water transfer provisions. To this end, they conditioned their support for Bradley's and Miller's bills on water market provisions (Boronkay, 1997). The result was that when Bradley introduced his bill in 1991 in the Senate, it was cloaked around water markets.

As an alliance was build between the environmental and the urban sector the agricultural sector realized it has to incorporate market provisions in their upcoming environmental bill. Adopting market provisions would enable them to gain the support of the MWD for their bill, and in so doing defeat the Miller and Bradley bills which would cut their water quotas and their contract length (Peltier, 1993). As the agricultural sector became aware of MWD support for the sale (Somach, 1998) they worked with the representatives of the MWD to incorporate market provisions in their bills (Peltier, 1993).

The environmental and the agricultural sectors competed for the support of the urban sector for their respective bills. This enabled the urban sector in California to differentiate itself from the agricultural sector, and to demand their part of the water budget (Boronkay, 1997.). The experience mobilized the urban coalition to bond together to form the "California Urban Water Agencies", the "Western Urban Water Coalition" and the "Share the Water". Attaching water markets provisions to the pending environmental bills also engaged the Californian business community including, the Bay Area Economic Form, the Business Roundtable and the Bank of America to support the environmental bill (Peltier, 1999).

Building a regional coalition

It was clear to Miller that the largest obstacle to getting the bill through lay in the Senate. There were many western Republicans in the Senate who had no interest in water reforms as their states had been receiving federal subsidies for years. (Beard, 1995, p. 30). Therefore, Miller concluded that there was a need for a regional coalition to support his bill. This was to be beyond a narrow Californian coalition between the environmentalists and the urban sector. To this end, Miller and Bradley, in 1991, rolled all the CVP wildlife bills in with the Reclamation Projects Authorization bill (Beard, 1995). Miller and Bradley, by way of a packaging strategy, informed all states in the west that their bills would not become law until the CVP reform was achieved (Peltier, 1993). This strategy was aimed at forcing the agricultural sector in California to the negotiation table. Otherwise the entire western water legislation would have been delayed (Nelson, 1993). To ensure further support for the bill from the other western states, they included 17 other western states' projects. For example to ensure Arizona's support for the bill, the Grand Canyon Protection Act was included (Rhodes, 1991). As expected by Miller and Bradley many of the Western states wanted their projects so badly that they were willing to sell out the Californian provisions in order to get what they wanted (Golb, 1996). As a result of this hostage strategy, Congressmen from states included in the package bill abandoned their former Californian allies in favour of their own projects (Golb, 1996; Peltier, 1993). Among them is Wyoming, Arizona and Utah that since they were concerned for their projects included in the package pushed the bill forward with the CVP included within (Beard, 1995).

The Final Packaging Maneuvers (round 4)

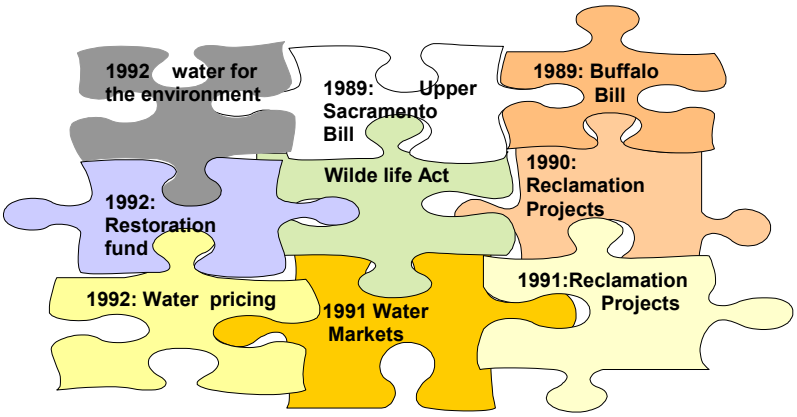
In February 1992 Miller introduced a new house bill (H.R. 5099). The bill in order to get the support of the MWD mirror the transfer langue in the agricultural environmental bill and allowing individual waters users to transfer their water without the district's approval (Peltier, 1993). It also included tired water pricing provisions in order to get the support of the Californian fisheries sector (Nelson, 1993). Finally it established a wildlife restoration fund, limit the length of the contracts to 20 years and allocated 1.5 million acre feet of water to the environment. Miller's bill passed the House on June, 18th, 1992.

As the H.R. 429 package moved out of the Committee of Energy and Natural Resources to the Conference Committee where both the House (H.R. 5099) and the Senate (S.2016) CVP bills were to merged it was stripped of the Reclamation Reform Bill (**fig 5).** Excluding the Reform Bill was due to the need to remove all barriers that could have blocked the CVP reform (Beard, 1995).

The conference committee process could be described as a classic sausage making exercise of cutting deals. Often one element of the package was traded for another, for example allocating less upfront water for the environment in return for more money to the restoration fund. Finally, the water allocated to the environment under normal years was reduced to 800,000 acre feet. It also imposed a 25 percent surcharge on people who sold water to outside the CVP rather 15 percent, the tier pricing has changed, and the contracts were set for 20 years.

On October, 6 the House voted 244 in favor and 159 against the compromise bill. 139 of the 192 Western congressman caught in the package supported the bill. Three days latter the Senate voted 83 in favor and 8 against. Only 3 were from the west. President Bush signed the law on October 30, while expressing his discontent with the provisions that relates to the CVP.

This Law, which cost in the order of $2 billion included provisions for water transfers, water pricing, water for the environment, and new contract conditions concerning the CVP. It also included 39 other bills, which initiated 57 projects in the western states. These covered diverse topics that included settlement of Indian water rights claims, management of recreation at Bureau of Reclamation facilities in the western regions and the establishment of water projects in many western states- **fig 5.**



Finale Repacking (Fig. 5)

Discussion and Conclusion

Water policy is often stressed as a matter of strict economic and environmental discipline, but in real life it is the political process that determines the policy selection. The political process requires obtaining sufficient support for policy proposals. This study has documented the construction of a winning coalition of interest groups through packaging. The wining coalition included both sectorial and regional advocacy coalition. The sectorial coalition included the Californian urban and environmental sector. The coalition was created through including water markets provisions within the CVP Wildlife bill since market provisions provided mutual benefits to all sectors. The urban sector gained by being permitted to buy CVP water; while the environmental sector was now in a position to finance the restoration and was now able to purchase water directly to develop wetlands areas. And perhaps most importantly the agricultural sector was now permitted to sell the water at a market price, with the revenues compensating for the water provided to the environmental sector. The regional coalition was created through packaging the wildlife bill together with Project Reclamation Bill. Attaching these two bills together secured the support of all states covered by the bill in the CVP reform, if this did not occur, projects in their states would not be covered by the law.

Yet, packaging is likely to involve a larger number of participants in a regime and hence it may raise the transaction costs of an agreement. This could explain the delay in the enactment of some of the Reclamation projects and in impingement upon the sovereignty of California in water related issues. It was also found to result in economically unsatisfactory

elements in the implementation phase of the bill (Weinberg, 2002) and in other case studies. Limitations on the ability to adapt management regimes to changes in the environment (Fischhendler, et al forthcoming). However, it may also open avenues for linkages and logrolling that essentially widen the vested interests that will determine if a water policy is accepted or rejected. In other words, since the CVPIA was reformed through packaging, the question is not whether or not to build packages, but rather how to reduce their cost.

This study identified some of the cost-reduction requirements for a successful packaging. It includes the need to build it around the right **size**. The stronger the opposition, the more projects to circumvent the opposition will be included in the package. The size of the package was also influenced by the perceived political time or opportunity to get the bill through. The shorter the period of time, the more comprehensive the reform package could or had to be.

It also the **timing** factor that contributed to the package's success. The unfairness and ineffectiveness of the current allocation system was highlighted by introducing the package when many of the water contracts between the Bureau of Reclamation and the districts were about to expire and during a continued drought. Finally it was the **structure** of the negotiation process as a repeated game that contributed to its success. Between 1989 until the reform was legislated in 1992, the CVP wildlife bill was brought before the House and the Senate for voting each time in a different shape and form. It was also changed during the pre-floor legislative arena. A repeated game allows coalitions to form gradually, thus allowing outsiders to join the coalition.

In conclusion, this paper has demonstrated how environmental and economic beliefs are not enough to form a winning coalition to reform the water sector. This study takes a different approach. Rather than focusing on the optimal policies, it focuses on the feasibility of options. The most feasible way to advance water reform is through a package of policies that unites divergent stakeholders in an environmental policy regime and at the same time fragments the existing alliances. Packaging may not be the best economic solution. But it may be much better than current situations. Too often, there is no agreed-upon water policy at all or policies are enacted too late. Then, the costs of inaction become prohibitive.

References

Allan J.A. 1994. Overall perspectives on countries and regions. In: *Water in the Arab World: Perspectives and Regions*, ed. P. Rogers and P. Lydon, Harvard University Press, Cambridge.

Boronkay, Carl. 1997. "The Passage of the Central Valley Project Improvement Act, 1991-1992: the Metropolitan Water District Perspective," an oral history conducted in 1997 by Malca Chall, Regional Oral History Office , the Bancroft Library, University of California, Berkeley, 1999.

Bradley, Bill, 1992. Statement of Bill Bradley a Sensor from the State of New Jersey before the Subcommittee of Water Power and Offshore Energy Resources, May, 14, 1992. In: Legislative History Miscellaneous Articles and Background Information related to Public Law 102-575 Reclamation Projects Authorization and Adjustment Act of 1992. Part 2. p. 139-141

Brooks, Jonathan C., Colin Cameron and Colin A. Carter. 1998. Political action committee contributions and U.S. congressional voting on sugar legislation. *American Journal of Agricultural Economics*, 80(3): 441-455.

Dinar, Ariel, Balakrishnan Trickur K, and Wambia, Joseph. (1999). *Political Economy and Political Risks of Institutional reforms in the Water Sector*. World Bank research Paper, 1999.

Fischhendler, I., Eaton, D., and Feitelson, E. "The Short and Long Term Ramifications of Linkages Involving Natural Resources: The U.S.-Mexico Transboundary Water Case". *Environment and Planning C, Government and Policy*, forthcoming

Golb, Richard K. 1996. "Passage of the Central Valley Project Improvement Act, 1991-1992: the Role of John Seymour," an oral history conducted in 1996 by Malca Chall, Regional Oral History Office , the Bancroft Library, University of California, Berkeley, 1997.

Graff, Thomas J. 1997. “The Passage of the Central Valley Project Improvement Act, 1991-1992: Environmental Defense Fund Perspective,” an oral history conducted in 1994 by Malca Chall, Regional Oral History Office , the Bancroft Library, University of California, Berkeley, 1996.

Hajer, M. 1995. *The Politics of Environmental Discourse*. Clarendon Press, Oxford.

Ingram, H. (1973). The political economy of regional water institutions. *American Journal of Agricultural Economics:*10-18.

Maddock, Tara A.2004. Fragmenting regimes: how water quality regulation is changing political-economic landscapes. *Geoforum* 35: 217-230.

Nelson, Barry. 1993. “The Passage of the Central Valley Project Improvement Act, 1991-1992: Executive Director, San Francisco Bay Association,” an oral history conducted in 1993 by Malca Chall, Regional Oral History Office , the Bancroft Library, University of California, Berkeley, 1994.

Peltier, Jason. 1993. “The Passage of the Central Valley Project Improvement Act, 1991-1992: Manger, Central Valley Project Water Association,” an oral history conducted in 1993 by Malca Chall, Regional Oral History Office , the Bancroft Library, University of California, Berkeley, 1994.

Rausser, Gordon C., and Pinhas Zusman. 1992. Organizational failure and the political economy of water resources management. In: *The Economics and Manganese of Water and Drainage in Agriculture*, ed. Ariel Dinar and David Zilberman. Boston: Kluwer Academic Publishers.

Rhodes, John J. 1991a. Supplemental Views of the Honorable John J. Rhodes III. In : Legislative History Miscellaneous Articles and Background Information related to Public Law 102-575 Reclamation Projects Authorization and Adjustment Act of 1992. p Part 1. p. 1170-1172

Sexton, R. (1990). Perspectives on the Middle East water crisis: analyzing water scarcity problems in Jordan and Israel. In *Irrigation Management Network*. London Overseas Development Institute (Paper 90/3f, December).

Somach, Stuart. 1998. “Passage of the Central Valley Project Improvement Act, 1991-1992: the Central Valley Project Water Association Perspective,” an oral history conducted in 1998 by Malca Chall, Regional Oral History Office , the Bancroft Library, University of California, Berkeley, 1999.

Weinberg, M. 2002. Assesing a policy grab bag: federal water policy reform. *American Journal of Agricultural Economics*. 84(3): 541-556

Wahl, Richard .W. 1989. Markets for Federal Water: Subsidies, Property Rights and the Bureau of Reclamation. Resources for the Future, Washington, D.C.

Wilhite, Donald A. 1997. Responding to drought: common threads for the past, visions for the future. *Journal of the American Water Resources Association*, 33(5):951-959.

Zilberman, D. (2002). Individual and institutional responses to the drought: the case of California agriculture. *Water Resources Updates,* 121:17-21.

"Liable but Not Guilty": The Political Use of Circumstances in a River Basin Council (Mexico)

Eric Mollard[1], Sergio Vargas Velázquez[2]

Being inspired to some extent by the French model, Mexico has a modern institutional framework open to social participation. About negotiation processes on water, both countries share stalemates with posture toughening or delay practices as the questioning of "hard" hydrological data by stakeholders. As institutions and negotiations show parallelism in both countries, differences in governance have to be call upon to explain what has be called “a poorly regulated space” in Mexico, namely the use of authoritarianism increasingly challenged by social groups as well many difficulties to get and enforce a collective decision. A special attention has to be paid to politicization of water because it illustrates some of these difficulties as well as it mirrors another feature of political recent history in Mexico: the transitions.

Before identifying political resources mobilized within a river basin council in Mexico, some differences about governance deserve to be noted (governance includes stakeholders’ practices and pressure means in and out the negotiation space). In France, some experience has been yielded in open negotiation; the exercise of prefect’s authority is subjected to many associations; and the politicization of water remains circumscribed. Participative experiments recorded successes, in particular in highly conflictive grounds like the Marais Poitevin, the Camargue and, more recently, in the management of the Beauce groundwater. Some hidden solving conflict mechanism exists through the dinner between a high ranked politician and a senior official in charge of the issue: "you reduce your project, I undertake the financing". Money extinguishes the controversy under two prerequisites: a strong public opinion and the legitimacy of such a practice after a prior participative process. In Mexico, not only the public opinion is incipient and elected representatives are less accountable vis-à-vis their electorate, but the politicization of public debate is stronger with representatives up to state governors openly supporting one stakeholder against others.

To identify interfering processes in Mexico, the paper characterizes the conflict and the negotiation blocking within a basin council (1st part). Political factors are analyzed through the use of climatic and political situations by the different actors, the first one making possible some successful hits in the opinion whereas the second one permanently changes the power relationships (2nd part). This factual history, which connects national and regional times, highlights leverage and structural interference for political action (3rd part). In conclusion, if the responsibility for the difficulties reflects the political play, as much within the institutional framework that in the daily practices, liability is discussed, as well as the political conditions required for a successful social participation.

I. Stage, action, actors: a classical play

1. *Ménage à trois* or *Ménage à cinq*? Elementary principles

A conflict opposes at least two parties which can declare war or decide to negotiate. The stronger imposes a conflict on the weaker and, apart from any moral countervailing power, be internal (population) or external (the concert of the nations), rivalry can badly finish for one of the two parties. Curiously, the weak part can also find interest to enter a conflict under certain conditions of supra-parties institutions or countervailing power, without which it can lose

[1] Institut de Recherche pour le Développement, France. Eric.Mollard@ird.fr
[2] Instituto Mexicano de Tecnología del Agua, Mexico. svargas@tlaloc.imta.mx

against the stronger one. Indeed, the weak party gains in an open conflict, with little chance to lose anything, since it can gain something, such as gathering a population around a leader or giving legitimacy to an action, in other words creating a cultural identity. Such situations show that the controversy very often calls upon a third actor, be a public opinion (people or nations), morals or a formal authority. Indeed, in old times, despotisms insensitive to political counterweights led to wars and, consequently, to empires until forces were balanced by distance and internal weaknesses such as nationalities. Much later, blocks and alliances created supranational institutions, more as a governance that a real government.

Within a national context, a recognized authority is a prominent actor who, even not physically present, is able to decide a deadline in negotiation, to avoid a fratricidal combat, to define standards and, ex post, to sanction in case of contract incompliance. The three-actor ménage is acknowledged as the most common. However, it is perhaps the case of a divorce; it is much less the case of a social conflict.

Indeed, political operations are more open and they largely go beyond law and the issue of the conflict. For example, the current controversy on dams goes on law details or on intensive agricultural model that water from reservoirs will supply, much more than local ecology modification or population displacement. This shift in strategy and scale is prone to any politics, and what is valid for dams is valid for a lot of other issues in resource management. One can even consider that the nature of open conflicts is different where laws are strictly enforced, because minorities want to take full advantage of their right, but with the detail that such numerous conflicts hardly exceed local or individual situations; when law is not the only reference, communitarian, long-term conflicts are usual.

The Mexican case gives an illustration of a general issue where two additional actors have to be sum up to the three traditional parties. The first one is an alternative authority. In Africa, land litigation opposes two parties, each one frequently calling upon civil law and common or religious law. The controversy moves upward and becomes a conflict between authorities which, if there is no temperance from both respected institutions resulting from a general balance of power, can lead to secession. In Mexico, ways and customs are sometimes called to rescue a party, as well as the presidency of the republic or an initiative for changing law.

Finally, what we call the fifth party is that which suits more any instrumental politicization of water as a means to gain legitimacy in public opinion or among stakeholders. This fifth part gathers actors who do not directly play around the negotiation table, but who are likely to interfere outside. This fifth acting party mainly deals with politicians, such as members of parliament in relation to lobbies, and with any agent with interest in conflict or in a particular solution of the latter. For example, the president of the republic indirectly intervenes when a conflict can affect him (see further). A lobby would seek modifying rules or law in order to direct a local conflict towards the desired solution. Another way of acting is, for electoral purpose to weaken by all the means a political party, that politicians seize a conflict on water to politicize it.

In Mexico, water suits many types of operations and politicization. We firstly examine some interventions and instrumentalization from actors who seek in a local conflict to build legitimacies and to weaken adversaries' one, with the clear result of a whole decreasing credibility in policy within public opinion. We will analyze then why water in Mexico is so openly politicized by connecting such current history with political transitions the country has gone through for more than ten years.

2. A definitely political transition

Firstly, political regime in Mexico was characterized as authoritarian by authors such as J.L. Reyna, J.L., Meyer and Aguilar or R. Ai Camp. All stressed the concentration of political

power and public decisions at federal level, as well as “no written” rules. Secondly, corporation organization under the control by federal executive authority (ultimately by the president in a strongly-presidential regime) was another main feature. Negotiations were common but the federal authority defined who could be a valid interlocutor. Thirdly, such regime was handled through a politically-dependent bureaucracy and technocracy. All these features resulted in a populist regime in the hands of state party (PRI or Revolutionary Institutional Party). Such political culture with client and corporatist relationships, as well of "no written rules", has managed political life in Mexico for many decades. Nowadays water management in river basins with conflict solving, rule enforcement and technical decisions yet relies on such practices even though the political framework changed a lot.

In the last decade, citizen mobilization mirrors the will for more room against authoritarian regime. Actions against the State, as Zapatista movement, or through electoral process aim at making a political shift in a long process of transition, whose one of the milestone was the presidential elections in 2000. The search for democracy is not simple because it goes through the destruction of traditional, operative bonds between elites and people. Well, as Olvera states it, "the nature of this process destroyed little by little the last bonds and intermediations between the political system and the society, but new ones were not constructed, which explains that the alternate in the power has not meant until the moment a true reform of the relations between the State and the society and that have not either opened still new forms of citizen participation in the public life." (2003: 13-14). Transition means a deficit between elites and social demand for conflict solving, law enforcement or basic needs. Social participation, as in basin river councils, faces many difficulties, which mirrors the transition to democracy.

The politicization of water issues in Mexico results from such transitional processes. Social groups such as farmer organization, political parties or government agencies still follow traditional behavior and negotiate under the previous scheme while spaces and whole-society expectative for institutional interlocution are changing. Alongside, state disengagement and decentralization gave more room to local issues. In such a context, water is not a political issue at the federal level, but it is at the provincial level. As a consequence, negotiation in a water basin council is a highly political issue.

3. A definitely political negotiation on water

In Mexico, government pays careful attention to two watersheds because of their economic importance and potentially conflictive dynamics. They are the Lerma Chapala river basin in middle Mexico and Rio Grande river basin at the border with USA. We will analyze the basin where the Lerma River throws in lake Chapala, the largest in the country.

The Lerma-Chapala Basin covers 54,300 km^2 and crosses five states (Mexico state, Querétaro, Guanajuato, Michoacán and Jalisco). Its agricultural sector is dynamic with nearly 800,000 ha under irrigation, namely 13 percent of the irrigated area in the country, while a rapidly growing industrial sector accounts for 35% of Mexico’s industrial Gross National Product and 9% of its overall GNP. The basin is the source of water for around 15 million people: 11 million in the basin and 2 million each in Guadalajara and Mexico City. From a water perspective the basin is in crisis, with demand exceeding supply in all but the wettest years. Average water availability per capita is 882 m^3 per year while the percentage of water use versus available water in the basin is 109%, making it one of the most water-scarce basins in the world.

The main controversy in the basin opposes farmers upstream, localized as a majority in Guanajuato state, and Lake Chapala defenders downstream, in Jalisco state. The lake lost more than 80% of its volume in the 20 last years. The second city in the country, Guadalajara, is also located in Jalisco. As the city pumps nearly 60% of its domestic needs

out of the lake, on the one hand, and as it is the main venue for groups active in favor of the lake rescue, on the other hand, Jalisco government defends the lake as well. Conversely, Guanajuato state defends farmers, less for reasons of electoral balance that for contingent and historical reasons. Indeed, current president of the Republic, Vicente Fox, when he was governor of Guanajuato, had made water a political combat tool against water federal administration. Farmers who benefited from unconditional support against Jalisco made pressure on the new governor, who had to answer a verbal escalade on both sides. This politicization of a water current affair finished to escape initial protagonists and led to instrumentalizing by other outsiders.

II. The play: a negotiation

Each Mexican recognizes that "all is politics" in his country; at the same time, he feels mistrust towards the political field as if the elected officials' practices and a weak commitment to solve any problems ended up even aggravating eroded legitimacy towards authority. Water management is only one aspect of the "all-politics", so that we underline in the narration of a social process what comes under this topic.

1. Antecedents of negotiation

As the largest lake in the country, exceeding the surface of the Geneva Lake, Lake Chapala is a national symbol. Located in the central high plateau downstream of the Lerma River, its volume has not ceased dropping since 1980 to approach 15% of the total capacity in 2003. The actors in the negotiation, supported by the hydrological decision support system, quickly agreed to designate two culprits: upstream irrigation and pumping for drinking water by the second city in the country, Guadalajara, located at some kilometers from the lake. Later it has been added a set of dryer years whose role has been quickly discussed. The last element of the consensus is agriculture, which uses 80% of available water and which is hydraulically and economically poorly efficient: it is consequently the object of all requests, even is accused by some sectors.

As this stage, we note that all the assumptions were not explored and that other explanations have been accepted without discussion: it is the case of over granting of surface water rights, concept recovered from ground water and wells, or of a stronger pressure exerted on farmers than on city. Experts have no time or independence to deepen the issues as independent, scientific institutes might do it. At the same time, some of them are aware of the role they play in legitimating negotiation on a scientific ground (interviews with representatives and experts). Finally, it is not improbable that further negotiations will be questioned and delayed because of such possible shortcomings.

Lake reduction gave place to an early alarm since 1989. At the time, Carlos Salinas de Gortari, as the Mexican president, made environment a personal crusade apart from electoral considerations. Training in high technocracy made him sensitive to international issues and environment whereas, on the institutional level, he got an uncontested authority on the country and on the then-unchallenged party (PRI). On his own initiative, he invited the 5 governors of the Lerma Chapala basin to sign an agreement with the federal executive.

The governors' agreement (1989) and Surface Water Distribution Agreement (1991) raises 3 questions today:

1. Were these agreements hydrologically founded?
2. Were they legal?
3. Have they been enforced?

In 1991 the agreement on water distribution did not address any method of water transfer to the lake. Such absence raises not only the question of the reason of a key point (indecision supports Guanajuato), but still that of the illegality of the procedure when water is let out from the dams by 1999 and annually since 2001, as it has been argued by Guanajuato Water State Commission and representatives of agriculturists. Actually, a federal trial pronounced in 2004 following the request of farmers considered that water let out from the dam is illegal.

Agreement implementation between 1991 and 1999, when the first release to lake takes place, was probably faulty, not because of the application of the algorithm which sets water volumes to be taken away for agriculture, but because of the questioning about water savings carried out by the application of the algorithm. Interviewed experts consider the possibility of water allocation to alleviate potential conflicts while others stresses the difficulties to precisely quantify the links between rain, irrigation and Lake Chapala levels.

First negotiations held in 1991, as idealistic as they can appear today, thus led to trade-offs which are time bombs today. In other words, old weaknesses are current problems. Moreover, the ecological release of water since 1999 did not succeed in stabilizing the lake. While the supporters of the lake consider the yearly 200 Mm3 as "aspirins", such volume spurred farmers' anger. Vis-à-vis this incipient confrontation, the negotiations began again in 2001 within the river basin council with presuppositions we have just seen.

2. The negotiation round

The table of negotiation welcomes not only state stakeholders in an institutional venue (basin council), but also the main authority and the negotiator (merged in the federal water agency). In this small group of experts, policy is not invited meanwhile it is omnipresent.

a. The institutional weaknesses of the river basin council

The river basin council arisen from 1992 water law is an advisory institution chaired by the federal water administration which holds the whole authority. Later on the representatives of six water uses were added to state representatives. Law modifications passed at the beginning of year 2004 confirmed the interest in social participation and in the basin council but did not solve three basic problems (without counting its advisory nature, choice which was discussed publicly).

- The lack of an own budget directly subjects the council to states and agencies, which only fund when they find their interest. For example, any search for information of social or technical nature to clarify council's decisions is prone to such limitations. Such a context suit opportunistic behavior for funding research only if it is expected to strengthen the position of one stakeholder. As there is no solidarity between states, any alliance is not likely to be done. Finally such a play is favorable to the federal water agency, which is the only stakeholder which can finance the request.
- User representation is the second main problem. Representatives firstly serve states, and their relationship to the base is quasi non-existent. For example, a young agricultural leader elected as the representative for agriculture was thanked by a state simply by removing its local mandates, which automatically removed him from remaining in the council. On the other side, people can question any collective decision that affects their interests by changing a leader. Nowadays elections are open and transparent but it is not universal suffrage, what provides argument to call into question a representative.
- If the council is advisory vis-à-vis the government agency, reality is more subtle. In addition to the charges of favoritism (see further) or to susceptibility when discussion agenda is changed without previous notification, the federal administration is open to social participation and gives more weight to consultation when it is itself politically weak or when country mobilizations are likely to overflow. Political weakness took

place in 2003 when one option for water law modifications was a revamping down for the federal water agency. It happens in 2004 too when high ranked staff in many government agencies was susceptible to be laid off. Conversely, government agencies have little contact with population (they never gave account to the mass media) and they are only accountable to the political sphere. By focusing criticisms from all users, such agency is a very useful scapegoat to protect politicians and avoid to them, in their turn, to be accountable.

Consequently, the basin council was constituted without countervailing powers. In the Lerma Chapala, this window has been used by two belligerent states to put forward their position. Such staging has a congenital weakness since the fight between both parties cannot achieve solution: river basin council could be doomed to darkness or, when it is under limelight, to failure.

b. The group of experts

The Group for Planning and Water Allocation is a technical committee within the basin council to discuss hydraulic scenarios. It is composed by state-appointed experts chaired by the federal water agency. Experts and scientists are not spared from politicking, i.e. by particular interests beyond the water issue.

i. Most experts know themselves from a long time. They are often former civil servants from water agencies and some of them already took part in designing the algorithm in 1991. As old hierarchies and friendships go on, such personal networks result in two consequences: one is rather benign insofar as the states which do not form part of it feel insulated. In such a case, strategy is then to call upon university competences or national or international consultants. The second consequence can be perverse in a country where client or group relationships have managed public affairs for a long time. In such a context, a very strict rule of independence would be enforced as in the new water user associations. Indeed, many associations have a regulation which stipulates the impossibility of family relationship with the board. Even though any compromising is not proven, the doubt became certainty for the opposing parties at the point to potentially call into question any decision.

Experts work with the political purpose of their backer, mainly the states. Their technical skills are used for supporting or invalidating hydrological data or simulator. For Guanajuato, which will lose and seeks compensations (for the moment no explicit), the objective is to delay any decision. One expert thus reached to cast doubt on the validity of rain official data and another proposed to make a new simulator.

Federal administration plays a key role in the committee of experts. The negotiator is free to call upon other experts within the agency, who are sometimes high ranked managers to recall the stakes. When negotiations resumed, administration produced its own scenario which gave them more room to manage water in the dams, especially reducing agriculture allocation following consecutive dry years. Other experts had then perceived the negotiation revival as the means for imposing its own solution.

ii. A hydrological decision support system was designed to make negotiation easier. A computerized program simulates run-off in sub-basins according to rain from a database of daily rain during fifty years. The decision support system was carried out by a governmental research institute specialized on water at the request of the federal administration.

The simulator produced from now on two significant breakthroughs in negotiations. It made it possible to obtain the agreement of all stakeholders on data reliability when any attempts for negotiating was called into question by one or the others. In addition, it made it possible for each state to define its strategy and to propose scenarios (that the simulator can classify).

The computerized system is unceasingly improved and it is today a cornerstone in basin negotiations.

However, hegemony it acquired requires identifying possible presuppositions in the initial request by administration and raises the issue of political use of negotiations. Indeed, the simulator computes saved volumes and economic balance for a range of options. For example, the simulator ratifies factors for lake drying out without addressing other assumptions; furthermore, its calibration was quickly discussed. However, this strategy may not result from a political will, but from a hydraulic ethos in a technocracy poorly informed about the social functioning of water user associations.

iii. Negotiation process within the Group for Planning and Water Allocation was quickly blocked by experts appointed by Guanajuato government. Besides the state representative announced in 2003 that it would not sign any agreement this year. On its side, the federal agency was unable to set a decisive deadline without political support in a period of uncertainty for its own future. A May 2004 deadline appeared later without a real capacity to force stakeholders to get a decision. In case of no mutual approval, experts agreed not to modify the governors' agreement of 1991, such decision supporting any dilatory bearings.

3. Operations outside the negotiation table

We illustrate some political operations outside the negotiation round emphasizing on the art of taking advantage from circumstances. In the "all-politics", we examine the influence of the Mexican presidency, the Secretariat for Environment, the federal water agency and local and federal politicians. We examine how "big actors" influence local organizations and lobbies (one could also analyze how the latter use big actors). One could analyze sociopolitic relationship within the states and between state and federal executive, with many conflict, short-term inefficiency and erosion of longer-term legitimacy. If such aspects exist in all the countries, it still misses in Mexico a public opinion aware of its power and demanding accounts from the leaders.

Ghiotti (2004) states that "in the absence of a clear distribution of competences, [policies were used] to reinforce the intervention of institutions in search of legitimacy". The environmental policies became the object of an instrumentalization (i.e. materialization for other purposes or manipulation) beyond their only significance and this, as much by European Union, nations or local authorities. One can generalize this behavior in Mexico.

i. Politicians of opposition party in Jalisco mirror the experience they got as former rulers. In 2003, members of parliament from the PRI left their neutrality to openly support deputies and Jalisco government from the PAN party (National Action Party) in their fight to restore Lake Chapala against Guanajuato. Once this position clearly identified through the request for a Declaration of Ecological Emergency and the petition to give the lake its own voice for elections in the basin council, they overtook local PAN by demanding the president's intervention. Indeed, Vicente Fox, which had put an end to the historical hegemony of the PRI party at the presidential elections in 2000, had based his campaign in particular on environment. As they could not jeopardize the president (see further), PAN could not but decline a too benevolent offer, revealing limits in their ecological engagement. Such event linked with water is of course only one skirmish in a disputed electoral course.

ii. The position of president Fox in the Lerma Chapala basin reveals many political practices on water. His position was undermined by a contradiction until the unhoped-for reversal of the climatic circumstances in 2003. Indeed, exceptional floods filled the lake sufficiently so that presidential intervention would not be necessary until next elections in 2006. Before this climatic bonanza, the president owed, on a side, to make the lake filled to hold his electoral pledge for environmental protection and law enforcement (law provides that any wetland

must be protected) and, on the other side, to prevent any social turmoil of farmers in Guanajuato, state he was the previous governor.

Farmers knew this contradiction and they were able to benefit from it. The most satisfactory strategy for the agricultural leaders and the presidency was to weave a network of functional relations together. Obviously, uncontrolled mobilization can take place with poorly informed and highly organized farmers who are difficult to operate on the battle field. In addition, the Mexican president, if he takes into account the conditions of the basin, associates issues and can yield on water to guarantee other ones. It then becomes difficult to decipher such interlacing of *concerta-cesión*, mexicanism which can be translated as the culture of compromise. It raises the idea that executive has little room to operate or, on the contrary, that it has much more if one manages to decipher all the goals:

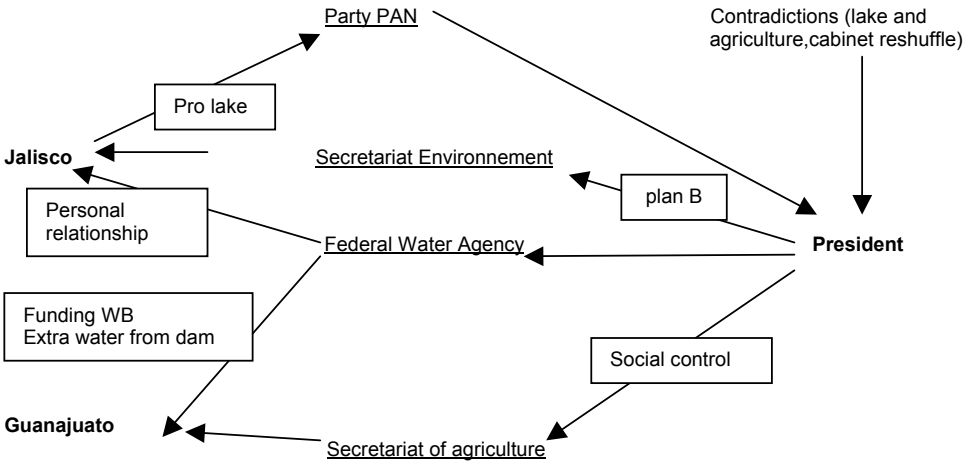
- At the local level, the president can aim funding at farmers in Guanajuato state. It is the case of credit for modernization in irrigation granted by the World Bank. It is probably the case of subsidies to cereal marketing through the secretariat of Agriculture or some substantial support directly channeled to Guanajuato government (this last assumption rests on the fact that the government of Guanajuato spends a lot for the farmers when electorate is firstly urban).
- The presidency has not bet all on water negotiation. Plan B or alternative option is the master plan for the basin. A first plan was presented in 2001 by the new, inexperienced Secretariat for Environment. Although this program did not plan but reforestations and sensible area protection without interfering with the productive sectors, it was locally rejected. In 2004, a new rehash, hardly more supported or negotiated, benefit from a strong line of promotion towards actors. In political words, it is expected that the failure one plan would lead to a strong political support for the other option.
- As other countries, Mexico experiences administration crisis and internal controversies in the institutional network. Even if these struggles are not strictly a political demonstration of interests, a poor regulating mirrors a political weakness. At the higher level too, negotiations to pass great laws (finances, administration, etc.) led the executive to bargain layoffs or the liquidation of research institutes, in particular that in charge of water. At the time of the second reading for the modifications of water law in 2003, the federal water agency tried to appeal against some modifications to the executive a second time (in vain because a bill cannot come back for a second time to the executive).
- Finally, the presidency intervenes on the two faces of the contradiction through the Secretariat for Environment on the side of the lake and through his secretary on the agricultural side. It is more a matter of the minister himself than the ministry. Indeed, the current holder is not only a president's personal friend but also, being the most important agro-entrepreneur in Guanajuato, he has effective relays to control agricultural leaders in Guanajuato. His leverage is of financial nature (see higher) and probably through hidden ways, for example by destabilizing any poorly-controllable local leaders. The local level in water management has consequently effects at the federal level with, during the first cabinet reshuffle at the end of 2003, the continuity of the secretary for agriculture whereas the secretary for environment, with a less political play and so far less necessary with a full lake until the elections, was thanked off.

iii. We lastly examine the case of Jalisco to achieve the political panorama in the basin. This state is important by its economy and demography, but also by some powerful entrepreneur groups and even its bishop. The fight for rescuing lake Chapala is probably less for environmental concern than for electoral purpose and, maybe, to reach a national debate by fighting with a weaker governor. While local newspapers announced great demonstrations of ecologists, small regroupings hardly were mentioned later in the same newspapers. In fact, a strong electoral concern directly in relation to water hides behind these political operations.

Guadalajara city, with more than 4 million people, supplies out of drinking water more than 50% of the population from the lake. This water is absolutely necessary because of a chronic shortage in investment, which will worsen because water price is among the lowest in the country. Thus, water price in the close city of León is 6 times that of Guadalajara. However increasing price would be an electoral suicide and Lake Chapala is vital not only for the city and its entrepreneurs, but also for political actors. Such convergence explains the alliance between the governor and the business milieu. However, it is difficult to explain to people such investment shortage and that Jalisco needs federal water to finance its drinking water. In other words, the purpose of the effort requested from the farmers is not only to restore a lake, but also to subsidize another state.

Whereas the local government of Guanajuato feels isolated in negotiations, feeling that is strengthened by an apparent lack of support from the former governor now president, Jalisco relies on various alliances:

- The state has the support from the secretariat for environment. This mainly moral help supports the legitimacy of the local leaders.
- Owing to the composition of the regional office of the federal water agency is accused to back up Jalisco.
- While others states do not involve in the basin controversy, Michoacán state recently decided to back Jalisco for a full lake. It abandons his invading farmers on the bare part of Lake Chapala against the probable revival of an environmental policy.
- Finally, the political party of the president, the PAN, is very active in Jalisco, a region with many traditional catholic entrepreneurs. In 2003, the president, belonging to a minority part of the PAN, needed the party to renew the image of the cabinet. He negotiated with his party and Jalisco, all the more easily as the lake had just filled and discharged him from his commitment with the farmers.



The diagram summarizes the configuration of circumstantial relations between big actors in the Lerma Chapala basin. The diagram does not take into account the trade-offs in laws under discussion in a context where the president only benefits from the partial support of the party which, itself, does not have the majority with the Congress.

III. Morals: moderate pessimism or optimism?

The first conclusion is the recent politicization of water in the basin. This politicization can be defined as the instrumentalization of a current affair for local electoral policy and lobbying close to the governors: entrepreneurs and landowners in Jalisco, agro-industrials in

Guanajuato. Skirmishes between political parties take place, but this politicization concerns two states and a president who belong to the same party. Local interest groups that do not have a satisfactory answer from the federal government or through traditional negotiation spaces, strives to get political support from their own states. In a context of decentralization giving more space to states, contradictions between federal and state governments are feed by such demands. That can appear curious insofar as, on the one hand, the party is affected (unless strategists think the contrary) and, on the other hand, water benefits from a broad consensus between the 3 big political parties at the federal level. As an explanation, the two conditions of such local politicization are that solidarity with government and party discipline are weaker than the search for a disputed local electorate.

The second conclusion states that the politicians in the basin (but not at the federal level) use the full range of methods to gain an electorate, revealing a more disputed democracy. These methods are undoubtedly varied in the state of Jalisco with personal contacts, manipulation of ecologists and agricultural associations, appeal to the president authority, bill for law modification or, when that is appropriate, law enforcement, without taking into account the manipulation of public opinion, not by aggressive adds as by diverting attention from the main concern. Finally, politicians are able to divert the law by allocating insufficient resources to administration (in particular the water agency which is then unable to carry out any control of wells or of polluting discharge), including research institute becoming dependent on backers and unable to explore other assumptions which one saw that they can become time bombs.

The third conclusion is that many current practices are related to political transitions that began in the 1990s. These transitions are embodied between the announced end of the populist system of redistribution which engaged reciprocities on all levels and disappointed expectative for more accountability and modernity among people. Indeed, the current weakness of political alliances prevents from renewing the social bond, partly broken, between elites and population. State disengagement and decentralization resulting from the same trend reinforce the vacuum that the newly empowered states try to fill. Institutions insufficiently opened to citizen become arenas where old solidarity and new initiatives interfere with legitimacy-seeking agents.

Water management in Mexico was largely modernized, but stubbles on difficulties aggravated by social participation manipulated by established groups. On a side, this institutional crisis does not go in the direction of a better effectiveness, except maybe electoral one in the short run. Conflicts on water multiply without hope of solution. The basin council and the lake are in the limelight while states strive to hide local conflicts, such as a violent demonstration by farmers against police force when the town of León started to pump overdraft ground water. Conversely, optimism comes back when we note that some institutional vacuum is being filled with many local initiatives independent of the existing structures, trade unions or lobbies. Politicians already tried to instrumentalize some of them. Must one hope that the number of initiatives is such as they will not be able to use all of them?

If politicians have an obvious responsibility in these plays and backfires, are they guilty? They are themselves actors of an organization and standards which generalize the masterwork of Crozier. Is it necessary to await a crisis and a new constitution? Or is it necessary to multiply alliances and negotiations so, at least, to depoliticize water? We arrive at the limits of the methodology used in this paper because so many factors intervene while neither history, nor comparison is able to distinguish the prime mover. Modeling or theory could perhaps do it, but that exceeds the objective assigned to this paper.

References

Aboites, Luis. 1998. El agua de la nación. Una historia política de México (1888-1946). Mexico City: CIESAS.

Ai Camp, Roderic. 2000. La política en México. El declive del autoritarismo. México, Siglo XXI.

CNA, 1993. Plan maestro de la cuenca Lerma-Chapala: Documento de referencia. Mexico City, Mexico: CNA.

CNA/MW, 1999. Proyecto lineamientos estratégicos para el desarrollo hidráulico de la región Lerma-Santiago-Pacifico: Diagnostico regional. Guadalajara, Mexico: CNA and Montgomery Watson.

Cornelius, Wayne, Ann Craig and Jonathan Fox. 1994. Transforming State-Society Relations in Mexico: The National Solidarity Strategy. San Diego: Center for US-Mexico Studies, University of California.

Ghiotti S., 2004, «Les Territoires de l'eau et la décentralisation. La gouvernance de bassin versant ou les limites d'une évidence.» Journée d'études Les territoires de l'eau. Université d'Artois. http://www.revue-ddt.org/colloque.htm

Greenberg, Martin H. 1970. Bureaucracy and Development: A Mexican Case Study. Lexington, Massachusetts: Heath Lexington Books.

Grindle, Merilee S. 1977. Bureaucrats, Politicians, and Peasants in Mexico. A Case Study in Public Policy. Berkeley and Los Angeles: University of California Press.

López R. Eduardo, Boris Marañon, Eric Mollard, Daniel Murillo L., Roberto Romero P., Denise Soares, Sergio Vargas V., Philippus Wester, Under press, Le gouvernement de l'eau au Mexique : légitimité perdue et régulation en transition. Territoires en mutation

Meyer, Lorenzo, y Héctor Aguilar Camín. 1993. In the shadow of the Mexican revolution. Contemporary history 1910-1989. Austin, University of Texas.

Mollard E., Paula Silva, Sergio Vargas, Flip Wester, 2003, Mexico: a governability of water in transition. Social and technical dynamic and elements of scenarios in the Lerma Chapala basin. IWMI, First Meeting of Comprehensive Assesment program, Columbo.

Mollard E., Paula Silva, Sergio Vargas, Flip Wester, 2003, Pump Till You Drop: Institutional Responses To Groundwater Depletion In The Lerma-Chapala Basin, Mexico. IWMI, First Meeting of Comprehensive Assesment Program, Columbo.

Mollard E., Sergio Vargas Velázquez, 2003, Démarrer une négociation au Mexique. Jeux d'acteurs et rôle du négociateur dans un espace peu régulé. Coll. Intern. NEGOCIA – PARIS : 11 et 12 décembre

Mollard. E, Sergio Vargas Velázquez, 2002, "¡Que se seque el pinche lago!" Las asociaciones de usuarios de riego ante los retos ambientales (México). Alasru

Mollard. E, Sergio Vargas Velázquez, 2002, Actores, iniciativas y conflictos en situación de transición política e institucional. Un primer acercamiento a la cuenca Lerma-Chapala. 2do Encuentro Chapala

Mollard. E, Sergio Vargas Velázquez, 2003, La politización regional del agua en la Cuenca Lerma Chapala. Elementos de diagnóstico e impacto de las modificaciones de la ley de 2003. Reunión AMER, Morelia

Olvera, Alberto J. 2003. "Las tendencias generales de desarrollo de la sociedad civil en México", en Sociedad Civil, esfera pública y democratización en América Latina: México. Alberto J. Olvera (coordinador). México, FCE.

PRI. 1988. Los Retos de la Modernización. Agua y Desarrollo. Mexico City: PRI.

Romero Pérez R., E. Mollard, 2003, Conflictos Sociales Por El Acceso Al Agua En El Distrito De Riego 087, "Rosario-Mezquite". Coloquio ANEIH, Zacatecas.

Romero Pérez R., Eric Mollard, 2003, Las sociedades de responsabilidad limitada. ¿Un espacio de representación de interés agroempresarial? Coloquio ANEIH, Zacatecas.

Rousseau, Isabelle. 2001. México: ¿una revolución silenciosa? Elites gubernamentales y proyecto de modernización. (1970-1995), México, El Colegio de México.

Stanford, Lois. 1993. "The "organization" of Mexican agriculture: conflicts and compromises". Pp. 188-201 In: Latin American Research Review.

Wester, P., Melville, R. & Ramos-Osorio, S. (2001). Institutional arrangements for water management in the Lerma-Chapala Basin. In A. M. Hansen and M. van Affreden (Eds.), The Lerma-Chapala Watershed: Evaluation and management (pp. 343-369). New York: Kluwer Academic / Plenum Publisher

An Assessment of Strategic Issues in the Policy Field Relating to Water Resource Management in Southern Africa

By
Anthony Turton, Gibb-SERA Chair[1] in IWRM, University of Pretoria and CSIR-Environmentek, aturton@csir.co.za
And
Peter Ashton, Principal Scientist[2], CSIR-Environmentek, pashton@csir.co.za

---

Introduction

The growing literature on water and politics, or what is increasingly being called hydropolitics, is generating a range of new ideas, concepts and management approaches. Yet the literature is also skewed in favour of water and conflict (Turton, 2002a:13). Whilst this has resulted in a reasonably deep knowledge of this aspect of water resource management, our attention has been diverted away from some of the real political issues associated with water in areas where conflict is not endemic. These include, but are not limited to, our understanding of power structures and coalitions for example, particularly when it comes to understanding these in a more profound manner like analysing how they develop, how they change, and how they impact on decision-making at various levels in society. Two levels are particularly important in the context of Integrated Water Resource Management (IWRM) - the national and sub-national scale of management on the one hand versus the international or supra-national level of scale on the other. This paucity of knowledge impacts in turn on the depth of our understanding of the dynamics of water resource management institutions. This paper seeks to present some work that is being done in this regard from a region that has water-scarcity limitations to its future economic growth and development potential. While it is widely accepted that the first region in the world to have reached this constraint is the Middle East and North Africa (MENA) (Allan, 2000:9), it is becoming increasingly apparent that the Southern African region is likely to become the second. This has given rise to deep introspection in the Southern African Development Community (SADC) region because every effort is being made to become reflexive and to generate a management approach that is proactive in nature. This paper will focus on the emergence of a new set of concepts that explain power structures and coalitions as they pertain to the management of international rivers in the SADC region. It will then distil out some strategic issues that arise from this set of concepts in order to make a range of recommendations for consideration by the World Water Council.

The Southern African Hydropolitical Complex as a Concept

A security complex is a set of units (usually states), whose major processes of securitization, desecuritization, or both, are so interlinked that their most important security problems cannot reasonably be analyzed or resolved separately (Buzan *et al.,* 1998:201; Buzan & Wæver, forthcoming). In this regard, securitization is constituted by the inter-subjective establishment of an existential threat within any sector (military, political, economic, societal and environmental) with a saliency sufficient to have substantial political effects (Buzan *et al.,*

---

[1] The Gibb-SERA Chair is fully sponsored by Arcus-Gibb (Pty) Ltd., as part of their ongoing commitment to capacity building in the water sector. Located at the CSIR, the Chair also works into the University of Pretoria in support of the post-graduate program in water resource management, the African Water Issues Research Unit (AWIRU) and the Universities Partnership for Transboundary Waters (UPTW). Anthony Turton is a founding member of the UPTW.

[2] Peter Ashton is a water resource and water quality specialist in the CSIR's Division of Water, Environment and Forestry Technology, and is also a founding member of the UPTW.

1998:25); whereas desecuritization refers to the shifting of specific, strategically important issues out of the emergency mode and into the formal bargaining processes of the political sphere (Buzan *et al.,* 1998:4). Security complexes thus emphasize the interdependence of both rivalry and shared interests (Buzan, 1991:190), or stated differently, reflect the shifting patterns of amity and enmity over time (Buzan, 1991:198). Security complexes are analytical[3] entities consisting of units displaying distinct patterns of both amity and enmity, characterized by predominantly inward looking national security relationships, surrounded by a zone of relative indifference.

Buzan (1991:194 & 210) has noted the existence of a regional Security Complex in Southern Africa comprising eleven of the twelve mainland SADC states of the Republic of South Africa, Namibia, Botswana, Zimbabwe, Zambia, Lesotho, Swaziland, Mozambique, Angola, Malawi and Tanzania. Given the fact that national security is a relational issue, usually mitigated by geographic proximity, the role of international river basins as an element of a regional security complex becomes an interesting, and as yet, largely unexplored analytical variable. In the case of contemporary SADC for example, there are no less than 16 rivers that cross the political borders of two or more states in the region. As such sovereign control over these rivers is shared when seen from the perspective of any given basin that is being managed as a hydrological entity. These international river basins are presented in Table 1.

Table 1. International River Basins found in the SADC Region.

River Basin	**Riparian States**
Buzi	Mozambique, Zimbabwe.
Cunene	Angola, Namibia
Cuvelai	Angola, Namibia
Incomati	Mozambique, South Africa, Swaziland
Limpopo	Botswana, Mozambique, South Africa, Zimbabwe
Maputo	Mozambique, South Africa, Swaziland
Nata	Botswana, Zimbabwe (a component of the Makgadikgadi System)
Nile	Burundi, Democratic Republic of Congo (formerly Zaire), Egypt, Eritrea, Ethiopia, Kenya, Rwanda, Sudan, Tanzania, Uganda
Okavango	Angola, Botswana, Namibia
Orange	Botswana, Lesotho, Namibia, South Africa
Pungué	Mozambique, Zimbabwe
Rovuma	Malawi, Mozambique, Tanzania
Save	Mozambique, Zimbabwe
Umbeluzi	Mozambique, Swaziland
Zaire (Congo)	Angola, Burundi, Cameroon, Central African Republic, Congo, Democratic Republic of Congo (formerly Zaire), Rwanda, Tanzania, Zambia
Zambezi	Angola, Botswana, Malawi, Mozambique, Namibia, Tanzania, Zambia, Zimbabwe

Threats to economic security can be seen as a national security issue, because relative economic growth is a major determinant of the power of states within a given system (Buzan, 1991:242). This is particularly pertinent to international river basins that are reaching the point of closure. In this regard, a closed river basin is one with no utilizable outflow of water (Seckler, 1996). A river basin is said to be facing closure when most of the readily available water has been allocated to some productive activity and there is little water left for allocation

[3] It is important to note that this is not an actor defined condition but rather an analyst defined condition. It is known for example that some actors prefer not to define themselves in this way for reasons of strategic negotiation positions being developed. Being a non-actor defined condition assists the analyst by developing an understanding of the clustering of issues, the dynamics of coalition formation and the generation of a likely future trajectory. This is in keeping with the methodology as developed by Buzan *et al* (1998:14).

(Svendsen *et al.,* 2001:184). When this condition is reached, competition for water becomes high, with a resultant increase in conflict potential. This can become an issue of high politics when this water scarcity results in a limitation of the economic growth potential of the state, or stated more accurately, when perceptions that this is possible take root in the ranks of the political elites of a given riparian state. Under such conditions perceptions become reality because they inform the decision-making process (Turton, 2003c:90).

Seen in this light, international river basins form an important element of the Southern African Regional Security Complex - a fact that seems to have gone largely unnoticed by scholars - leaving a significant gap in the International Relations literature of the region. Given that this is largely about the dynamics of power structures and coalitions, this is of major significance to the World Water Council.

A Hydropolitical Security Complex as a Concept

Using the Security Complex Theory articulated by Buzan (1991) and Buzan *et al* (1998), Schulz (1995) has developed the concept of a Hydropolitical Security Complex in the context of the Tigris and Euphrates River Basins. Schultz (1995:97) defines a Hydropolitical Security Complex as "including those states that are geographically part 'owners' and technically 'users' of the [shared] rivers and further, as a consequence, consider the rivers as a major national security issue. In this way Turkey, Syria and Iraq compose a security complex or, rather, form *the Euphrates and Tigris hydropolitical security complex*" (emphasis in original text).

Emerging from this analysis, Schulz isolated what he calls horizontal and vertical relations within the Euphrates and Tigris Hydropolitical Security Complex, and between that complex and other complexes. Vertical linkages include relationships with higher structural levels, such as superpower rivalry, whereas horizontal linkages relate to the same structural levels between complexes, such as the Palestinian-Israeli linkage (Schulz, 1995:97).

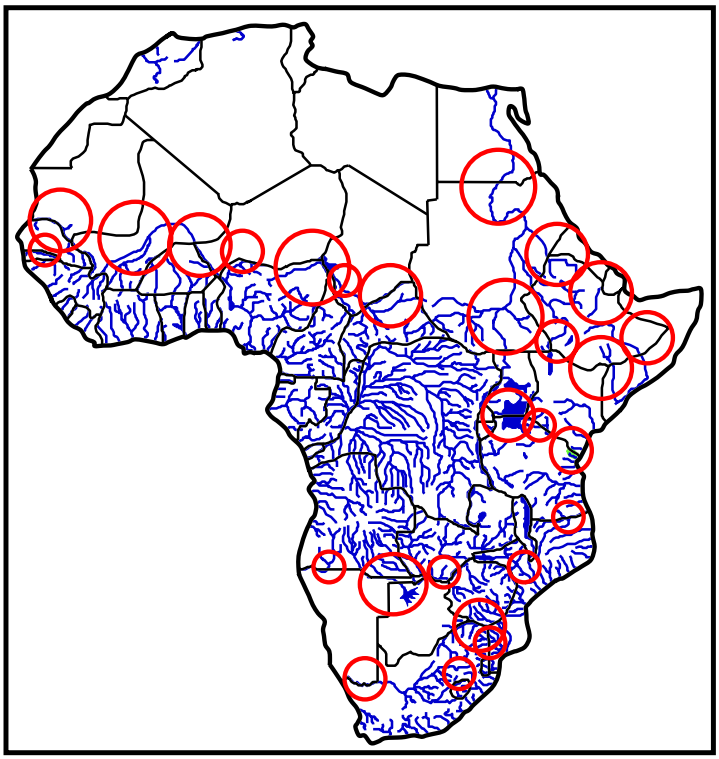
The significance of Schulz' work is that it indicates what can happen in the field of hydropolitics if water resource management becomes linked to national security concerns, or other issues of a high politics nature. This has happened in many parts of the Middle East North Africa (MENA) region, where economically damaging water deficits first arose (Allan, 2000:37). One of the indicators of the securitization of water resource management is the classification of hydrological data as secret, and its consequent removal from the public domain, as has occurred in the MENA region (see Lesch, 1992:148; Warner, 1996). It is therefore instructive to understand the dynamics of this process, and in particular, ways of avoiding the securitization of water resource management. In support of this, it is interesting to note that Allan (2000:245) has found the concept of Security Complexes to be a useful way of describing the hydropolitical dynamics of the MENA region.

The Southern African Hydropolitical Complex

Using the work of Buzan (1991; 1994), Buzan *et al.,* (1998), Buzan & Wæver (forthcoming) and Schulz (1995), Turton has been developing a model that factors in the hydropolitical dimension of international relations within the SADC region (Turton, 2001; 2003a; 2003b; 2003c; 2003d; 2003e). The rationale for this model is based on the fact that a large number of international rivers (refer to Table 1) establish a permanent linkage between different states within the Southern African Security Complex as originally defined by Buzan (1991:210).

The importance of water to any given national economy is self-evident. No state has ever grown economically without developing its national water resources. It can be said that the reliable availability of water is a fundamental determinant of the economic growth potential of

the state. This makes reliable access to sustainable water supply a strategic issue, particularly for developing countries that are situated in arid and semi-arid regions of the world. The full significance of water in the context of Southern Africa is illustrated by the fact that the first protocol that was signed within the SADC region was the Protocol on Shared Watercourse Systems (Ramoeli, 2002:105). Heyns (2002:158) notes that one of the major development challenges in the near future within the context of SADC will be the implementation of large, regional water transfer schemes in order to meet the economic limitations imposed by endemic water scarcity.



Map 1. The distribution of perennial rivers in Africa (Redrawn from Ashton, 2002). The circles indicate areas of existing disputes that have water as an element and also coincide with the transition from perennial to ephemeral river systems (Ashton, 2002; Turton *et al.,* 2003:10).

The SADC region is characterized by significant differences in the distribution of water resources, with large areas of land receiving less than 500 mm of precipitation per annum. In fact, around 60% of the total mean annual runoff (MAR) of South Africa arises from 20% of the land surface area. Coupled with this is an extremely high evaporative demand, which means in effect that what water does fall as rain, is almost immediately lost to evaporation. In South Africa for example, the annual average rainfall is 487 mm, with one of the lowest conversions of rainfall to runoff in the world. In fact, the total average runoff (that portion of rainfall that is not lost to evaporation and which eventually finds its way into rivers) is only some 10% of total annual rainfall (Rabie & Day, 1992:647). Of the resultant runoff that becomes streamflow, a mere 60% (Rabie & Day, 1992:647) to 62% (O'Keefe *et al.,* 1992:278) can be economically exploited, because of the extreme variability of these rainfall events. This natural climatic variability has acted as a stimulus for the construction of dams in attempts to retain as much streamflow as possible. Significantly, the World Commission on Dams report listing the top ten countries by virtue of the number of dams constructed for particular purposes (irrigation, water supply, flood control and hydropower) contains both South Africa and Zimbabwe (WCD, 2000:373). In fact South Africa and Zimbabwe have between them 752 large dams while the SADC region's other nine mainland countries have

only 55 among them. The SADC region's wetter countries (Angola, Malawi, Mozambique, Tanzania and Zambia) have amongst the lowest density of dams in the world for non-karstic regions with annual precipitation in the range of 600-2000 millimetres (Turton, 2003d:76).

The erratic nature of streamflow, particularly in Namibia, Botswana, Zimbabwe and South Africa, has also resulted in a number of ephemeral rivers in the region. A distinguishing feature of the SADC region is that Botswana and Namibia have no permanent rivers flowing on their sovereign soil, other than a short reach of the Okavango, which is difficult to exploit for a variety of reasons. This series of facts is generally left unexplored in the International Relations literature of the region, so the political implications of this are largely unknown at present. This has prompted the authors to develop a series of research projects in Southern Africa, in an effort to determine the role of international river basins as potential drivers of political dynamics within SADC in future, particularly in light of the unpredictability of global climate change as an interceding variable. This has led to the development of a typology of riparian states and international river basins, which appears at first glance to be useful.

As noted earlier, a distinguishing feature of the SADC region is the large number of international river basins. The relevance of this becomes clearer when one realizes that four of the economically most developed states in the region - South Africa, Botswana, Namibia and Zimbabwe - are all water scarce. In fact these four states are approaching the limits of their readily available water resources and water scarcity poses limitations to economic growth potential in the near future. Significantly, these four states are also linked by virtue of their co-riparian status with each other, in the Orange and Limpopo River Basins.

The emerging typology is based on a distinction between two distinct types of riparian state (pivotal state and impacted state), and two distinct types of international river basin (pivotal basin and impacted basin). In this regard, the following definitions have been developed (Turton, 2003d):

- Pivotal States are those riparian states with a high level of economic development that also have a high reliance on shared river basins for strategic sources of water supply. In the context of Southern Africa, there are four states in this category - the Republic of South Africa, Botswana, Namibia and Zimbabwe.

- Impacted States are those riparian states that have a critical need for access to water from international river basins that are shared with a Pivotal State for their own economic and social development, but by virtue of the unequal power relations within the basin concerned, are unable to negotiate what they consider to be an equitable allocation of water. In the context of Southern Africa, there are seven states in this category - Angola, Mozambique, Swaziland, Lesotho, Zambia, Malawi and Tanzania.

- Pivotal Basins are those international river basins facing closure that are also strategically important to any one (or all) of the Pivotal States by virtue of the range and magnitude of economic activity that they support. In the context of Southern Africa, there are two basins in this category - Orange and Limpopo.

- Impacted Basins are those international river basins that have at least one (or more) of the Pivotal States as co-riparians, which in turn reduces the freedom of choice for the Impacted States to develop their water resources in a manner that they deem to be fair and equitable. In the context of Southern Africa, there are seven basins in the category - Zambezi, Cunene, Okavango, Incomati, Maputo, Pungué and Save.

Using these key concepts, the authors have developed a model that attempts to show the impact of inherent patterns of amity and enmity within international river basins as a critical component of the Southern African Security Complex as defined by Buzan (1991:194).

Figure 1 shows the authors' rendition of what is visualized as being the structure of the Southern African Hydropolitical Complex.

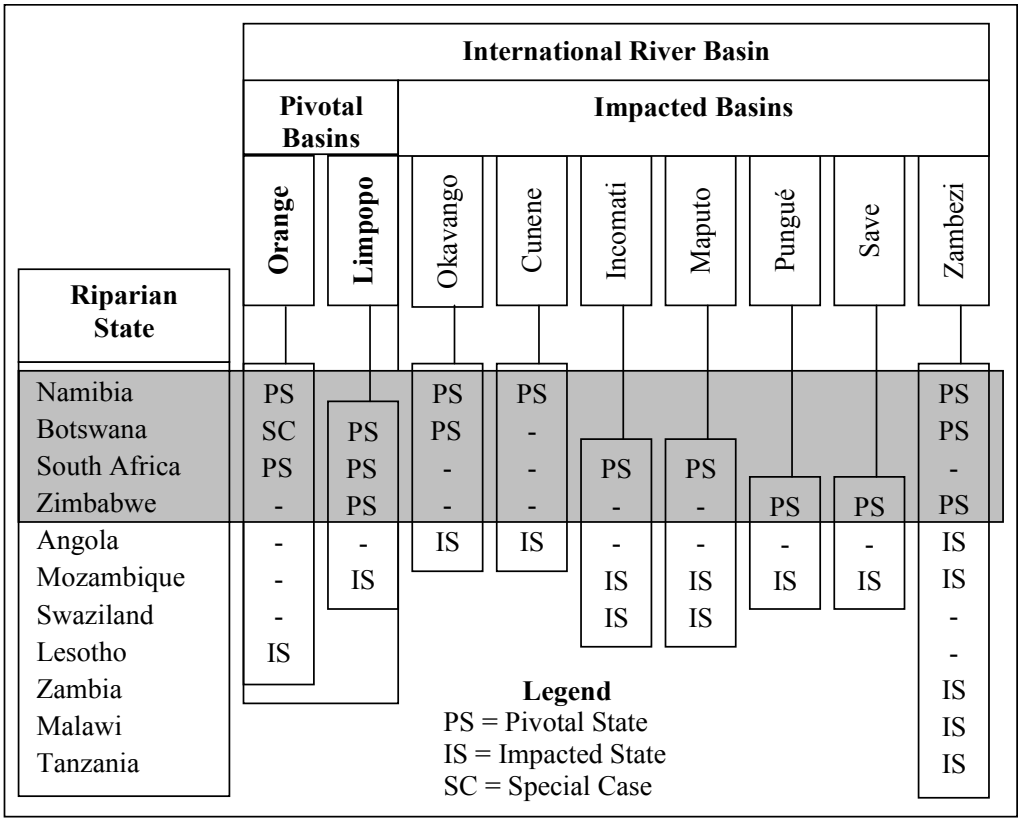


Figure 1. The Southern African Hydropolitical Complex (Turton et al, 2003:13).

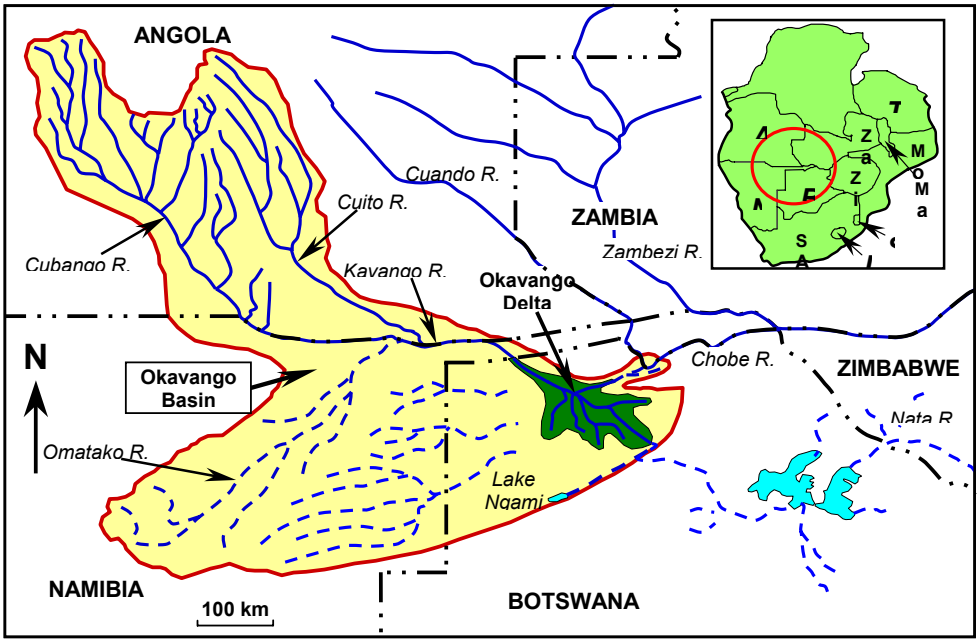
In this regard it must be noted that earlier work used the terminology "Southern African Hydropolitical Security Complex" (Turton, 2001), in keeping with the work by Schulz (1995). Subsequent research has shown that the degree of securitization within the water sector is far less in Southern Africa than is the case in the Euphrates and Tigris Hydropolitical Security Complex, prompting a revaluation of the concepts being used, and removal of the word "security" from the chosen name of the concept. Within the SADC region however, water has a long history of politicization, having played a prominent but subtle role during the conflict years of Superpower overlay and Apartheid's struggle for regional hegemony (Turton, 2003a). In the post-Apartheid era, the overt nature of water politics has changed somewhat in the region, but the underlying drivers remain largely unchanged. The four economically most developed states in the region are the most water scarce, they all share international river basins with other states, and they all face significant limitations to their future economic growth prospects as a result.

By using these conceptual nuances, the facts presented in Table 1 start to take on a new meaning. Clearly all international river basins are not equal in strategic importance or in terms of their inherent conflict potential. The two Pivotal Basins in the SADC region are the Orange and Limpopo, by virtue of three critical criteria: significant portions of the basin fall within Pivotal States; those Pivotal States have a high reliance on the water from those basins; and the basin itself is approaching the point of closure. A deeper analysis of the two Pivotal Basins raises a number of subtle but important facts that are not visible when one uses the Regional Security Complex approach on its own. For example, the larger of the two Pivotal Basins in terms of volume is the Orange River (11,200 Mm^3 per annum, compared

with 5,750 Mm^3 per annum for the Limpopo) (Basson, 1999). The Orange River is extremely important for South Africa, arguably being the strategically most important river it has unfettered access to. Botswana is listed in Table 1 as being a co-riparian, yet the portion of the basin that lies within the geographic area of that country is located within the Kalahari Desert. As such the watercourses within the Orange basin that lie in Botswana are ephemeral in nature, contributing no streamflow to the main stem of the river. Botswana is therefore listed as being a Special Case, because it occupies its position as co-riparian in all deliberations over the Orange River, but it makes no use of the water and it contributes no streamflow.

This prompts one to ask why this should be the case? The answer is revealed when one examines Botswana's potential strategic interests in greater detail. Botswana is a rapidly growing economy and is critically water scarce. The main economic growth hub is located around Gaborone, which is supplied with water via the North-South Carrier, deriving its source of supply from the Limpopo Basin. This supply is supplemented by a small transfer from South Africa via the Molatedi Dam (Conley, 1995:13). Gaborone could be supplied in future from Lesotho, giving it a strategic interest in the Orange River Basin. In addition to this however, Botswana could use its presence in all international negotiations on the Orange River Basin, to leverage advantage for itself in other more strategically important basins such as the Limpopo and Okavango. This could be achieved by offering to support certain parties such as South Africa in return for diplomatic favours in other deliberations on the Limpopo or Okavango River Basin. Conversely, pressure can be placed on South Africa by siding with Namibia when future deliberations about Phase 2 of the Lesotho Highlands Water Project (LWWP) occur. Seen in this light, Botswana is certainly not as powerless as it first seems on the strength of hydrological data alone, and can be seen as the balancer of hydropolitical power in both the Orange and Limpopo River Basins. The significance of this only becomes apparent when one understands the historic relevance of past South African planning to gain access to the waters of the Zambezi River, via either Botswana or Zimbabwe (Blanchon, 2001:123; Borchert & Kemp, 1985; Borchert, 1987; James, 1980; Midgley, 1987:15; Scudder *et al.,* 1993:263 & 268; Turton, 2003a; Williams, 1986). These plans now seem to have been placed on the backburner in the immediate post-Apartheid era, but could conceivably be resurrected in the future as water scarcity becomes more acute in the Pivotal States.

Referring now to the concepts of an Impacted Basin and an Impacted State, again a more nuanced understanding of the international relations of the SADC region can be developed. Figure 1 indicates the existence of no less than seven Impacted Basins and seven Impacted States. What is the significance of this in terms of the international relations of the region? Two clear examples can be used to illustrate this point.



Map 2. The Okavango River Basin as an example of an Impacted Basin in the Southern African Hydropolitical Complex. Inset shows the location of the Okavango River Basin in Southern Africa (Redrawn from Ashton & Neal, 2003).

The first example is found in the Okavango River Basin, which is strategically important for the two Pivotal States (Namibia and Botswana) that lie downstream (refer to Map 2). The Okavango is somewhat of a unique river basin. It is endorheic in nature, meaning that it does not flow into the sea. The water that arises from the relatively water-abundant Angolan highlands, flows into the Kalahari Depression in Botswana and simply disappears, lost largely through evapotranspiration in the Delta (Scudder *et al.,* 1993:290; Turton, 1999). In this case, the two downstream riparians are Pivotal States with a high resource need, but they are held captive in a sense because the upstream riparian (Angola) appears to be reluctant to agree to anything that will ultimately limit its own future economic development potential, which is likely to become more important as post-war reconstruction commences. Therefore, when seen strictly in terms of the Okavango River Basin, both Namibia and Botswana can be considered as being rivals with different development agendas and resource needs. Namibia and Botswana are not entirely equal in terms of hydropolitical power in this basin, however. Namibia is highly dependent on water from the Cunene River Basin, which it shares with Angola. As such, there is a long history of water-sharing and cooperation between Namibia and Angola, whilst Namibia and Botswana have cooperated on joint technical exercises (Ashton & Neal, 2003; Turton, 2003a). Namibia and Botswana are also co-riparians on the Zambezi, but they both share portions of the basin that are unfavourable for the development of the resource. This forces them into a cooperative mode. As such, Namibia and Botswana could be induced to cooperate with Angola in order to develop the water resources of the Zambezi in future, which can also impact on their negotiations regarding the Okavango. Similarly, South Africa could consequently gain future access to Zambezi River water if it is channelled via Botswana, which could be used to the advantage of the latter, illustrating the complexities of future strategic hydropolitical options in greater detail.

The second example relates to the Impacted State of Mozambique, which shares a number of international river basins and on paper ought to be relatively water abundant. The truth is somewhat less optimistic, however. In all six cases presented in Figure 1, Mozambique is a downstream riparian and therefore in a traditionally weak position. In the case of the Limpopo as a Pivotal Basin, Mozambique is downstream of three of the four regional Pivotal States

and negligible volumes of water are left after the strategic needs of those states have been taken care of. Furthermore, any attempts by Mozambique to develop dams on the Limpopo will be opposed by the upstream riparians because this will mean that each will have to relinquish a degree of control over water that they already monopolize. On the other five Impacted Basins, Mozambique is downstream of South Africa (as an historically hegemonic Pivotal State) in two cases (Incomati and Maputo), and downstream of Zimbabwe (as a Pivotal State with a known aggressive posture) in two cases (Pungué and Save), and downstream of seven riparians (three of them being Pivotal States) in the case of the Zambezi. This means that in the overall context of the hydropolitics of Southern Africa, Mozambique always occupies a weaker position than its co-negotiating partners. This is manifest in the relative absence of working agreements involving Mozambique, and which accounts for the extremely cautious approach that Mozambican officials have always adopted when negotiating the SADC Protocol on Shared Watercourse Systems and the various Zambezi River agreements that have been attempted in the past.

Seen in this light, the hydropolitical dimension of the international relations of Southern Africa can be viewed as being a key component of the Regional Security Complex, acting as an interceding variable on occasion. This is shown schematically in Figure 2. Nowhere in contemporary Southern Africa is there hard evidence of the emergence of a Hydropolitical Security Complex along the lines of that found in the Euphrates and Tigris River Basin, and possibly the Nile and Jordan River systems. This has resulted in a revision of the original concepts (Turton, 2001) to those presented subsequently (Turton, 2003a; 2003d; 2003e).

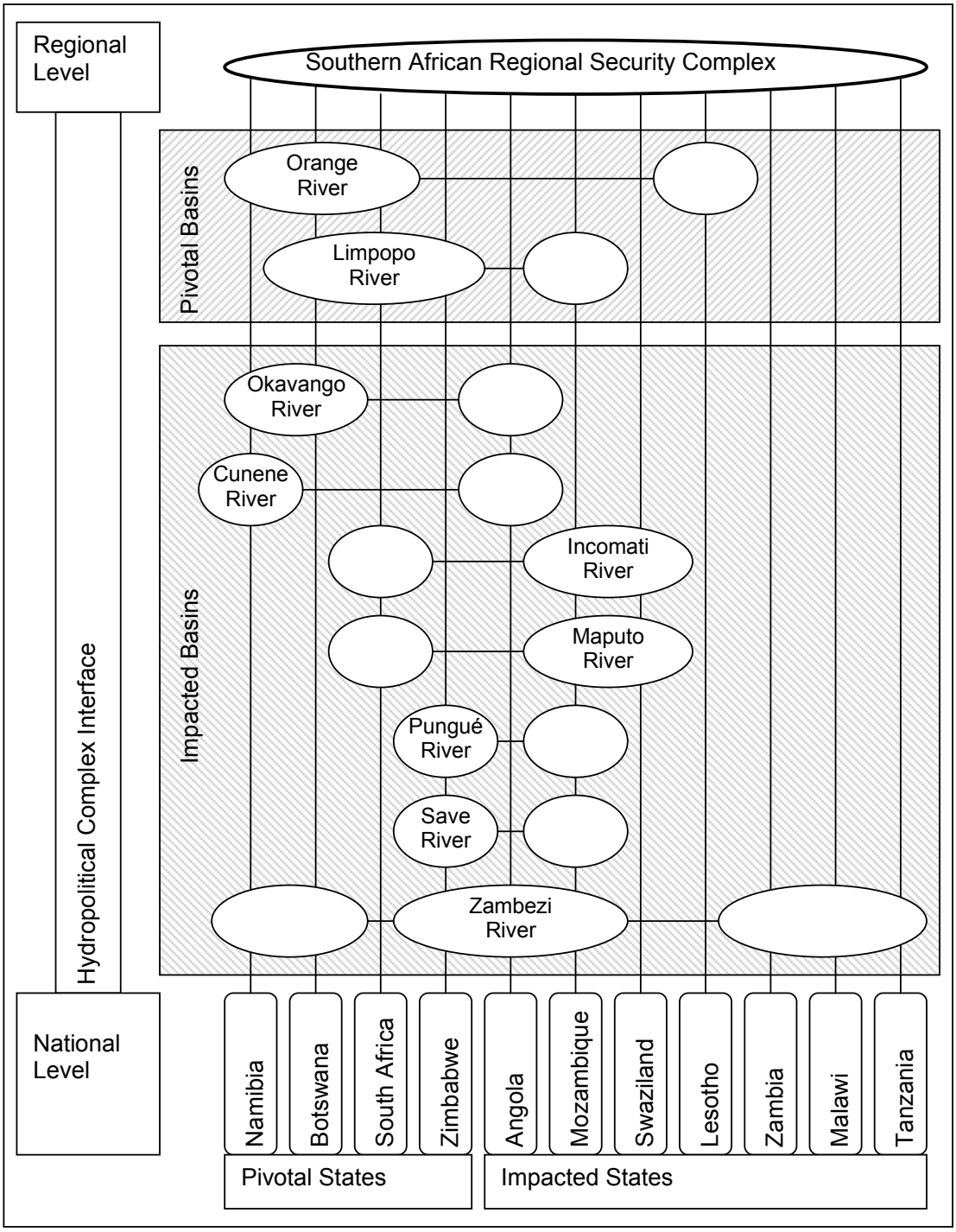


Figure 2. The Southern African Regional Security Complex showing the relationship of the Hydropolitical Complex as an interceding variable (Turton, 2003e:267).

A Hydropolitical Complex as an Element of the Southern African Regional Security Complex

So what are the implications of the development of these theoretical elements?

Firstly, by using these new concepts, a more nuanced understanding can be developed of the international relations dynamics of the Southern African region. This is particularly relevant in the post-Cold War and post-Apartheid era, where the dynamics of regionalism seem to be more strongly manifest than before. Central to the process of regionalization is the formation of coalitions and the transformation of past power structures and relationships into new ones. This means that the political processes of the past are unlikely to resemble the political processes of the future, particularly as the need to secure access to strategic supplies of water at a high assurance of supply level become a necessary pre-condition for future sustained economic growth for the Pivotal States on the one hand, and the SADC region on the other.

Secondly, the current drought and looming famine can be analyzed in a more nuanced context than before. The role of water as an independent variable in the overall political dynamics of the SADC region can now be assessed in greater detail. The implications of this for early-warning capabilities are self-evident. For example, while environmental factors have long been considered by some as being a driver of migration and conflict (Homer-Dixon, 1991; 1994a, b; 1996; 1999), few predictive models have been developed.

If there is any validity to the assertion that a Hydropolitical Complex exists in Southern Africa, and acts as an important interceding variable in the context of the Regional Security Complex that Buzan has identified, then it becomes potentially fruitful to dwell for a few moments on five strategic issues that arise.

The first strategic issue that needs to be unravelled further is the implication of water as a limiting factor to the long-term economic growth potential of the four Pivotal States in particular, along with the implications of this for the seven Impacted States in general. In this regard is has been suggested by Turton & Warner (2002:67) that the determining variable is the relative availability of so-called Second-Order Resources. This has been defined by Ohlsson (1999:161) as the ability of societies, administrative organizations and managers responsible for dealing with natural resource scarcities, to find the appropriate tools for dealing with the consequences of those natural resource scarcities. This is similar to the logic used by Homer-Dixon (1994c; 1995; 1996; 2000) and Barbier & Homer-Dixon (1996) in developing the case for ingenuity as a resource with which to develop economies. If this is true, then the Pivotal States will need to mobilize significant quantities of what Ohlsson calls “second-order resources”, and what Homer-Dixon calls “ingenuity”, if they are to avoid the consequences of water scarcity as a limiting factor to their future economic growth potential. In other words, if a Hydropolitical Security Complex along the same lines as that found in the Euphrates and Tigris River Basins is to be avoided in Southern Africa, special emphasis will have to be placed on the mobilization of so-called “second-order resources” by the relevant Pivotal States. What are the necessary conditions for this to occur in a sustainable manner? The answer to this is as yet unknown.

The second strategic issue relates to what can be considered to be the great unknown of our modern times - the political impact of global climate change in the developing world. In all likelihood, climate change will create more variability in what is already a highly variable and unpredictable precipitation pattern. This is likely to result in more extreme events such as floods, droughts and famines, with a series of secondary effects that are not yet fully understood. From an early warning perspective, this has major ramifications for the SADC region and its international trading partners.

The third strategic issue relates to the conflict potential of water scarcity. This is not well understood at present, despite the work that has already been done by Homer-Dixon (1991; 1994a, b, c; 1996; 1999) and others (Molvaer, 1989; Porter, 1998; Turton, 2003d; Warner, 2000; Westing, 1991). A significant component of this issue-area relates to the impact of famine and drought as manifest in the SADC region. To what extent can this food security issue have a politically destabilizing effect? How will this impact on the economic growth potential of both Pivotal and Impacted States in the SADC region? The answers to these questions are as yet largely unknown.

This leads directly into the fourth strategic issue, which relates to the trade of virtual water as a mitigator of the conflict potential inherent in water scarcity. Virtual water is the volume of water used to produce a commodity such as wheat, which has been identified as one of the fundamental reasons why war over water has not erupted in the water scarce economies of the MENA region (Allan, 1997; 1998a, b; 1999; 2000; 2002). Basically, it is easier to meet national water deficits via the importation of water-rich cereals, but this raises a series of downstream political issues that are not yet fully understood. For example, what level of economic activity is needed in a given Pivotal State before it can rely on the importation of virtual water as a strategic solution to the problem of endemic water scarcity? What new dependencies arise from this situation, particularly in terms of a global economy that is characterized by a playing field that is skewed in favour of the industrial nations of the world? How can this trade in virtual water be used to balance out the skewed intra-regional trade patterns within SADC, with scarce foreign exchange being directed to water-rich but economically weak economies such as Zambia, Angola, Mozambique and the Democratic Republic of Congo, rather than being sent to the already rich United States of America, Canada and the European Union? The definitive answers to these vexing questions are as yet largely unknown.

The fifth strategic issue is a crosscutting one and is based on the need to achieve a degree of regional developmental equity within the SADC family of member states. At present development is highly skewed in the region, mostly concentrated in the hands of the Republic of South Africa, but also generally concentrated in the four[1] Pivotal States. The water resource component of this becomes evident when one views the distribution of large dams and related hydraulic infrastructure, most of which is in South Africa, but a large portion of it is under the direct control of the Pivotal States[2]. The linkage between dams and development is thus acute in the SADC region and if any viable regional development plans are ever formulated they will have to take this inequity into consideration. One important component of the spatial maldistribution of development in the region that is likely to become increasingly visible is the link between areas of high HIV/AIDS prevalence, poor water and sanitation infrastructure and underdevelopment. The strategic significance of poor water and sanitation infrastructure in a region where a substantial portion of the population has a compromised immune system has yet to be unravelled, although initial attempts are being made (see Ashton & Ramasar, 2002). At the strategic level of water resource management in the SADC region, the concept of virtual water as a tool to stimulate intra-regional trade between water-rich but economically underdeveloped states and water-scarce but industrialized states can become a driver of regional integration. However, this will place a

1 As always, Zimbabwe is a special case. Zimbabwe is a regional economic power but this advantage has been systematically lost under the demagogic leadership of President Robert Mugabe. It is anticipated that his fall from power is imminent, driven by rampant hyper-inflation, the technical insolvency of a number of the banks in the country, the critical shortage of foreign exchange and the famine that is growing in response to the loss of production caused by illegal land redistribution and a regional drought. In the post-Mugabe era Zimbabwe is likely to regain its position of regional economic importance once again.

2 South Africa and Zimbabwe have between them 752 large dams while the SADC region's other nine countries have only 55 among them. The SADC region's wetter countries (Angola, Malawi, Mozambique, Tanzania and Zambia) have amongst the lowest density of dams in the world for non-karstic regions with annual precipitation in the range of 600-2000 millimetres (Turton, 2003d:76).

high level of demand on institutional and policy development at the supra-national level if it is to succeed.

The Reform of Water Institutions in the SADC Region

Effective institutions are an important factor that mitigates conflict potential (Turton, 2003e). This is particularly important in the context of Pivotal States as the condition of basin closure is being approached. Basin closure can result in a heightened probability of conflict potential, but this is linked to cases where institutional development is stunted or inadequate. Stated differently, basin closure places an increased demand on institutional development, which if managed effectively, can mitigate the conflict potential by reducing the range of uncertainty left open to other riparian states (Turton, 2003c). In short, institutions build trust, but they also enable a strategically-important aspect of river basin management under conditions of closure to be executed – the shift in paradigm away from water sharing to benefit sharing instead - which simply increases the range of potential solutions to a given problem that is sourced from outside the stressed river basin (Earle, 2003).

The SADC region has undergone a period of rapid institutional development in the water sector. Significantly, the four Pivotal States all have a high level of institutional development in their shared river basins, and all have embarked on ambitious legal and policy reforms. South Africa, as the regional power, has a basin-wide agreement in all of the four international river basins on its sovereign soil. Namibia has a basin-wide agreement[3] on four of the five international river basins it relies on (Orange, Okavango, Cuvelai and Cunene) and is working towards an agreement on the Zambezi. Botswana has a basin-wide agreement[4] on three of the five international river basins it relies on (Orange, Okavango and Limpopo) and is working towards an agreement on the Zambezi. Zimbabwe has a basin-wide agreement on the Limpopo River and is working towards a similar arrangement on the Zambezi. In the other four international river basins it shares with other riparian states there is no visible sign that a basin-wide agreement[5] is being explored.

Coalition Formation: The Parallel National Action Approach

The emergence of a Hydropolitical Complex in Southern Africa has started to impact on the international relations of the SADC region, with the formation of coalitions starting to become evident for the first time. One of the elements of this is the way that states engage one another in the field of water resource management. The most appropriate model to describe this process is what is known as Parallel National Action (PNA). Originally described by Nielsson (1990) as it applied to Scandinavia prior to the inclusion of the respective Nordic countries into the EU, PNA has been applied to an analysis of the Southern African water sector by Turton (2002b), to an analysis of the Okavango River Basin by Turton & Earle (2003), and to the environmental sector in Central Africa by Braid (2003). In essence PNA as an approach seeks to develop and apply policy that is appropriate and sustainable in a multi-

---

[3] The Cuvelai River is shared between Namibia and Angola but it is an ephemeral endoreic system that has limited capacity for the development of dams. This means that it is not a major river in terms of international cooperation. The Cuvelai River system is extremely important for the rural community in Northern Namibia however (Marsh & Seeley, 1992). See Jacobsen *et al* (1995) for more information about ephemeral rivers in general.

[4] The Nata River is an ephemeral or episodic river that flows from Zimbabwe to Botswana. Some authors (incorrectly) name this is part of the Okavango River Basin. The Nata River is too episodic to be dammed to any great extent although it is used in rural Botswana as an important water source for communities in the Kalahari area.

[5] The Nata River shared with Botswana is too small and episodic to be commercially exploited to any large extent. The Buzi, Pungué and Save are all shared with Mozambique and there is a considerable history of tension between these two states over the management of these rivers. Zimbabwe has shown no real interest in negotiating a bilateral agreement with Mozambique despite the loyal political support of the latter during the period of protracted Cold War-related localized conflicts (see Turton, 2003a).

country setting. As such it is a way that states can structure the anarchy in which they find themselves when it comes to dealing with neighbouring (co-riparian) states.

In essence PNA strives to achieve four core objectives (Turton, 2004):

- Institutional strengthening is achieved through the commitment to understanding policy-making processes in order that support can be given by developing appropriate institutional arrangements. In many developing countries such as those found in Southern Africa, institutions are weak with this aspect becoming a major stumbling block to the development of coherent and viable policy.

- Encouragement of communication both vertically and horizontally within institutions. Vertical communication refers to the way that policy is developed within the national borders of the sovereign state concerned. As such it seeks to harmonize local grass-roots structures with provincial and national-level structures in an attempt to improve the coherence of the policy by marrying the bottom-up needs with what are often top-down technocratic solutions. Horizontal communication has two distinct sub-components to it. At the national and sub-national level horizontal communication focuses on establishing linkages with other government departments, special interest groups and governance structures as appropriate to the integrated management of a fugitive resource like water. This seeks to link for example the Department of Agriculture to the Departments of the Environment, Water, Industry and Tourism in a way that makes the management of water more streamlined and effective. At the international level horizontal communication focuses on establishing linkages with similar government departments in neighbouring co-riparian states.

- Harmonization of policy is the stated objective of these initiatives. The word harmonization is very important in this regard because it recognizes that each state has the right to make policy and legislation in response to the specific mandate given by the electorate within that country. Harmonization therefore seeks to make the policy as compatible as possible without making it totally seamless or homogenous. This allows for differences where appropriate while striving to reduce those differences as much as possible. PNA therefore tries to establish the lowest common denominator first and then roll this out progressively over time by increasing the area of overlap and by reducing the area of incompatibility.

- State sovereignty is recognized at all times and is never challenged. This is a core principle of the PNA approach so there is never any stated attempt to fuse together national departments or to promote regional integration to the point of merging two (or more) countries into one new sovereign entity. This is an important aspect for the newly-independent states of Southern Africa, many of which have paid for that independence with a high blood price and all of which jealously guard their newfound sovereignty (see Turton, 2002b; Turton & Earle, 2003).

So much for theory; how is this achieved in practice, and more importantly, how does this approach impact on our understanding of coalition formation? There are a number of interesting examples from the Southern African Hydropolitical Complex that suggest a PNA approach is potentially applicable to policy-making.

- The Permanent Okavango River Basin Water Commission (OKACOM) is currently being presented with the possibility of using a PNA approach (Turton & Earle, 2003) in light of the joint management imperatives arising from the United Nations Convention on Biological Diversity (UNCBD), the Ramsar Convention on Wetlands of International Importance (Ramsar), the United Nations Convention to Combat Desertification (UNCCD), the United Nations Framework Convention on Climate

Change (UNFCCC) and the United Nations Convention on the Non-navigational Uses of International Watercourses (see Ashton & Neal, 2003).

- During the negotiations that led to the revival of the Limpopo Basin Permanent Technical Committee (LBPTC) and its recent upgrade to a Commission, contact was made between the various government departments involved in the process at levels lower than the Minister at a time when talks were bogged down. This sustained communications horizontally across international borders, which in turn facilitated the vertical communication within each government department, to the extent that negotiations could resume once the specific issues had been resolved internally. This contact was mostly informal and served to gain consensus around contentious issues while keeping alive the desire to seek cooperative solutions to seemingly intractable problems.

- The SADC Secretariat has recently completed a major regional water policy review. This involved a number of consultants and donor agencies that combined forces to produce the first draft of a regional water policy that will be presented to the Heads of State later in 2004 for their debate, acceptance and hopeful signature. This will foster communication and debate over specific issues, which in turn will probably mean that policy harmonization will take place at a regional level to the benefit of all SADC member states. The Pivotal States have a specific interest in this regard because it develops a normative framework that in turn reduces uncertainty and fosters a cooperative approach to problem-solving.

Actions to be considered by the World Water Council

An assessment of the above enables the authors to distil out a number of actions that can be considered by the World Water Council. These are as follows:

- A research agenda should be drawn up that serves to focus the combined attention of scientists, practitioners and water resource managers. This agenda should be linked with, and supported by, appropriate financial instruments that aim to further the research on the one hand, while fostering regional and international cooperation.
    - Increased emphasis should be placed on the role of water resource management in international river basins as a driver of regional integration and a catalyst of cooperation.
    - The role of the Water Cooperation Facility, consisting of the World Water Council, UNESCO, the International Court of Arbitration and the Universities Partnership for Transboundary Waters needs to be strengthened.

- Particular attention needs to be paid to unravelling the complexity surrounding the linkage between national and international levels of scale.
    - The role of PNA in this regard needs to be given greater prominence in an attempt to determine its usefulness and applicability to the developing parts of the world.
    - The way in which the existing obligations that arise from multilateral agreements to which states are signatories, should be linked to IWRM principles and used to strengthen the efforts already being made to implement policy and institutional reform.
    - The relationship between these processes and existing regional integration efforts that are underway in SADC needs to be made more explicit.

- The concept of a Hydropolitical Complex needs to be assessed independently in order to determine its value as an analytical tool to understand the dynamics of coalition formation, power structures and negotiations over shared water resources.

- Particular attention needs to be given to an exploration of the vertical and horizontal linkages that can inform the negotiating positions of respective co-riparian states in the context of international river basins.
- Attention needs to be given to an understanding of the dynamics of institutional development, particularly as it pertains to the fostering of trust between riparian states, the development of institutional learning and the capacity of the negotiating parties to develop new paradigms in which water management problems can be re-formulated.
- A deeper understanding is needed of the role and function of second-order resources in the process of institutional development and coalition formation, in order that it may be fostered by honest brokers and third parties such as donor agencies, the Water Cooperation Facility and the World Bank.

- The dams and development debate needs to be taken to a new level, beyond that achieved by the World Commission on Dams, in an attempt to understand the need for major water infrastructure projects on the one hand, while mainstreaming the normative elements of the WCD report as a benchmark for best practices.
    - The role of dams and inter-basin water transfers in the context of semi-arid and arid regions needs to be better understood.
    - The water/poverty nexus needs to be nested within this "dams and development" debate.
    - The implications of poor water supply and sanitation infrastructure in regions where a significant portion of the population have compromised immune systems needs to be better understood.
    - The importance and limitations to the utility of Inter-Basin Transfers of water, particularly in places like the Southern African Hydropolitical Complex, needs to be better understood in order to inform policy-making processes in areas where water scarcity is becoming a limiting factor to the economic growth potential of the state.
    - The role and function of virtual water trade, as one of the possible solutions should be better understood. This should specifically aim to mainstream virtual water as a viable policy option while assessing the opportunities that such a policy creates, without ignoring the vulnerabilities that inevitably arise from such a policy.

- The whole issue of global climate change needs to be better understood, particularly as it pertains to an increase in the vulnerability of states that are already facing water scarcity constraints to their future economic growth potential.
    - Specific emphasis needs to be placed on the role of institutional development and second-order resources in developing appropriate solutions through policy, coalition formation and cooperation.

Conclusion

Water scarcity is becoming a key driver of political dynamics in Southern Africa. More acutely felt by the most economically developed countries in the region - South Africa, Botswana, Namibia and Zimbabwe - water scarcity is increasingly becoming a limiting factor to the future economic growth potential of these states. Yet the SADC region as a whole is not water scarce. The spatial maldistribution of water resources, particularly those found in international river basins, is one of the most strategically significant challenges facing SADC as a regional structure that has been formed along the lines of the EU. Analysis has shown that a Hydropolitical Complex is emerging in Southern Africa, clustered around key international river basins and driven by differing interests in these river basins by the respective riparian states. The theoretical concept of a Hydropolitical Complex provides a simple and robust classification system that takes the differing strategic interests of the respective co-riparian

states into consideration. When viewed through the lens of this theoretical construct, explanation, analysis and possibly even prediction is possible, because it enables the analyst to tease out the processes and dynamics of power structures, coalitions and decision-making in a more nuanced fashion than before. Two levels of analysis are important - the sub-national and the international - both of which are captured in the concept of a Southern African Hydropolitical Complex. Superimposed on this is the potential value of the PNA model of inter-state engagement, which is highly appropriate to water resource management in international river basins, specifically in a region where newly-independent states jealously guard their sovereignty and view any attempt at an erosion of that sovereignty with a jaundiced eye. State sovereignty can become a stumbling block to regional cooperation, but by defining challenges to that sovereignty out of the overall hydropolitical equation by using a model similar to the PNA approach, this can, and already is, a significant feature in the process of coalition formation in Southern Africa. The World Water Council can play an important role in fostering a new understanding of the drivers of, and factors influencing, this process.

Acknowledgements

The authors wish to thank the World Water Council for their support in making this research available to a wider audience of scientists, practitioners and stakeholders. The opinions, views and conclusions contained in this paper are those of the authors and are not in any way linked with any of the sponsors.

References

Allan, J.A. 1997. '*Virtual water': A Long Term Solution for Water Short Middle Eastern Economies.* British Association Festival of Science. University of Leeds. 9 September 1997.

Allan, J.A. 1998(a). 'Virtual water': An Essential Element in Stabilizing the Political Economies of the Middle East. Yale University Forestry & Environmental Studies Bulletin, No. 103; 141-149.

Allan, J.A. 1998(b). Virtual Water: A Strategic Resource. Global Solutions to Regional Deficits. In *Ground Water*, Vol. 36, No. 4 ;545-546.

Allan, J.A. 1999. Avoiding War over Natural Resources. In Fleming, S. (Ed.*) War and Water.* Geneva: ICRC Publication Division

Allan, J.A. 2000. The Middle East Water Question: Hydropolitics and the Global Economy. London: IB Tauris.

Allan, J.A. 2002. Water Resources in Semi-Arid Regions: Real Deficits and Economically Invisible and Politically Silent Solutions, in Turton, A.R. & Henwood, R. (Eds.) *Hydropolitics in the Developing World: A Southern African Perspective*. Pp 23-36. Pretoria: African Water Issues Research Unit (AWIRU).

Ashton, P.J. 2002. Avoiding Conflicts over Africa's Water Resources. *Ambio*, Vol. 31. No. 3; 236-242.

Ashton, P. & Ramasar, V. 2002. Water and HIV/AIDS: Some Strategic Considerations in Southern Africa. In Turton, A.R. & Henwood, R. (Eds.) 2002. *Hydropolitics in the Developing World: A Southern African Perspective*. Pp 217-235. Pretoria: African Water Issues Research Unit (AWIRU).

Ashton, P. & Neal, M. 2003. An Overview of Key Strategic Issues in the Okavango Basin. In Turton, A.R., Ashton, P. & Cloete, T.E. (Eds.) *Transboundary Rivers, Sovereignty and Development: Hydropolitical Drivers in the Okavango River Basin.* Pp 31-63. Pretoria & Geneva: AWIRU & Green Cross International.

Barbier, E. & Homer-Dixon, T.F. 1996. Resource Scarcity, Institutional Adaptation, and Technical Innovation: Can Poor Countries Attain Endogenous Growth? Washington: American Association for the Advancement of Science.

Basson, M.S. 1999. *South Africa Country Paper on Shared Watercourse Systems.* Presented at the SADC Water Week Workshop that was held in Pretoria, South Africa.

Blanchon, D. 2001. Les nouveaux enjeux géopolitiques de l'eau en Afrique Australe, in *Hérodote Revue de Géographie et de Géopolitique*. Troiseme Trimestre. No. 102; 113-137.

Borchert, G. 1987. *Zambezi-Aqueduct.* Institute of Geography and Economic Geography, University of Hamburg, Hamburg.

Borchert, G. & Kemp, S. 1985. A Zambezi Aqueduct. *SCOPE/UNEP Sonderband Heft*. No. 58; 443-457.

Braid, S. 2003. Managing Lake Victoria's Water. Unpublished draft of a M.Sc. Dissertation, Department of Land and Water Resources Engineering. Kungl Tekniska Högskolan (KTH), Stockholm, Sweden.

Buzan, B. 1991. People, States and Fear. An Agenda for International Security Studies in the Post-Cold War Era. London: Harvester Wheatsheaf.

Buzan, B. 1994. *National Security in the Post Cold War Third World.* Paper presented at the Conference on National Security in Developing Countries, 26 January 1994, Institute for Strategic Studies, University of Pretoria, South Africa.

Buzan, B., Waever, O. & de Wilde, J. 1998. *Security: A New Framework for Analysis*. London: Lynne Rienner.

Buzan, B. & Wæver, O. (Forthcoming). Regions and Powers: The Structure of International Security. Draft copy dated June 2001. Forthcoming publication by Oxford University Press.

Conley, A.H. 1995. A Synoptic View of Water Resources in Southern Africa. Paper presented at the Conference of Southern Africa Foundation for Economic Research on Integrated Development of Regional Water Resources, Nyanga, Zimbabwe, November 1995.

Earle, A. 2003. Watersheds and Problemsheds: A Strategic Perspective on the Water/Food/Trade Nexus in Southern Africa. In Turton, A.R., Ashton, P. & Cloete, T.E. (Eds.) *Transboundary Rivers, Sovereignty and Development: Hydropolitical Drivers in the Okavango River Basin.* Pp 229-249. Pretoria & Geneva: AWIRU & Green Cross International.

Heyns, P. 2002. Interbasin Transfer of Water Between SADC Countries: A Development Challenge for the Future. In Turton, A.R. & Henwood, R. (Eds.) *Hydropolitics in the Developing World: A Southern African Perspective.* Pretoria: African Water Issues Research Unit (AWIRU).

Homer-Dixon, T.F. 1991. On the Threshold: Environmental Changes as Causes of Acute Conflict, in *International Security,* Vol. 16, No. 2, Fall; 76-116.

Homer-Dixon, T.F. 1994(a). Environmental Changes as Causes of Acute Conflict, in Betts, R.K. (Ed.) *Conflict after the Cold War: Arguments on causes of War and Peace.* New York: Macmillan.

Homer-Dixon, T.F. 1994(b). Environmental Scarcities and Violent Conflict: Evidence from Cases, in *International Security*, Vol. 19, No. 1; 5-40.

Homer-Dixon, T.F. 1994(c). The Ingenuity Gap: Can Developing Countries Adapt to Environmental Scarcity? In *Population and Development Review*. Vol. 21, No. 3; 587-612.

Homer-Dixon, T. 1995. The Ingenuity Gap: Can Poor Countries Adapt to Resource Scarcity? In *Population and Development*, Vol. 21, No. 3; 587-612.

Homer-Dixon, T.F. 1996. Environmental Scarcity, Mass Violence and the Limits to Ingenuity, in *Current History*. No. 95; 359-365.

Homer-Dixon, T.F. 1999. *Environment, Scarcity and Violence*. Princeton, NJ: Princeton University Press.

Homer-Dixon, T.F. 2000. *The Ingenuity Gap*. London: Jonathan Cape.

Jacobson, P.J., Jacobson, K.M. & Seeley, M.K. 1995. *Ephemeral Rivers and their catchments: Sustaining People and Development in Western Namibia*. Desert Research Foundation: Windhoek.

James, L.H. 1980. Total Water Strategy Needed for the Vaal Triangle: Meeting the Challenge of the Eighties. In *Construction in Southern Africa*, May, 1980; 103-111.

Lesch, A.M. 1992. *Transition to Palestinian Self-Government*. Report of a Study Group of the Middle East Programme Committee on International Security Studies, American Academy of Arts and Sciences, Cambridge, MA: Published in collaboration with Indiana University Press, Bloomington and Indianapolis.

Marsh, A. & Seeley, M. (Eds.) 1992. *Oshanas: Sustaining People, Environment and Development in Central Owambo, Namibia.* Windhoek: Desert Research Foundation of Namibia.

Midgley, D.C. 1987. *Inter-State Water Links for the Future.* The South African Academy of Science and Arts Symposium: Water for Survival. August.

Molvaer, R.K. 1989. Environmental Security in the Horn of Africa: An Annotated Bibliography. Nairobi: United Nations Environment Programme.

Nielsson, G. 1990. The Parallel National Action Process. In Groom, A.J.R. & Taylor, P. (Eds.) *Frameworks for International Cooperation*. London: Pinter Publishers.

Ohlsson, L. 1999. *Environment, Scarcity and Conflict: A Study of Malthusian Concerns*. Department of Peace and Development Research. University of Göteborg.

O'Keeffe, J., Uys, M. & Bruton, M.N. 1992. Freshwater Systems, in Fuggle, R.F. & Rabie, M.A. (Eds.) 1992. *Environmental Management in South Africa.* Johannesburg: Juta & Co.

Porter, G. 1998. Environmental Security as a National Security Issue, in Tuathail, G.O., Dalby, S. & Routledge, P. (Eds.) *The Geopolitics Reader*. London: Routledge.

Rabie, M.A. & Day, J.A. 1992. Rivers, in Fuggle, R.F. & Rabie, M.A. (Eds.) 1992. *Environmental Management in South Africa.* Johannesburg: Juta & Co.

Ramoeli, P. 2002. SADC Protocol on Shared Watercourses: Its History and Current Status, in Turton, A.R. & Henwood, R. (Eds.) 2002. *Hydropolitics in the Developing World: A Southern African Perspective.* Pretoria: African Water Issues Research Unit (AWIRU).

Schulz, M. 1995. Turkey, Syria and Iraq: A Hydropolitical Security Complex, in Ohlsson, L. (Ed.) *Hydropolitics: Conflicts over Water as a Development Constraint*. London: Zed Books.

Scudder, T., Manley, R.E., Coley, R.W., Davis, R.K., Green, J., Howard, G.W., Lawry, S.W., Martz, P.P., Rogers, P.P., Taylor, A.R.D., Turner, S.D., White, G.F. & Wright, E.P. 1993. *The IUCN Review of the Southern Okavango Integrated Water Development Project*. Gland: IUCN Communications Division.

Seckler, D. 1996. The New Era of Water Resources Management: From "Dry" to "Wet" Water Savings. *IIMI Research Report No. 1*. Colombo, Sri Lanka: International Irrigation Management Institute (IIMI).

Svendsen, M., Hammond Murray-Rust, D., Harmancioğlu, N. & Alpaslan, N. 2001. Governing Closing Basins: The Case of the Gediz River in Turkey. In Abernethy, C.L. (Ed.) 2001. *Intersectoral Management of River Basins*. Colombo: International Water Management Institute (IWMI).

Turton, A.R. 1999. *Sea of Sand, Land of Water: A Synopsis of some Strategic Developmental Issues confronting the Okavango Delta.* MEWREW Occasional Paper No. 6. Water Issues Study Group, School of Oriental and African Studies (SOAS), University of London,

http://www.soas.ac.uk/Geography/WaterIssues/OccasionalPapers/home.html Available from http://www.up.ac.za/academic/libarts/polsci/awiru

Turton, A.R. 2001. *Hydropolitics and Security Complex Theory: An African Perspective*. Paper presented at the 4th Pan-European International Relations Conference, University of Kent, Canterbury (UK). 8-10 September 2001.

Turton, A.R. 2002(a). Hydropolitics: The Concept and its Limitations. In Turton, A.R. & Henwood, R. (Eds.) *Hydropolitics in the Developing World: A Southern African Perspective.* Pretoria: African Water Issues Research Unit (AWIRU).

Turton, A.R. 2002(b). Water and State Sovereignty: The Hydropolitical Challenge for States in Arid Regions. In Wolf, A. (Ed.) *Conflict Prevention and Resolution in Water Systems.* Pp 516-533. Cheltenham: Edward Elgar.

Turton, A.R. 2003(a). The Evolution of Water Management Institutions in Selected Southern African International River Basins. In Tortajada, C., Unver, O. & Biswas, A.K. (Eds.) *Water and Regional Development*. London: Oxford University Press.

Turton, A.R. 2003(b). An Introduction to the Hydropolitical Dynamics of the Orange River Basin. In Nakayama, M. (Ed.) *International Waters in Southern Africa.* Tokyo: United Nations University Press.

Turton, A.R. 2003(c). The Hydropolitical Dynamics of Cooperation in Southern Africa: A Strategic Perspective on Institutional Development in International River Basins. In Turton, A.R., Ashton, P. & Cloete, T.E. (Eds.) *Transboundary Rivers, Sovereignty and Development: Hydropolitical Drivers in the Okavango River Basin.* Pp 83-103. Pretoria & Geneva: AWIRU & Green Cross International.

Turton, A.R. 2003(d). Environmental Security: A Southern African Perspective on Transboundary Water Resource Management. In *Environmental Change and Security Project Report*. The Woodrow Wilson Centre. Issue 9 (Summer 2003). Pp 75-87. Washington, DC: Woodrow Wilson International Center for Scholars.

Turton, A.R. 2003(e). The Political Aspects of Institutional Development in the Water Sector: South Africa and its International River Basins. Unpublished draft of a D.Phil. Thesis. Department of Political Science. Pretoria: University of Pretoria. Available from the Website http://www.up.ac.za/academic/libarts/polsci/awiru.

Turton, A.R. 2004. *The Challenges of Developing Policy in a Multi-Country Context.* Paper presented at the Seminar on Policy Development and Implementation in the Water Sector: Reflection and Learning, 10-12 February 2004 at the CSIR Conference Centre, Pretoria, South Africa.

Turton, A.R. & Warner, J. 2002. Exploring the Population / Water Resources Nexus in the Developing World. In Dabelko, G.D. (Ed.) *Finding the Source: The Linkage Between Population and Water.* Environmental Change and Security Project (ECSP). Woodrow Wilson Centre. Washington, DC. (Pages 52-81).

Turton, A.R. & Earle, A. 2003. Discussion Document on the Implications of International Treaties on the Development of a Management Regime for the Okavango River Basin. Deliverable D 6.2 of the Water Ecosystem Resources in Rural Development (WERRD) Project funded by the European Union. Pretoria: African Water Issues Research Unit. Available from the Website

http://www.up.ac.za/academic/libarts/polsci/awiru.

Turton, A.R., Ashton, P. & Cloete, T.E. 2003. An Introduction to the Hydropolitical Drivers of the Okavango River Basin, in Turton, A.R., Ashton, P. & Cloete, T.E. (Eds.) *Transboundary Rivers, Sovereignty and Development: Hydropolitical Drivers in the Okavango River Basin.* Pretoria & Geneva: AWIRU & Green Cross International.

Warner, J. 1996. De drooglegging van de Jordaanvallei, in *Transaktie*, Vol. 25, No. 3; 363-379.

Warner, J. 2000. Global Environmental Security: An Emerging Concept of Control. In Stott, P. & Sullivan, S. (Eds.) 2000. *Political Ecology: Science, Myth and Power*. London: Edward Arnold.

WCD, 2000. Dams and Development: A New Framework for Decision-Making. London: Earthscan.

Westing, A.H. 1991. Environmental Security and its Relation to Ethiopia and Sudan, in *Ambio*, Vol. 20; 168-171.

Williams, G.J. 1986. Zambezi Water for South Africa? In *Zambia Geographical Journal*. No.36; 57-60.

Contending Approaches to Water Disputes in Transboundary Rivers: What can International Relations Discipline Offer? [1]

Ayşegül Kibaroğlu, Assistant Professor, Department of International Relations, Middle East Technical University

Abstract

The vital role of water for human beings and development has received worldwide attention. Through the activities of intergovernmental and nongovernmental organisations since the beginning of the 1970s, much emphasis was placed on the global status of water, namely water scarcity in absolute terms, and a lack of access to clean water and sanitation. Later on, some specific regions of the world were identified as the scarcest regions with shared surface and groundwater resources between two or more countries, which received much more attention than other parts of the globe. Under such striking developments, water was picked up as a sensational issue by the popular press. And, scholarly interest joined them. Hence, there has arisen an ongoing debate among scholars on the issue of management and utilisation of water resources, as well as on the likelihood of a conflict that would be a result of the worsening situation of water supply and demand. In the debate one can delineate basically three groups of scholars and experts whose views can be associated with any of the three leading schools of thought in international relations theory: the realists, the political economists, and the institutionalists. The paper will discuss these contending approaches to water disputes in transboundary river basins with particular references to the international relations theory.

Global Water Predicament and Transboundary Water Resources Management

The Earth has 1,386,000,000 km^3 of water total, but only 2.5% of that is freshwater. Less than 1% of the world freshwater is usable in a renewable fashion. During the past century, the world population has tripled, and water use has increased seven folds. All water management is multi-objective. There are various conflicting interests embedded in water resources management. Hence, conflicts over water resources occur at multiple scales, from sets of individual irrigators, to urban versus rural uses, to nations that straddle international waterways. Transboundary water disputes occur whenever demand for water is shared by any sets of interests, be they political, economic, environmental, or legal. Thus, transboundary waters share certain characteristics that make their management especially complicated, most notable of which is that these basins require a more complete appreciation of the political, cultural, and social aspects of water (Wolf, 2002).

There are 263 watersheds that cross the political boundaries of two or more countries. The Cold War terminating in the 1990s marked a significant increase in the number of transboundary rivers. These international basins cover 45.3% of the land surface of the earth, contain about 40% of the world's population, and account for approximately 60% of global river flow. A total of 145 nations include territory within international basins (Wolf, 2002).

International Relations Theory: Contending Approaches to the Water Dispute in the Transboundary River Basins

Under such striking developments, water was picked up as a sensational issue by the popular press.[2] And, scholarly interest joined them. Hence, there has arisen an ongoing

[1] Some of the discussions in this article are drawn from A. Kibaroglu, *Building a Regime for the Waters of the Euphrates-Tigris River Basin,* Kluwer Law International, London, The Hague, New York, 2002.
[2] In the headlines of daily papers and in certain columns of some outstanding magazines and journals, there were

debate among scholars from various fields of science on the issue of management and utilisation of water resources, as well as on the likelihood of a conflict that would be a result of the worsening situation of water supply and demand of the water resources of the Middle East. In the debate one can delineate basically three groups of scholars and experts whose views can be associated with any of the three leading schools of thought in *International Relations Theory*: the realists, the political economists, and the institutionalists.

In the course of the twentieth century International Relations (IR) as a discipline has developed and refined perspectives for the investigation of political behaviour at the international level. IR emerged as a subject in its own right at the end of the First World War, when political thinkers questioned the nature of a system that had allowed such destruction to happen. They sought to create a better one framed in the values of liberal internationalism and buttressed by laws and institutions (Muir, 1997). Hence, IR is not only busy with what it occurs, but also what ought to take place in the international system.

Realism and Reflections on Water

As the prevalent school of thought in the IR theory, political realists argue that power and capabilities define relations in the international system.[3] The anarchic structure of the international system and the notion of unified and rational states as the principal actors within this anarchic environment constituted the major premises of classical realism. Hence, they argue that the political-structural condition of anarchy, and the absence of a common government in the international system have an impact on the (un)willingness of states to engage in cooperation. Given this condition, states are motivated by fear and distrust, and their principal concern is their security and survival. Since ensuring their security is their chief objective, states are preoccupied with their power and capabilities. Indeed, capabilities, in the form of economic, military, and political resources, are 'the ultimate basis for state security and independence in the self-help context of international anarchy'. In other words, according to realists, states have to rely on their own means, that they can generate, and the arrangements that they can make for themselves. Before all else, states must make provisions for their security in the power struggle among states. The preoccupation with autonomy, power and security predisposes states toward conflict and competition.

Likewise, during the 1980s and the early 1990s the spectre of armed conflict over water was argued as the logical outcome of the resource scarcity by realists inspired by dangerous persuasiveness of unquestioned environmental determinism. Accordingly, in regard to the water dispute in the Middle East, realists assert that as the water in the region is becoming a more and more scarce resource, it will become a major source of a conflict that might escalate to an armed struggle. This school of thought includes scholars from political science and history, as well as experts on the Middle Eastern geography, with their rather timely interest in the emerging situation in the region.[4] In advocating their standpoint, these analysts

---

many references to water as a potential source of conflict with special references to the situation in the Middle East. See for example, G. Moffet III, 'By the Year 2000 Water, not Oil, will be the Dominant Resource Issue' *Christian Science Monitor,* 8 March 1990, p. 10; A. Alexander, 'Ever-Deepening Water Crisis could Fuel Conflicts in the Middle East' *Atlanta Journal & Constitution*, 19 March 1989, p. 1A; A. Gowers, 'Water War in the Middle East' *Financial Times*, May 1989, p. 57; C. A. Robbins, 'Bridge Over Troubled Waters' *U.S. News & World Report*, 27 Aug. - 3 Sept. 1990, p. 26; C. Murphy, 'Middle East Faces Major Water Woes' The *Washington Post*, 10 March 1990, p. A20; A. Cowell, 'Now a Little Steam Later may be a Water War' *The New York Times*, 7 February 1990, p. A21; - 'More Precious Than Oil, and may be as Volatile' *The New York Times*, 17 March 1991.

[3] For a comprehensive discussion about realism see H. Morgenthau, *Politics Among Nations* (4th edn, Knopf, New York, 1966); K. Waltz, *Man, the State and War* (Columbia University Press, New York, 1959); R. Gilpin, *War and Change in World Politics* (Cambridge University Press, Cambridge, 1981); J. M. Grieco, *Cooperation Among Nations: Europe, America and Non-Tariff Barriers to Trade* (Cornell University Press, Ithaca, 1990).

[4] See, for instance, T. Naff and R. Matson, *Water in the Middle East: Conflict or Cooperation* (Westview Press, Boulder, 1985); J. Starr and D. Stoll, *US Foreign Policy on Water Resources in the Middle East* (CSIS, Washington, D.C., 1987); J. Starr and D. Stoll (eds), *The Politics of Scarcity* (Westview Press, Boulder, 1988); J. Bulloch and A. Darwish, *Water Wars: Coming Conflicts in the Middle East* (Victor Gollancz, London, 1993); M.

basically use the statements that are made by political leaders of the concerned countries for internal political reasons, which in fact appear to contradict their actual policies of adjustment. In their writings, the water issue has been elevated from low politics to high politics. These studies are rather descriptive and they embody political slogans like 'water wars'.

This literature describes water both as an historic and a future cause of interstate warfare. A. T. Wolf categorises these studies as 'water wars' literature and asserts that the main problem with these theories is a complete lack of evidence (Wolf, 2000). The examples most widely cited by this literature are wars between Israel and its neighbours.[5] They described water as a causal factor in both the 1967 War and the 1982 Israeli invasion of Lebanon. Conversely, through his empirical work A. T. Wolf concludes that water was neither a cause nor a goal of any Arab–Israeli warfare (Wolf, 1999). Thus, A. T. Wolf charges that much of the writing on water wars is anecdotal. With an aim to base research on firm empirical ground, he and his team investigated those cases of international conflict in which armed exchange was threatened or took place over water resources *per se*. They used the most systematically collected information available on international conflict -the International Crisis Behavior data set, collected by J. Wilkenfeld and M. Brecher.[6] Their systematic work demonstrated that the historic reality has been quite different from what the water wars literature would have one believe. In modern history, only seven minor skirmishes have occurred over international waters -invariably, other interrelated issues also factor in (Wolf, 1999).

Realists also share the view that 'when a riparian dispute in an arid region unfolds within the context of a more comprehensive political conflict, the former can neither be effectively isolated from the latter, nor be resolved as such'. To illustrate, M. Lowi focused on the dispute over the waters of the Jordan river basin, namely a dispute that co-exists with a larger political conflict among the states in question. Thus, she claimed that the riparian dispute in a protracted conflict setting is not simply about water, but that it takes on many of the attributes of inter-state conflict (Lowi, 1993). Others also emphasised that water conflicts develop between countries which have already had prolonged conflicts that have severely strained mutual relations, and many of which are yet to be resolved (Kolars & Bakour, 1999). In the same manner that realists adopt in examining the behaviour of states, this latter group of scholars largely limits their analysis to power and interest orientations of the riparians. In other words, they primarily focus on the water as a scarce and essential resource and more importantly support their ideas with deeper analysis on power relations and structures of the riparians of a particular river basin.

Realists stress certain conditions for cooperation, such as the presence and acceptance of a dominant power (a riparian acting as a hegemon) in taking the lead to reach a basin-wide cooperation. That is to say, cooperation is likely only when the dominant power in the basin is induced to cooperate for one reason or another. By drawing sharp distinctions among the endowments of the riparians in political, military, economic and geographic terms, upstream riparians are thought to be in the most advantageous position. Hence, realists see almost no possibility for a negotiated order, and argue that if negotiations could be initiated, the mid-stream and downstream riparians would sit at the bargaining table with an unfavourable position. They do not see any prospects for any fruitful outcome through a negotiation process either, largely because the least needy and/or most powerful riparian will derive little benefit from cooperating and relinquishing its most favourable position. However, realists equally argue that certain states which could act as a hegemon, relying on their military and economic power, might neither be sufficiently powerful to take on the role of a hegemon, nor would have any incentive to do so (Waterbury, 1999). Such an outcome would certainly

---

Lowi, *Water and Power* (OUP, Oxford, 1993).

[5] See A. H. Westing (ed.), *Global Resources and International Conflict: Environmental Factors in Strategic Policy and Action* (OUP, New York, 1986) and N. Myers, *Ultimate Security: The Environmental Basis of Political Stability* (Norton, New York, 1993).

[6] M. Brecher and J. Wilkenfeld, *A Study of Crisis* (University of Michigan Press, Ann Arbor, 1997).

complicate the situation even further in river basins and would impair the likelihood of cooperation. Nonetheless, realists admit that the benefits of cooperation are numerous: for instance through cooperation it would be possible to recognise the rights of each riparian that would in turn enhance predictability in use; similarly, an infrastructural integration could be built which would rule out the option of resorting to force among the riparians over water or any other issue.

Studying the likelihood of cooperation solely within the theoretical limits of political realism impedes researchers in proceeding further with producing more cooperative frameworks, which could avoid the emergence of water conflicts, that they often claim to be very likely to take place in the major river basins of the Middle East. The major drawback of the realist approach is that, it is short of proposing substantial cooperative solutions though they truly admit that water scarcity could lead to further tensions in this volatile region of the world. Hence, realists identify potential trouble areas related to the water issue, but do little good in the name of providing tools for mitigating the problem. Their theoretical discussion stays at a rather abstract level and in isolation from the real-world practices of the riparians of the major catchments in the Middle East.

Moreover, these analysts continue disregarding the recent shifts in the 1990s in the stance of each riparian within the framework of Middle East Peace Talks. For instance, J. A. Allan gives the example of two very important shifts in the approach to the allocation and management of water in Israel: first a remarkable amount of water that was previously allocated for agricultural practices is diverted to industrial and domestic uses, and secondly demand management principles are adopted, recommended for the region (Allan, 1996). J. A. Allan adds that realists did not devote any section to these striking developments in the region in their well-informed studies. He, therefore, argues that the international relations setting, which this community of scholars addresses, has been subject to very dynamic changes in international politics over the last few years in the Jordan Basin in particular, and in the Middle East region and the global system in general.

Realist arguments proved to be less insightful for the other two major river systems, namely the Nile and the Euphrates-Tigris as well. That is, even the most 'powerful' riparians in these two river systems, Egypt and Turkey, respectively, did not engage in any kind of coercive practices to date. Quite to the contrary, they tend to ameliorate their cooperative postures, which are in accordance with the rising necessity for efficient, and equitable allocation and management practices in the water sector both at national and basin-wide levels. Water wars literature is proved to be short-sighted in its analysis pertaining to the sustained cooperation in the Nile basin. The on-going success story of cooperation in the Nile basin, namely the Nile Basin Initiative, which has become a formal cooperation process grew out of six years of intense technical and scientific cooperation, and has been supported by high-level political commitment. The realists disregard this process.

International Political Economy and Reflections on Water

In international relations literature, international political economy is defined as an integrated field that encompasses a number of specialised disciplines such as political science, economics and international relations. Liberal theory ultimately rests upon the belief that economic specialisation produces gains in productive efficiency and national income. Liberal theory also posits that trade enlarges consumption possibilities, thus international trade has beneficial effects on both the demand and supply sides of the economy. The liberal theory maintains that a nation's comparative advantage is determined by the relative abundance and most profitable combination of its several factors of production such as capital, labour, resources, management, and technology. More specifically, a country will export (import) those commodities, which are intensive in the use of its abundant (scarce) factor (Gilpin,

1987). With these in mind, one group of scholars adopts a political economist approach while dealing with the water-related tensions.

Political economists who are involved in the water issue presuppose that agriculture is the major consumer of water resources in economies even in circumstances in which the water-scarce countries do not have comparative advantage in growing agricultural products. International trade in food staples between the water-scarce countries and the countries having a comparative advantage in food, is seen by the political economists as the primary remedy to ease the tension over water resources. Prominent members of this school of thought assert that almost all countries in arid or semi-arid regions, particularly for those where water scarcity is a genuine concern, should reallocate their water resources by shifting the major emphasis from irrigation to domestic and industrial uses. They argue that, to compensate the overall deficiencies in agricultural production, such states could import foodstuffs as 'virtual water'.

Water has been and will be a potential source of tension in the Middle East. However, there is an increasingly persuasive group of political economists who argue that the past 25 years of the hydropolitical history of the Middle East in particular has been remarkable for the absence of overt, hot conflict over water. They also point to the remarkable degree of economic adjustment to the tensions deriving from the mismatch of current water demand and supply.[7] Thus, the priority assigned to the water issue has not led to greater conflict so far. Rather, it has tended to focus attention on the need to adjust. Political economists argue that realists would mislead those wanting to understand the current water management options and provide no signposts at all for those wishing to predict future opportunities. They emphasise that those analysing the water problems of the region should tighten up their economic analysis so that they can track the political economy of water effectively and thereby understand apparently contradictory public and private statements and decisions.

The most important way the region has been able to meet its increasing water needs since the 1970s is with 'virtual water', a term adopted by J. A. Allan of School of Oriental and African Studies (SOAS).[8] According to J. A. Allan, virtual water is the water imported to the Middle East in terms of products, especially wheat, that have been produced with water in farming sectors in the United States and Europe. He comments that the international trading system has enabled the economies of the region to escape being trapped in the closed hydrological systems to which they have access. Hence, despite the dramatically worsening regional water balance there have not been any incidents of hot conflict over water, and that has prevented all but the most obsessive sensation mongers to recognise that the governments in the region have been very effectively solving their water problems.[9] Accordingly, J. A. Allan describes the economies of the major Middle Eastern countries as open political economies whose governments have been quite successful in avoiding conflicts over water through international trade. To recall, the realists built their conflict-prone disposition on the assumption that each riparian performs in the geopolitical limitations of closed hydrological systems, which impose them to act solely by power and interest calculations.

---

[7] Prof. J. A. Allan is a leading figure in this school of thought. He published extensively on regional water issues and is the founder of the Water Issues Group at the School of Oriental and African Studies (SOAS) in London. The Water Issues Group focuses on freshwater as a key global renewable natural resource; their attention was first devoted to the Middle East as the region, which has experienced the world's most serious, and accelerating water deficits since the early 1970s. Through their analysis they concluded that the region's governments had been able to achieve remarkable economic adjustments to the apparently conflict-loaded water challenge in the region, and the emphasis has shifted to viewing the problem globally.

[8] The Water Issues Group at SOAS has contributed to facilitating this concept, namely 'virtual water' which is a term already used in the literature and the media; it featured in an internet conference on water scarcity and river basin management convened by FAO (Interview with J. A. Allan, October 1996).

[9] J. A. Allan, 'Escaping Water Constraints in the Middle East: Water, "Virtual Water", Some Promising Initiatives and the Peace Process' (1995) 4 *Middle East and African Water Review (MEWREW)* 1.

In fact, realists did not give any weight to the interdisciplinary nature of water, which may enable the researcher to be acquainted with the various constructive and cooperative proposals of social sciences as in political economy. Political economists evidently give significant place to the works of those scholars and scientists, which make an overall assessment of the water disputes of the Middle East region in a comprehensive manner and produce a number of propositions for cooperative outcomes. They argue that this body of work is quite useful in providing a better analysis of the numerous sources of the realists who have suggested that resource deficits will lead to hot conflict. Indeed, the arguments presented in those studies are cautious and generally utilise the tools of political analysis in an attempt to analyse the place of water in the international politics of the region.

However, political economists claim that almost all of these studies ignore crucial concepts deployed by the political economy approach. In their reasoning, without such perspectives the past forty years of water management in the region cannot be explained since the solution to water shortages was linked more to the capacity of the region's economies to import 'virtual water' than to agreements for sharing inadequate indigenous resources. Political economists assert that there are indeed incontestable signs of the reassessment of regional governments in the allocation of water resources among the competing sectors.

Political economists emphasise the need for urgent reconsiderations of water allocation and management practices primarily at the national level and subsequently at the basin-wide level. In their reasoning, local water remains to be an important element in national economies but it is of less and less significance as governments solve their water problems in international markets. Accordingly, this group of scientists, especially within the framework of the Water Issues Group at SOAS, have scrutinised the recent trends in world food markets by placing special emphasis on the need to determine the capacity of the global systems to enable the development and use of freshwater. Thus, between 1970 and 1995, regional hydropolitics were stabilised by the availability of unlimited subsidised quantities of food staples except with regard to Iraq. However, with the emergence of the World Trade Organisation (WTO) in spring 1995, there has been a rapid increase in grain prices. With these developments, the Middle East started to face new circumstances in the political economy of global trade in food, and local governments would soon have to take these changes into account in their regional and international relations. These analysts proposed that increased trade within the region could be one of the principal means of tackling the wider problem of higher world food prices and tighter world supplies.

In the political economist perspective, major problems with successful development of water resources lie in the refinement of economic analysis (Rogers, 1992). In their opinion, to fully appreciate water policy options and how they are evaluated, it is necessary to understand how economics is used and misused in the water area. Political economists acknowledge that politics ultimately control water resource planning, however, the ability to understand and manipulate the economic analysis may significantly improve the final outcome. Meanwhile, they state that the major attention paid to economics in their studies should not be taken to mean that the institutional and technological dimensions are unimportant, but rather the pay-offs from improving the economic dimensions are currently larger than those from other areas of concern.

In sum, political economists view water as part of the complex national and international political economies of the Middle East, and draw an optimistic picture of the region by utilising the powerful explanatory economic models, namely the advantages of international trade. They also support their arguments with the view that water entering the region through trade in food staples is a major reason for the past absence of conflict. Accordingly, they suggest that this will ensure the future absence of conflict, at least in the short and medium terms.

Institutionalists and Reflections on Water

Neoliberal institutionalism has emerged as a prominent field of study in international relations over the last couple of decades. Proponents of this school of thought attempt to make a synthesis of the realist and liberal approaches to international relations.[10] Therefore, neoliberal institutionalism is characterised by an approval and adoption of the key realist assumptions such as the anarchic nature of the international system, states being the principal actors in world politics, and the importance of self-interest and relative capabilities. Nevertheless, neoliberal institutionalists maintain that although realists are correct in so far as the condition of anarchy impedes cooperation, in their view, states in non-zero-sum situations can cooperate with the assistance of institutions. International institutions are considered by neoliberal institutionalists as organisational bodies that regularise and facilitate interaction between states and improve the proliferation of cooperative processes. By means of international institutions, actors sharing common interests within the system can be motivated toward collaboration since the existence of such institutions increases the rate and scope of information exchange, and they serve as promoters of compatible state interests by coordinating negotiations. Institutions decrease uncertainty and reduce costs while enhancing cooperative elements such as predictability, harmony and convergence of interests, stability and transparency in the realm of international politics.

Neoliberal institutionalism, as an intellectual construction, takes the regulating functions of international institutions within this anarchic system as the basis of its interpretation while attempting to explain the interactions of the world system. If these institutions are established appropriately, according to institutionalists, they can generate policy coordination among states and open the way to advanced institutional arrangements for water resources management and allocation. Yet, neoliberal institutionalists do not assume that international institutions are easy to build up or to maintain. However, like functionalists, they are more optimistic about the potential for cooperation in economic and welfare matters than in military and security affairs. Institutionalists involved in the water issue argue that realists focus much on the role of water in international relations giving water a degree of strategic prominence, which it does not necessitate. Thus, in the institutionalist viewpoint, water is regarded rather as a part of economic welfare matters.

Institutionalists assume that water-related disputes are more likely to lead to political confrontations and negotiations short of violent conflict. In their reasoning, water wars are highly unlikely in the region, while there are still real concerns over the equitability of distribution. In their contention, the core of the Middle East water crisis is clearly national water-planning policy, which is a potential cause of instability but also the basis for solutions. They emphasise that water-related disputes are a consequence of, rather than a catalyst for, deteriorating relations between states. Moreover, institutionalists insist on the point that it would be too simplistic a scenario to argue that an upstream riparian, being the sole hegemon, would engage in unilateral appropriation or diversion of a shared watercourse without consultation, because such an argument does not take into account the complex political and economic interrelationships among the riparian states. Institutionalists point out that there has been a significant trend towards collaboration, even though this is largely confined to technical matters, such as cooperation on the exchange of hydrological data, flood forecasting, joint hydroelectric power and water-recovery ventures. Thus, they assert that it is these small-scale confidence-building measures combined with re-evaluation of national water allocation that are of interest to, and indeed are encouraged by, international financial and development institutions. Further, institutionalists claim that water war scenarios are misleading and mask the complexity of water resource management at the national as well as international level.

---

[10] R. O. Keohane, 'Institutional Theory and the Realist Challenge after the Cold War' in D. Baldwin (ed.), *Neorealism and Neoliberalism: The Contemporary Debate* (Columbia University Press, New York, 1993), p. 271.

Indeed, institutionalists emphasise the interdisciplinary nature of water, and determine some coordinated tasks for scientists, scholars and policy-makers in creating alternative cooperative models for the disputed waters of the Middle East. Further, they argue that the pressing problems of environmental degradation, regional and global poverty, and political tension and conflict are fundamentally interrelated, and that long-term solutions must consider these issues in an interdisciplinary manner.

Institutions Derived from International Law

After giving an account of the physical, historical and political setting of the disputes, institutionalists suggest that institutional frameworks and particularly international law have significant roles to play in reducing the risks of water-related conflicts and supplying the universal guidelines for better management and allocation of international water resources. Accordingly, international law experts principally work on three sources of international law: the bilateral and multilateral treaties concerning international watercourses; the customary international law which evolves through the efforts of the international organisations in the codification of the water law, namely the works of International Law Association (ILA) and International Law Commission of the UN; and the legal framework doctrines which develop through a process of claim and counter-claim between riparians along a transboundary river.[11]

Based on their experience with the legal aspect of the water issue, these experts conclude that international water law with its inherent peculiarities could provide major principles and norms that can guide the states to build effective institutions for transboundary relations. However, as one commentator argues that while practitioners of international law have formulated doctrinal schemes of considerable sophistication about the water issue, in many instances they have not been able to translate those schemes into effective institutions for the management of transboundary relations. And he emphasises that institution builders, namely politicians and diplomats, must combine the sophisticated insights of international law experts with practical structures created by the political actors. Similarly, S. C. McCaffrey comments that international law in general, being a decentralised system which relies for its enforcement principally on self-help, lacks such features as compulsory jurisdiction and centralised enforcement that are characteristic of domestic legal systems. However, almost all nations observe almost all principles of international law (McCaffrey, 1993). The above general argument is practically valid for international water law as well. That is, most principles of international water law derive from one of two categories of sources: treaties or international custom. Treaty-based rules are relatively easy to ascertain, although there is always the possibility of differing interpretations of individual provisions. FAO has identified more than 3 600 treaties relating to international water resources dating between 805 and 1984.[12] Additionally, the full text of 149 treaties dealing with water per se, excluding those which focus on boundaries or fishing rights have been collected in the Transboundary Freshwater Dispute Database as a systematic compilation.[13] These systematic collections of

[11] A. H. Garretson, R. D. Hayton and C. Olmstead (eds), *The Law of International Drainage Basin* (Oceana Publications, Dobbs Ferry, 1967); D. A. Caponera, 'Patterns of Cooperation in International Water Law: Principles and Institutions' (1985) 25 *Natural Resources Journal* 563-88; G. J. Cano, 'The Development of the Law of International Water Resources and the Work of the International Law Commission' (1989) 14 *Water International* 167-171; J. W. Dellapenna, 'Building International Water Management Institutions: The Role Of Treaties And Other Legal Arrangements' in J. A. Allan and C. Mallat (eds), *Water in the Middle East: Legal and Commercial Implications* (Tairus, London, 1994), pp. 55-93; S. C. McCaffrey, 'The Evolution of the Law of Transboundary Rivers' paper presented at the conference on *Transboundary Waters in the Middle East: Prospects for Regional Cooperation,* Bilkent University, Ankara, Turkey, 2-3 September 1991; S. C. McCaffrey, 'International Organizations and the Holistic Approach to Water Problems' (1991) 31 *Natural Resources Journal* 139-165.

[12] United Nations Food and Agriculture Organisation, *Systematic Index of International Water Resources Treaties, Declarations, Acts and Cases by Basin*: Vol. II, Legislative Study #34, 1984.

[13] See the website <http://www.transboundarywaters.orst.edu>.

treaties can be used by the researchers to make a point about specific conflicts, areas of cooperation, or larger issues of water law (Wolf, 1999).

Yet, norms of customary international law are somewhat more difficult to establish, but efforts at codification of those rules by organisations of high repute greatly assist the process. While the role of law in major international water controversies differs from case to case, states have rarely shown a disposition to defy generally accepted principles of international law. Indeed, they usually rely on those principles in their diplomatic exchanges. S. C. McCaffrey adds that the more concrete and generally accepted the applicable legal principles become, the more likely is that they will play a major role in the resolution of international water controversies. Thus, international law experts contend that, the adoption of the United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses (UN Watercourses Convention, hereinafter) is a remarkable achievement in the codification and progressive development of rules of international law which would, in turn, assist the countries in building institutions to tackle the problems of mismanagement and misallocation in major international water controversies.

However, international water law could only go as far as providing some universal principles and major guidelines, namely the 'principles' and 'norms' of the institutions which are to be built for effective management and allocation of troubled waters.[14] For instance, among the *general principles* set forth in the UN Watercourses Convention are those of *equitable utilisation*, the *obligation not to cause significant harm*, the general *obligation to cooperate*, and the *obligation to exchange hydrologic and other relevant data and information on a regular basis*. Those principles certainly provide useful references for the riparians of the disputed regions striving to conclude agreements, yet they have to be operationalised and institutionalised through the 'rules' (rights and obligations) of specific regimes.[15] Thus, for instance, the foremost principle of international water law, equitable and reasonable utilisation and participation, defines the equitable and reasonable use, development and protection of an international watercourse in rather general terms; and it just draws the framework of the actions to be pursued. States should make these principles operational, measurable and verifiable through the rules and 'decision-making procedures', which are evidently more specific, and are often established by international treaties that relate to the specific circumstances of the concerned watercourses.

International law and international institutions have important roles to play to develop a satisfactory water law that is acceptable to all nations. The codification efforts of the ILA and the ILC have played an important role in developing guidelines and principles for international watercourses, but legal experts should continue to press for the adoption and application of the principles in water-tense regions such as the Middle East. An overview of bilateral or multilateral river treaties proves that they have been effective in the past, however they should consistently include all affected parties, they should include a joint management committee empowered to negotiate disputes, and they should be flexible enough to adapt to long-term changes in hydrologic conditions.

Institutions derived from International Organizations

International governance or international organisation has traditionally been one of the central problems in international relations theory. As part of IR theory: functionalists, neofunctionalists, and integration theorists have all dealt with the question of organising and

[14] The principles of an international regime (institutions) reflect the aims and the premises of the members of the regime, and the purposes the members are expected to pursue whereas the norms of an institutional setting indicate what is legitimate or illegitimate. See T. Bernauer, *The Chemistry of Regime Formation* (UNIDIR, Dartmouth, 1993), p. 55.

[15] The rules of an international regime are prescriptions and guidelines for actions the member states are expected to perform or refrain from performing.

governing the anarchic relations among states as their principal theoretical concern. These theorists refuted the realist contention that states are disinclined to cooperate. For them, cooperation is the norm, and states are becoming increasingly interdependent. As a result, they argue, states rightly consider each other as partners in growth and development.

Water has certainly become a high priority issue in the strategies of key international agencies such as the World Bank, FAO and UNDP. The approach of international agencies to water resources took a significant turn at the beginning of the decade. The Organisation for Economic Co-operation and Development (OECD) in the late 1980s focused on the need for policy integration and institutions for water and was amongst the first to draw attention to the urgency of improved water demand management (OECD, 1989). The World Bank has benefited from this early initiative and also provided initially a policy paper, which is an invaluable compression of a wide range of studies, papers, reports and its own conferences and discussions of the 1990s (World Bank, 1993). Later on, a rather voluminous work prepared jointly by the World Bank, FAO and UNDP came on the agenda (World Bank, FAO, 1995). These publications set new directions for the large and diverse community concerned with water allocation and management. They provide a lead for interested parties, namely national water resource authorities, the founders of water projects, as well as users of domestic, industrial and agricultural water. The works of these international agencies are very authoritative, founded on lengthy and deeply researched reviews of the water management policies and practices prevailing worldwide. These papers summarise the status of the resources and outline the policies and measures, which will have to be adopted in the coming decades to allocate and manage scarce water to gain maximum benefits.

The material accrued by the key figures of these agencies reflects the transition from the 'old agenda' of providing household water and sanitation services to large numbers of people to a 'new agenda' that requires sustainable, environmentally sensitive use of water resources. Moreover the shift from supply to demand management and the adoption of economic principles are emphasised in those studies. In their contention, stretching existing water supplies can help satisfy new water needs within countries as well as relieve tensions between countries. Accordingly, in line with the institutionalist approach, the works of these agencies point to the importance of reducing the demand for water through investments in conservation, recycling and increased efficiency. The large subsidies to water users in agriculture continue unchecked, discouraging efficient investments and conveying a false message about water's scarcity and value. As a remedy, institutionalists advise applying demand management techniques such as water pricing, water marketing, and application of efficiency standards, which offer potential for water savings in domestic, agricultural, industrial, and other municipal uses as well (Postel, 1997). Thus, the World Bank policy has moved away from an emphasis on developing new water supplies toward a focus on comprehensive management, economic behaviour, and policies to overcome government and market failures, incentives to promote users with better services, and technologies to increase the efficiency of water use (Serageldin, 1995).

All these developments during the 1990s initiated a new paradigm in the last years of the decade, that of Integrated Water Resource Management (IWRM) which has become a concept and strategy for policy change in the water sector, taking over from the traditional understanding and practice of water resources development mainly directed at policy and institutional changes on a national and sub-national level. Although IWRM is bringing forward approaches, which include participation, consultation and inclusive political institutions, it still remains as a vague concept received much reluctance from the developing world. Some principles of IWRM remain subject to continued debate in the international discussion context, particularly along the North-South line, while others receive redefinition and different emphasis by individual states or other actors.

IWRM requires a new holistic approach and an unprecedented level of political cooperation. A logical implication of the importance of holistic management was the need for integration among the many agencies and organisations involved in water management, and for a shared understanding of problems and challenges. Two institutional responses to the need for integrated action were the establishment of the Global Water Partnership (GWP) and World Water Council (WWC) in 1996. The concept 'water security' was introduced by these two leading water organisations as the central goal for future action, a term that captures the complex concept of holistic water management and the balance between water resources protection and resource use. Both GWP and WWC are organised, as networks with multi-sectoral and multi-institutional membership, are active in producing reports and organising the World Water Forum (WWF) meetings. Subscribing to the policy consensus is a quasi-requirement for membership: the water experts of the World Water Commission of the World Water Council wrote a report on water security which contains a section strongly supporting IWRM, including a strong commitment to river basin management. WWC prepared the World Water Vision in 2000 (Cosgrove&Rijsberman, 2000). The Vision process is the first major attempt to construct knowledge about global and local water since 1992, and the most serious attempt yet to include all interested stakeholders in a worldwide consultation process. Its goal is to provide the pressure that leads to changed attitudes and changed and most importantly -funded- water policy priorities.

References

Allan, J. A.'The Political Economy of Water: Reasons for Optimism But Long Term Caution' in J. A. Allan (ed.), *Water, Peace and the Middle East*, Tauris, London, 1996, pp. 75-133.

Cosgrove, W. and F. Rijsberman, *World Water Vision: Making Water Everybody's Business*, Earthscan, London, 2000.

Gilpin, R. *The Political Economy of International Relations,* Princeton University Press, New Jersey, 1987.

Kolars, J. and Y. Bakour, 'The Arab Mashrek: Hydrologic History, Problems and Perspectives' in P. Rogers and P. Lyndon, (eds), *Water in the Arab World: Perspectives and Prognoses* (Harvard University Press, Cambridge, 1994) pp. 121-147.

Lowi, M. *Water and Power*, OUP, Oxford, 1993.

McCaffrey, S. C. 'Water, Politics, and International Law' in P. H. Gleick (ed.), *Water in Crisis: A Guide to the World's Fresh Water Resources*, OUP, New York, 1993, pp. 97-98.

Muir, R., *A New Introduction to Political Geography*, London: MacMillan Press, 1997.

OECD, Water Resource Management: Integrated Policies (OECD, Paris, 1989)

Postel, S. 'Changing the Course of Transboundary Water Management' (1997) 21 *Natural Resources Forum* 85-90.

Rogers, P. 'Comprehensive Water Resources Management: A Concept Paper' *World Bank Policy Research Working Papers: WPS 879*, The World Bank, Washington D.C., 1992.

Serageldin, İ. Towards Sustainable Management of Water Resources, The World Bank, Washington D.C., 1995.

Waterbury, J.'Dynamics of Basin-wide Cooperation in the Utilisation of the Euphrates' paper prepared for the *Conference on the Economic Development of Syria; Problems, Progress, and Prospects*, Damascus, Syria, 1991.

Wolf, A. T. Atlas of International Freshwater Agreements, UNEP, FAO, 2002.

Wolf, A. T. 'Trends in Transboundary Water Resources: Lessons for Cooperative Projects in the Middle East', in D. Brooks and Ö. Mehmet (eds.) *Water Balances in the Eastern Mediterranean,* International Development Research Centre, Ottowa, 2000.

Wolf, A. T. 'Hydrostrategic Territory in the Jordan Basin: Water, War, and Arab–Israeli Peace Negotiations' in H. Amery and A. T. Wolf (eds), *A Geography of Water in the Middle East at Peace*, University of Texas Press, Austin, 1999.

Wolf, A. T. ‘Criteria for Equitable Allocations: The Heart of International Water Conflict’ (1999) 23 *Natural Resources Forum* 8.

Wolf, A. T. ‘Water Wars and Water Reality: Conflict and Cooperation along International Waterways’ in S. Lonergan (ed.), *Environmental Change, Adaptation, and Security*, Kluwer Academic Press, Dordrecht, 1999.

World Bank*, Water Resources Management: A Policy Paper*, The World Bank, Washington D.C., 1993.

World Bank, FAO and UNDP, *Guide to the Management of Water Resources*, First Draft for Review in the Expert Consultation on Methodology for Water Resources Policy Review and Reform, FAO, Rome, 1995.

Dam Debates Challenging French River-Basin Participatory Planning: a "Negotiated Public Action" Perspective

Sophie ALLAIN, Research Fellow at the Institut National de la Recherche Agronomique.
Groupe d'Analyse des Politiques Publiques (ENS Cachan / CNRS)[1]

Conflicts over dams have heightened in the last two decades all over the world, due largely to political dimensions that were disregarded. As the World Commission on Dams (WCD) emphasized, the issue of dams "is not confined to the design, construction and operation of dams themselves" (2000, p.xxvii), but "is about the very meaning, purpose and pathways for achieving development" (*Ib.*, p.xxxiii), and therefore about fundamental issues of justice and governance. In order to embrace the social, environmental and economic dimensions linked to dams all together, the WCD developed recommendations for a new policy framework based on a negotiation principle: "Only decision-making processes based on the pursuit of negotiated outcomes, conducted in an open and transparent manner and inclusive of all legitimate actors involved in the issue are likely to resolve the complex issues surrounding water, dams and development" (*Ib.*, p.xxxiv). The Commission explained that such a recommendation can be implemented by embracing the entire planning and project process and by reaching an agreement at each key-stage. During the upstream planning process more precisely, this orientation means: firstly, assess and validate the needs for water and energy services; secondly, select the preferred development plan among the full range of options, conducting either to dam option, either to non dam options. Participatory planning is clearly recommended for both steps, which should respectively rely on "an appropriate consultation process" (*Ib.*, p.262) and on a "participatory multi-criteria assessment" (*Ib.*, p.262).

France developed river-basin participatory planning by enforcement of the 1992 Water Law. To what extent do such procedures represent an appropriate political framework for dam debates? How can political science help to understand and improve such public decision-making? To answer those issues, we will rely on two case studies: the projects of building respectively a dam on the *Trézence* River (Charente-Maritime *Département*) and a reservoir at *Charlas* (Haute-Garonne *Département*) taking water from the Garonne River[2]. Furthermore, we shall present a new theoretical perspective in terms of "Negotiated Public Action" (Allain, 2002a), and show how it can be implemented.

1. – Dam debates within the framework of French river-basin participatory planning: the institutional framework and some empirical findings

Before presenting some empirical findings concerning our two case studies, we shall begin by presenting the French institutional context shortly.

1.1. - The French institutional framework

It is necessary to examine the French system of river-basin participatory planning, but also some specific legal elements concerning dam debates.

[1]. Ecole Normale Supérieure de Cachan – GAPP (CNRS)
61, avenue du Président Wilson (Bâtiment Laplace)
94 235 CACHAN Cedex
E-mail : sophie.allain@tiscali.fr
[2]. This ongoing study is supported by the French Ministry of the Environment, in the framework of the research program « Concertation, Décision, Environnement ».

- The French institutional framework for river-basin participatory planning

The French institutional framework for river-basin participatory planning relies on two kinds of instruments.

* Two regulation instruments

The 1992 Water Law created two procedures for river-basin participatory planning:

- The Master Water Management Plan (SDAGE3) aiming to determine fundamental orientations likely to guarantee a "balanced" management of water resources at the level of the large "river-basins" delimited by the 1964 Water Law and corresponding to the Agences de l'Eau territories. More precisely, these plans had to define quantitative and qualitative objectives for water resources, and the main operations necessary to be conducted in order to meet these objectives. The SDAGE had to be initiated by the Prefect chosen to have authority on such river-basins, and drawn up by the River-Basin Committees (Comités de Bassin), who steer the Agences de l'Eau's financial policy, and which are multipartite bodies, composed of 1/3 elected people from local authorities, 1/3 users and non-profit associations, and 1/3 representatives from the State at the local level). All the SDAGE were completed by 1997, enforcing therefore the law, which let five years to define such plans.
- The Local Water Management Plan (SAGE4), aiming to define rules for the use, development and protection of water resources at the level of smaller river-basins presenting hydrographical consistency. Such plans had to be drawn up by a multipartite entity created for that purpose, the Local Water Commission (CLE5), gathering 1/2 elected people from local authorities, 1/4 users and non-profit associations, and 1/4 representatives from the State at the local level. A first step in the planning process therefore consists in establishing the CLE, namely in delimiting the geographical perimeter, which will determine the CLE domain, and in defining precisely its composition. Contrary to the SDAGE, the law did not fix who is responsible for initiating a SAGE, which is supposed to rely on "local initiative", nor any deadline to define such plans; therefore, most of them are still on the process.

* A kind of voluntary agreement specific to Adour-Garonne river-basin

Concerning Adour-Garonne river-basin, where both dam debates studied take place, the SDAGE furthermore created a specific kind of plan called *Drought Management Plan* (PGE)[6], aiming to manage water shortage situations at the level of hydrographical units defined by the SDAGE. In this large region located in the South-West of France, where irrigation expanded a lot to mainly develop corn production, such issues of quantitative management indeed represent the main water management problem. The PGE were therefore expected to be defined very quickly (less than two years after the approval of the SDAGE).

Indeed, it seems that, in this region, priority has been given to the PGE in comparison with the SAGE. Besides, the rules adopted to define such plans have been modelled on the SAGE one: indeed, PGE have to be defined by the same kind of multipartite body than a CLE and in a participatory way. However, it is worth noticing that PGE rather correspond to voluntary agreements than to regulation instruments to the extent that they do not have legal value, unlike the SDAGE and SAGE.

Concerning the dam plans, PGE are expected to play an important role, as the granting of financial public subsidies for building dams justified by such quantitative purpose is

[3]. SDAGE stands for Schéma Directeur d'Aménagement et de Gestion des Eaux.
[4]. SAGE stands for Schéma d'Aménagement et de Gestion des Eaux.
[5]. CLE stands for Commission Locale de l'Eau.
[6]. PGE stands for Plan de Gestion des Etiages.

conditioned by the previous definition of a PGE. In that way, these plans are recommended to be initiated by the actors responsible for dam management.

- The French legal procedures for dam debate

As the French system of river-basin participatory planning is quite recent compared to dam decision-making processes, which can last for many years, it is also necessary to take a look to the French legal procedures for dam debates.

** The Public Inquiry procedure*

For a long time, the only legal procedure allowing public participation to dam planning has been the Public Inquiry: in that direction, the concerned population may peruse the dam file in each town hall of the geographical area and give their opinion about the project. On the basis of the different opinions expressed, the commission inquiry gives its own final opinion (positive, negative, or conditioned by some improvements). The State authorization necessary to build the dam can then be given or refused.

* The Public Debate procedure

As many critics have been directed to this procedure occurring too late in the dam decision-making, a new procedure was created in 1995, giving the possibility to organize a public debate much more "upstream". Only important equipments such as dams, railways, airports can be submitted to such a debate, controlled by an independent national commission. However, a recent law (2002) provides for an extension of the field of such public debates.

- Conclusion

This short presentation conducts us to raise the following questions:

- How are dam plans discussed in the framework of the SDAGE, SAGE and PGE drawing up process?
- When a dam plan is already on the process, how do these river-basin participatory planning processes intervene in dam debates? Such a question is also relevant, since the WCD pointed out that its recommendations may also be applied to "dams in the pipeline", namely to projects already at an advanced stage of development.

1.2. - An analysis of two recent dam debates

Both dam plans studied here were initiated much before 1992 and the development of river-basin participatory planning. Let us examine how both processes met.

- The Trézence dam debate

The idea of building a dam on the Trézence River, affluent of the Boutonne River which flows into the Charente River, was initiated in the seventies because of the important development of irrigation for corn production and of unsalted water needs in the estuary for oyster production. The project, which was strongly supported by a local authority, the General Council (*Conseil Général*) of the Charente-Maritime *Département*, however met hard oppositions from local ecologist associations and from the Ministry of the Environment. Therefore, it was modified twice. To the extent that both new versions were designed after 1992, we shall examine how these ones met the river-basin planning process concerning this site, namely the Boutonne SAGE and the Charente PGE.

Although the idea of defining a SAGE on the Boutonne river-basin appeared from the very start of the SDAGE drawing up in 1992, and although the process aiming to establish the

CLE itself began in 1994, *the preparation of both last versions of the project was quite disconnected from the planning process*:

- The second version (25 millions cubic meters) was defined in 1993-1994, at the moment when the local authorities of both Départements concerned by the SAGE (Charente-Maritime and Deux-Sèvres) examined juridical solutions to collaborate in the framework of this procedure. No links were yet established between both processes. Anyhow, because of the opposition of the Ministry of the Environment, this version did not reach the regulation stage of the public inquiry.
- The third version (39 millions cubic meters) was defined in 1996-1997, at the moment when the CLE itself was established and when public meetings were held in the river-basin to inform people about water resources management and to promote informal discussions among stakeholders. No more links were yet established. Even after the SAGE definition started in 1998, the dam plan followed up its own path.

Let us however examine to what extent the SAGE and PGE planning processes took the dam into account:

- In the framework of the SAGE planning process, the CLE President first explained that it was not relevant to debate about the dam, because it was then the moment to assess the present situation (1999-2001), whereas the dam was concerning the future. During that period, however, the project was confronted to increasing disputes: the public inquiry (1999) as well as the State authorization (2001) took place in a climate of conflicts escalation conducting to juridical litigation about the authorization given.

During the second step of the planning process (2001-2002), when the subject was to discuss about the needs trends and orientations for water management, there was no more debate about the dam: the CLE President indeed began by stating that irrigation needs could not be a debate topic to the extent that irrigation was a key-element to secure local crop-production. Such a declaration conducted the ecologist associations, who were members of the CLE, to stop attending the CLE meetings until the moment of the final vote, when they came back only to vote against the plan. No decision was yet made concerning the Trézence dam: while the SAGE points out that it is necessary to abide by the minimal summer flows allowing the reach of the quantitative objectives defined by the SDAGE, and that new water reserves should be created, the Trézence dam is only evoked to emphasize that if it is built, it should respect the qualitative objectives determined by the SDAGE. Furthermore, the precise assessment of the water needs justifying the dam is rejected at the PGE level.

Therefore, it appears that the Trézence dam was a political issue avoided in the Boutonne SAGE.

- The *PGE planning process* was launched in 2000. This plan concerns a larger territory than the Boutonne SAGE, which is the encompassing Charente river-basin. It had become necessary to draw up this PGE, to the extent that, relying on the SDAGE, the commission of inquiry conditioned a positive opinion on the Trézence dam at the definition of the Charente PGE, at the end of the Public Inquiry process (2001).

In 2003, the PGE Committee was yet still analyzing the water needs. To a question concerning the Trézence dam, I was answered that the purpose of the PGE was not to make a decision about the opportunity of such a project, and that the different options concerning the dam plan should probably be presented “diplomatically”, namely not with the two traditional options, “with the dam” and “without the dam”, but rather “before the dam” and “after the dam”.

Then, it is looking like the Trézence dam was going to be an issue subject to manipulation in the Charente PGE.

However, at the autumn 2003, the State Council (*Conseil d'Etat*) gave its verdict concerning the Trézence dam at the end of a long juridical process: this dam does not present a public usefulness; consequently, the State approval was nullified.

- The Charlas reservoir debate

The idea of building a new reserve of water along the Garonne River appeared in the seventies too, there also because of the strong development of irrigation for corn production. However, the project has really begun to progress since 1989, when Charlas site was acknowledged as the most relevant to satisfy the needs of a large territory: indeed, this site presents the feature to allow the building of a huge reservoir (110 millions cubic meters) filled with water stemming from the Garonne River, which may supply water to both the Valley of the Garonne and the neighboring western Gascogne territory, very poor in natural water resources. A study was then conducted to examine both technical and environmental dimensions of the project (1992-1996). Its results made the River-Basin Committee claim that he was favorable to the building of the reservoir (1996) and that it was now necessary to examine financial and operational aspects. However, this decision made the opposition become harder: the local association of riparian against this project called for help from a stronger association, a regional ecologist association. This one decided to resort to the recently created Public Debate procedure. Applied in 1997 for, this Public Debate could not take place before 2003 yet, because of both local and national intricacies.

In the meanwhile, the PGE planning process concerning Charlas reservoir was quickly initiated (it began in 1997-1998, just after the approval of the SDAGE Adour-Garonne). Because of the extension of the territory likely to be supplied by the Charlas reservoir, two PGE were at stake: the Garonne-Ariège PGE, covering the territory where the Charlas site is located, and the western Neste-Gascogne PGE.

Let us examine how those both PGE, which have been now approved, - the first one early 2004 and the second one in 2002 -, took the reservoir into account. While both plans emphasize the necessity to abide by the minimal summer flows allowing the reach of the quantitative objectives fixed by the SDAGE, and therefore to both save water and create new reserves of water, it appears that they however diverge on several main points:

- Firstly, the assessment of the water needs: The Garonne-Ariège PGE considers that the main use of water, the irrigation, must be controlled and therefore give several precision to do it, such as: stopping the irrigation at the present level; organizing a collective management of the water used for irrigation; introducing a payment system for the users, in order to finance the operations aiming to supply added water in the rivers. In contrast, the Neste-Gascogne PGE states that it is necessary to supply water to farmers, who are waiting for irrigation rights (more than 700). Furthermore, this plan claims that the level of certain quantitative objectives should be increased because of qualitative reasons (reducing pollution).
- Secondly, the ways of reaching the objectives: In the first step of its two-stages program, the Garonne-Ariège PGE concentrates on measures aiming to save water and to mobilize water stemming from other reserves of water (mainly from dams managed by the National Company of Electricity). In contrast, in this same first step, the Neste-Gascogne PGE states that the creation of small reservoirs (16 millions cubic meters) should be added at the saving water solution. Furthermore, while both plans present their second step directed to the creation of new resources of water in a similar way relying on two options (the building of the Charlas reservoir or the mobilization of reserves initially created for hydroelectric production), and while both plans consider that the second option cannot be sufficient to satisfy the water needs,

they differ in their conclusions: the Charlas reservoir is presented as the "preferred option" in the Garonne-Ariège PGE, but as the "necessary option" in the Neste-Gascogne PGE.

Therefore, while the Charlas reservoir project was here debated in both PGE, *the planning process did not give the possibility to orient clearly the decision-making process concerning the project: indeed, both PGE assess the water needs and the options differently, and furthermore, the Garonne-Ariège PGE does not choose between the two options concerning the mobilization of new reserves of water*. Besides, the Public Debate about Charlas reservoir, which occurred at the autumn 2003, revealed how the agreements reached in the PGE were fragile and how the conflicts about this project were still violent.

- Conclusion

This first analysis shows that the creation of an institutional framework favoring the participation of the stakeholders such as the French system of river-basin participatory planning does not guarantee dam debates and negotiated outcomes about such projects. Let us now examine why.

2. – Shedding new light on empirical findings within a "Negotiated Public Action" perspective

We are now going to show that, in order to shed new light on our empirical findings, it is necessary to adopt a new theoretical framework, likely to grasp the political dimensions of negotiation. Then, we shall be able to understand the reasons of the stalemate that occurred in our both dam cases.

2.1. - The need for a new theoretical framework likely to grasp the political dimensions of negotiation

- The idea of negotiation in a political approach

In the WCD approach, the idea of negotiation is applied to a basic instrumental decision-making process, which means:

- Firstly, that the key-issue is to select a good solution to handle problems along a linear and sequential process and that such a solution represents the right agreement.
- Secondly, that the gap between divergent points of view is assumed to be bridged by technical rationality.

In contrast, a political standpoint requires considering the treatment of public affairs like a collective action:

- Firstly, which involves a variety of stakeholders at different steps or levels of the process, and therefore which presents a social "thickness".
- Secondly, which assumes the definition of responsibility (at least for the management of the action itself, but also as regards the results), as well as acceptable justification (in order to gain legitimacy), both aspects implying institutional dimensions.

Taking those dimensions into account while using the idea of negotiation conducts to lay down two principles (Allain, 2002a, 2003b):

- Firstly, the treatment of any public affairs (such as a planning process, a project development…) must be regarded as a negotiation process embedded in a social environment and interacting with an institutional context.

- Secondly, the justification process as well as the responsibility definition process must be placed at the heart of the negotiation process.

Let us now examine how we made those principles operational.

- A "Negotiated Public Action" perspective

Those principles conducted us to define a set of interrelated unitary concepts likely to guide the analysis (Allain, 2002a, 2003b). We just sum up them here:

- A negotiation process can be viewed as a joint process of "framing" and "organizing": the idea of "framing" aims to grasp the symbolic dimensions which shape the definition of a content and which crystallize reciprocal commitments, while the concept of "organizing" refers to the establishment of concrete links among actors and to the organization of the activity itself.
- A negotiation has to be analyzed from the "situation of tense interdependency" from which it emerges until the "negotiated order" to which it leads: indeed, it is a matter of discovering the interdependency relations likely to provoke conflicts of interests but also to incite to cooperate; besides, it is a matter of taking the results of the negotiation into account not only in their instrumental and instantaneous dimension but also as regards the implementation of the agreement and the institutionalization of the outcomes.
- A negotiation progresses through a set of interactions among the stakeholders, which can be analyzed in terms of "games" and "argumentation": the idea of "games" refers to the observable concrete behavior aiming to orient the negotiation in a specific direction, while the concept of "argumentation" aims to qualify the discursive techniques and the modes of justification involved in the negotiation. It is necessary to pay attention to the specific "sequences of direct interactions" occurring in the process.
- Finally, a negotiation is expected to be influenced by a "negotiation context", which is a portion of the encompassing institutional context likely to bear directly on the course of the negotiation, by determining some regulative, normative or cultural-cognitive aspects. While this "negotiation context" is assumed to be more stable than the negotiation process, it may also evolve in the course of the negotiation and therefore modify some of the rules of the negotiation.

We argue that such a theoretical framework above all presents a heuristic value useful both to explain and improve the negotiation process.

2.2. - Coming back to our dam case studies: the reasons of the stalemate

We are here going to use our theoretical framework in two specific directions, in order to show that it is relevant to explain the reasons of the stalemate that occurred in our both dam case studies7:

- The first direction of research aims to reveal how an analysis of the justification process occurring in "specific sequences of interactions" and conducted in terms of "argumentation" and "framing" may help to identify the "closing" points stopping dam debate too early.
- The second direction of investigation intends to underscore how an examination of the responsibility definition process occurring in the course of the negotiation process, which will be grasped through both the "games" among local institutions as regards the control of the "organizing" process and the evolution of the "negotiation context" may allow the discovering of an uncontrolled shaping of the negotiation process.

[7]. See also Allain (2001; 2002b; 2003a); Allain and Emerit (2003).

Then, it may conduct to discover gaps or on the contrary nubs of tension likely to provoke further conflicts or at least prevent dam debate.

- Analyzing argumentation and framing in the justification process to identify the "closing" points stopping dam debate too early

In both dam cases studied, the assessment of the project appropriateness during the river-basin participatory planning process relies on the assessment of three main interrelated basic elements: the minimal summer flows that must be kept in the rivers, the water needs for irrigation and the ability to mobilize other kinds of water reserves than dams. Therefore, it is important to examine how each of these elements was debated.

The analysis of the planning files, as well as inquiries held with participants reveal that those technical elements were yet not really debated:

- The minimal summer flows to preserve were considered as already defined by the quantitative objectives fixed by the SDAGE;
- Irrigation was regarded firstly as a water use necessary for the development of local agricultures and not likely to lose its economic significance in the future, even if participants were aware of the damages that it causes to the rivers;
- The mobilization of other kinds of water reserves than dams was not really considered as possible alternative options, but rather only as possible additional solutions.

Therefore, the issue of dams was framed in a way which did not really allow a debate.

The explanation of such a situation mainly lies in the participants' beliefs, which frame what they consider as matters of fact not likely to be questioned, or, on the contrary, as issues subject to controversies or deserving some further investigation, and therefore which fix the realm of possibility. These beliefs are revealed by the argumentation appearing in the planning files:

- The quantitative objectives determined by the SDAGE are considered as *legal constraints,* which are imperative.
- The argumentation concerning irrigation is directed to justify this water use: along these lines, it therefore refers either explicitly to a register of *economic security* (maintaining crop-production), either implicitly to a register of *social justice* (allowing every farmer to get access to water rights, like in the PGE Neste-Gascogne). In both cases, it is a *civic argument*, which is basically at stake: the solidarity with the farmers.
- Finally, the argumentation concerning the mobilization of other kinds of water reserves than dams de facto intends to prove that these options are not reliable. Consequently, *risk arguments* are put forward, especially as regards the mobilization of water reserves initially created for electricity production.

It is important to notice that such arguments do not stem from a debate allowing the emergence and the recognition of arguments grounded on rationality. On the contrary, they are stated so, without further investigation or debate, because they implicitly refer to *authority arguments,* which are not expected to be questioned, such as*: the law* (the legal value of the SDAGE, or the concessions granted to the National Company of Electricity for the exploitation of dams) or *moral principles* (the solidarity with farmers).

This aspect particularly appears when stakeholders are asked to justify their arguments further, by questions pertaining to other possible futures concerning the water needs or the mobilization of new reserves of water, such as: what would happen if lower water needs due to a decreasing of the irrigation were assumed? Or, if reserves of water initially created for electricity production were really used? Some typical answers then run as follows: "The Garonne should not be a wadi!" Do you want a France without peasants?" Or, "do you prefer nuclear plants?" Such answers reveal that other possible futures are not really taken into

account by the stakeholders, who firstly put forward threatening images of the future to justify their position. When such symbolic arguments are used in a situation of interaction between stakeholders, they make however switch the communication from rationale to emotion, impeding any further debate.

- Analyzing games and organizing in the responsibility definition process to identify gaps or nubs of tension preventing dam debate

Let us now analyze the responsibility definition process in both cases. We shall therefore examine the progression of each project in its interrelations with the institutional context over years, with the purpose of understanding how the steering of the project has been established and what it implies for dam debate.

** The responsibility definition process concerning the Trézence dam*

When the Trézence dam was designed, it was one element of an encompassing dam program at the level of the Charente river-basin. This program was steered by the Charente River Institution *(Institution de la Charente)*: this a local authority gathering the different General Councils *(Conseils Généraux),* whose area is included in the Charente River-Basin, namely mainly the upstream Charente *Département* and the dowstream Charente-Maritime one; such an authority aims to finance operations concerning the entire river-basin.

Because of a political clash among the Charente and the Charente-Maritime *Départements* in the 80's, the agreement concerning this program was broken off and each *Département* decided to steer independently the dam planned on its own area. Therefore, the Charente-Maritime General Council became the only authority responsible for the Trézence dam.

The consequence of such a change in the responsibility definition is that the Trézence dam issue was not handled anymore in the framework of water management institutions. Such a situation explains that the dam was not really debated in the framework of the SAGE planning process: the project was clearly considered as the Charente-Maritime General Council business.

The Trézence dam debate had yet to come back in the domain of water management institutions, when the commission of inquiry conditioned a positive opinion on the project at the definition of the Charente PGE in the framework of the Public Inquiry. While the drawing up of the PGE Charente had to be steered by the Charente River Institution, it is worth noticing that the presidency of that institution had changed betweentimes: it was now presided by the Charente-Maritime General Council and not anymore by the Charente General Council; therefore, the Charente-Maritime General Council had more power within the institution than before and could expect to better control the PGE drawing up. We saw that such an expectation was not a dream, since the PGE Committee was ready to work in the direction hoped by the General Council, and that the dam development was stopped only because of juridical decisions made elsewhere.

** The responsibility definition process concerning the Charlas reservoir*

As we already explained, the large territory likely to be covered by the supply of water stemming from the Charlas reservoir made that two PGE were concerned by the project: the Garonne-Ariège PGE and the Neste-Gascogne PGE. The first one was placed under the authority of a river-basin institution, the SMEAG *(Syndicat Mixte d'Etudes et d'Aménagement de la Garonne)*, whose area spreads along the linear of the Garonne River; the second one was steered by a kind of regional rural planning institution, the CACG *(Compagnie d'Aménagement des Côteaux de Gascogne)*, who carries on two kinds of activities: engineering, concerning mainly the designing of dams and irrigation systems, and the

management of such systems. In particular, this institution is the manager of the huge irrigation system concerning the Gascogne area (called Neste system), which is supplied by the Neste River, affluent of the Garonne River.

Such a situation explains why the Neste-Gascogne PGE was framed differently from the Garonne-Ariège PGE, as regards the Charlas reservoir: for the CACG, who has to organize the supply of water to the farmers in the region of Gascogne and who is confronted with unsatisfied demands, the aim is to be able to supply more water to the farmers. Therefore, this institution mainly put forward the creation of new water reserves, the Charlas reservoir but also smaller reservoirs, during the planning process.

The separation of the responsibilities concerning the PGE also explains that while both areas are interdependent as regards the supply of water (firstly, through the Neste system, and, if the case arises, through the Charlas reservoir), such an interdependency was not really analyzed. Therefore, while the building of the Charlas reservoir is generally presented as an issue of "solidarity" between both regions of Garonne and Gascogne, such a political issue has never been debated (neither approved).

Finally, a further investigation of the roles of each institution as regards the Charlas reservoir lets appear latent conflicts, still not handled: indeed, the CACG was the company who designed the technical draft of the Charlas reservoir, and who expected to build it and manage the supply of water. However, while the SMEAG was the institution responsible for the project, it expected to recover the control of the project after the technical studies conducted by the CACG. The conflict which arose between both institutions could only find a temporary solution, which was necessary for allowing the unfolding of the Public Debate. Nevertheless, the issue of the authority responsible for the project is not yet definitively clarified, since several questions have not been the subject of an agreement, such as: who will be the owner? Who will be the project manager?

Conclusion

After having shown that institutional solutions such as river-basin participatory planning do not guarantee negotiated outcomes as regards dam issues, we proposed an analysis in terms of "Negotiated Public Action" giving the possibility to grasp the political dimensions of dam decision-making processes and, therefore, to understand why such processes may reach deadlock and how they may be improved. This approach lays the justification and the responsibility definition processes at the heart of the analysis of the negotiation process and offers a set of interrelated unitary concepts to organize this analysis.

In the cases studied here, we then saw that dam debates taking place in the framework of river-basin participatory planning were restricted and channeled in a specific way because of two main reasons:

- Firstly, the confinement of the debate within a narrow frame because of the use of authority arguments impeding basic elements to be questioned during the planning process;
- Secondly, the difficulties in establishing a consistent system of authority on the overall negotiation process, especially in the case of a changing institutional context like the French one, where river-basin institutions have to assert their power against traditional local authorities.

Such kinds of problems suggest the development of *mediation skills*, but in a new way in comparison to what has been done until now: mediation indeed generally focuses on the assistance of negotiations taking place "around a table", and mainly proposes techniques aiming to manage conflicts and to facilitate the communication between the stakeholders (Susskind and Cruikshank, 1987; Susskind and alii, 1999). In contrast, our analysis invites to

conceive of a mediation system likely to intervene not only during direct moments of interactions, but also among institutions; likely not only to facilitate the communication but also to organize a widened investigation and to build new rules and relationships at the institutional level (Allain, 2003c).

References

Allain S., 2001 - Planification participative de bassin et gouvernement de l'eau. *Géocarrefour*, vol 76, 3/2001, 199-209.

Allain S., 2002a - A "Negotiated Public Action" perspective for Public Management. Paper presented at the 18th EGOS Conference, Barcelona, 4-6/07/02.

Allain S., 2002b - La planification participative de bassin. Rapport final de synthèse pour le Groupe Inter-Bassins SDAGE-SAGE, vol. 1 ; Dix histoires de SAGE, vol. 2a et 2b. Paris : INRA, ENS Cachan, CNRS-GAPP. http://www.sitesage.org

Allain S., Emerit A., 2003 - Projets d'aménagement hydraulique, concertation et planification participative de bassin : une approche en terme d'« Action Publique Négociée ». *Natures, Sciences, Sociétés*, Vol. 11, N°3, 255-265.

Allain S., 2003a - Délibérations et action publique locale : une approche en terme d'« Action Publique Négociée » appliquée au domaine de l'eau. Communication au colloque du CEDP, Tours, 14-16/05/03. *A paraître (2004) dans Castagna B., Gallais S., Ricaud P., Roy J.-P. (dir.) – La situation délibérative dans le débat public. Presses Universitaires François Rabelais, Tours.*

Allain S., 2003b – Quels concepts organisateurs pour une approche intégrée de la négociation ? Communication à la Première Biennale Internationale de la Négociation. Négocia, Paris, 11-12/12/03. *A paraître (2004) dans Négociations, N°2.*

Allain S., 2003c - La médiation environnementale comme système de régulation politique. Application au gouvernement de l'eau. Communication au colloque du CERVL, Bordeaux, 15-17/10/03. *A paraître (2004) dans un ouvrage collectif dirigé par J. Faget.*

Susskind L. E., Cruikshank J., 1987 – Breaking the Impasse : Consensual Approaches to Resolving Public Disputes. Basik Books.

Susskind L. E., McKearnan S., Thomas-Larmer J., 1999 - The Consensus-Building Handbook. SAGE, London.

World Commission on Dams, 2000 – Dams and development. A new framework for decision-making. London and Sterling, Earthscan.

Political Structure and 'Dam' Conflicts: Comparing Cases in Southeast Asia

Ashok Swain, Associate Professor, Department of Peace and Conflict Research, Uppsala University, Box 514, Uppsala, SE-751 20 Sweden. Fax: +46-18-69 5102. E-mail: Ashok.Swain@pcr.uu.se

Ang Ming Chee, Researcher and Project Coordinator, Institute for Dispute Resolution, Khon Kaen University, Khon Kaen, 40002 Thailand. Fax: 66-4320 2788. E-mail: micky_ang@hotmail.com

Abstract

This paper argues that different political structures use different conflict management mechanisms to manage opposition to large hydro projects. Conflicts over the Pak Mun Dam, Thailand (a liberal democracy), and the Bakun Dam, Malaysia (a semi-authoritarian state), are the cases selected for comparison. The export oriented, fast industrialization process brought rapid development in these two countries. Large-scale water development projects, particularly big dams, have been constructed to meet an increasing demand for energy. However, these hydroelectric projects have been the source of conflict between the policy maker and the public. Though the countries face similar conflict situations, the regime's conflict management responses significantly differ from each other.

The paper finds that the political design of the liberal democratic country allows better public participation in the management of 'dam' conflicts. In contrast, the authoritarian regime reacts with a more oppressive approach to prevent escalation of the opposition against dam building. A non-democratic regime is thus more effective in the implementation of policy decisions to build big dams through its suppressive methods. Suppressive action may force reconciliation of the conflict at the surface level, but it neither addresses the root of the problem nor helps to secure benefits for the majority.

Keywords**:** Dam Conflicts; Southeast Asia, Liberal democracy; Semi-authoritarian, Pak Mun Dam, Thailand; Bakun Dam, Malaysia; Conflict Management.

1. Introduction

During the 1990s, the third wave of democratisation swept several countries of Southeast Asia (Crouch, 1993; Larry & Plattner, 1998; Stiglitz & Yusuf, 2001). This helped to bring new power elites to the fore, create a resurgence of civil-society and decentralize power. However, the democratising process was impeded by the economic crisis of 1997, which ended the miracle of the Newly Industrializing Countries (NICs) and their sustained economic growth and equitable income distribution (Haynes, 2001; Jomo, 2001). The economic crisis had a particularly adverse effect on the implementation of government policies. Previous latent problems in public policy implementation came to the surface and were highly criticised by the public during the economic down turn. Large-scale resource development undertakings, particularly hydroelectric projects, caused serious disputes within society. Incompatible perspectives and interests of the stakeholders involved brought them to confrontation.

Thailand and Malaysia are among the NIC countries that had experienced high industrialisation and economic growth since 1990. Both countries had planned and implemented a few hydroelectric power plant projects to meet their energy shortages. Due to the differing political structures of the two countries, different procedures were used to

manage conflicts over the hydroelectric projects. An attempt is made within this paper to study alternative conflict management approaches used by conflicting parties under two different political structures: a liberal democracy in Thailand, and a semi-authoritarian pseudo democracy in Malaysia. Conflicts are over two hydropower projects, the Pak Mun Dam in Thailand and the Bakun Dam in Malaysia. Both dam building projects were created as public policies to meet their respective nation's growing demands for energy. Both public policy projects also became conflicts on ecological, environmental, social and economic grounds.

2. Political Structure and Public Policy Conflicts

Public policy is a program or project that is planned, developed and executed by the state in order to supply facilities and the welfare needs of its citizens (Lewis, Gewirtz & Clarker, 2000; Curtain, 2000). Public policy is important in determining a nation's conduct and societal goals in a particular setting to create social harmony and peace. Carefully conceived, multi-faceted and interactive processes among the government and the public will ensure the effective implementation of public policy (Sisk et al., 2001; Titmuss, 1958). On the other hand, the allocation of resources, services, and opportunities can also be an instrument of social exclusion, discrimination and oppression (Placier & Hall, 2000). Public policies have a substantial impact on the stability of society.

The formulation and implementation of new development policy will introduce change in peoples practise and may involve a reconfiguration of social identities and roles of state policy making. This often contributes to tension in the community. Conflicts emerge when a feeling of scarcity and different interests predominate. Conflict involves the struggles of more than one party. Public policy conflicts involve two main parties, the policy makers and the public. These conflicts might vary in their dimension, level, and intensity. However, they have a significant potential to transform, becoming an important catalyst for positive social change. Nevertheless, public policy conflicts need to be properly managed (with suitable mechanisms), in order to overcome enormous practical barriers and contribute to positive social change (Buckles & Rusnak, 1999). Successful management of conflicts can help improve acceptance among the public to the state's public policy decisions; improve social integration and increase the efficiency and flexibility of state action.

Public policy conflict management often involves the interaction of the conflicting parties; it also entails analysis of the cultural and historical experiences that underlie the conflict. However, the management of public policy conflict depends very much on the political practice and structure, which constrain or facilitate policy implementation. The political structure of a state consists of local political culture, structure and institutional design, as well as the involvement and influences of civil society and public participation. Managing public policy conflicts in a democratic set-up differs from management within a non-democratic one. Yet the boundary between democratic and non-democratic structure is sometimes a blurred and imperfect one (Diamond, Linz & Lipset, 1989). Political structure as such can be further described as 'mixed' or 'ambiguous' along a scale, and varies from case to case. A regime having mixed characteristics can be responsive and repressive at the same time. They are significantly responsive to some pressures from society while repressing others (Crouch, 1996).

The identifying characteristics of public policy conflict are its short duration, low degree of organisation, and limited goals. The type of political system strongly affects the nature of this low intensity conflict. Democracies are more prone to the experience of opposition to their public policies compared to autocracies. The structure and ethos of a democratic state are such that it is adjusted to respond to limited challengers in a conciliatory way. On the other hand, authoritarian regimes generally suppress public opposition, relying on coercive control (Swain, 2002).

2.1. Public Policy Conflicts and Democracies

Undoubtedly, democracy provides a fertile setting, which permits a large number of public policy conflicts to merge and operate. Moreover, due to their values and dependence on popular support, democratic regimes more often respond favourably to public demand. One of the key characteristics of democracy is governmental responsiveness to citizens on a continuing basis. Robert Dahl (1971) believes that the key requisites for achieving this end are citizen's opportunity to signify their preferences to their fellow citizens and the government by individual and collective action and have those preferences weighted equally in the conduct of government. Due to the right to rule being derived from public support, governments in a democratic system should be responsive to bottom up pressure. Democracy, characterized by the presence of its institutions, may force governments to take serious consideration of the demands and interests of their citizens (Crouch, 1996).

One of the key elements for managing public policy conflict in a democracy is an interactive process among conflicting parties using a broadly inclusive, and consensus based decision-making approach. As Wade and Curry (1970) argue, it is an obligation for democratic political systems and institutions to permit the people to require that their government reorder its priorities whenever the existing pattern of benefits is found to be unacceptable to a majority of the population. In a mature democracy, the public are well represented, and have the right to measure the regime's legitimacy and the effectiveness in engaging, representing, serving, and protecting the public in a meaningful and effective way. This helps prevent feelings of alienation and frustration, consequently resolving public policy conflicts by creating opportunities for collaborative effort. According to the International Institute for Democracy and Electoral Assistance, Sweden studies on *Democracy at The Local Level,* with democracy as a set of institutions and practices for conflict management, public policy dispute can be processed, debated and reacted to. Democracy can be operated as a conflict management system without recourse to violence (Sisk et al, 2001).

Community participation is essential to decision-making on public policy. This strategy enhances stakeholders' participation in constructive conflict management processes and increases dual direction communication in order to achieve optimal management capacity (Goldberg, Green & Sander, 1985). Democracy facilitates enhanced community involvement in the dispute resolution process, which helps the parties to perceive the agreement as fair (Burton & Dukes, 1990). Dahl (1989) emphasizes the notion of 'effective participation' as the core meaning of democracy. The public in a democratic society have adequate opportunity to express their preferences, place questions on the agenda, and articulate reasons for endorsing one outcome over another.

Useful dialogue, debate and discussion in an effort to solve problems help close the gap between political elites and the populace. The idea of 'power sharing,' with the values of partnership and cooperation integrated into policy design and implementation can be a viable alternative to 'winner takes all' democracy. It can bring further legitimacy to decisions, produce more durable solutions and prevent the escalation of confrontation and violence (Mansbridge, 1983). By participation people express their view, they listen to others, they have a 'voice', and they are heard. Although they do not necessarily make the decision, they have the opportunity to influence other people as well as the decisions (Bunker, 2000). With the perceived opportunity to participate in shaping their future, people tend to give more support to a policy they helped create.

2.2. Public Policy Conflicts and Non-Democracies

An authoritarian state offers restricted freedom in favour of obedience to authority, and this authority itself exercised with few restrictions (Schapiro, 1972). The notion of authoritarian government is often used as a virtual synonym for non-democratic government (Brooker,

2000). According to Linz (1970), authoritarianism has four main elements: the presence of limited and non responsible political pluralism; absence of elaborate and guiding ideology and instead distinctive mentalities; absence of intensive or extensive political mobilization throughout most of the regime history; and a leader (or a small group) which exercises power within poorly defined formal limits but nonetheless quite predictable ones. Authoritarian regimes are less affected by factional divisions, and have greater capacity to carry out policy implementation and national development (Haggard & Kaufman, 1995). The charismatic ruler in the regime enjoys autonomous and absolutist power to indulge personal ideological prejudice and fantasies with regards to public policy making (Brooker, 2000)

According to Brooker (2000), some non-democratic regimes achieve legitimacy by using the state as the prime mover of economic and social development. These regimes also try to penetrate society to establish control over political actors and social units at the local level, and extract resources from a largely agrarian economy. The belief in the 'strong would survive and the stronger would have the authority' encourages the authoritarian policy makers to accumulate more power with the help of each decision they make. Devolution of power to various localities is rare, especially for the policy makers who see power as tool to secure their hegemony and to protect their own political interests.

According to Rummel (1976), in a modern state where the political system keeps and enforces the general structure of expectations, conflict is often between the political elite and those attacking their policies or the status quo. The more dominate the political system in social affairs, the more social conflict swirls around the extensions of government control. Conflict may be mutual, but not necessarily symmetric (Höglund & Ulrich, 1972). Power differences between conflicting parties can be enormous in the process of conflict management, especially when it involves asymmetric power relations between strong policy makers and weak local communities, a fairly common phenomenon in an authoritarian state.

Non-democratic regimes tend to use top down decision-making approaches to public policy making. The top down decision-making process often ignores popular consensus and participation. Participation of people is limited to a 'listens but not heard' level, and any opposition from the public is overlooked or suppressed. Propaganda exhorts the people to make 'sacrifices' for the larger interest. Policy makers tend to impose decisions on the local population in the name of modernity, economic growth, and national prestige (Sugden & Keogh, 1990). The state also controls social sectors by an 'encapsulation' process, which excludes and deactivates the unfriendly popular sector (O'Donnell, 1979). Coercive power is used to suppress protest movements at the grassroots levels, in the pretext of national security, national identity, and nation building, with the aim of asserting regime authority. Advocacy groups, NGOs, international networks, and academics, that is, those who extend their support to local communities, are regarded by the regime as an act of intervention and a threat (Tyler, 1999). The authoritarian state often argues that participatory policy-making is a utopian notion (Sisk et al., 2001). Complete consensus is not possible over the policies, particularly those that have high political and economic significance. Enhanced public participation may worsen the situation by raising the stakes of the issues and preventing an efficient and binding decision.

Public policy conflicts involve asymmetric power struggles between policy makers and the public over policy formulation and implementation. The purpose of conflict management of these public policy conflicts is to address the short-term problems and prepare a comprehensive plan for long-term benefits. However, the design of political structures often results in differing conflict management approaches for each specific country. Arguments favoring democracy suggest that its institutions, structure and participative features can be consolidated as alternative conflict management procedures in public policy conflicts. While authoritarian regimes claim that when power is broadly shared, it will be difficult or even impossible to make decisions.

3. Big Dam Projects in Southeast Asia as Public Policy Conflicts

The Southeast Asian region has witnessed the most dynamic and rapid economic growth in the post war era. As newly industrialised countries, Malaysia and Thailand's economies are considered as two of the eight high performing Asian economies (HPAEs) (World Bank, 1993; Jomo, 2001). The export-oriented manufacturing boom in Southeast Asia had increased the need for energy. Large-scale hydropower projects have become part of the public policy aims to meet the increasing scarcity. Economic growth and rapid industrialization have brought development, but at the same time, the list of problems that have arisen is countless (Wong & Mohan, 1999). Big projects such as the Pak Mun Dam and Bakun Dam while providing cities with electricity and water, have created other problems such as flooding, displaced villagers, disrupted fish stocks, and polluted air, water and soil. These devastations weigh heaviest on those who use these land, water and forest resources as the basis of their livelihood. These people then take up the struggle to defend themselves (Phongpaichit & Baker, 1998).

3.1 The Pak Mun Dam in Thailand

Pak Mun Dam[1] is situated on the Mun River, 5.5 kilometres upstream from the Mekong River in Kong Jeam District, Ubon Ratchathani Province, Northeast Thailand. It is a 17 metre high and 300 metre long 'run of the river'[2] project, to divert water from the Mun River to the Mekong River for power generation (World Bank Fact Sheet, 2000; Amornsakchai, et al., 2000). The Pak Mun Dam Project costs about 3.88 Billion Baht (155.2 million USD)[3] and is estimated to generate 136 Megawatts (MW) of power (Amornsakchai, et al., 2000).

The dam also created a reservoir covering an area of 60 sq kilometers. In 1967, Thailand started planning this project on the Mun River. After more than 20 years of studies and reviews, the Thai cabinet finally approved the Pak Mun Dam proposal in May 1990. Ever since, the project has faced opposition from the local populace. More than 3080 families have been directly affected due to loss of houses, farmlands and fishing areas. Academics, NGOs, environmentalists, students, local politicians and lawyers have provided support to the affected villagers to oppose the implementation of the project.

The Pak Mun Dam conflict has become a dilemma for the Thai government in its effort to reconcile economic development and environmental protection policies. The Thai government prepared a package of economic and industrial development policies in the 1990s for the Northeast region of the country, stressing hydropower development as an essential infrastructure requirement to meet increasing energy demand. However, while formulating the policy to build the Pak Mun project, there was a clear absence of public participation. Escalation of opposition due to compensation and resettlement problems further complicated the situation. Since the Pak Mun Dam came into operation in 1994, issues such as the loss of heritage, rapids, forest, homes, fishing areas and farms, as well as a possible epidemic of blood fluke, and the negative social impact to local villagers have haunted the policy makers (Vatanasapt, 1999).

---

[1] 'Pak Mun' or 'Pak Moon' is used alternately in literature. In this paper, 'Pak Mun' is used for standardisation purposes to prevent unnecessary confusion.

[2] The 'run of the river' dam design can ensure that the water level does not rise above 106 MSL during the dry season and retains at a maximum level of 108 MSL for the rest of the year.

[3] The exchange rate between the Thai Baht and the US Dollar here is 25 Baht to 1 USD. The Pak Mun Dam project was originally funded with 23 million USD from a World Bank loan and 157 million USD of EGAT funds and local borrowings. EGAT is the government agency responsible for planning, studying potential impacts, building, and managing the operation of the hydropower plants in Thailand. This project was a component of the Bank's Third Power System Development Project, which sought to help Thailand meet the growing demand for power required to sustain its economic growth.

3.1.1 Protest against the Pak Mun Dam

Although the affected villagers demanded a halt to the dam building at an early stage, the authorities did not take the public demand seriously. According to the WCD report, "the authorities of Thailand did not consult affected villagers in the early stages of the decision-making process, nor attempting to include them in the project conflict mitigation and preventive measurements" (Amornsakchai, et al., 2000). Lack of consensus building at the conflict avoidance stages is one of the major factors of the escalation of conflict.

Compensation for people affected by the Pak Mun Dam project did not come from a comprehensive initial assessment. The Association of the Poor (AOP),[4] environmentalists and academics had protested against the Pak Mun Dam project by urging the government to form a committee to review and assess the costs and benefits, economic impacts and ecological changes. In May 1990, the Thai government set up a 'Committee for the Compensation of Land Rights and Properties and a Committee for Resettlement.'[5] The cash compensation of 24 million USD was paid for 'loss and damage to properties' (Suwanmontri, 1998). After six long years of protest, the affected fishing families received a one-time package of 3600 USD per family as compensation for 'social costs' and 'job opportunity lost' during the three years of construction (1992-1995) (Thabchumpon, 2002).

Both Banharn's government (July 1995 - September 1996) and General Chawaliti's government (November 1996 - November 1997) agreed to offer compensation to 3084 families who lost their livelihood due to the Pak Mun Dam. However, once Chuan Leekpai took over power (September 1997 - February 2001), he reversed this decision in April 1998. This uncertainty was compounded by inappropriate rehabilitation measures and policy implementation delays. It created a situation of general unrest among the public towards the policy makers. The affected villagers escalated their protests and demonstrations against the project (Amornsakchai et al., 2000).

The villagers were apprehensive that the dam would affect their livelihood and the well being of local fishermen. Furthermore, several species of fish in the Mun River would become extinct as a consequence of the interruption to the natural flow of water. The villagers, NGOs, student organisations, academics and environmentalists organised exhibitions and seminars to protest against the dam. They sent petitions to district, provincial and central governments with the aim of halting the project at the early stages (1989-1994), and to decommission the dam after its construction in 1994. The affected villagers also launched several protest demonstrations at the dam site and in front of the Government House since March 1993. The protesters claim that their livelihoods have been destroyed by the failed development policies of the government. Villagers could no longer survive on their land, as the Pak Mun Dam had blocked fish migrations from the Mekong River thereby causing a significant decline in fish catches, which had serious consequences for the people of this area. The villagers demanded the permanent opening of the Pak Mun Dam gates, to improve the standard of living of the villagers and to protect the environment. A non-violent "Let the Mun River Run Free" campaign was launched in February 1999 demanding the river's rehabilitation. A demonstration village, with more than 1000 protesting villagers and environmentalists, was

[4] The AOP is an umbrella group of six networks of organized villagers and factory workers who had been adversely affected by development policy during the last few decades. AOP has raised more than 200 problems, mainly concerning the impact of dam projects, forest and land conflicts, unhealthy working conditions-related sickness, and the rights of urban slum dwellers.

[5] It was later replaced by the Committee for Assistance to Project Affected Persons in December 1993. The main function of the committee is to provide appropriate compensation to villagers who were affected by Pak Mun Dam. Villagers were divided into three main categories. Priority compensation was given to villagers who lost their land and houses due to flooding of the river water. In the second category were villagers who live near Pak Mun Dam and were affected indirectly by the project. Villagers who were not directly affected by the project were identified as the least priority regarding compensation distribution. The compensation scheme includes 241 resettled households, and 1378 partially affected households.

established near the power generation plant on the Pak Mun Dam site. Fifty fishing boats navigated through the Mun River below the dam and symbolically released a young Mekong giant catfish into the water as a part of the campaign to demand opening the dam sluice gates and restoring the Mun River.

The Government blamed the opposition parties for supporting the anti-dam protests. It alleged that the ultimate aim of the opposition was to bring down the government. In spite of EGAT's (the government agency responsible for the dam construction and compensation in Thailand) request to take action against the demonstrators for unauthorised access to the dam site, the local officials pleaded that they were unable to address the problem (World Rainforest Movement, 1999a). Police forces guarding the site remained at a distance and observed the protest activities without trying to foil them with the use of force (World Rainforest Movement, 2000).

3.1.2. State Response to People's Protest in Thailand

EGAT has spent a large amount of its resources on a media campaign regarding the alleged benefits of the dam (Tantiwitthayaphithak, 2001). On the compensation and rehabilitation front, it claims to have spent almost 8 million USD to build roads, schools, temples, and a hospital; and provides training in agriculture, and supported occupation rehabilitation on sewing cloth and fishing for the affected villagers. In April 2002, it announced the completion of the compensation programme.[1] EGAT believes that they have tried their best at rehabilitation, and see the villagers as merely trying to get as much compensation as possible.[2]

To the demand of permanently opening the gates of the dam, the response of the state has been a mixed one. At one point during the climax of the confrontation between protesters and the state in the Thai capital in 2000, riot police acted against the demonstrators when some of them tried to brake into the Government House. The police fired tear gas and wielded batons at the protesters to control the situation. Protestors were injured, arrested, and charged with trespassing and illegal assembly. Prime Minister Chuan Leekpai defended police action, saying that although the protestors have the right to demonstrate outside the Government House, they have no right to breach the compound wall. However, the police action against protesters was criticised by more than thirty groups representing academics, human rights and democracy activists, and politicians (Economic Justice News Online, 2000).

Thailand enacted its new Constitution in 1997. For the first time in Thailand, the Constitution included elements that are essential for maintaining a sustainable society: transparency, accountability, public participation, and decentralisation. It brought greater opportunities for civil society in Thailand to coordinate. The affected villagers, with the help and support of local academics, NGOs and international NGOs, have gathered their power under AOP and formed a very strong protest network in Thailand to demand their rights.

When Thaksin Shinawatra[3] came to power in 2001, he promised 'good governance' by implementing the elements of public participation and transparency in public policy making. In comparison to its predecessors, Thaksin's government was forced to be more democratic in its decision-making under the new Constitution. On the 17 April 2001, Thaksin's government

[1] EGAT's decision to finish the compensation program in 2002 was believe to be largely due to pressure from the World Bank. Back in June 1998, the World Bank's Operations Evaluation Department released a report stating that the Pak Mun Dam's resettlement program was "exceedingly generous' and is considered to be in 'a class of its own."

[2] Ang Ming Chee's interviews with Suwit Phumiwiengsri, EGAT Senior Engineer (Level 11), official in charge for Pak Mun Dam and North-eastern Region Hydro Plant, on 15 May 2002 at Ubolratana Dam, Khon Kaen, Thailand.

[3] Mr. Thaksin Shinawatra has led the 54th Thai government since 9 February 2001.

ordered EGAT to temporally open the gates of the Pak Mun Dam for four months to conduct studies on the impacts of the dam on fisheries, social life and electricity supply. On 11 December 2001 the Cabinet agreed to the proposal by the office of the Prime Minister, to increase the period of the opened gates to one year (The Nation, 12 December 2001). The Thai government decided to take this decision due to continuous pressure from the affected population, which had been expanded into a nation wide campaign.

The opening of the Pak Mun Dam gates enabled the government constituted, URU Pak Mun Dam Research Team, to conduct the "Project to Study Approaches to Restoration of the Ecology, Livelihood, and Communities Receiving Impacts from Construction of the Pak Mun Dam". This research project focused on social, environmental, and economic impacts. The study was conducted between June 2001 and July 2002.[4] Meanwhile, a parallel track two research project, Ngarn Wijai Taiban (Grassroots People's Research), was taken up by the Chiang Mai based NGO, Southeast Asia Rivers Network (SEARIN) (Villagers Affected by Pak Mun Dam, 2002).

Although the URU research on Pak Mun Dam concludes clearly that opening the sluice gates all year would enhance and restore a healthy ecology and livelihood to the villagers,[5] the cabinet panel led by former Deputy Prime Minister Pongpol Adireksan decided that the gates would be open for four months per year (from July-October), covering the flooding period for restoration purposes (Bangkok Post, 25 September 2002). This decision was followed by the cabinet's order to immediately close the Pak Mun Dam gate door from 1 November 2002 onwards, to enable Pak Mun Dam re-operation, and continued generation of electricity. Many affected villagers and supporting groups criticized the government decision to close the dam gate. The decision to close the gate door for eight months in a year has brought protesters back to the streets of Bangkok. The campaign is gaining momentum against the restrictions imposed on the opening the Pak Mun Dam sluice gates. Facing these new developments, particularly in the face of the coming 2005 general election, the Thaksin government has started searching for an improved conflict management mechanism for the Pak Mun Dam situation.

3.2. The Bakun Dam in Malaysia

The Bakun Dam[6] is situated on the Bakun Rapids at the confluence of the Rajang[7] and Balui Rivers, in Sarawak, East Peninsular Malaysia. This dam is estimated to produce 2400 MWs of hydropower and would cost 13.5 billion Ringgits (3.6 billion USD).[8] The project included a plan for 650 kilometres of undersea electricity transmission lines to transmit electricity from Sarawak to Peninsular Malaysia, and some related infrastructure such as roads, a new township and an airport. The Bakun Dam project contains a 210 metre high concrete dam, which will create a catchments area of 14,750 sq kilometres, and floods a tract of 69,640 hectares of Sarawak's primary rainforest, roughly the size of Singapore. It will be the biggest of its kind in Southeast Asia once construction is completed. The project was first proposed in 1986, approved by the cabinet in 1994, and shelved in 1997 during the Asian economic crisis. This project was revived in 1999 in a scaled-back version with 500 MW capacities, but

---

[4] Ang Ming Chee's interview with Dr Kanokman Manorom, The Project Coordinator for Pak Mun Dam Research Project, URU, Ubon Ratchathani on 14 May 2002.

[5] Ang Ming Chee's interview with Dr Kanokman Manorom, The Project Coordinator for Pak Mun Dam Research Project, URU, Ubon Ratchathani on 22 April 2002.

[6] 'Bakun Hydro Electric Project' is the official term for the dam used by the Malaysian Government. To avoid confusion, the term 'Bakun Dam' will be used for standardization purposes.

[7] 'Rajang' or 'Rejang' River is the longest river in Malaysia, with a length of 565 km.

[8] The exchange rate between Ringgit Malaysia (RM) and the US Dollar ($) used here is RM 3.75 to $1. Some international financiers state that the cost is as much as 7 billion USD at the original planning stage of the project. However, the Malaysian government claims that the cost of the Bakun project has been cut to 2.4 billion USD after being revised in 1997. Here, the official figure given by the Malaysian Government press statement at the announcement of the Bakun Dam project has been used.

the decision was revised again in 2001 to revert to its original 2400 MW scale, though without the installation of the 600 kilometres of undersea cable. Bakun Dam is currently under construction and is expected to start its operations in 2007.[9]

Malaysian government national policy (Vision 2020), aims to achieve a fully industrialized nation by the year 2020. Large-scale projects are the key to achieving this. The Bakun Dam is expected to be the main powerhouse to meet the nation's increasing demand for energy. It will also aid economic growth and industrialisation in the Sarawak region. The Malaysian government, with the help of the Bakun Dam, also aims to develop and modernise the indigenous people of the area. Thus, the regime favours the Bakun Dam project without any reservations.[10]

3.2.1. Protest against the Bakun Dam

The Bakun Dam threatens the region's forests, rivers, soils and traditional economy. Activities such as logging, habitat destruction and reservoir flooding are expected to have a serious impact on the rainforest, resulting in severe ecological problems. These are the main concerns of the local population and activists, which lead to their open opposition of the Bakun Dam project. The lack of consultation with the affected indigenous people, and no public participation in the EIA process has been criticised by various parties. Environmentalists, NGOs and indigenous peoples' organizations in Sarawak argue that there is no need in the region for such a large power generation project (Bocking, 2003; Thompson & Hui, 2001). Kua Kia Soong, director of Malaysian Suara Rakyat Malaysia-SUARAM (The Voices of Malaysian People) alleges: "The manner in which the Bakun Dam has been justified, from the original 2400 MW with submarine cable to West Malaysia, to a downscaled 500 MW dam, now back to 2400 MW without submarine cable, smacks of very irresponsible policy making…Almost certainly, no serious attempt has been made to justify the project in terms of energy needs and supply" (Thompson & Hui, 2001).

More than 10,000 indigenous people from 15 communities used to live along the Rajang and Balui River. They have been forcibly displaced and relocated to the government-sponsored resettlement area located at Kampung Sungai Asap (Asap River Village) and Kampung Sungai Koyan (Koyan River Village). The Coalition of Concerned NGOs on Bakun (Gabungan), the Bakun Region People's Committee (BRPC), Sahabat Alam Malaysia-SAM (Friends of the Earth) and other members of Malaysian civil society are providing support to the affected indigenous people in their fight against the Bakun Dam project. These groups believe that the only real solution is shelving the project. They address the growing crisis faced by people displaced by the project, and advocate a more realistic, sustainable, transparent and democratic approach to the issue of energy needs and supply in Malaysia. However, policy makers do not provide any information to the Bakun residents nor arrange any dialogue and consultation with the different tribal groups regarding the details of compensation or resettlement schemes.

[9] The Bakun Dam is fully funded by the Malaysian Federal government led by the Barisan Nasional (BN) cabinet. The Federal government had invited the State Government of Sarawak, Tenaga National Berhad (TNB), Sarawak Electricity Supply Corporation (SESCO), Malaysia Mining Corporation Bhd (MMC) and others to participate in this joint-venture company, the Bakun Hydroelectric Corporation Berhad (BHC). Major construction contracts for the Bakun Dam project were given to Asea Brown Boveri (ABB), Comphania Brasileira de Projetos e Obras (CBPO) and Dong-Ah of South Korea. However, after the 1997 economic crisis hit Malaysia, these private companies received 250 million USD as compensation when the Malaysian Ministry of Finance decided to take over the project from BHC. The revived Bakun HEP was taken over by Sarawak Hidro Sdn. Bhd (SHSB) and its main contractor is Malaysia-China Joint Venture (MCH JV) for the civil works portion.

[10] The Bakun Dam project will have adverse impacts on water levels and salt-water intrusion in the river downstream, causing fish habitat degradation and loss of fisheries resources. At the same time it will also destroy 93 species of protected wildlife, and 1230 species of flora and fauna.

In 1999, the authorities carried out the codenamed 'Operation Exodus' resettlement exercises, which provided limited information to the affected villagers. The only information imparted was that the 70 per cent balance of their cash compensation (for the 'loss of property and goods' from their previous homes in Bakun) could only be given within two weeks of their arrival at the government-planned Asap Resettlement village. The state government also warned the villagers that compensation payments would be withheld from those who refuse to move out. Moreover, army and police forces would be used to remove protesting villagers. The fear of losing their compensation money and the worries of the armed forces action were the main reasons that drove the people to move into the resettlement area.

At the resettlement area, people are suffering from poverty, malnutrition, unemployment and adverse socio-economic conditions. There are claims that the house units at the Asap Resettlement Scheme were not in accordance with that promised in the relocation plan (World Rainforest Movement, 1999b). The land given to each family was limited to food growing but not adequate for farming activities. Without expertise in market investment, the underpaid compensation money was insufficient for the villagers and their families. These unsustainable dilemmas continue to escalate and create greater conflicts (Thompson, Harlan & Hui, 2001). Villagers from the dam site and those who lived downstream of the Balui River have petitioned to the government, demanding work on the dam be halted until compensations disputes, land rights issues, and water pollution problems have been adequately addressed (World Commission on Dams, 2001). Deteriorating conditions have forced some families to move from the resettlement area and return to their original homes in the inundation zone (Gabungan, 2001). They look up to the hundreds of families who have refused to move to the Asap Resettlement village. They have successfully established new villages on their ancestral lands near the dam. There they have enough fish, land for cultivation and forest for hunting. However, their statuses remain vulnerable, as their land is not legally recognized by the state.

The affected communities have organized several lobbying trips to the capital of Sarawak and other major cities in Peninsular Malaysia. However, it is not yet to part of the political culture in Malaysia to meet with grassroots representatives directly. The government has actively discouraged public debate and prohibited local media reporting on the adverse effects of the Bakun Dam since the beginning of construction (Gabungan, 2001). The mainstream media in Malaysia is used to support the government's policy. The dissenting voices of more than 10,000 indigenous people who have been resettled have never been adequately represented. In December 1996, a group of indigenous people arrived at the dam site's airport with the banners saying, "Do not invest in this project" and "This project will destroy our culture" just as a planeload of prospective British investors arrived. Nevertheless, such opposition to the project was never reported in the national media. Furthermore, common people and journalists are prohibited from entering the construction area, as it has been classified as a restricted security zone. This is just one of the government efforts to avoid negative reports and public criticism of the project (Schultz, 1997).

The planning and implementation of the Bakun project lacks transparency, and suffers from usual Malaysian cronyism. The feasibility studies and EIA of the project was never brought to light, despite being required under federal law. In 1995, The Sarawak Chief Minister, who was alleged to have direct financial interest[11] in the project was appointed to head the Sarawak Natural Resources and Environment Board (SNREB). Since the Sarawak EIA Guidelines do not allow public participation in the EIA process (unless the project proponents desire), there was no public input in the seventeen EIA studies[12] commissioned for the Bakun

[11] The two sons of Sarawak's Chief Minister used to hold more than four million shares in the dam construction company, Ekran Berhad, as well as 17 % of the shares of Pacific Chemicals, which has the contract for the current Stage I catchment logging, valued at 62 million USD.

[12] The research companies included Universiti Sarawak (UNIMAS), SAMA consortium, Swed Power, Snowy

Dam. Indeed, the report on the EIA finding has been classified as a confidential document under the Official Secrets Act (OSA) and therefore it is not available for public distribution (International River Network, 2002). Malaysian activist groups, which include the World Wildlife Fund for Nature (WWF) Malaysia, opposition Democratic Action Party (DAP) and the Environmental Protection Society of Malaysia (EPSM) have called on the government to release all studies on the Bakun Dam. However, the government reacted only by giving verbal assurances that the EIA of the project 'had already been done' and 'the project was safe and environmentally friendly' (Gabungan, 2001; Asia Pacific Solidarity-Sarawak, 1993).The Malaysian opposition leader, DAP chairman Lim Kit Siang alleges that the Barisan Nasional-BN (ruling National Front Alliances) revived the project in 2001 in order to influence the Sarawak state general election, hoping to win votes by promising mega development projects. Some claim that the dam construction only benefits a certain section of powerful individuals, and not the local community. The Bakun Dam project construction was granted to Ekran Berhad without proper public tender. Ekran Berhad is a private company with close links to the ruling government. When Ekran abandoned the Bakun Dam project after the 1997 economic downturn, a compensation of 253.3 million USD was given to Ekran by the government as payment for 'work already done'. Moreover, companies close to the ruling alliance, such as Shin Yang, Sam Ling and Ekran, have reserved usable land around the resettlement area for palm oil plantation.

The local population of the Bakun project area brought legal proceedings against the Bakun Dam project. They filed a lawsuit against Ekran Berhad and the Malaysian government for failing to include the public participation principle in Bakun Dam project. The Malaysian High Court handed down a judgement on 19 June 1996, declaring the project invalid and illegal because it did not comply with federal environment law, which requires some form of public participation in the EIA study (Gabungan, 1999). However, the Malaysian Government and Ekran Berhad later brought the decision to the Malaysian Court of Appeal. The Appeal Court's ruling overturned the High Court decision on 17 February 1997, and removed the legal obstacles to the construction of the Bakun Dam and exempted the Bakun Dam from complying with the federal Environmental Quality Act of 1974. The lack of judicial independence in Malaysia has made it difficult for the people affected by the dam to fight for their rights (Gabungan, 1999).

3.2.2. State Response to People's Protest in Malaysia

The political authority in Malaysia has used all its power to suppress open opposition to the Bakun Dam project. Police and armed forces have been used to apply coercive power in the name of maintaining public order. In April 1996, protestors gathered at the Ekran Berhad office in Kuala Lumpur to deliver a memorandum condemning the Bakun project. Police used tear gas and batons to disperse the crowd. Police forces also used highhanded tactics to foil protest at the dam site (Schultz, 1997). The government has regularly denounced the opponents of the project as unpatriotic and irresponsible, and even 'extremists' (World Rainforest Movement, 1999b).

The government-controlled media has come up with stories regarding several local activist groups, which campaigned against the Bakun Dam project, claiming that they are in the pockets of overseas NGOs. The government then denounced them as 'foreign agents', acting against national development policies (D'Cruz, 2002). The then Malaysian Prime Minister, Dr. Mahathir, issued a clear and unambiguous warning: "Malaysia wants to develop, and I say to the so-called environmentalists 'Mind your own business" (Schultz, 1997). The government also publicly threatened that it would monitor the activities of those who campaign against the project and might use the Internal Security Act (ISA) against them (Muslimedia, 1996). Moreover, several anti-dam activists have been denied entry into the

---

Mountains, Engineering Corporation, Lahmeyer and others.

Sarawak region. In short, the government of Malaysia has not only overlooked, but even suppressed popular opposition to the Bakun Dam project, and is determined to construct this massive dam.

4. Similar Conflicts but Different Conflict Management Approaches

Pak Mun Dam and Bakun Dam have both caused similar types of low intensity conflict between policy makers and the public over these huge hydropower projects. The policy makers from both countries have decided to construct the big dam projects, providing very little information and acting without consultation with the affected local people at the planning stages. This has led to organised opposition by the local people and their supporters against the projects construction and operation. Conflict prevention has failed at the early decision making process due to insufficient communication and interaction between the two conflicting parties.

Although both the 'dam' conflicts have similar causes, they are different in the way in which they have been managed. People who were affected by the dam projects have difficulty in finding proactive institutional support or even well defined complaint procedures to express their opposition. Moreover, both states have failed to minimize community suffering and combat the negative social impacts of the massive hydropower projects. Desperation has led the people to publicly protest in an organised manner for changes to the projects, which affect their life and environment.

Between the two countries, Thailand has a more liberal democratic structure that allows its society to enjoy greater political rights and access to a broader social movement. People in Thailand enjoy more freedom to gather and disseminate information as well as to have their input in government policy making. In the Pak Mun Dam project, conflict escalated with the absence of effective public participation processes at the preliminary stage.[13] As the living conditions on the Pak Mun River declined, people affected by the Pak Mun Dam project gathered more support from other villagers (who were suffering from other development projects) under AOP.[14] The anti Pak Mun Dam movement has, since 1990, seen the affected villagers launching various protests and demonstrations. Opposition to Pak Mun Dam was transformed from small gatherings of a few villagers protesting at a local district office in the early 1990s to the recent organised, large-scale national demonstration in Bangkok, which last for months. The villagers have been using novel demonstration methods to gain support from the public and to put pressure on the authorities. The marathon demonstration in Bangkok, a large-scale nationwide protest that marched all the way from Ubon Ratchathani to Bangkok, and the establishment of the Mai Mun Man Yuen demonstration village are parts of a series of social actions against the government's Pak Mun Dam project.

Though the affected indigenous population in Bakun and their NGO supporters are in complete disagreement with the Bakun project implementation, their organised opposition has been weak and relatively unsuccessful. Civil society in Malaysia, unlike Thailand, is constrained by the strong and predatory state. Grass-roots opposition is very limited due to highly suppressive action and a narrow degree of openness under the Malaysian semi-democratic political system. The Bakun Dam affected villagers try to influence the government decision in regular ways. They send petitions and memorandums to the government and construction companies, as well as attempts at public protest on a smaller scale (compare to Thailand). The indigenous people, using their unique cultural identity,

[13] People participation in the national development agenda was practically absent until after the violent student riots that took place in 1973 and 1976. It was only after the end of 1970's that the Thai policy makers, the technocrats and the bureaucrats began to realise that there is a need to tailor national policy to serve the need of the people.

[14] Ang Ming Chee's interview with Dr Suwit Laohasiriwong, Director of IDR, KKU on the 21 May 2002 at Khon Kaen, Thailand.

perform blockades, rituals, community meetings and networking, as well as passive actions (such as refusing to move out of the dam affected area) to challenge the state power.15

The indigenous people's effort has received support from other activists and NGOs in Malaysia. NGOs, who are often at odds with the government, have been particularly helpful in launching more efficient campaigns using universal norms and the rule of law to demand fair and just rights regarding national development decision-making (Saravanamuttu, 1987). Some activists in Malaysia also seek collaboration with members of the government, using divisions between bureaucrats, and by forging closer relations with officials (especially in development agencies) to influence policy implementation (Eccleston, 1996). However, these efforts are relatively insignificant and have not changed the basic principles of policy making and its implementations. The villagers' success in winning the court case temporarily halted dam constructions for months. However, this decision was overturned in 1997, and villagers' actions, in the eyes of the regime, delayed the construction project, wasted government money and increased the cost of the construction.

5. Political Structure and Conflict Management

Through democratisation, the principles and processes of democracy are built and strengthened within the democratic institutions. Practices and beliefs are built by fostering the participation of citizens in the democratic process. Different institutions and practises have varied influence over conflict management processes. They may intensify, escalate or diffuse the conflict situation. Democratisation tends to mobilise counter forces, as democratic states are more likely to be accountable and responsive to demand from the public. Authoritarian states are less likely to react to people's demands, requiring the public to compromise and sacrifice in the name of development.

In the case of the Pak Mun Dam, though both parties are in serious dispute, the government has made several concessions to public demand. EGAT's willingness to conduct extended studies and investigations on the adverse effects of the Pak Mun Dam, and the formation of a compensation committee to look into the possibility of providing support for the loss of fisheries incomes show that the policy makers are willing to compromise in the face of public demand. Although on many occasions EGAT have openly defended and debated with the villagers regarding details of compensation, the Thai government has chosen in several cases to compromise with the people's demand. After Thaksin came to power in 2001, the opening of the dam gate for one year, allowing the academics to conduct their study and research, and the cabinet resolution on 17 April 2001 to create several committees, sub-committees and working groups to address the problems, alleviated conflict conditions. However, the people are not satisfied with these concessions and ask for the permanent opening of the dam gate (Tantiwitthayaphithak, 2001).

Policy makers' conflict management approach in Malaysia is different from their Thai counterparts. The Malaysian authority shows no intention of resolving the dam related conflicts. Their aim is to suppress conflict instead of resolving them. Furthermore, the regime does not compromise with any public opposition, instead viewing the action as a challenge to its authority that needs to be suppressed. In the Bakun Dam conflict, the government applies coercive measures to force the affected community to accept the terms and conditions designed by the authority, particularly with respect to compensation and resettlement arrangement. Indigenous tribal leaders are being threatened with replacement if they refuse to cooperate. Furthermore, the regime in Malaysia uses its state power to negate the influence of local NGOs and other opponents who campaign on behalf of the powerless (Eccleston, 1996). The powerful semi-democratic regime also denies opportunities for

[15] Personal communication with Wong Meng Chuo, activist from IDEAL, Malaysia (Institute for Development of Alternative Living) from 29 March-6 May 2003, Sibu, Malaysia.

dialogue with opponents. NGOs and activists who intervene are condemned as 'troublemakers'. NGOs who receive support from their international network, are also publicly accused of being foreign 'puppets' (Milne & Mauzy, 1999).

In Thailand's democratic system, the fierce competition among political parties in gaining electoral support forced the government to be more accountable to public demands. The reflection and recognition of the public to government's performance can be seen as one of the measurements of power continuity. The villagers that often are the direct casualty from large-scale public policy implementation are important voters of Thailand's political leaders.

Under the new Constitution of 1997,[16] the state has to decentralize its powers, delegating from the capital to the region and then to local areas. The new constitution brought substantial reforms to the Thai political process and expanded the rights and civil liberties of Thai citizens creating a more transparent and open government. The Constitution encourages the practice of good governance to create a better political and legal environment. One of the major components is the charter that entitles and empowers people to participate in local administration and management of natural resources and the environment in their communities (Suwanmontri, 1998). The increase in people's participation in policy formulation, national development decision making processes and the national project development agenda in economic, social and political activities, is particularly evident in the Pak Mun Dam conflict after 1997 (Poapongsakorn, NaRanong & Na Ayudhaya, 1999).

Thailand has gradually strengthened the capacities of local authorities, especially in natural resource and environmental management although the public administration systems are still highly centralized (Uhlin, 2002). Despite the frequent changes in government, it has not affected the country's overall stability as the policy is designed and executed by a competent professional bureaucracy that works within democratic principles. The policy and planning of Thailand's development has become the combination of top-down and bottom up approaches (U.S. Commercial Service, 2002).

In the Malaysian political structure, the degree of democracy varies over time, yet the regime has been quite stable. Unlike Thailand, political continuity in Malaysia has been more pronounced and facilitates more ambitious public policy. Malaysia inherited basic democratic institutions from the British political tradition 40 years ago. The colonial system was highly authoritarian and the democratic institutions left behind remain until now with relatively few modifications. Although Malaysia is a federal parliamentary republic with formal democratic institutions and elections, the opposition has never had a realistic chance of defeating the ruling national front. The design of the first past the post electoral system is heavily weighted in favour of the government, with no reasonable chance of the opposition winning (Uhlin, 2001). Since independence, Malaysia's ruling multiparty and multiethnic coalition BN (Barisan National), has enjoyed unchallenged pre-eminence with control of both the legislative and executive pillar of government institutions. They have won every single parliamentary election with more than a two-third majority since independence. Barisan Nasional, under the leadership of the United Malays National Organization (UMNO), remains the most vital and powerful political outfit in Malaysia. Leaders of parties allied to UMNO in the ruling Barisan Nasional coalition use non-democratic methods to maximize theirs bargaining power within the coalition (Means, 1998).

Popular participation by the majority of the people in state decision making arenas is rare apart from the power exercised by voting in periodic elections (Callahan, 1996). The

[16] The 1997 Constitutions were drafted with extensive involvement of people throughout the country. The process of constitution drafting in 1996-97 was not limited to parliamentary sessions, but involved an exceptionally high level of public participation. Academics, NGOs, business associations, the mass media and individual citizens throughout the country had the opportunity to participate in the process. Public hearings, meetings, and representations were carried out in every province to hear people's opinion of the new constitution.

opposition parties in Malaysia cooperate on a limited level, and are therefore unable to form an effective counter alliance, particularly as they are heavily ethnically and community dependent (Crouch, 1996). The power of the opposition is too weak to influence or make significant changes to public policy decision-making (Milne & Mauzy, 1999). The lack of proportioned power to counter balance government actions has further contributed to the on-going suppressive strategy of the ruling regime. For the government, the suppressive action works well, as it sees power sharing as a threat (Coleman, 2000). The heavy-handed measures of development-proponents, by containing the people's grievances using the state machinery rather than acknowledging the need to address them, end in most cases with untold suffering by the affected people (Gabungan, 1999).

The long period of domination enables the Barisan Nasional government to bring the judiciary system under the control of the executive power. The recent successful repeal of the Bakun Dam court suit has shown the control of the regime over the Malaysian judiciary. Moreover, the civil servants who are responsible for carrying out public policy have very close ties with the ruling political coalition. In practice, the government encourages government employees to join the dominant party. The civil servants have been 'brain washed' to serve for the party and not the public (Crouch, 1996). They have to support and defend government policies, and are not to sympathise with those who act against national policy (Gomez, 1994; Gomez, 1994; Gomez, 2001).

6. Concluding Observation

In a democratic system, a high proportion of government decisions receive input from a substantial number of citizens. In a non-democratic political structure, fewer citizens make or influence a smaller number of decisions (Milne & Mauzy, 1999). Thailand comparatively has more liberal democratic characteristics than Malaysia. Still, the root of public policy conflicts over the Pak Mun Dam in Thailand lies with the traditional domination of the top-down "Decide, Announce, and Defend (DAD)" decision-making approach to national planning policy in the region. Adherence to this policy at the beginning of project construction has created a convoluted situation for the policy makers. It bypassed public participation and underestimated the need for sufficient ecological information and proper EIA before implementing the project. However, Thailand's democratic political structure provides possibilities to counter the non-consultative policies of the state. Affected people and their supporters have organized large-scale demonstrations and a highly motivated social action. Democratic culture and constitutional restrictions ensure a more accountable, responsible, and transparent regime.

Malaysia under the rule of the irreplaceable BN coalition promoted the concept of 'Asian Democracy' (Chan, 1993; Francis Loh & Khoo, 2002). which advocates economic dynamism, political stability, social discipline and cultural conservation (Rodan, 1999; Francis Loh & Khoo, 2002). Thus, the Malaysian semi-authoritarian 'modified democracy' (Crouch, 1993) and 'representative regime' (Crouch, 1996) subsequently do not act democratically especially in its public policy conflict management approach. Although the policymaking process hides behind a 'democratic procedure' smokescreen, the regime tends to use coercive practices to sustain the notion of 'less democracy, more stability, more development' (Gomez, 1994). The Bakun Dam case study has shown that the Malaysian regime sets very narrow parameters for negotiating settlements. The public has limited ability to launch counter challenges and change policy principles.

The soft authoritarian Malaysian regime is more effective in the implementation of policy decision through its dominating and suppressive methods that constrain any manifest conflict escalation. However, the suppressive action may reconcile surface conflicts but never remove the root of the problem, nor ensure secure benefits for the majority. On the other hand, Thailand, which is a more democratic country, is facing greater difficulties in solving

their public policy conflicts. The goal seeking competition through the democratic process involves complicated procedures, which may take a longer period of time to achieve mutual consensus. Nevertheless, this process is more beneficial for the nation, society and the government in the long term, particularly the growth of a healthy democratic state, where poor and marginal section of the society has the possibility to protect its interest. No particular political structure is the perfect design to prevent public policy conflicts. However, when conflicts emerge, a better-designed democratic political structure helps the parties to manage the conflict in a more just and fair manner.

Acknowledgements

Appreciation goes to the Southeast Asian Conflict Studies Network for its financial support, making the fieldwork research in Thailand possible. Cooperative responses from interviewee, research assistance of Erin Mooney and the support from the Swedish Water House to attend the Marseilles workshop is gratefully acknowledged.

References

Amornsakchai, S. et al. (2000). *Pak Mun Dam, Mekong River Basin, Thailand.* Cape Town: World Commission on Dams.

Asia Pacific Solidarity-Sarawak (1993). Sarawak's Unwanted Huge Dam. *Panchar Penemu.* 25.

Bangkok Post (2002). Thailand. 25 September.

Bocking, S. (2003). *Dams and Development, The Bakun Dam: A Case Study*. Ottawa: International Development Research Centre.

Buckles, D. & Rusnak, G. (1999). Conflict and Collaboration in Natural Resource Management. In: *Cultivating Peace-Conflict and Collaboration in Natural Resource Management.* (ed. Buckles, D.). Ottawa: International Development Research Centre.

Bunker, B.B. (2000). Managing Conflict Through Large-Group Methods. In: *The Handbook of Conflict Resolution: Theory and Practice.* (eds. Coleman, P.T. & Deutsch, M). San Francisco: Jossey-Bass Publishers.

Burton, J.W. & Dukes, F. (1990). Conflict: Practices in Management Settlement and Resolution. London: Macmillan Press.

Brooker, P. (2000). Non-Democratic Regimes: Theory, Government and Politics. London: Macmillan.

Callahan, W.A. (1996). Re-scripting East/West Relations, Rethinking Asian Democracy. *Pacifica Review.* 8 (1).

Chan, H. C. (1993). Democracy: Evolution and Implementation, An Asian Perspective. In: *Democracy and Capitalism: Asian and American Perspectives.* (eds. Bertley, R., Chan, H.C., Huntington, S.P. & Ogata, S.). Singapore: Institute of Southeast Asian Studies.

Coleman, P.T. (2000). Power and Conflict. In: *The Handbook of Conflict Resolution: Theory and Practice.* (eds. Deutsch, M. & Coleman, P.T.). San Francisco: Jossey-Bass.

Crouch, H. (1993). Malaysia: Neither Authoritarian nor Democratic. In: *Southeast Asia in the 1990s: Authoritarianism, Democracy and Capitalism*. (eds. Hewison, K., Robinson, R. & Rodan, G.). New South Wales: Allen and Unwin.

Crouch, H. (1996). *Government and Society in Malaysia.* Ithaca: Cornell University Press.

Curtain, R. (2000). Good Public Policy Making: How Australia Fares, Agenda. *Journal of Policy Analysis and Reform.* 8 (1). 33-46.

D' Cruz, N. (2002). SAM Accused of Lying about U.S. Funding. *Bernama.* Malaysia. 23 May.

Dahl, R.A. (1971). *Polyarchy: Participation and Opposition.* New Haven: Yale University Press.

Dahl, R.A. (1989). *Democracy and its Critics.* New Haven: Yale University Press.

Diamond, L. & Plattner, M.F. (eds.) (1998). *Democracy in East Asia.* Baltimore: The John Hopkins University Press.

Diamond, L., Linz, J.J. & Lipset, S.M. (eds.) (1989). *Democracy in Developing Countries, Volume Three: Asia . Boulder.* Col: Lynne Rienner.

Eccleston, B. (1996). Does North-South Collaboration Enhance NGO Influence on Deforestation Policies in Malaysia and Indonesia. In: *NGOs and Environmental Policies: Asia and Africa.* (ed. Potter, D.). London: Frank Cass.

Economic Justice News Online (2000). International Monetary Fund/World Bank News Brief. 3 (2).

Francis Loh, K.W. & Khoo, B.T. (2002). *Democracy in Malaysia.* London: Curzon Press.

Gabungan (1999). *Final Report of the Bakun Fact Finding Mission of 7th - 14th May 1999*. Malaysia: Institute for Development of Alternative Living.

Gabungan (1999). Resettlement of Indigenous Peoples. *World Commission on Dams Final Report*. Cape Town: World Commission on Dams.

Gabungan (2001). International Campaign To Stop the Bakun Hydroelectric Dam. 14 March.

Goldberg, S.B., Green, E.D. & Sander, F.E.A. (1985). *Dispute Resolution.* Boston: Little Brown.

Gomez, E.T. (1994). *Political Business: Corporate Involvement of Malaysian Political Parties.* Brisbane: Centre for South East Asian Studies, James Cook University.

Gomez, E.T. (1994). *Malaysia's Political Economy: Politics, Patronage and Profits.* United Kingdom: Cambridge University Press.

Gomez, E.T. (2001). Corporate Bailouts: National Interest or Vested Interest? *Aliran Monthly*. 3.

Haggard, S. & Kaufman, R.R. (1995). *The Political Economy of Democratic Transitions.* Princeton: Princeton University Press.

Haynes, J. (ed.) (2001). Democracy and Political Change in the 'Third World'. London: Routledge.

Höglund, B, & Ulrich, J.W. (1972). Peace Research and the Concepts of Conflict Summary and Criticism. In: *Conflict Control and Conflict Resolution.* (eds. Höglund, B. & Ulrich, J.W.). Copenhagen: Munksgaard.

International River Network (2002). *Bakun Dam, Balui River, Sarawak, Malaysia.* http://www.irn.org/wcd/bakun.shtml

Jomo, K.S. (2001). Rethinking the Role of Government Policy in Southeast Asia. In: *Rethinking the East Asian Miracle.* (eds. Stiglitz, J.E. & Yusuf, S.). New York: Oxford University Press.

Lewis, G., Gewirtz, S. & Clarker, J. (2000). *Rethinking Social Policy.* London: Sage Publication.

Linz, J.J. (1970). An Authoritarian Regime: Spain. In *Mass Politics.* (eds. Allardt, E. & Rkkan, S.). New York: Free Press.

Mansbridge, J. (1983). *Beyond Adversary Democracy.* Chicago: University of Chicago Press.

Means, G.P. (1998). Soft Authoritarianism in Malaysia and Singapore. In: *Democracy in East Asia* (eds. Diamond, L. & Plattner, M.F.). London: John Hopkins University Press.

Milne, R.S. & Mauzy, D.K. (1999). *Malaysian Politics under Mahathir.* London: Routledge.

Muslimedia (1996). Malaysia. April-August.

O' Donnell, G. (1979). Modernization and Bureaucratic Authoritarianism: Studies in South American Politics. Berkeley: University of California Press.

Phongpaichit, P. & Baker, C. (1998). Thailand's Boom and Bust. Bangkok: Silkworm Books.

Placier, M. & Hall, P.M. (2000). Policy as the Transformation of Intentions: Making Multicultural Education Policy. *Journal of Educational Policy.* 14 (2). 259-290.

Poapongsakorn, N., NaRanong, V., & NaAyudhaya, A.I. (1999). *Final Report: The Process of Formulating Poverty Reduction Strategies in Thailand*. Bangkok: Thailand Development Research Institute.

Rodan, G. (1999). The Internationalisation of Ideological Conflict: Asia's New Significance. *Pacific Review.* 9 (3). 328-351.

Rummel, R.J. (1976). *Understanding Conflict and War (Vol. 2).* New York: Sage Publications.

Saravanamuttu, J. (1987). The State, Authoritarian and Industrialization: Reflections on the Malaysian Case. *Kajian Malaysia.* 5 (2).

Schapiro, L. (1972). *Totalitarianism*. London: Pall Mall.

Schultz, D. (1997). Rivers of the Dammed - The Australian. *The Australian Magazine.* 10-11 May.

Sisk, T.D. et al. (2001). Democracy at the Local level: The International Institute for Democracy and Electoral Assistance (IDEA) Handbook on Participation, Representations, Conflict Management and Governance. Sweden: International IDEA.

Stiglitz, J.E. & Yusuf, S. (eds.) (2001). *Rethinking the East Asian Miracle.* New York: Oxford University Press.

Sugden, D. & Keogh, J (1990). *Problems in Movement Skill Development*. Columbia: University of South Carolina Press.

Suwanmontri, M. (1998). Thailand: Development and Public Participation-The Status and Process in Thailand. In: *Public Participation in Electric Power Projects.* Bangkok: Programme For Asia Cooperation on Energy and the Environment.

Swain, A. (2002). *Social Networks & Social Movements: Are Northern Tools Useful to Evaluate Southern Protests?* Uppsala: Uppsala Peace Research Papers No. 4.

Tantiwitthayaphithak, V. (2001). Thailand: Voice of the Poor. *Matichon Daily.* 30 November.

Thabchumpon, N. (2002). Thailand in Conflict: A Hidden Cost of Conventional Development Policy. In. Proceedings of the Third Southeast Asian Conflict Studies Network Regional Workshop-Public Policy Conflicts, Khon Kaen, Thailand, 6-8 May 2002. (eds. Laohasiriwong, S. & Blake, D.J.H.). Thailand: Institute for Dispute Resolution.

The Nation (2001). Thailand. 12 December.

Thompson, H. & Hui, S. (2001). Bakun Dam Lurches Forward. *World Rivers Review.* June.

Titmuss, R. M. (1958). *Essays on The Welfare State.* London: Allen & Unwin.

Tyler, S.R. (1999). Policy Implications of Natural Resource Conflict Management. In. *Cultivating Peace-Conflict and Collaboration in Natural Resource Management*. (ed. Buckles, D.). Canada: International Development Research Centre.

Uhlin, A (2001). The Trans-national Dimension of Civil Society: Migration and Independence Movements in Southeast Asia. In: *Civil Society and Authoritarianism in The Third World: A Conference Book* (eds. Beckman, B., Hansson, E. & Sjögren, A.). Stockholm: Politics of Development Group, Department of Political Sciences, Stockholm University.

Uhlin, A. (2002). Development and The External Dimension of Regime Transitions. In: *Development and Democracy: What Have We Learned and How?* (eds. Elgstrom, O. & Hyden, G.). London: Routledge.

U. S. Commercial Service (2002). *Country Commercial Guide-Thailand,* http://www.usatrade.gov/Website/CCG.nsf/CCGurl/CCG-THAILAND2002-CH-3:-005ACCCF.

Vatanasapt, V. (1999). Research in Conflict and Conflict Management in Asia in Peaceful Conflict Management and Good Governance. In: *Proceedings of Southeast Asia Regional Forum on Peaceful Conflict Management and Good Governance, Khon Kaen, Thailand, 17–20 September 1999.* (eds. Laohasiriwong, S. & Grzybowski, A.). Thailand: Institute for Dispute Resolution.

Villagers Affected by Pak Mun Dam (2002). Findings of Villager Research on the Impacts of Opening Pak Mun Dam Gates in Thailand. *Progress Report of Thai Baan Research.* Southeast Asia Rivers Network: Thailand Chapter.

Wade, L.L. & Curry, R.L. (1970). *A Logic of Public Policy: Aspects of Political Economy.* California: Wadsworth Publishing.

Wong, T.C. & Mohan, S. (1999). Development and Challenge: Southeast Asia in the New Millennium. Singapore: Times Academic Press.

World Bank (1993). The East Asian Miracle: Economic Growth and Public Policy. New York: Oxford University Press.

World Bank Fact Sheet (2000). *Brief on Issues around Pak Mun Dam*. 12 September.

World Commission on Dams (2001). *Sarawak People's Declaration Against Large Dams.* A Declaration Issued during the Sarawak Workshop on the World Commission on Dams, Bintulu, Sarawak, Malaysia, 27-28 June 2001.

World Rainforests Movement (1999a). The Statement of AOP: Demonstration Pak Mun Dam site in Ubon Ratchathani Province. *World Rainforests Movement Bulletin. 23.*

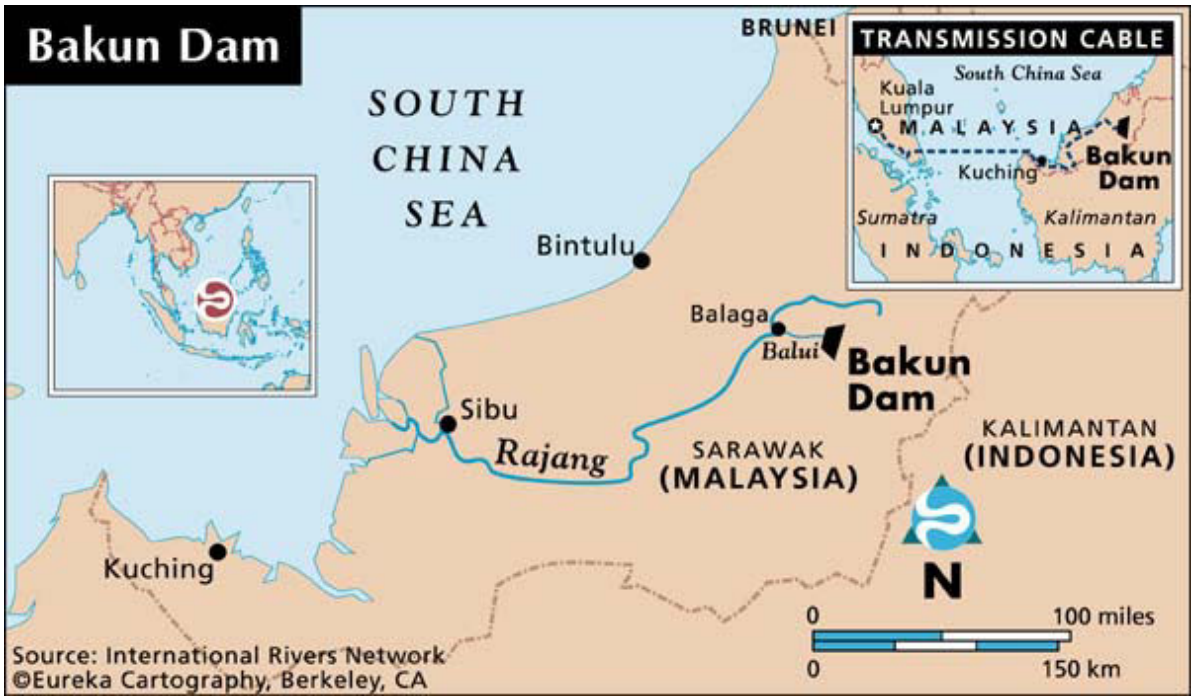
World Rainforests Movement (1999b). Malaysia: Conflict Caused by Bakun Dam continues in Sarawak. *World Rainforests Movement Bulletin.* 24.

World Rainforests Movement (2000). Free the Moon River. *World Rainforests Movement Bulletin.* 33.

Appendix 1: Location of Pak Mun Dam, Thailand

Sources: The World Commission on Dams, http://www.dams.org/images/maps/map_mekong_bw.htm

Appendix 2: Location of Bakun Dam, Malaysia



Source: International Rivers Network, http://www.irn.org/programs/bakun/map.html

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

Stephen Tyler, International Development Research Center.

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

Raouf F. Khouzam, Ph.D.[1]

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 2nd World Water Forum in The Hague and the World Summit on Sustainable Development in Johannesburg. In 2003, the 3rd 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*

[1]Independent researcher.
Mailing address: P.O. Box 150, Gezira, Cairo 11568, Egypt.
Mobile phone: 002-010-526 0776
email: rfkhouzam@yahoo.com

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 disadvantageous 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).[2] 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

[2] 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.

References [3]

Affeltranger, Bastien, and Alexander Otte 2003, "Shared Freshwater Resources: Management or Governance?". In Anthony Turton, Peter Ashton and Eugene Cloete (eds.), Transboundary Rivers, Sovereignty and Development: Hydropolitical Drivers in the Okavango River Basin, African Water Issues Research Unit (AWIRU) and the Green Cross International (GCI), ch.12, pp. 251-74.

Allan, J. A. 2000, "IWRM essentials: Political Feasibility Requires A Fifth Water Management Paradigm", Draft handed over during the Dialogue on Water for Food and Environmental Security, Colombo, Sri Lanka, 13-16 Dec.

----- 1996, "Policy Responses to the Closure of Water Resources: Regional and Global Issues." In P. Howsam and R. C. Carter (eds.), Water Policy: Allocation and Management in Practice, Proceedings of International Conference on Water Policy, held at Cranfield University, 23-24 September, pp. 3-12, London: E & FN EPON.

Bathia, R. and M. Falkenmark. 1993. "Water Resource Polices and the Urban Poor: Innovative Approaches and Policy Imperatives." Water & Sanitation Currents. UNDP–World Bank Water and Sanitation Program.

[3] The information of Arabic references are translated into English by the author.

Bosch, Christophe, Kirsten Hommann, Gloria Rubio, Claudia Sadoff, and Lee Travers 2003, "Water and Sanitation." In the World Bank, Poverty Reduction Strategy Sourcebook, Macroeconomic and Sectoral Approaches: Social Indicators, vol. 2, ch. 23, Washington D.C.: the World Bank.

Bromley, D. 1991, Environment and Economy: Property Rights and Public Policy. Cambridge, MA: Basil Blackwell.

CPI (Center for Public Integrity) 2004, "The Water Barons", Investigative Journalism in the Public Interest. http://www.publicintegrity.org/

Chalker of Wallasey (Rt Hon Baroness) 1996, "Foreword". In P. Howsam and R. C. Carter (eds.), op. cit.

Dinar, Ariel, Mark W. Rosegrant, Ruth Meinzen-Dick 1997, "Water Allocation Mechanisms: Principles and Examples", Policy Research Working Paper 1779, the World Bank: Agriculture and Natural Resources Department, Sector Policy and Water Resources Division and International Food Policy Research Institute, June 1997.

Easter, K. William, 1990, "Inadequate Management and Declining Infrastructure: The Critical Recurring Cost Problem Facing Irrigation in Asia." In R. K. Sampath and Robert A. Young (eds.), Social, Economic, and Institutional Issues in Third World Irrigation Management, ch. 11, pp. 217-45, Studies in Water Policy and Management, No. 15, Boulder, Colorado, Westview Press.

El-Hessy, Farida and Mona El-Kady 1995, "Water Management and Conservation Strategies in the Northern Delta", Strategic Research Program, Working Paper Series No. 23-1, Ministry of Public Works and Water Resources, Environmental and Natural Resources Policy and Training Project (EPAT), Winrock International Institute for Agricultural Development, and US Agency for International Development.

FAO 2004, "The State of Food Insecurity in the World 2003: Counting the Hungry: Latest Estimates," FIVIMS Secretariat, Economic and Social Department, Rome: FAO. www.fao.org March.

FAOSTAT 2004. http://faostat.fao.org/faostat/

FAO 2002-a, "The State of Food Insecurity in the World", Rome: FAO.

FAO 2002-b, "World Agriculture towards 2015/2030", Rome: FAO.

FAO 2000-c, Deficit Irrigation Practices, Water Reports 22, Rome: FAO.

http://www.fao.org/DOCREP/004/Y3655E/y3655e00.htm

Gardiner, Rosalie 2000, "The Second World Water Forum: A New Way Forward?" In Danielle Morley (ed.), "Perspectives on Freshwater: Issues and Recommendations of NGO's." Background Papers of the Dialogue on Water for Food and Environmental Security, Colombo, Sri Lanka, 13-16 Dec.

Guerquin, Francois, Tarek Ahmad, Mi Hua, Tetsuya Ikeda, Vedat Ozbilen, and Marlies Schuttelaar 2003, "World Water Actions: Making Water Flow for All," WWC (World Water Council), Water Action Unit, London: Earthscan Publications Ltd.

Kindall, Henery W and David Pimentel 1994, "Constraints on the Expansion of the Global Food Supply", Ambio vol. 23, no. 3, May.

Lundqvist, Jan and Torkil Jonch-Clausen (eds.) 1994. Putting Dublin/Agenda 21 into Practice: Lessons and New Approaches in Water and Land Management, Special Session at VIII IWRA World Congress, Cairo, Nov. 21-25.

Meinzen-Dick, Ruth S., Rajendra Pradhan, and Monica Di Gregorio 2004,"Collective Action and Property Rights for Sustainable Development: Understanding Property Rights", 2020 Focus 11, Brief 3, IFPRI, February.

Morris, J. 1996, "Water Policy: Economic Theory and Political Reality". In Howsam and Carter (eds.), op. cit., pp. 228-34.

Ostrom, Elinor 2004, "Collective Action and Property Rights for Sustainable Development: Understanding Collective Action", 2020 Focus 11, Brief 2, IFPRI, February.

Paarlberg, Robert L. 2001, "The Politics of Precaution: Genetically Modified Crops in Developing Countries", International Food Policy Research Institute (IFPRI), Food Policy Statement, No. 35, Oct. 2001, Washington, D.C.

Pinstrup-Andersen, Per, Rajul Pandya-Lorch, and Mark W. Rosegrant 1999, "World Food Prospects: Critical Issues for the Early Twenty-First Century," IFPRI Food Policy Statement, no. 29, October.

Rosegrant , Mark W., Ximing Cai, and Sarah A. Cline 2002, World Water and Food to 2025: Dealing with Scarcity, International Food Policy Research Institute, Washington, D.C.

Scott, Brian 2003, "World Food Trade – What Must We Do?" OXFAM, Local and Global Dimensions of Food Security.

Seckler, David W. 1986, "The Management of Paddy Irrigation Systems: A Laissez-Faire, Supply-Side Theory." In K. C. Nobe and R. K. Sampath (eds.), Irrigation Management in Developing Countries: Current Issues and Approaches, Studies in Water Policy and Management, No. 8, Boulder: Westview Press, ch. 13, pp. 413-26.

Small, Leslie E. 1990, "Financial Tools for Improving Irrigation Performance." In Sampath and Young (eds.), op. cit., ch. 12, pp. 247-67.

UN 2003, World Population Prospects: The 2002 Revision Highlights. Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, New York: the United Nations. *http://www.un.org/esa/population/unpop.htm* March, 2004.

UNESCO 2002, "Summary of the Monograph World Water Resources at the Beginning of the 21st Century", prepared in the framework of IHP (International Hydrological Programme). *www.unesco.org/water/ihp/db/shiklomanov/summary.html* *March.*

WHO 2003, "General Comment on the Right to Water;" ch. 2.

www.who.int/entity/water_sanitation_health/en/rtw2.pdf

Wills-Johnson, Nick, Alan Lowdon, and Hudson Bill 2003, "Access and Competition in the Water Industry", Water Policy, vol. 5, no. 2, pp. 101-14.

World Food Council 1984. World Food Program in Africa - Fighting famine and assisting development. Mimeograph 84-46412. World Food Council, Rome.

Young, Robert A. 1996, "Measuring Economic Benefits for Water Investments and Policies," World Bank Technical Paper No. 338, the World Bank, Washington D.C.

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

Amy Stewart, Politics Department, University of Newcastle upon Tyne

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 12th meeting in April this year where the progress that TTPs have made will be reviewed. In May 2003, at its 11th 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 Imerialist 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 6th 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 practioners 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, practioners, 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 or 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.

References

Anti Imperialist League (2001) "IMF forces African countries to privatise water" Anti Imperialist League (http://www.lai-aib.org/lai/article_lai.phtml?section=A3ABBT&object_id=8661, March 14, 2003)

Barlow, M. (2003) "Blue Gold: The global water crisis and the commodification of the world's water supply – A Special Report issued by the International Forum on Globalization" Third World Traveler (http://thirdworldtraveler.com/Water/Introduction_BG.html, January 28, 2003)

Biersteker, T. J. (1992) "The 'Triumph' of Neoclassical Economics in the Developing World: Policy Convergence and Bases of Governance in the International Economic Order" in J. N. Rosenau & E.O. Czempiel eds. Governance Without Government: Order and Change in World Politics, Cambridge: Cambridge University Press

Brinkerhoff, J.M. (2002) "Global Public Policy, Partnership, and the Case of the World Commission on Dams" Public Administration 62 (3), 324-336

Calder, F. (2002) "Strange New Alliances" The World Today (Aug/Sep), 8-9

Caplan, K. & Payne, L. (2000) "The Workshop Series: NGO Workshop Report" Business Partnerships for Sustainable Development in Water and Sanitation (http://www.bpd-waterandsanitation.org/english/docs/ngoreport.pdf, February 6, 2003)

Cook, P. (1997) "Privatization, Public Enterprise Reform and the World: Has 'Bureaucrats in Business' Got it Right?" Journal of International Development 9 (6), 887-897

Corporate Europe Observatory (2002) "Girona Declaration" Corporate Europe Observatory (http://www.xs4all.nl/~ceo/un/gironadecl.html, March 10, 2003)

Crawford, G. (2003) "Partnership or power? Deconstructing the '*Partnership for Governance Reform'* in Indonesia" Third World Quarterly 24 (1), 139-159

Engelberts, H, (2003) "Preface" in D. Hall "Financing water for the world – an alternative to guaranteed profits" Public Services International Research Unit (http://www.psiru.org/reportsindex.asp, March 14, 2003)

European Commission (2003) "Water for Life: Europe Day at the World Water Forum" Commission Press Room (http://europa.eu.int/rapid/start/cgi/guesten.ksh?p_action.gettxt=gt&doc=MEMO/03/63|0|RAPID&lg=EN&display=, May 16, 2003)

European Union (2002) "EU Water Initiative: Water for Life – Health, livelihoods, economic development, peace and security. Implementing the Programme of Action of the WSSD." Johannesburg Summit 2002 (http://www.johannesburgsummit.org/html/sustainable_dev/p2_managing_resources/2508_eu_water_initiative.pdf, January 13, 2002)

Gallant, M.H., Beaulieu, M.C. & Carnevale, F.A. (2002) "Partnership: an analysis of the concept within the nurse-client relationship" Journal of Advanced Nursing 40 (2), 149-157

Gardiner, R. (2001) "Freshwater: A Global Crisis of Water Security and Basic Water Provision" in F. Dodds ed., Earth Summit 2002: A New Deal [2nd ed] London: Earthscan

Gardiner, R. (2002a) "Governance for Sustainable Development: Outcomes from Johannesburg" Earth Summit 2002 Building Partnerships for Sustainable Development (http://www.earthsummit2002/es/issues/governanceoutcomes.pdf, December 11, 2002)

Gardiner, R. (2002b) "Freshwater: A Global Crisis of Water Security and Basic Water Provision" Earth Summit 2002 Building Partnerships for Sustainable Development (http://www.earthsummit2002.org/es/issues/Freshwater/freshwater.htm, December 11, 2002)

Hall, D., Bayliss, K. & Lobina, E. (2002) "Water privatisation in Africa" Public Services International Research Unit (http://www.psiru.org/reportsindex.asp, March 14, 2003)

Haque, M. S. (1996) "Public Service Under Challenge in the Age of Privatization" Governance 9 (2), 186-216

Hemmati, M. (2002) Multi-Stakeholder Processes For Governance and Sustainability, London: Earthscan

Hemmati, M. & Whitfield, R. (2003) "Partnership Follow-up to Johannesburg" Network 2015 – May Issue (http://www.earthsummit2002.org/es/newsletter/Network%202015%20Issue%20IV.rtf, May 12, 2003)

Interviewee 1 (2003) Representative of a partner organisation in PAWS and the EUWI (November 11)

Interviewee 2 (2003) Representative of a partner organisation PAWS (November 11)

Interviewee 3 (2003) Representative of a partner organisation in PAWS and the EUWI (November 12)

Interviewee 4 (2003) Representative of a partner organisation in PAWS and the EUWI (November 14)

Jackson, P.M. & Price, C. (1994) "Privatisation and regulation: a review of the issues" in P.M. Jackson & C. Price eds., Privatisation and Regulation: A Review of the Issues, Harlow: Longman

Kara, J. & Quarless, D. (2002) "Guiding Principles for Partnerships for Sustainable Development ('type 2 outcomes') to be Elaborated on by Interested Parties in the Context of the World Summit on Sustainable Development (WSSD)" Johannesburg Summit 2002 (http://www.johannesburgsummit.org/html/sustainable-dev/sustainable_dev.html, January 13, 2003)

Kirkpatrick, C. (2002) "The UK Privatisation Model: Is it Transferable to Developing Countries?" in V.V. Ramanadham ed., Privatisation in the UK, New York: Routledge

Mathiason, N. (2003) "Left high and dry by the water companies" Guardian Unlimited (http://www.observer.co.uk/business/story/0,6903,915139,00.html, June 5, 2003)

Mitchell, E. (2003) Head of Corporate Social Responsibility, Europe, RWE Thames. [Interview] November 14.

Nowak, S. (2003) Policy Co-ordinator, Water UK. [Interview] November 13.

Partners for Water and Sanitation (2004) "Proposal for Partners for Water and Sanitation Partnership with Nigeria" attached file in Les Peacock (Les.Peacock@defra.gsi.gov.uk, 9 February, 2003) RE: PAWS research. Personal email to A. Stewart (amyeleanorstewart@yahoo.co.uk)

Partners for Water and Sanitation (2003a) "pawsbriefjan03" attached file in Peacock. L. (Les.Peacock@defra.gsi.gov.uk, 27 January, 2003) RE: Personal email to A. Stewart (Aimster2508@yahoo.co.uk)

Partners for Water and Sanitation (2003b) "Rule of Engagement for Partners' Participation in Projects in South Africa" attached file in Les Peacock (Les.Peacock@defra.gsi.gov.uk, July 15, 2003). Personal email to A. Stewart (amyeleanorstewart@yahoo.co.uk)

Partners for Water and Sanitation (2003c) "The Partners" Partners for Water and Sanitation (http://www.partnersforwater.org/, July 23, 2003)

Peacock, L. (2004) (Les.Peacock@defra.gsi.gov.uk, February 10) RE: PAWS research. Personal email to A. Stewart (amyeleanorstewart@yahoo.co.uk)

Peacock, L. (2003a) Civil Servant (DEFRA) - PAWS Secretariat. [Interview] November 10.

Peacock, L. (2003b) (Les.Peacock@defra.gsi.gov.uk, 15 July) RE: PAWS research. Personal email to A. Stewart (amyeleanorstewart@yahoo.co.uk)

Pitelis, C. & Clarke, T. (1993) "Introduction: The Political Economy of Privatisation" in T. Clarke & C. Pitelis eds., The Political Economy of Privatization, London: Routledge

Robinson, D. (1999) "Partnerships - Practice and Theory" in D. Robinson ed., Partnership – From Practice to Theory, Wellington: Institute of Policy Studies

Terry, G. & Calaguas, B. (2003) Financing the Millennium Development Goals for domestic water supply and sanitation, London: WaterAid

Tompkins, J. (2003) Policy Advisor, Water UK. [Interview] November 13.

Torjman, S. (1999) "Partnership: Building Block for a Caring Society" in D. Robinson ed., Partnership – From Practice to Theory, Wellington: Institute of Policy Studies

UNED Forum (2002) "Multi-stakeholder Processes" Earth Summit 2002 (http://www.earthsummit2002.org/msp/, May 15, 2003)

United Nations (2003) "The Road from Johannesburg: What Was Achieved and The Way Forward" United Nations Johannesburg Summit 2002 (http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/POIChapter4.htm, February 10, 2004)

United Nations Department of Economic and Social Affairs (2002) "European Union Backs Development of New Partnership Initiative on Water" Johannesburg Summit 2002 (http://www.johannesburgsummit.org/html/whats_new/feature_story12.htm, December 4, 2002)

United Nations Development Programme (1997) Governance for Sustainable Human Development, New York: UNDP

United Nations Division for Sustainable Development (2003) "Partnerships for Sustainable Development" United Nations Division for Sustainable Development (http://www.un.org/esa/sustdev/partnerships/partnerships.htm, July 7, 2003)

Vidal, J. (2003) "All dried up" Guardian Unlimited (http://www.society.guardian.co.uk/societyguardian/story/0,7843,916631,00.html, June 5, 2003)

Waller, R. (2003) Regional Director, Mouchel Parkman [Interview] November 13.

Wilson, A. & Charlton, K. (1997) Making partnerships work: A practical guide for the public, private, voluntary and community sectors, York: Joseph Rowntree Foundation

World Health Orgainzation (2003) The Right to Water, Geneva: World Health Organization

World Resources Institute (2002) "News Release: WRI expresses disappointment over many WSSD outcomes" World Resources Institute (http://newsroom.wri.org/newsrelease_text.cfm?NewsReleaseID=135, February 10, 2004).

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

John Dore, Unit for Social & Environmental Research, Chiang Mai University, PO Box 144, Faculty of Social Sciences, Chiang Mai University, 50202, Thailand, johndore@loxinfo.co.th

Yu Xiaogang, Green Watershed, 7th floor, 133 Qixiang Road, Kunming 650034, Yunnan, China, yxg@greenwatershed.org

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.[1] 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.

[1] 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.[2] 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^3 (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**?[3] It is important to clarify whether demand estimates are unnecessarily 'high'

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

[3] 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[4]

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

---

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

[4] 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 <u>and potential</u>** (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.[5] 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).

[5] 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	End of SPC monopoly with announcement that SPC assets are to be acquired/transferred to 5 independent electricity generating, 2 transmission & 4 consultant/construction companies. The impending creation of an industry regulator was also signalled. Not all energy assets were included in this restructure. *Power generation companies:* > Huaneng, Datang, Huadian, Guodian, China Power Investment Company *Distribution (grid) companies:* ▪ State Power Grid Company which controls the operation of 5 regional power grid companies in the North, Northeast, East, Central and Northwest. 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). ▪ 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. 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). *Consultant/construction companies:* ▪ Hydraulic Power Designing Institute ▪ Electric Power Designing Institute ▪ China Water Conservancy & Hydropower Construction Group ▪ China Gezhouba Group *Regulator:* ▪ State Electricity Regulatory Commission (SERC).
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	*Example:* Signing of MoU to transfer power plants in Jiangsu Province to Guodian.
	19-Sep	*Example:* 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	*Example:* 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).

Hydroropower 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[6] 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 Sarng 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).[7]

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

[6] 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.

[7] 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 Thongrung 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.8 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 also 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.

8 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:[9]

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

[9] 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.

References

ADB (2002) 'The 2020 project', Comprehensive report describing the Western Region Development Strategy. Asian Development Bank, Manila.

Alexanders Oil and Gas Connections (2003) 'Profile of China's electric power industry', *News and Trends: East and Southeast Asia* 8:2.

Blake D (2001) 'Proposed Mekong dam scheme in China threatens millions in downstream countries', World Rivers Review, June 2001, 4-5.

Business Weekly, 'Power companies rushing to build new plants', 26 March 2003.

China Daily, 'Power monopoly broken down, electricity regulatory commission to set up', 30 December 2002.

China Daily, 'State run power grid reforms underway', 4 September 2003.

China Daily, 'CLP Power to invest in thermopower plants in Guangxi', 15 October 2003.

China Daily, 'Leaders stress development', 6 March 2004.

China Economic Review, 'China's hydro capacity to double', December 2002/January 2003, 6.

China People's Daily Online, 'Energy demand set to double by 2020', 19 November 2003.

China People's Daily Online, 'China's grid giant gives shares to Huaneng company', 24 September 2003.

China People's Daily Online, 'Regulator sets target for China's power sector reform', 26 March 2003.

China People's Daily Online, 'China steps up development of southern power grid', 27 March 2003.

China Power News (translated by Kevin Li), 'Economic vision: hydropower faces dilemma again in China', 10 February 2004.

Forsyth T (1999) International Investment and Climate Change: Energy Technologies for Developing Countries. Royal Institute of International Affairs, London.

Freshfields Bruckhaus Deringer (2003) 'Restructuring China's power sector', China Notes, March 2003.

Gao Shixian (2000) 'China' in PB Stares (ed.) *Rethinking Energy Security in East Asia*. Japan Centre for International Exchange, Tokyo.

ICOLD (2001) A brief Introduction to Dachaoshan hydropower project, [15 December 2001, International Commission on Large Dams website]

IRN (2002) 'China's Upper Mekong dams endanger millions downstream', Briefing paper 3. International Rivers Network, Berkely.

Jia Mulan (2003) 'Overview of power industry', tdctrade.com, 10 March 2003.

Medlock KB and Soligo R (1999) 'China and long-range Asia energy securities: An analysis of political, economic and technological factors shaping Asian energy markets'. Rice University's James A Baker Institute for Public Policy.

Mingsarn Kaosa-ard and Dore J (eds.) (2003) *Social Challenges for the Mekong Region*. White Lotus, Bangkok.

MRC (2002) *Annual Report 2001*. Mekong River Commission, Phnom Penh.

MRC (2003) *State of the Basin Report*. Mekong River Commission, Phnom Penh.

MRC, UNDP, CNMC, NEDECO and MIDAS (1998) 'Natural resources-based development strategy for the Tonle Sap area, Cambodia: Final Report, Volumes 1-3'. Mekong River Commission, Phnom Penh.

Nareerat Wiriyapong (2003) 'Egat wants China and Burma to join in huge hydropower project', The Nation, 16 November 2003.

Plinston D and He Daming (1999) 'Water resources and hydropower', Report for ADB TA-3139 Policies and Strategies for Sustainable Development of the Mekong River Basin. Asian Development Bank, Manila.

Rajesh N (2003) 'Thailand's Salween dams to fuel Southeast Asian regional power grid at the cost to ethnic communities forests and rivers', *Watershed* 9:1, TERRA.

Roberts TR (2001) 'Killing the Mekong: China's fluvicidal hydropower-cum-navigation development scheme', *Natural History Bulletin of the Siam Society* 49, 143-159.

Sarkkula J, Koponen J and others (2003) 'Modelling Tonle Sap for environmental impact assessment and management support', Final report. Finnish Environment Institute and EIA Ltd., Helsinki and Espoo.

Stares PB (ed.) (2000) *Rethinking Energy Security in East Asia*. Japan Centre for International Exchange, Tokyo.

TERRA (2002) 'Creating catastrophe: China and its dams on the Mekong', *Watershed* 8:2, Towards Ecological Recovery and Regional Alliance.

Vaitheeswaran V (2003) Power to the People: How the coming energy revolution will transform an industry, change our lives, and maybe even save the planet. Farrar Straus and Giroux.

van Zalinge N, Nao Thuok and Sam Nuov (2001) 'Status of the Cambodian inland capture fisheries with special reference to the Tonle Sap Great Lak', Cambodia Fisheries Technical Paper Series Volume III. Inland Fisheries Research & Development Institute of Cambodia, Phnom Penh.

Watcharapong Thongrung (2003) 'EGAT told to suspend dam talks', The Nation, 27 October 2003.

Xinhua News Agency, 'World's biggest power grid built in China', 23 September 2003.

“The Importance of the Ecoregiòn Sierra-Costa of Chiapas and the Water and Nature Iniciative in The Tacana Volcano with the UICN”.

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

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 Km² 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 Km², 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 km². The river basin of the Suchiate has 1,400 Km² 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 Km² 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 Km². 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 monitorear 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 Cacahoatán.

- *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 Cacahoatán, 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 foliages of the region by women of Cacahoatán, Chiapas.

- *With this project it is wanted to develop to a breeding ground for the propagation of flowers and tropical foliages 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 rambután 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 Cacahoatán, 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[1] and Peter Kangwa[2]

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.

[1] Programme Officer, PAMOJA .(Water Resource Development specialist)
[2] Director, PAMOJA Trust. (Political Scientist, a former Diplomat and District Commissioner)

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

by
Kwame Odame-Ababio, Ghana Water Resources Commission, e-mail: odameababio@yahoo.com

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^2 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 ^{0} 45' N in Ghana to latitude14 ^{0}N in Mali. The widest stretch spans between longitudes 5^{0}W and 2^{0}E along 11^0 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^2), White Volta (106,000 km^2), Oti (72,000 km^2) and Lower Volta, including Lake Volta (73,000 km^2).

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^3/s of which some 42% originates from outside Ghana.

The White Volta with an estimated annual flow of 300 m^3/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^3/s, which occasionally can reach more than 500 m^3/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^2. 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^3 *(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)*.

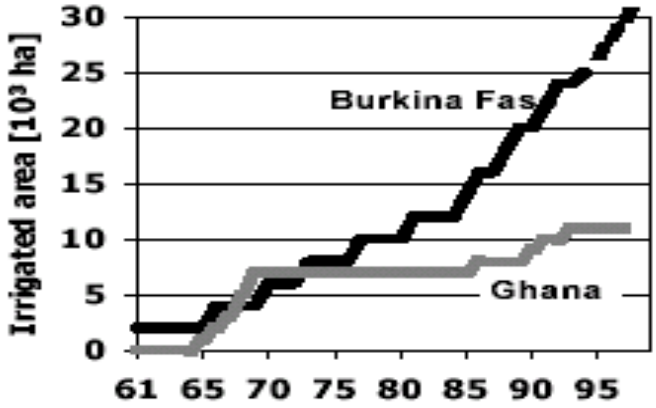


Figure 2: Trends in irrigation development in Ghana and Burkina Faso

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.

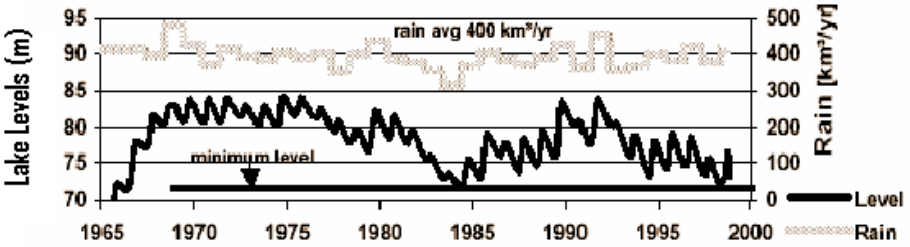


Figure 3: Lake Volta water levels (1965 – 1999)

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.

References

Andreini, M., van de Giesen, N., van Edig, A., Fosu, M. & Andah, W. (2000) Volta Basin Water Balance. ZEF Discussion Paper no. 21, ZEF, Bonn, Germany.

van de Giesen, N., Andreini, M.., van Edig, A., Vlek, P. (2001) Competition for Water Resources of the Proposal.

IUCN-BRAO & GWP-WAWP (2003) Improving Water Governance in the Volta River Basin, Project Proposal.Volta Basin. IAHS publication no. 268.

FAO (2000), FAOSTAT. FAO, Rome, Italy. http://apps.fao.org

Gyau-Boakye, P. & Tumbulto, J. W. (2000) The Volta Lake and Declining Rainfall and Streamflows in the Volta River Basin. Environment, Development and Sustainability 2, 1–10.

Sally, H. (1997) Améliorer les Performances des Périmètres Irrigués: Les Actes du Séminaire Régional du Projet Management de l'Irrigation au Burkina Faso. IIMI, Colombo, Sri Lanka.

GEF-Volta TDA (2002) Volta River Transboundary Diagnostic Analysis, GEF-PDF B.

Madiodio, N. (2002) Dialogue on Water, Food and Environment -- the Volta River Basin, Project

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

Sébastien TREYER, Futures studies unit - Research department - Ministry of Ecology and Sustainable Development[1], France
and
RGTE (Recherche en gestion sur les territoires et l'environnement) - ENGREF (French institute of forestry, agricultural and environmental engineering), Paris

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

[1] Service de la recherche et de la prospective, Ministère de l'Ecologie et du Développement Durable
20, Avenue de Ségur 75 302 Paris 07 SP - France
Tél : 01 42 19 22 76 – Fax : 01 42 19 17 71 – mail : sebastien.treyer@environnement.gouv.fr
This research contribution does not represent the official position of the French ministry in charge of the environment.

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 efficiency2 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[3] 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[4] 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

[2] We borrow this distinction between « end use efficiency » and « allocative efficiency » from Allan, quoted by Turton and Ohlsson, 1999.

[3] 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.

[4] 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[5]. 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

[5] 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.

Variable and process	Past trend, extrapolated	Possible intervention
Development of desalination	Slow development and diffusion, nearly restricted to private investment (tourism)	Strong subsidised development for domestic, industrial, municipal uses and for tourism
Treated wastewater reuse diffusion	Slow development and diffusion of wastewater reuse	Strong development of wastewater reuse, based on voluntary public mobilisation (on the Israeli model)
Evolution of agricultural water use in private irrigates schemes	Growth of water use in private irrigated schemes, causing further overexploitation of aquifers	Overexploitation of aquifers by private farmers is stopped
Evolution of agricultural water use in public irrigated schemes	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%.
Evolution of per capita water demand for domestic uses	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
Growth of water use for tourism	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
Changes in the national water management model	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

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

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.

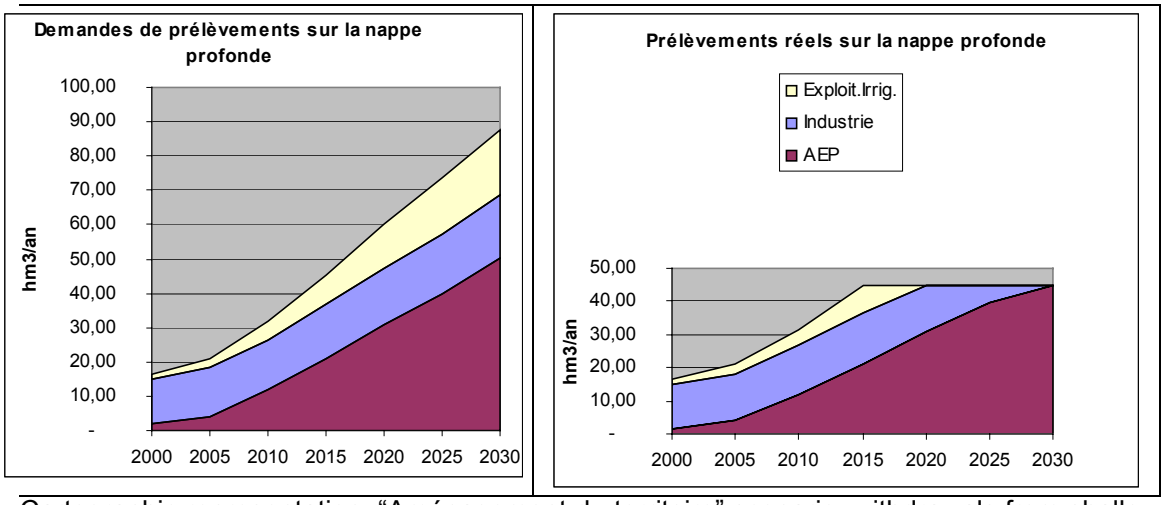
For further illustration of how the scenarios are constructed, see Box 1.

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

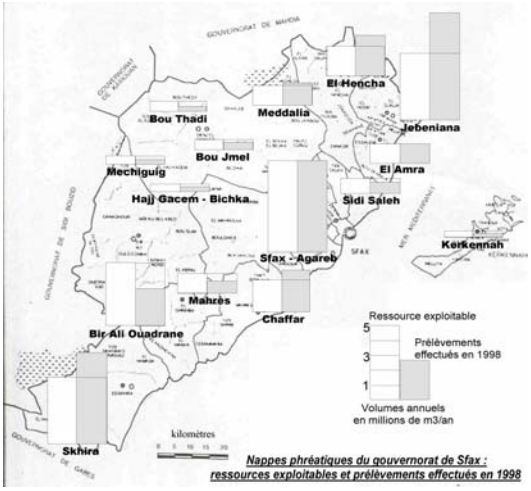
Storyline: scenario "Développement spontané", a brief summary.

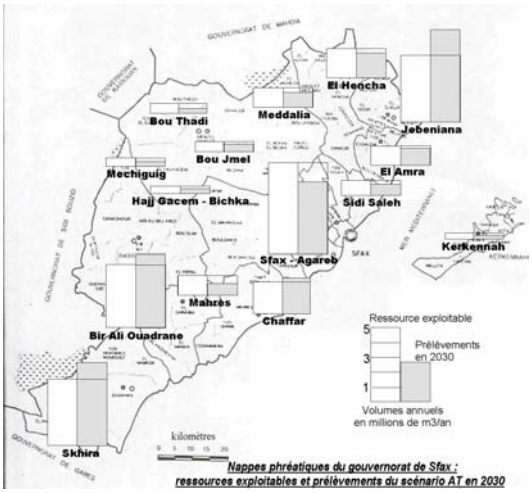
« The city of Sfax continues growing without implementation of land use planning policies. Because of water scarcity and of the euro mediterranean free trade zone, agricultural employment in the region decreases drastically. Sfax must incorporate this new population and labour force, which accelerates 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.

References

Blue Plan (2003) « Résultats du Forum de Fiuggi sur les avancées de la gestion de la demande en eau en Méditerranée : Constats et Propositions », Technical report, Sophia Antipolis, 20p.

DG-EGTH, Ministère de l'Agriculture (1995), *Economie d'eau 2000 - Rapport final*. Direction Générale des Equipements et Grands Travaux Hydrauliques, Tunis.

DG-RE, Ministère de l'Agriculture (1999), *Etude du secteur de l'eau*. Direction Générale de la Ressource en Eau, Tunis (10 vol.- 10 thèmes).

Jouvenel, Bertrand de (1964) “L’art de la conjecture”, Editions du Rocher.

Khanfir, R., El Echi, M.L., Louati, M., Marzouk, A., Frigui, H.L., Alouini, A. (1998) *EAU 21 : Stratégie du secteur de l'eau en Tunisie à long terme 2030 – Rapport final*, Rapport pour le ministère de l'Agriculture, mars 1998

Mamou, A., Kassah A. (2000) Economie et valorisation de l'eau en Tunisie, Sécheresse, 11(4):246-256

Pérennès, J.J. (1993) "L'eau et les hommes au Maghreb", Karthala, Paris.

POLAGWAT (2001) « Possibilities of implementation of future water demand management policies in the Mediterranean - Scenario Phase Report of the POLAGWAT Research Programme », EU funded POLAGWAT Research Programme (« Impact of sectoral policies on agricultural water use in the Mediterranean »), July 2001

Ravenel, P. (2002) La société civile en Tunisie, l'Harmattan.

Treyer, S., (2000), «Equilibre à long terme entre ressource et demande en eau en région méditerranéenne : comment utiliser les méthodes de prospective ? L'exemple de la région de Sfax (Tunisie)», Communication to the Conference «Interdépendance entre agriculture et urbanisation : conflits sur l'usage durable de l'eau et des sols» (Tunis, April 2000, published) - Concerted Action «Agriculture and urbanization in the Mediterranean region : enabling policies for sustainable use of soil and water» (DG Research, EU).

Treyer, S. (2002) « Analyse des stratégies et prospectives de l'eau en Tunisie – Rapport II : Prospective de l'eau en Tunisie », Technical report, Blue Plan, Sophia Antipolis, November 2002.

Turton, A. R. and L. Ohlsson. (1999). Water scarcity and social stability : towards a deeper understanding of the key concepts needed to manage water scarcity in developing countries. Occasional Paper: School of Oriental and African Studies (SOAS) - Water Issues Study Group, University of London.

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

Juan Mª Fornés, África de la Hera & M. Ramón Llamas
Department of Geodynamics, Complutense University, 28040 Madrid. Spain
E-mails: jmfornes@geo.ucm.es; delahera@geo.ucm.es; mrllamas@geo.ucm.es;
Fax: + 34 913944845

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^3 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 that 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^3/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^3/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^3 in 1960 to about 6,000 Mm^3 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^3 / yr)	Percentage of total use supplied by background	Range of average values (€/m^3)	Total economic value (10^6 €)
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).

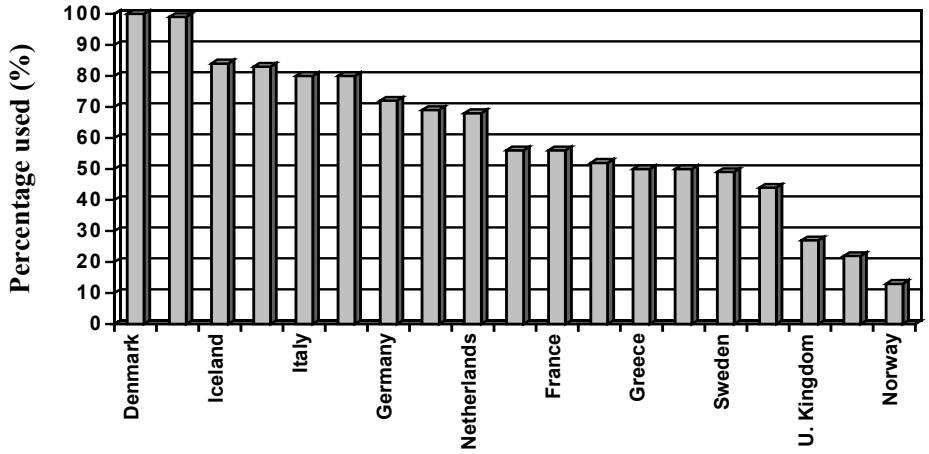


Figure 1. Percentage of groundwater used for public supply in different European countries
Source: Llamas, Fornés, Hernández-Mora and Martínez Cortina, (2001). Data from EEA (1999).

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^3/ha/yr and 8,200 m^3/ha/yr, respectively.

Table 2. Water use for irrigation in Spain

Origin of water	Surface water	Groundwater	Mixed	Total
Irrigated areas (10^3 ha)	2,250	950	150	3,350
Average volumes used (m^3/ha/yr)	8,200	4,700	-	7,200
Total volume used (Mm^3/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^3 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 (10^3 ha)	600	210	810
Total production (10^6 €)	1,950	1,800	3,750
Average consumption at origin (m^3/ha/yr)	7,400	4,000	6,500
Water productivity (€/m^3)	0.42	2.16	0.72
Employment generated (EAJ/10^6 m3)	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 is 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 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 multisecular 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.

Acknowledgements

The authors are extremely grateful to the British Ecological Society/European Ecological Federation, that has made possible to comment some of these topics in a recent Symposium "Ecology without frontiers: environmental challenges across Europe" held in Exeter at the beginning of April 2004.

References

Adams, B. & MacDonald, A. (1995). Overexploited aquifers. Final Report. British Geological Survey. Technical Report WC/95/3.

Barraqué, B. (1997). Groundwater management in Europe; regulatory, organizational and institutional change. Proceeding of the International Workshop: how to cope with degrading groundwater quality in Europe. Stockholm, Sweden.

Bredehoeft, J.D., Papadopoulos, S.S. & Cooper, H.H. (1982). The water budget myth (scientific basis of water management). Studies in Geophysics. National Academy of Sciences: 51–57.

Burke, J.J. & Moench, M. (2000). Groundwater and Society: Resources, Tensions and Opportunities. United Nations Publication. Sales No. E.99.II.A.1.

Corominas, J. (2001). El papel económico de las aguas subterráneas en Andalucía. In: N. Hernández-Mora and M.R. Llamas (eds.), La economía del agua subterránea y su gestión colectiva. Mundi-Prensa and Fundación Marcelino Botín. Madrid: 111–139.

Custodio, E. (1992). Hydrogeological and hydrochemical aspects of aquifer overexploitation. In: I. Simmers, F. Villarroya and L.F. Rebollo (eds.). Selected Papers on overexploitation. International Association of Hydrogeologists. Selected Papers, Vol. 3. Heise, Hannover, Germany. Verlag Heinz Heise: 3-27.

Custodio, E. & Llamas, M.R. (2003). Intensive use of groundwater: introductory considerations. In: M.R. Llamas & E. Custodio (eds.). Intensive use of groundwater: challenges and opportunities. Lisse, The Netherlands: Swets & Zeitlinger B.V: 3-12.

European Environmental Agency. EEA (1999). Sustainable water use in Europe–Part 1: Sectoral use of water. Environmental assessment report, No. 1. European Environment Agency. Office for Official Publications of the European Communities. Luxembourg.

European Union, EU, (2003). Technical Meeting to Discuss Certain Aspects of the Proposed Ebro Transfer. Date of Meeting: 16th/17th October 2003. (http://europa.eu.int/comm/environment/water/spanish_hydrological_plan.html).

Foster, S., Lawrence, A. & Morris, B. (1998). Groundwater in Urban Development, World Bank Technical Paper, nº 390.

German Federal Government. (2001). Ministerial Declaration. Bonn keys. Bonn recommendations for Action. International Conference on Freshwater. Bonn.

Hernández-Mora, N., Llamas, M.R. & Martínez Cortina, L. (2001). Misconceptions in aquifer overexploitation: implications for water policy in Southern Europe. In: C. Dosi (ed.). Agricultural use of groundwater. Towards integration between agricultural policy and water resources management. Kluwer Academic Publishers: 107–125.

Hernández-Mora, N., Martínez Cortina, L. & Fornés, J. (2003). Intensive Groundwater Use in Spain. In: M.R. Llamas & E. Custodio (eds.). Intensive use of groundwater: challenges and opportunities. Lisse, The Netherlands: Swets & Zeitlinger B.V: 387-414.

Llamas, M.R. (1985). Spanish water resources policy: the illogical influence of certain physical and administrative factors. Mem. of the 18th International Congress of the International Association of Hydrologists, Vol. XVIII, part.2, 160-168.

Llamas, M.R. (1999). Consideration on ethical issues in relation to groundwater development and/or mining. In: UNESCO International Conference on regional aquifer systems in arid zones. Managing

non-renewable resources. Tripoli, Libya. Technical Documents in Hydrology V IHP, Nº 42, UNESCO, Paris, 467-480.

Llamas, M.R. (2002). Groundwater and human development. Proceedings of the XXXII IAH & VI ALHSUD Congress. Mar del Plata, Argentina.

Llamas, M.R. (2003a). Epilogue. Water International, 28(3), 405-409.

Llamas, M.R. (2003b). Comments on groundwater Issues. In: A technical Review of Spanish National Hydrological Plan. Ebro River out-of-basin Diversion (TRSNHP). Written by the U.S. Technical Review Team c/o Alex Herne Associates. (http://www.unizar.es/fnca/dow/docu12.doc).

Llamas, M.R.; Fornés, J.M.; Hernández-Mora, N. & Martínez Cortina. L. (2001). Aguas subterráneas: retos y oportunidades. Madrid. España: Mundi-Prensa and Fundación Marcelino Botín.

Llamas, M.R. & Custodio, E. (2003). Intensive use of groundwater: a new situation which demands proactive action. In: M.R. Llamas & E. Custodio (eds.). Intensive use of groundwater: challenges and opportunities. Lisse, The Netherlands: Swets & Zeitlinger B.V: 13-31.

Llamas, M.R. & Custodio, E. (eds.) (2003). Intensive use of groundwater: challenges and opportunities. Lisse, The Netherlands: Swets & Zeitlinger B.V.

Llamas, M.R. & Martínez Santos, P. (in press). Ethical issues in relation to intensive groundwater use. In: A. Sahuquillo, J.E. Capilla, L. Martínez Cortina & X. Sánchez Vila (eds.). Intensive use of groundwater. Lisse, The Netherlands: Swets & Zeitlinger B.V: 17-36.

López Geta, J.A. & De la Orden, J.A. (2003). Drought as a catalyser of intensive groundwater use. In: M.R. Llamas and E. Custodio (eds.). Intensive use of groundwater: challenges and opportunities. Lisse, The Netherlands: Swets & Zeitlinger B.V: 177-189.

Martínez Cortina, L.; Hernández-Mora, N. & Llamas, M.R. (2002). El uso sostenible de las aguas subterráneas en España. Boletín Geológico y Minero. July-September. Instituto Geológico y Minero de España. 113 (3): 229–241.

Martínez Cortina, L. & Hernández-Mora, N. (2003). The Role of Groundwater in Spain's Water Policy. Water International, 28(3), 313-320.

Moench, M. (1999). Addressing constraints in complex systems. Meeting the water management needs of South Asia in the 21st Century. In: M. Moench et al. (eds.). Rethinking the Mosaic. Institute for Social and Environmental Transition. Boulder, Colorado, USA.

Moench, M. (2003). Groundwater and poverty: exploring the connections. In: M.R. Llamas and E. Custodio (eds.). Intensive use of groundwater: challenges and opportunities. Lisse, The Netherlands: Swets & Zeitlinger B.V: 441-455.

Salameh, E. (1996). Water quality degradation in Jordan. Royal Society for the conservation of Nature. Amman, Jordan.

Selborne, L. (2000). The ethics of freshwater use: a survey. COMEST, UNESCO. Paris, France.

Shah, T., Molden, D., Sakthivadivel, R. & Seckler, D. (2000). The global groundwater situation: overview of opportunities and challenges. International Water Management Institute. Sri Lanka.

Sophocleous, M. (2000). From safe yield to sustainable development of water resources. The Kansas Experience. Journal of Hydrology, 235: 27–43.

Sophocleous, M. (2003). Environmental implications of intensive groundwater use with special regard to streams and wetlands. In: M.R. Llamas and E. Custodio (eds.). Intensive use of groundwater: challenges and opportunities. Lisse, The Netherlands: Swets & Zeitlinger B.V: 93-112.

Theiss, C.J. (1940). The source of water derived from wells. Essential factors controlling the response of an aquifer to development. Civil Engineering, 10: 277–280.

World Commission on Dams (2000). Dams and developments, a new frame for decision-making. Earthscan.

Parliamentarians Role In Water Management: Water and Politics in the South Caucasus

By Anna Gekht, Programme Officer, Sustainable Development & Population Programme, Parliamentarians for Global Action (PGA)

Although the subject of water management is seemingly unrelated to political tensions, environmental resources, especially access to clean water, provide a unique venue for common discussions and partnership building between the opposing sides. During the long years of fighting and gradual desolation significant ecological decline equally suffered by Armenia and Azerbaijan has become a problem for both sides and thus requires joint action. Cooperation on environmental issues carries over to political dialogue. A strategic long-term partnership on shared water interests allows for increased collaboration and mutual agreement on issues in other areas. On the basis of this principle, Parliamentarians for Global Action (PGA) conducted a series of roundtable discussions between parliamentarians of Armenia and Azerbaijan to address the link between regional conflict management and environmental policy.

PGA Background

Parliamentarians for Global Action (PGA) is a membership organization of national legislators from around the world. Initiated in 1979 by a group of concerned parliamentarians, the organization includes only legislators from elected parliaments within its membership. All of PGA's activities are coordinated by the Secretariat based in New York. PGA's programmes in Sustainable Development & Population, Peace & Democracy, and International Law & Human Rights are directed by members of the governing body and the Executive Board, in cooperation with the International Council. Executive Board Members also serve as Chairs and Vice Chairs for specific programmes, and work closely with their respective programme officers at New York headquarters.

With a network of over 1,350 political leaders from 111 countries, PGA has been working with individual parliamentarians on environmental matters, with special focus on clean water access as critical mechanism for partnership building between countries with common borders, since 1995 when it convened South Asian Workshop on Water Management in the Maldives. The workshop involved parliamentarians from Bangladesh, India, the Maldives, Nepal, Pakistan and Sri Lanka who gathered together to discuss a range of regional water management projects, including hydro-electric dams and the distribution issues between India and Nepal and India and Bangladesh. PGA has continued its work on water management a series of dialogues between the parliamentarians of Greece and Turkey aimed at promoting better relations between the two countries torn apart by the ongoing conflict over the status of the island of Cyprus. At the same time, upon the recommendation of the USAID PGA Executive Committee has decided to run similar series of parliamentary discussions between the MPs from Armenia and Azerbaijan that had commenced in January of 2002.

Project Background

The conflict between the Armenians and the Azeri over Nagorno-Karabakh is among the most intractable disputes in the world. Both Armenians and Azeri claim absolute historic ownership of the region, located between the two countries and populated predominantly by the Armenians. As a result of serious fighting, Armenia has occupied the contentious area along with about 20% of Azeri territory by 1993. The leaders of Karabakh have declared the independence of the country hat has not been recognized by any other state.

Prolonged political tension and open fighting have led to a significant economic decline of all the participating sides that were already significantly impacted by the collapse of the Soviet system. Reduced GDP brought about economic and social problems and a 'free-fall' in the standard of living.[1] Armenia has suffered deeply from an energy blockade initiated by Azerbaijan and joined by Turkey; and Azerbaijan has so far been unable to use its rich oil and natural gas resources essential for normalization of its economy. Organised to find a resolution to the Nagorno-Karabakh stalemate by the OSCE in 1997, the "Minsk Group" has shown little progress in resolving the conflict. As a result, for over 13 years, the stalemate between Armenia and Azerbaijan has remained in place and the situation appears immovable. These tensions have had an enormous impact on water shortages in both countries that share the same water resources of the Kura-Araks water basin. Without good governance and a commitment by both governments to address social, developmental and political concerns at both the executive and legislative levels, the threats to human security will continue.

Environmental Background

The area occupied by the basin of Kura-Araks rivers is 188 thousand km^2 and spreads over the territory of five states.[2] An enormous part of the population of South Caucuses lives on these two rivers and most of agricultural and industrial enterprises are located on their banks. Furthermore, the basin of these two rivers, that also involves Lake Sevana in Armenia, is the main source of fresh water to the populations of Armenia and Azerbaijan as well as Georgia. Their waters, however, are subject to substantive pollution of physical, chemical and biological after-products of production. The average amount of pollutants exceeds the established norms by 2 to 9 times and often represents a substantial threat to human health.[3]

Various fragmented efforts applied on intergovernmental level by the states of the South Caucasus have not led to significant improvement as it requires cooperation among of all the states involved in the initial pollution of the Kura-Araks waters as well as lake Sevana and the Caspian Sea. All the sides involved have become signatories to a number of international conventions protecting transborder water resources as well as passed their own legislation to cleanse and protect the water-basins. However, the implementation of these conventions and laws, aimed at protecting the transboundary water resource has been severely hampered by the ongoing stalemate over the Nagorno-Karabakh.

Project Details

As institutions, parliaments have an enormous role to play in helping to stabilize nascent democracies and as national legislative bodies remain indispensable to any long-term resolution of conflict and maintaining peace. Parliamentarians play a role as political actors who can engage in discussions with protagonists as peers. The role of parliamentarians as legislators directly accountable and representative of affected constituencies necessitates their involvement in bilateral discussions to develop needed strategies and exchange information.

It has, therefore, been widely agreed that a comprehensive settlement requires the input and participation of legislators; the fifteen-year conflict, for which the parties are asked to assume responsibility and decide on the right of self-determination for the region, necessitate such

[1] Caucasus Environment Outlook (CEO) 2002, publication by UNEP
[2] ibid.
[3] ibid.

input. Parliamentarians, representing minority populations affected by the ongoing dispute, are responsible for decisions on development aid and assistance to displaced populations, critical to Nagorno-Karabakh.

On the basis of this belief, PGA has begun the series of dialogues on water management between the parliamentarians of Armenia and Azerbaijan in 2002 with the anticipation that the environmental discussions on a topic of common interest may later lead to more political programme of action that would lead to closer cooperation and relations between the stalemated states. The two parliamentary delegations, facilitated by an independent facilitator, Sen. Longin Pastusiak, President of Polish Senate, a water consultant and PGA's staff have convened three times since January 2002 and have defined and agreed on a practical strategy aimed to improve the cooperation and relations between the two countries. The negotiations, coined as Track 1 ½ diplomacy, have involved parliamentary groups of 5 parliamentarians representing relevant environmental committees and political groups from both sides. In the course of their collaboration the participating MPs have reviewed and prioritized national and regional water and environmental issues/problems though the site visits conducted in August 2002, where environmental damage to identified lakes and rivers was assessed. During their subsequent meetings in Johannesburg, August 2002 and Vienna, October 2002, the delegations have developed a tentative water and environmental vision for the two countries, which includes the relation of the environmental problems to regional stability and development.

After the initial introduction of the participating sides and site visits aimed at identifying concrete sites for specific projects for joint development such as Lake Sevana, Kura and Araks rivers and delta of the Caspian Sea, both delegations have participated in Parliamentary Workshop on Clean Air and Clean Water held by PGA on August 29 – 30, 2002, in Johannesburg, South Africa, as a parallel event to the World Summit on Sustainable Development (WSSD). In the letter of intent derived from the Johannesburg series of meetings both parties stressed the importance of international involvement in the region and an initiative that would establish a joint monitoring of water sites under the facilitation of PGA. The monitoring strategy is currently being devised by the participating legislators in collaboration with independent experts and PGA staff.

Furthermore, it has been continually stressed in the previous bilateral meetings between the delegations of Armenia and Azerbaijan that lack of information-sharing resulting from the political instability and lack of trust between the two sides offers a major obstacle to potential collaboration of the two countries in dealing with the environmental issues. Both delegations have requested PGA's facilitation in organizing a confidential information exchange channel exclusively available to the series' participants and PGA staff members. PGA is currently working on establishing a confidential electronic medium that will disseminate the technical information on water-pollution already available in both countries to each group via a confidential Internet database.

The Azeri and Armenian delegations continued their discussions in four bilateral side meetings to further develop their joint proposals. The delegations agreed that parliamentary site-visits would be conducted of the major pollution sites and a comprehensive, ongoing monitoring mechanism would be developed involving regional experts in water management and the parliamentarians of both countries.

When the two delegations reconvened at the Diplomatic Academy in Vienna in October of 2002, the parliamentarians formed a Coordination Council (CC), consisting of members of parliament and representatives of PGA to oversee the work of selected technical experts in identifying sites along the Kura and Araks rivers for monitoring and cleanup. This Coordination Council has been already put in place and is currently establishing a monitoring group composed of the selected experts, along with representatives of international

organizations who will liaise with relevant state and public organizations, scientific, research and educational institutions, and other legal entities in information collection and the creation of a database on the condition of transboundary water resources.

Conclusions

Collaboration on such technical environmental concerns has incorporated political dialogues from the start of the series, with parliamentarians providing a legislative perspective on the proposed compromise peace accords drafted by the Minsk group of the OSCE for discussion with both President Aliyev and President Kocharian. However, political matters have purposefully remained secondary to the series as it was recognized that cooperation on matters such as water management has more potential in promoting warmer relations that will allow the discussions on sensitive political issues to reconvene.

Indeed, the dialogues have provided an opportunity for collaboration and discussion and have led to the development of a concrete programme of action that will further the cooperation on the common environmental problems and hence potentially promote the dialogue on politically charged issues.

As the result of the discussions, both countries exhibited strong interest in establishing initiatives and programs to address water pollution and signed two letters of understanding that they would work through a commission of parliamentarians and water experts to identify significant sources of transboundary water pollution and develop projects on improving water monitoring. The participants have established a long working relationship and active participation in water management efforts. Furthermore, aside for the environmental collaboration the series have resulted in building a close personal relationship among the participating parliamentarians, who were able to see and get acquainted with the grievances of 'the other side'.

Unfortunately, the series have been temporarily stopped due to the lack of funding that organisations such as ours severely depend on. The interest of the parliamentarians involved, however, has remained unchanged. They remain active members of PGA network and re-emphasize their search for wider development international involvement that they believe is crucial for environmental and political improvement in the region.

Le niveau pertinent pour la gestion des services d'eau et d'assainissement

René Coulomb, Président de la Société Hydrotechnique de France, Gouverneur du Conseil Mondial de l'Eau

Abstract

Relevant level of decision making for water supply and sanitation

As far as the integrated water resources management is concerned, the general consensus is that the appropriate level of the management is the river basin.

But it is not the case for water supply and sanitation, which bring us to the following question: what is the relevant level of planning, management and decision making for water supply and sanitation?

Water supply and sanitation are both entirely local problems, not only for historical or cultural reasons, but mainly because transportation of drinking water is a costly procedure and waste water transport is even more expensive. Both are narrowly linked together and the best way of managing waste water is to finance investments, operation and maintenance of waste water transport and treatment, with money collected by drinking water bills.

Even if the relief is important for the cost of sanitation (it is not so true for drinking water), the physical geography is not important at all. In the case of water supply and sanitation, the responsibility of the management should be handed to the local communities. At this local level, all the problems may generally be taken in consideration in the best way: customer services quality, price (and the apportionment between the different types of users, between rich and poor, the distinction between what is paid by the present customers and what will be paid by the future generation through the reimbursement of debts), along with the consultation of the civil society carried through by the elected local councilors.

On a national level, it will just be necessary to enact general rules, minimum standards of water quality (for European countries it is even done on the European level), legal control of local communities and the possibility of partial price equalization between different communities (but preferably for a limited period of time without withdrawing the main responsibility of the local communities).

° °
°

Il est actuellement reconnu que les bassins des fleuves, des lacs et des aquifères sont les territoires appropriés pour l'organisation et la gestion intégrée des ressources en eau, visant la satisfaction durable de l'ensemble des besoins essentiels et légitimes des différents usagers, la protection contre les risques (inondations, sécheresses), la préservation et la restauration des écosystèmes. Le Réseau International des Organismes de Bassin (RIOB/INBO) rappelle dans sa dernière lettre (n° 12 Décembre 2003-janvier 2004) les conditions de mise en œuvre de cette politique, y compris pour les bassins transfrontaliers.

En France, la politique de mise en œuvre de Schémas d'Aménagement des Eaux (SAGE) applique ce principe à l'échelon local permettant la meilleure gouvernance possible grâce à la participation des toutes les parties concernées.

Il est également reconnu que la politique générale de l'eau doit être définie aux niveaux des états souverains, dans des conditions que rappelle le rapport du Panel mondial sur le financement des infrastructures de l'eau -
Financer l'eau pour tous", établi en 2003 sous la direction de Michel Camdessus pour satisfaire, dans les pays en développement, les objectifs du Millénaire dans le domaine de l'alimentation en eau et de l'assainissement.

Les considérations développées par le Panel restent pertinentes même pour les pays développés, étant entendu que la politique de l'eau peut être, pour partie, définie à un niveau plus élevé que celui des Etats, comme c'est le cas dans l'Union européenne, où de nombreuses directives établies au niveau européen s'imposent aux Etats membres (notamment la directive cadre européenne sur l'eau).

° °
°

Par contre, en ce qui concerne l'alimentation en eau et l'assainissement, il n'y a pas, en pratique de consensus sur le niveau pertinent de l'autorité en charge de la gestion des services correspondants, si l'on en juge par la diversité des solutions adoptées dans le monde. Il n'y a sans doute pas une réponse unique à cette question et il ne s'agit pas d'empiéter sur la souveraineté des Etats, ni même de porter un jugement quelconque sur les solutions adoptées: cette responsabilité est assurée parfois directement au niveau de l'Etat (cas de la Tunisie avec la SONEDE et l'ONAS) elle peut l'être par des collectivités locales pour les grandes agglomérations et par l'Etat pour les zones rurales (cas du Maroc avec les Régies des grandes villes en gestion directe ou déléguée et avec l'ONEP), par des grandes structures régionales privatisées, assorties d'une régulation au niveau central et d'une autorité nationale des rivières (cas de l'Angleterre et du Pays de Galles) ou par des collectivités locales (ou leurs regroupements) assurant elles-mêmes ou par délégation la gestion de ces services (cas de la France)….

Chaque solution a ses défenseurs et présente des contraintes, des avantages et des inconvénients, mais, même si les considérations qui suivent ne prétendent pas comparer entre elles des différentes possibilités d'assurer cette gestion, il nous paraît intéressant d'approfondir la réflexion sur cette question: quel est le niveau pertinent de responsabilité pour la gestion de l'alimentation en eau et de l'assainissement? On peut même envisager que puissent être établies ultérieurement des comparaisons (Benchmarking) pourvu que des indicateurs de performances fiables et admis par tous puissent être établis, mais le présent propos est seulement d'expliquer pourquoi il nous semble que le niveau le plus satisfaisant est celui assurant une "gestion de proximité" et que les problèmes qu'il pose peuvent tous trouver une solution

Alimenter en eau une maison, un village, voire même une grande agglomération est en général un problème essentiellement local. Bien que les ressources en eau soient inégalement réparties dans le temps et dans l'espace, elles sont liées au sol (nappes) ou aux écoulements de surface et le transport de l'eau à de grandes distances est très coûteux, rendant souvent plus économique le traitement d'eau locale de mauvaise qualité que la réalisation de longues adductions. La géographie physique importe peu et si le bassin versant constitue un territoire pertinent pour la répartition d'eau entre usagers, ce n'est qu'un élément tout à fait secondaire en ce qui concerne la distribution d'eau, le coût de la mobilisation de l'eau potable à distribuer dépendant beaucoup moins du relief que de la distance.

Le coût du transport des eaux usées dépend certes, beaucoup plus du relief, mais c'est un problème encore plus local, y compris en ce qui concerne le traitement des eaux usées avant

leur retour au milieu naturel (qui dépend étroitement de la qualité à maintenir dans ce milieu). De toute façon, l'eau et l'assainissement sont étroitement liés et comme l'assainissement nécessite de lourds financements, sans bénéfice direct pour les habitants, le meilleur moyen de financer les investissements et l'exploitation des services d'assainissement est de les assurer par la facturation de l'eau, comme cela est d'ailleurs pratiqué presque partout dans le monde.

Pour ces raisons le développement des services de distribution d'eau a été en général assuré historiquement à partir de projets locaux, même si ultérieurement la gestion des services d'eau et d'assainissement a été parfois assurée à des niveaux régionaux ou nationaux.

La distribution d'eau est un service de première nécessité et il nous semble de ce fait que la gestion de ce service public doit être assurée au plus près des usagers, qui doivent être traités comme des clients souvent plus attentifs à la qualité du service (fournir d'une façon fiable 24 heures sur 24 et 7 jours sur 7 une eau saine et à une pression suffisante) plus encore qu'à son prix, quoiqu'en disent les médias. C'est au niveau local que les élus et les associations peuvent le mieux faire valoir leurs préoccupations. En ce qui concerne le prix du service et son recouvrement, la meilleure gouvernance n'est-elle pas d'en confier la tarification aux élus locaux lesquels peuvent être confirmés ou récusés à chaque élection, cette tarification pouvant assurer une certaine modulation, entre riches et pauvres, entre résidents permanents et résidents occasionnels, entre ce qui est payé grâce aux emprunts (renvoyant la charge des financements sur les usagers futurs) et ce qui est payé directement par les usagers actuels? La qualité de la ressource en eau étant différente d'un point à un autre et le traitement de l'eau brute pouvant être plus ou moins poussé, n'est -ce pas au niveau local que l'on peut au mieux arbitrer entre la qualité de l'eau et le niveau des investissements à réaliser?

C'est le raisonnement qui a été depuis toujours suivi en France malgré à diverses reprises, la tentation d'autres solutions. Le "système" français conjugue trois aspects d'une façon originale en Europe; comme le souligne un rapport du Bipe de décembre 2003 " Eléments pour un benchmark des services d'eau et d'assainissement"

- la participation de la population, garantie par le rôle des élus, des collectivités locales, entités organisatrices,

- la concurrence pour le service, la France étant le seul pays à organiser une concurrence obligatoire, dans des conditions définies par la loi, entre prestataires pour la fourniture d'un service sur un territoire.

- la diversité des formes de contrat qui favorise l'adaptation aux situations locales des propositions faites par les sociétés de service, étant entendu qu'outre des sociétés privées, il existe des régies directes, des sociétés d'économie mixte, voire des structures organisées au niveau départemental.

Ces réflexions au niveau français correspondent aussi d'ailleurs à celles du "Panel mondial sur les infrastructures de l'eau" déjà cité. Dans le paragraphe consacré aux "entités publiques non souveraine" on peut lire:

" Les organismes au niveau régional sont les plus à même de faire évoluer les services de l'eau, que ce soit en termes de quantité ou de qualité. Dans la plupart des pays, ce sont les collectivités locales ou les autorités publiques en charge des eaux qui ont la charge de l'approvisionnement en eau. En effet, lorsque apparaissent des insuffisances, ces instances locales sont les mieux équipées pour définir des solutions, préparer la mise en œuvre et gérer la distribution à l'avenir. La décentralisation de la prise de décision permet de choisir

les technologies et les types de services les mieux adaptés. Enfin, on sait que l'erreur dans ces domaines critiques peut mettre fin à tout espoir de pérennité financière pour les prestataires de services d'eau concernés…."

Plusieurs critiques peuvent être faites qui méritent discussion, mais auxquelles des réponses peuvent être trouvées:

1) si la **"gestion de proximité"**, c'est-à-dire au niveau communal et intercommunal, paraît le meilleur échelon d'exercice de la responsabilité de la maîtrise d'ouvrage et de la maîtrise d'œuvre, n'est-ce pas un échelon trop faible sur le plan de la capacité des collectivités à assumer ces responsabilités? Il y a plusieurs réponses à cette question et elles peuvent être mises simultanément en œuvre: tout d'abord, le développement de l'intercommunalité, favorisé par la loi, mais voulu par les élus locaux eux-mêmes, permet de plus en plus d'obtenir des entités suffisamment importantes pour prendre en main ces responsabilités; ensuite, les collectivités ne sont pas livrées à elles-mêmes, car elles sont assistées par les services déconcentrés de l'Etat, voire par des bureaux d'études spécialisés. Enfin, à partir du moment où les collectivités sont en mesure de discuter les contrats avec des sociétés spécialisées, ces dernières, par leur capacité financière, leur savoir-faire, la possibilité grâce à leurs services administratifs (relevé des compteurs, facturation, encaissement…) et techniques (matériel, stocks….) d'obtenir l'effet d'échelle que certaines collectivités ne peuvent avoir par elles-mêmes, permettent d'assurer des services de qualité à des prix compétitifs et qui peuvent être comparés utilement à ceux de collectivités voisines, ce qui assure l'émulation nécessaire au maintien de cette qualité de service.

2) Il est nécessaire d'avoir une gestion qui ne soit pas en contradiction avec la politique de l'eau, mais au contraire soit totalement en cohérence avec elle. Rendre compatible une gestion au niveau local avec la gestion par bassin (en France, avec les SAGE) nécessite de conforter le rôle des Agences de Bassin, ce qui pour la France paraît être d'ailleurs dans la ligne de la mise en oeuvre de la directive cadre européenne sur l'eau. Les travaux actuels de l'Académie française de l'Eau, portent d'ailleurs sur les territoires de l'eau, et la nécessité, malgré le cloisonnement sur un même territoire des responsabilités, d'avoir pour un développement durable, une gestion intégrée dans le cadre d'un aménagement du territoire défini et voulu dans l'intérêt général, transcendant les intérêts spécifiques des différents usagers. Le fait de soutenir que l'on peut sans doute avantageusement dissocier la responsabilité des services de distribution d'eau potable (et par voie de conséquence d'assainissement) de celle de la gestion intégrée des ressources en eau, ne revient pas à minimiser l'importance de celle-ci et ce désir de "gouvernance locale" ne voudrait en aucun cas s'opposer au développement durable. La Journée d'études organisée à Arras le 26 mars 2004 sur "les territoires de l'eau" par Res-Eau à l'Université d'Artois, avec l'appui de divers organismes de recherche, montre que ces préoccupations sont d'actualité.

3) Il est nécessaire d'assurer une solidarité entre collectivités riches et pauvres, entre collectivités déjà bien équipées (même si ayant investi antérieurement, il est normal qu'elles aient un service moins coûteux) et collectivités nécessitant de lourds investissements. Ceci peut et doit être obtenu par des subventions au niveau départemental, régional ou national, par des aides des Agences de Bassin, mais si possible en évitant de déresponsabiliser les collectivités locales et donc avec des aides seulement temporaires.

4) Il peut être nécessaire de coordonner les services de collectivités voisines, et de les interconnecter pour qu'ils puissent se prêter mutuellement secours. L'exemple de Paris et de la région parisienne montre que cela est possible, bien que les services dépendant d'entités distinctes soient assurés par des sociétés également distinctes et concurrentes. D'importantes interconnexions ayant existé de tout temps et ayant été renforcées grâce à l'aide de l'Agence de l'Eau Seine-Normandie, ou n'a jamais manqué d'eau ni à Paris ni dans les première et deuxième "couronnes" de la banlieue parisienne.

5) Les financements des investissements sont au niveau local plus difficiles à obtenir qu'au niveau national. On peut, néanmoins en partie, pallier à ces difficultés y compris dans les pays en développement si on suit les différentes propositions du "Panel Mondial sur les infrastructures de l'eau" sous la rubrique " promouvoir les marchés locaux de capitaux et l'épargne locale".

6) Les conditions de la gestion d'un service d'eau et d'assainissement varient au cours du temps pour des raisons démographiques (urbanisation), économiques (création de zones industrielles), techniques (pollution d'une ressource…), ou politiques (désir de moduler différemment la tarification, fusion de collectivités…) et il faut dans le cas d'une gestion déléguée à une société privée pouvoir renégocier éventuellement le contrat avec la collectivité, mais ceux-ci comportent en France, des clauses de révision qui permettent à l'un des deux co-contractants d'obtenir cette révision sans attendre la fin du contrat. Des avenants à ce contrat parfois très importants ont en général permis de résoudre les problèmes posés à la satisfaction des deux parties.

° °
°

Ces réflexions sont d'actualité. Ce qui se passe en Italie depuis la loi Galli montre d'ailleurs que l'on peut avoir différentes approches de cette question, mais à une époque où l'on voudrait résoudre les problèmes au plus près des personnes concernées, dans le cadre d'une gouvernance de proximité, compatible avec la "mondialisation" et la fourniture de l'eau pour tous, on n'évitera pas des solutions apparemment compliquées, mais qui permettent en fait la meilleure réactivité et la meilleure qualité de service.

Is Water Policy Responding to Rural Preferences? A Choice Experiment of Household Water Priorities in South Africa

Hope, R.A.[1] and Garrod, G.D.[2],
[1]Centre for Land Use and Water Resources Research, Bedson Building, Room 3.49, University of Newcastle-upon-Tyne, NE1 7RU, UK
[2] School of Agriculture, Food and Rural Development, Agriculture Building, Room 115, University of Newcastle-upon-Tyne, NE1 7RU, UK
Corresponding author:
Email: robert.hope@ncl.ac.uk
Tel: 00-44-(0)191-246 4882

Abstract

Water policy is often designed and implemented without negotiation with or participation of the intended beneficiaries. This is often the case in the implementation of global water policy initiatives that aim to benefit rural households in the developing world. Evidence of water policy responding to locally-defined preferences of the rural majority without improved water services is weak. Significant efforts have made to unpack quantity, quality and source attributes of domestic water supply to the least well-served populations in Sub-Saharan Africa and Asia. This effort has been limited to evaluating individual attributes in relation to health, productivity and usage criteria rather than a 'user evaluation' of these attributes together. The advantage of the latter approach is that trade-offs between attributes can be estimated to provide parameters for each attribute and marginal rates of substitution between attributes. A choice experiment in rural South Africa examines the preferences of households to changes in domestic water sources, water quantity, water quality, streamflow failure, and productive uses of domestic water. Trade-offs in rural household domestic water preferences estimate welfare coefficients that provide a 'user evaluation' of water policy interventions. The findings provide defensible estimates of the magnitude and direction of the utility gain/loss from water attributes that allows a more evidenced-based understanding of rural households' preferences to water policy interventions.

Keywords: choice experiment; rural development; South Africa.

1. Introduction

Globally, an estimated US$14 billion is spent annually on water and sanitation provision with calls for an additional US$30 billion per year to overcome the estimated under-provision in developing countries (ODI, 2002). The aim is to reduce the 1.2 billion people without access to improved water supplies and 3.3 billion without access to adequate sanitation. The human mortality, morbidity and related hardships that is attributed to this water under-provision has institutionalised the international drive to eradicate these problems within the Millennium Development Goals. However, evidence of water policy responding to the locally-defined preferences of the rural majority without water access is weak.

Significant efforts have made to unpack quantity, quality and source attributes of domestic water supply to the least well-served populations in Sub-Saharan Africa and Asia (Thompson, Porras, Tumwine, Mujwahuzi, Katui-Katua, Johnstone & Wood, 2001; Rosen & Vincent, 1999; Cairncross, 1990; White, Bradley & White, 1972). This effort has been limited to evaluating individual attributes in relation to health, productivity and usage criteria rather than a 'user evaluation' of these attributes together. The advantage of the latter approach is that trade-offs between attributes can be estimated to provide parameters for each attribute and marginal rates of substitution between attributes.

The purpose of this paper is to provide exploratory experimentation of water policy scenarios on a key primary stakeholder group, the rural poor. The paper attempts to provide a better understanding of the relative preferences of the rural poor to interventions that impact on domestic water services (source, quantity, quality), water resources (streamflow) and the productive use of domestic water (kitchen garden irrigation). These attributes are derived from two years fieldwork based on collaboration with policy makers, research institutes and the primary stakeholders. The findings estimate welfare coefficients that provide a defensible and multiple-level 'user evaluation' of water policy interventions. The research was conducted in Limpopo Province, South Africa, which provided an opportunity to evaluate innovative aspects of the 1998 National Water Act.

2. Domestic water issues in South Africa

In the Republic of South Africa (RSA), the National Water Act (NWA) of 1998 has promulgated bold and innovative legislation to provide equitable access to water services for all its citizens. One of the key initiatives in the NWA is the establishment of a 'Reserve' that includes both a Basic Human Needs Reserve (BHNR) and an Ecological Reserve. The BHNR "provides for the essential needs of individuals served by the water resource in question and includes water for drinking, for food preparation and personal hygiene" (RSA, 1998: Part 3). This has been legislated to be 25 litres/capita/day (lcd) of potable water, within 200 metres of the home, at a flow rate of 10 litres/second, and a 98% reliability of service delivery. Whilst domestic consumption of total available water resources is negligible in most countries (Gleick, 1996), efficient and equitable allocation of water resources involves important trade-offs between different potential users, and their rights.

The unitary and interdependent role of water raises allocation issues between upstream-downstream users. This is acknowledged in the NWA by taxing land-based activities that reduce streamflow above a natural vegetation cover. For example, streamflow reduction activities in upper catchment zones, such as plantation forestry, will reduce the availability of surface runoff that could be available for abstraction for downstream domestic or industrial use (Calder, 1999; Bosch & Hewlett, 1982). Estimating how much households value a river resource against other alternatives provides policy guidance on compensation measures for allocating high water-consumption (evaporation) land use options in upper catchment areas that contribute to economic growth against negative social impacts downstream. For example, if dry season flows in a river system are likely to be significantly reduced compared to the average condition would this represent a significant change in household welfare (utility) for downstream users? If not, allocating surplus water above the Ecological Reserve to industry, inter-basin transfers or plantation forestry could promote national productivity and local employment.

Linked to land use and domestic water supply is interest in the productive uses of domestic water as a poverty reduction intervention (IRC, 2003; Thompson *et al*., 2001.). The lobby that promotes increased IWS provision (from 50 lcd up to 200 lcd, see IRC, 2003) feeds into the narrative that increasing water supply reduces poverty. However, the debate on domestic water quantity has moved from quota or rights-based arguments of 20-50 lcd to recognise that accessibility defined by domestic water service levels is the more significant issue (WHO, 2003: 24-25). Generally, the level of access to water determines the quantity used[4]. For example, in a study in Uganda, traditional sources and communal street taps lead to average consumption rates of 16 lcd, a yard tap increases use to 50 lcd, and a house connection raises use to 155 lcd (WELL, 1998). Though, the utility of water above a certain threshold is likely to exhibit a diminishing marginal rate of utility for domestic purposes this

[4] Issues of reliability, flow rate and cost recovery are often considered to be of secondary importance though vary by situation

does not necessarily hold true for productive uses such as dry season kitchen garden irrigation for food security or income-generation. Concern over whether these productive uses will be adopted are highlighted by studies that report households with house taps undertake domestic activities with increased water quantities (washing, laundry, flush toilets) and adopt more amenity uses (lawn-watering) (WHO, 2003). Further, water use for productive purposes in rural areas in Kenya, Tanzania and Uganda was found to be low (<3 litres/day) and equivalent for both piped and unpiped households (Thompson *et al.*, 2001: 32).

This study explores these issues to evaluate the trade-offs between water attributes in two rural communities in Limpopo Province, RSA. The specific problems that the research addresses are:

What are household preferences to different domestic water sources?
How much relative utility does water quality improvement deliver?
Will a reduction in dry season river flows affect household welfare?
What is the utility of dry season kitchen garden irrigation?

3. Research methods

3.1 Choice experiments

Choice experiments (CE) (or stated preference methods) are commonly-used in marketing, transportation, psychology, environmental valuation, municipal planning and, more recently, valuing animal genetic resources (Scarpa, Ruto, Kristjanson, Radeny, Drucker & Rege, 2003; Haider & Rashid, 2002; Willis & Garrod, 1998; Adamowicz, Boxall, Williams & Louviere, 1995). The value of CEs is that an evaluation of alternative trade-offs can be made. In the case of estimating the behaviour of the rural poor to domestic water policy, the stated preference method permits investigation of a range of attributes that are currently being considered but not yet available to potential users. Analysis of the stated preferences of potential users to the set of alternatives may assist policy-makers make better-informed decisions.

The appeal of CE in economic analysis is that it is based on random utility theory (Ben-Akiva & Lerman, 1985; McFadden, 1974). Choice variations are explained by a random preference component:

(1) $$U_i = V_i + \varepsilon_i$$

where U_i is the unobservable but true utility of alternative *i,* V_i is an observable systematic component of utility, and ε_i is the random component. The probability that respondents choose a particular alternative, say the ith, from the set of competing alternatives is modelled as

(2) $$p(i/C) = p\left[(V_i + \varepsilon_i) > (V_j + \varepsilon_j)\right], \forall j \in C$$

where p(i/C) is the probability of choosing alternative *i* from the set of competing alternatives C. If it is assumed that the stochastic elements of the utilities follow a Gumbel distribution, the multinomial logit (MNL) model can be specified as:

(3) $$\text{p}(i \text{ chosen}) = e^{Vi} / \sum e^{Vj}$$

There are several advantages of using CE approach to elicit passive use values (Louviere, Hensher & Swait, 2000; Willis & Garrod, 1998; Adamowicz *et al*., 1995). First, CEs are based on attributes, which allow valuation of the attributes as well as situational changes. In particular, in situations of trade-offs, compensating amounts of other goods (rather than compensating variation based on money) can be calculated. This was of particular value in this study as the pilot survey discovered that a money-metric attribute dominated the response pattern. Removing this attribute resulted in no one attribute dominating each choice set though this constrained financial evaluation of the attribute trade-offs. Second, 'strategic voting', a common and distorting influence in contingent valuation methods, may be reduced as respondents are asked to chose between several scenarios. Changes in attribute levels change across the sets of choices, which limits any clear signal of which is the 'right' alternative. Third, 'embedding' occurs when a good is assigned a lower value (often, willingness-to-pay) if it is inferred from a more inclusive good, than when it is evaluated on its own. For example, a domestic water supply attribute embeds preferences of water quantity, water quality, water source, reliability and flow rate within the overall category.

There are limitations in the application of CEs due to statistical design criteria, information provision, survey design and survey administration. In contrast to revealed preference data, CE data are generated by a systematic and planned design process in which attributes and their levels are pre-defined from exploratory research and varied to create preference or choice alternatives. A 16 choice set, main effects orthogonal design procedure was generated for this study from a $4^4*4^4*2^2*2^2*2^2$ factorial design (Table 1). Design property specifications were improved by restricting attribute levels to factors of two (Louviere *et al*., 2000: 120). Four versions of the survey were generated from the design with three choice sets offered to each respondent: 1) status quo (no choice scenario); 2) option one, which followed the main effects design sequentially; 3) option 2, a random pairing from the main effects design that did not match option one (*ibid*: 132). For example, household one would be offered choices labelled 1-4, household two offered choices 5-8, household three offered choices 9-12, and household four offered choices 13-16; the sequence would resume with household five starting with the same options as household one. Each household responded to four choice sets in total plus a dummy set to establish the procedure had been sufficiently well-understood (Figure 1).

Table 1 Attributes and levels used in Choice Experiment

Attributes	Levels			
Domestic water source	River	Groundwater	Street tap	House tap
Domestic water quantity[1]	12.5 lcd	25 lcd	50 lcd	75 lcd
Domestic water quality	Same	Improved		
Dry season river failure	Current (1 in 10 years)	Worse (1 in 3 years)		
Irrigate kitchen garden in dry season	No	Yes		

[1]Respondents were shown a total household quantity based on a 6 person average occupancy

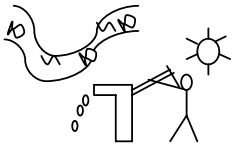
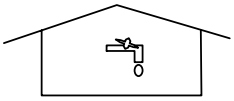
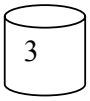
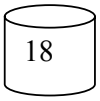
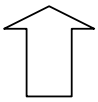
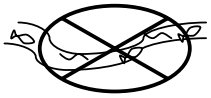
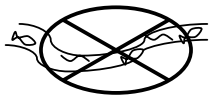
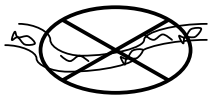
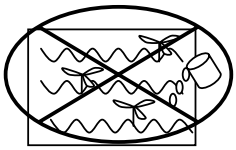
ATTRIBUTE	STATUS QUO	OPTION 1	OPTION 2
HOUSEHOLD DOMESTIC WATER SOURCE			
HOUSEHOLD DAILY DOMESTIC WATER USE (25 LITRE CONTAINERS)	CURRENT		
HOUSEHOLD DOMESTIC WATER QUALITY	=	=	
RIVER FLOW **FAILURE** IN OCTOBER	 1 IN 10 YEARS	 1 IN 3 YEARS	 1 IN 10 YEARS
IRRIGATE KITCHEN GARDEN CROPS IN **DRY** SEASON	CURRENT		
TICK <u>ONE</u> BOX	☐	☐	☐

Figure 1 Dummy card from choice experiment

3.2 Study location

Two communities reliant on river and/or groundwater for domestic water supply were identified following reference to a RSA Department of Water Affairs and Forestry (DWAF) GIS database and ground truthing in a scoping phase (Figure 2). Ha-Matsika is located at the confluence of the Luvuvhu and Mutshindudi rivers. It is reached by a gravel road, approximately 5km off the sealed road to the main urban centre of Thohoyandou (circa. 40 km). The population is estimated at 594 people. The community is served by two boreholes installed in the mid 1980s. Respondents indicated that groundwater was preferred to river water as it tasted better. The boreholes have never run dry though mechanical failure does occur with government repairs taking up to five months. There is no institutional management of the groundwater resource. Notification of failure is made to the local municipality through the headman and civic structure.

Figure 2 Location of study communities in the Luvuvhu catchment, Limpopo Province

Lukalo is located downstream of Ha-Matsika on the Luvuvhu river close to the Kruger National Park. The community is approximately 60 km from Thohoyandou, 10 km off the sealed road. The population is estimated at 951 people. The community is served by three boreholes, which again have never run dry. Informants indicate that groundwater is the preferred water source due to proximity though river water is also used in the dry season when runoff pollutants and sediment are reduced.

3.3 Survey instrument

The survey instrument (SI) elicited parsimonious socio-economic data to provide an indication of the representativeness of the sample to a larger catchment survey and illustration of basic data. The pictorial format assisted many illiterate household members being able to fully participate in the survey. Forty households from each community were randomly sampled over a two week period in October 2003. Households voted on four choice sets per household, which produced a total CE sample of 320. The sampling strategy followed cardinal points' transect walks across the communities with systematic sampling every n^{th} household. No household refused permission and many reported enjoying selecting the choice sets.

4. Results and discussion

4.1 Sample representativeness

Comparison of the CE sample with data collected in a catchment household survey in 2002 is presented in Table 2. Descriptive analysis indicates that the CE households have more members, poorer access to water supplies and sanitation, have greater reliance on fuelwood for cooking, own more land and cattle but generate less income than the catchment sample. A one sample t-Test of interval-level, variable means records no significant difference between household size and cattle but a significant difference between mean annual income and dryland at a 95% confidence interval. No conclusive evaluation of representativeness can be drawn though the CE communities appear both generally income poorer and less well-served with basic services than the larger catchment sample.

	CE survey (n=80)	Luvuvhu (n=552)
Household size	6.04 (2.62)	5.89 (2.70)
Adult education (years)	6.83 (3.35)	n/a
Proportion of households <200 metres from water source	0.11	0.47
Proportion using woodfuel as main cooking source	0.98	0.77
Proportion with no sanitation	0.46	0.29
Dryland field (ha)	0.98 (1.55)	0.68 (1.20)
Cattle	1.66 (4.25)	1.37 (6.53)
Annual household income (US$/pa)*	1,759 (2,031)	2,680 (3,450)

Table 2 Comparative analysis of CE sampled households to catchment data

Standard deviations in brackets for interval data. Exchange rate: US$=7Rands. n/a indicates that the data are not comparable. *Including state remittances (pension and Child Support Grant) and all other reported income

4.2 Drawers of Water

Descriptive data was collected on household domestic water collection. The mean household domestic water consumption was estimated at 22 lcd. This is thought to be an upper estimate as households were restricted to a discrete choice set of alternatives that matched the later choice options. Hope, Jewitt and Gowing (2003) report household collection as 14 lcd, which fits well with rural domestic collection quantities of unconnected, rural African households (Thompson *et al*., 2001). The dominant collection method was by head or hand (80%) with the remainder using a wheelbarrow. Households spent an average of 59 minutes each day collecting water. 97% of household water collectors are female with an average of 1.7 collectors per household. The average age of water collectors is 31 years[5] with the youngest 20% below 21 years and the oldest 20% above 44 years.

The health impact of water consumption was estimated by occurrence of diarrhoea in children (<16 years) and adults in both the last week and the last month. Diarrhoeal diseases attributed to poor water supply, sanitation and hygiene are reported to account for 1.73 million deaths each year (WHO, 2003). No cases of diarrhoea were reported for either group in the last week. Within the last month, 15% of households reported one child having diarrhoea, 4% reported two child cases and 1% reported three cases. 8% of households reported one adult having diarrhoea and 1% reported two adult cases.

4.3 Results of the Choice Experiment

Table 3 presents the multinomial logit (MNL) results of the CE model. The goodness-of-fit is defined by the log likelihood at convergence, equal to -115.516. There is a high likelihood ratio index (or pseudo-R^2) of 0.520 without adjustment for degrees of freedom, and 0.514 after adjusting for degrees of freedom (Louviere *et al*., 2000:158). This suggests the

[5] Median = 27 years; standard deviation = 13 years.

constants contribute little to the reduction in the log likelihood (equal to 0.007 of 0.520) in comparison to the attributes. The high likelihood ratio may be explained by strict design criteria and respondent familiarity with the attributes under investigation. All attributes and levels have the expected sign and are significant at the 95% confidence interval except for the river water source. The status quo option was rejected in over 99% of the choice sets. This reflects the design of the CE to evaluate the preferences of rural households to water supply improvements.

Table 3 Attribute utility parameters from MNL estimation

	Utility parameters	t-Statistic
Water source: River	0.693	0.112
Water source: Groundwater	3.882	5.159
Water source: Street tap	4.163	5.436
Water source: House tap	8.104	8.427
Water quantity (lcd)	0.032	3.655
Water quality improvement	1.164	3.453
Increased dry season streamflow failure	-1.180	-2.777
Irrigate kitchen garden in dry season	1.065	2.596
Number of observations = 320		
Log likelihood function = -115.516		
Likelihood ratio (pseudo-R^2) = 0.52		

Evaluation of the trade-offs between the domestic water sources illustrates the low incremental utility gain between groundwater and street tap provision. The coefficients are almost identical with a marginal rate of substitution between the alternatives equal to 9 lcd. For example, a household with six occupants would gain an additional utility of 54 litres/day from street tap provision. Alternatively, the additional utility from provision of house taps is double that of groundwater or street taps. If groundwater is taken as a base-line, then the incremental utility of a house tap supply is equal to 65 lcd or 391 litres/day for an average household. The utility estimates identify upgrading groundwater supply to house tap as the only intervention that will result in significantly increased welfare. Upgrading domestic water service level from groundwater to street tap will provide little additional utility gain.

The water source utility coefficients support findings that there are distinct levels in water consumption, which are moderated by domestic water service level (WELL, 1998). 'Threshold effects' in water use may partly explain the dominance of the water source attribute in the CE (Figure 3). The 'threshold effect' sequence follows:

river water is rejected in preference for groundwater;
street taps are preferred to groundwater with a marginal welfare gain due to similar effort, time and drudgery factors;
house taps provide the biggest welfare gain as the convenience of and opportunity to use water is no longer constrained by physical effort, which results in increased domestic, productive and amenity uses.

The water quantity attribute can be converted into lcd units to reflect household utility from consuming 25 lcd; this is equal to a utility parameter of 4.736. The estimated quantity collected of 22 lcd would derive a similar household coefficient of 4.224. This value is greater than both the groundwater and street tap estimates, and four times the water quality estimate. The comparatively high water quantity utility estimate suggests that the Human Reserve of 25 lcd will provide a high level of welfare to rural households. However, the utility function for domestic water consumption is unlikely to be linear and it would be misleading to

promote higher domestic water consumption based on extrapolations of the water quantity estimate. But, it clearly indicates here that households prefer quantity of water above quality of water.

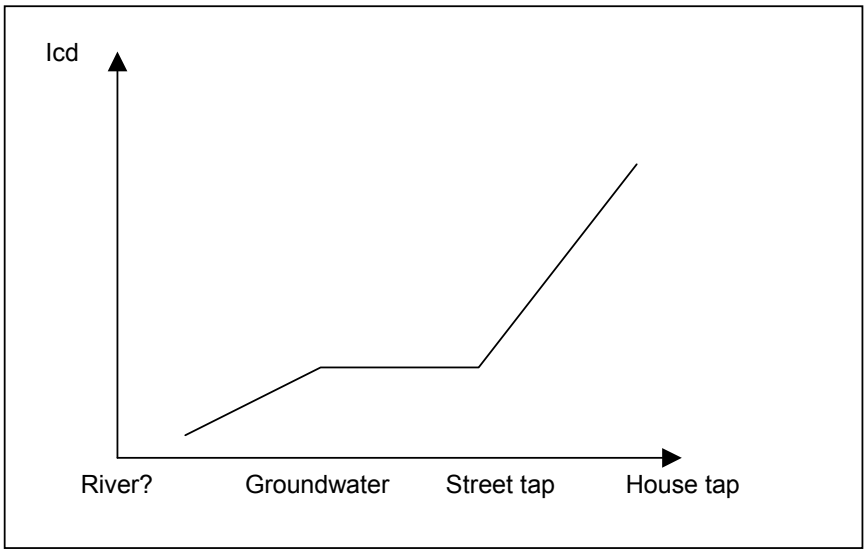


Figure 3 Threshold effects of domestic water service levels on water use

The comparatively modest welfare estimate for water quality suggest that groundwater quality is acceptable and that little incremental utility will be derived from effort to improve its quality. WHO (2003:8) note that "a 'zero-risk' scenario for public (water) supplies is not achievable and evidence points to the need to define tolerable risks, commonly based on estimates of numbers of excess cases per defined population size". The preferences of this sample would concur with this finding through trading-off higher water quantity than improved water quality.

The negative utility associated with an increase in streamflow failure from 1 in 10 years to 1 in 3 years is equivalent to the positive utility estimate for an improvement in water quality. Though households would suffer a utility loss if upstream water abstraction were to increase the loss is relatively small. The attribute characterisation was not limited to domestic water collection but embraced all household uses. The low parameter value suggests that downstream communities may be willing-to-accept compensation for increased upstream water use. Upgrading water supply from groundwater to street taps would not be sufficient compensation.

The utility estimate for irrigating a kitchen garden in the dry season is the lowest of all the discrete attributes. It is positive and provides welfare equivalent to a water quality improvement and one quarter of a water quantity provision of 25 lcd. Approximately 18% of respondents recorded currently irrigating kitchen garden crops in the dry season. This suggests that some empirical knowledge of the relative gains from this activity were known by the respondents and traded-off against the other attribute levels. Whilst it would be logical to initially prefer a more convenient water source rather than water uses based on access to the source, the utility parameter suggests that households would derive little improved welfare from this activity. This suggests modest welfare improvements from adopting productive uses of domestic water.

5. Conclusion

The results of the CE model indicate four inter-related policy findings. First, the largest increase in household welfare occurs when groundwater is upgraded to a house tap. Second,

water quality provides a relatively low level of utility, particularly in comparison to water quantity. Third, increased dry season river failure will result in a small loss in welfare that suggests opportunities for compensation mechanisms from upstream productive users.

Fourth, the welfare estimate from irrigating kitchen garden crops in the dry season suggests a low adoption rate that may limit poverty reduction impacts.

Upgrading groundwater supplies to street taps will provide little additional welfare to rural households. The trade-off which provides the greatest welfare gain is the change from groundwater to house tap. This finding has significant implications for domestic water policy that is broadly premised on delivering water within 1km to 200 metres of the home. It is argued that allocation of resources to provide street taps under current domestic water policy will result in modest welfare improvements, in relation to groundwater provision, for rural households.

The high utility estimate for a home connection suggests that 'convenience' is a dominant variable in domestic water supply preferences. The incremental welfare that is derived from a home tap compared to street tap or groundwater indicates that the physical effort, time and drudgery of water collection results in substantial disutility for rural households. Whilst this has long been recognised the relative magnitude of the inconvenience of water collection has been difficult to accurately estimate. This study estimates the disutility of water collection at 391 litres/day for an average household. The comparative value and magnitude of this attribute identifies where the greatest welfare gains could be made in domestic water policy and how resources can be seriously misallocated.

Water quality preference will vary by situation but the finding here is that groundwater quality is acceptable with a low inferred rate of health impacts from the reported adult and child diarrhoea occurrence. The design of the CE forced respondents to explicitly trade-off contentious domestic water attributes such as quality and quantity variables to allow a legitimate insight into the actual preferences of rural households rather than science-based prescriptions. The result allows a clearer understanding of the minimal welfare gain from improving water quality. Current groundwater water quality is considered by the users to be of a 'tolerable risk' and of a lower priority than a minimum threshold quantity (25 lcd). The basic water service level already achieved suggests that additional health gains will not result from access to higher quantities of water but from improved hygiene practices: "many of the health benefits ultimately accrue form proper water usage and good hygiene behaviours and simple provision of infrastructure alone is unlikely to maximise health gains" (WHO, 2003: 25).

The estimated low utility parameter derived from an increase in dry season river failure may contribute to the debate and development on the efficient and equitable water allocation mechanisms in water-scarce countries. The Reserve in RSA provides a useful methodological approach to allocate surplus water above the Human and Ecological components. If downstream rural water users' preference for low flows is small, there appears opportunity to allocate surplus flows through market demand for direct consumption (crops), inter-annual storage locally, or inter-basin transfers regionally, to allow a more efficient exploitation of the productive potential of water-yielding catchments. Taxing or levying these activities could fund mechanisms to compensate downstream communities. Though water is defined in RSA as an "indivisible national asset" and downstream users do not have land-based rights to streamflow they do have small-scale productive rights (Schedule 1 uses, see RSA, 1998). Streamflow utility estimation offers a potential tool in assisting how to evaluate and estimate social impacts of water resource allocations in the current development of catchment management plans.

Growing interest in the productive uses of domestic water has advocated increasing domestic supply from 50-200 lcd to facilitate poverty reduction (IRC, 2003). Allocation of limited development funds to deliver this level of service in rural areas has to be evaluated against realistic gains. The positive but low utility parameter estimated indicates that dry season crop irrigation is a secondary preference to households compared to water quantity and water source convenience, and of equivalent preference to a water quality improvement. With almost one in five households from the sample undertaking dry season kitchen garden irrigation, the findings would suggest caution in the likely uptake and impact of this initiative for household food security. This finding is consistent with wider research in Africa that note: "unsubstantiated assumptions about user demand for water can lead to large investment mistakes" (Davis, Kang, Vincent, & Whittington, 2001).

This study has illustrated the interrelated issues of domestic water supply for rural communities in evaluating welfare estimates, which in turn may contribute to policy-makers understanding of and response to these preferences in improved domestic water policy. The findings provide defensible estimates of the magnitude and direction of the utility gain/loss from water attributes that allows a more evidenced-based understanding of rural households' preferences to water policy interventions. These results demonstrate that water policy interventions implemented without understanding livelihood preferences may not achieve postulated welfare gains or poverty reduction in rural communities in the developing world.

Acknowledgements

This publication is an output from a research project funded by the United Kingdom Department for International Development (DFID) for the benefit of developing countries. The views expressed are not necessarily those of DFID. (R7937-Forestry Research Programme). Mashudu Phaphana and Peter Tshisikhawe (University of Venda, RSA) assisted in the implementation of the survey instrument. Eric Ruto (University of Newcastle-upon-Tyne) made useful critical insights in the analysis.

References

Adamowicz, W., Boxall, P., Williams, M., & Louviere, J. (1995) *Stated Preference Approaches for Measuring Passive Use Values: Choice Experiments versus Contingent Valuation*. Staff Paper 95-03. Department of Rural Economy, University of Alberta, Edmonton, Canada.

Ben-Akiva, M. & Lerman, S. (1985) *Discrete Choice Analysis: theory and application to travel demand*. MIT Press, Cambridge, Massachusetts.

Bosch, J.M. & Hewlett, J.D. (1982) A review of catchment experiments to determine the effect of vegetation changes on water yield and evaporations. *Journal of Hydrology* **55**: 3-23.

Calder, I.R. (1999) *The Blue Revolution*. Earthscan: London.

Cairncross, A.M. (1990) Health impacts in developing countries: new evidence and new prospects. *Journal of the Institution of Water and Environmental Management*: **4** (6): 571-577.

Davis, J., Kang, A., Vincent, J., & Whittington, D. (2001) How important is Improved Water Infrastructure to Microenterprises? Evidence from Uganda. *World Development* **29** (10): 1753-1767.

Gleick, P.H. (1996) Basic water requirements for human activities: meeting basic needs. *Water International* **21**: 83-92.

Haider, W. & Rashid, H. (2002) Eliciting public preferences for municipal water supply options. *Environmental Impact Assessment Review* **22**: 337-360.

Hope, R.A., Jewitt, G.P. & Gowing, J.W. (2003) *Linking the hydrological cycle and rural livelihoods: A case study in the Luvuvhu catchment, South Africa*. Paper presented at the Waternet / WARFSA conference, Gaborone, Botswana, 15-17th October, 2003.

IRC (2003) Responding to poverty: Promoting productive uses of water at the household level. IRC/NRI/IWMI/DWAF. Delft, Netherlands.

Louviere, J.J., Hensher, D.A. & Swait, J.D. (2000) *Stated Choice Methods. Analysis and Application*. Cambridge University Press, Cambridge: UK.

McFadden, D. (1974) Conditional Logit Analysis of Qualitative Choice Behaviour. In Zarembka, P. (ed) *Frontiers in Econometrics*. New York: Academic Press, pp 105-142.

ODI (2002) *The 'Water Crisis': Faultlines in Global Debates*. Water Policy Programme, Overseas Development Institute, London.

Rosen, S. & Vincent, J.R. (1999) *Household Water Resources and Rural Productivity in Sub-Saharan Africa: A Review of the Evidence*. Harvard Discussion Paper No. 673, February 1999. Harvard Institute for International Development, Harvard, USA.

RSA (1998) *National Water Act*. Act 36 of 1998. Government of Republic of South Africa, Cape Town.

Scarpa, R., Ruto, E.S.K., Kristjanson, P., Radeny, M., Drucker, A.G., & Rege, J.E.O. (2003) Valuing indigenous cattle breeds in Kenya: an empirical comparison of stated and revealed preference value estimates. *Ecological Economics* **45**: 409-426.

Thompson, J., Porras, I. T., Tumwine, J. K., Mujwahuzi, M. R., Katui-Katua, M., Johnstone, N., & Wood, L. (2001). *Drawers of Water II: Domestic Water Use in East Africa*. International Institute for Environment and Development (IIED). IIED: London.

WELL (1998) Guidance manual on water supply and sanitation programmes. WEDC, Loughborough, UK.

White, G.F., Bradley, D.F., & White, A.U. (1972) *Drawers of Water: Domestic Water Use in East Africa*. Chicago: University of Chicago Press.

Willis, K.G. & Garrod, G.D. (1998) Water companies and river environments: the external costs of water abstraction. *Utilities Policy* **7**: 35-45.

WHO (2003) *Domestic Water Quantity: Service Level and Health*. World Health Organisation, Geneva, Switzerland.

Hydropolitics: an Overview with Special Focus on the Farakka Barrage

Mohammad Ehteshamul HOQUE, Bangladesh Coordinator, South Asian Forum for Young Researchers (SAFYR), Dhaka, Bangladesh, Email: 148083@soas.ac.uk

"*Whisky is for drinking, water is for fighting over*"
- MarkTwain

"*If the wars of this century were fought over oil, the wars of the next century will be fought over water*"

- Ismail Serageldin[6], The World Bank.

Introduction

Frontiers are one of the strange inventions of human beings. Nature does not respect national borders. She does not care to endow every place or geographical entity of the earth with an equal or proportional amount of resources. This Natural 'injustice' unleashes competition for acquiring the 'gifts' of nature. Power and international politics have been increasingly significant in the access to natural resources like water, most importantly. Some experts believe that the mobility of water makes it more lucrative than other resources such as coal, oil, forest and soil or solar energy (Clarke, 1991).

The history of conflicts over water dates back more than four thousand years ago although religious myths and legends have common roots even in the earlier years[7] (Hatami and Gleick, 1994). Some historians claim that the Mesopotamian cities of Lagash and Umma were in dispute over water as early as 4500 BC (Clarke, 1991). Nevertheless, there is no disagreement about the scarcity of water and how confrontational the world would be in the future if water crises are not managed either by treaties and agreement or by the all out cooperation of people.

In 2000, the world's population was 6.1 billion. According to the UN medium projection,[8] the number might rise to 9 billion in the next 50 years. Researchers estimated that the demands for freshwater would increase by about 64 billion cubic meters a year, an amount almost equal to the annual flow of the river Rhine, largely because of the population growth and industrialization (The United Nations, 1998). Naturally, states become involved in sheer competition for freshwater that lead to international crises between the countries which share common rivers geographically. In terms of population and effects, the most significant and disputed international drainage basins are the Parana-La Plata, Nile, Jordan, Euphrates-Tigris, Ganges-Brahmaputra-Barak and Mekong. This essay will shade some light on these river basins generally in terms of the Hydrological point of view and elaborate on the sour relations between Bangladesh and India because of the squabble related to the Farakka Barrage, which has threatened disaster to the people of Bangladesh since 1975.

[6] Serageldin, I, the Vice President of World Bank said in an Interview with Newsweek, August 24, 1998.
[7] Please see, Hatami, H. and P. Gleick (1994) "Water, war, and peace in the Middle East" in *Environment,* Vol. 36, No. 3, pp.6-on. Heldref Publishers, Washington, for a chronology of conflicts over water.
[8] The United Nations, *World Population Prospects, The 1998 Revision*; and estimates by the Population Reference Bureau.

What is Hydropolitics?

The term Hydropolitics is self-explanatory; it means politics over water. Hydropolitics is a new phrase for an age-old problem. As water is so vital for human life, like other precious resources, it becomes a political affair. Hydropolitics is the investigation and the uncovering of tension amongst competing interests through the study of water conflicts. It addresses the political reality of freshwater sharing, predominantly the issues of international rivers[9] (e.g. the Danube, the Nile, the Ganges).

Hydropolitics is characterized as one of the most complex arenas of interaction between states that share international river basins. The level of complexity even increases with the level of interdependence among riparian countries and the interdependence increases as the demand for water grows (Elhance, 2002).

International Water Law

Though countries are becoming belligerent over the issue of water sharing, the United Nations has failed to pass any generally accepted international river law. The UN Watercourses Convention, adopted in May 1997, and ratified so far only by six parties[10], is nothing more than a global framework of guidelines that tries to 'ensure the utilisation, development, conservation, management and protection of international watercourses' (The United Nations, 1997a). The International Law Commission (ILC) has worked for almost two decades since 1970 (The United Nations, 1970) to organise a set of rules and regulations for the access and the use of the international watercourses (mostly, rivers). In 1997, ILC research resulted in the Law relating to the Non-Navigational Uses of International Watercourses that was first discussed in the Working group and then was adopted by the UN General Assembly. It was a two-step typical voting exercise in the UN. In the Working Group, 42 states voted for the Convention, 3 were against and 18 abstained (The United Nations, 1997a). Noticeably, China, France and Turkey voted against the convention while India abstained from voting. Finally, the Convention on the Law of the Non-Navigational Uses of International Watercourses was adopted by Resolution of the UN General Assembly on 23 May 1997. In the General Assembly, 104 States voted in favour, 26 States abstained and again China and Turkey, as well as Burundi, (all upstream states) voted against. Though not voting against the Convention, upstream countries like India and Pakistan abstained from voting (The United Nations, 1997b).

International Conflicts over Water

Freshwater scarcity is a serious threat to regional stability and peace (Wouters, 2003). The development of international law in the field is quite recent. Although the substantial treaty practice that has developed over the last century could solve some of the water crises, disputes over water persist worldwide. Most of the crises are related to upstream/downstream controversies. Typically, the upper riparian country withdraws water by constructing dams and digging feeder canals. This is in part, the primary cause of the sour relations between India and Bangladesh is the Farakka Barrage over the river Ganges.

In the Middle East, Israel and the Palestinians continue to negotiate about their respective rights and obligations concerning their shared waters[11]. Allocation of the uses of the limited

---

[9] The river either flowing through the territory of two or more countries or separating the territory of two states is referred to as an international river.

[10] The parties are Finland, Jordan, Lebanon, Norway, South Africa and Syria. The signatories include Côte d'Ivoire, Germany, Hungary, Luxembourg, Paraguay, Portugal, and Venezuela. *http://www.un.org/Depts/Treaty/final//ts2/newfiles/part_boo/xxviiboo/xvii_12.html* (16 November 1999).

[11] The 1993 Israeli-Palestinian Declaration of Principles proposed the joint management and "equitable utilisation of joint water resources."

waters of the Jordan River, shared by Lebanon, Syria, Israel and Jordan, is of a particular concern to the downstream States: Israel and Jordan. In 1965, a dispute arose when Israel wanted to divert the water of the river Jordan for its own use. Unfortunately, no agreement was reached despite long discussions; Israel, then, carried out the diversion unilaterally. In response, Syria and other upstream Arab states planned to divert water into other friendly states depriving Israel of some of its water supply (Clarke, 1991). Besides, longstanding Arab-Israel differences, many other countries of the Middle East are in disagreement over water. The countries on the banks of the Nile, the Jordan and the Yarmuk rivers namely, Syria, Libya, Jordan, Turkey, Iraq and Egypt are in dispute over water and understanding between and among the states make the situation more fragile and dramatic.

Four deltaic countries Vietnam, Cambodia, Laos and Thailand share the water of the Mekong River by an agreement signed recently. However, increasingly powerful China has plans to build dams in its territory that may cause adverse environmental effects for the whole Indochina. In South Asia, the relations between Bangladesh and India had been soured several times due to the Farakka Barrage that India constructed on the Ganges to keep Kolkata port alive. Its construction has been threatening the very existence of the people of Bangladesh where agricultural production still predominantly depends on irrigation water.

The disintegration of Soviet Union has caused a potential for struggle in Central Asia. The rivers like Amu-Daria and Sir-Daria have become international overnight. Almost land locked countries (such as, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan) which were once friendly neighbours inside the Union have discovered them bitter rivals for the hold of “shrinking and polluted” Aral Sea basin waters resources and the lakes of Eastern Europe (Vinogradov, 1993). Failing to reach in an agreement between them, Hungary and Slovakia had to go before the International Court of Justice (ICJ) regarding the water sharing of the river Danube although they had a long history of cooperation in this regard. After the Court decision, three years passed by. The parties have yet to reach agreement on the debated issues (Wouters, 2003).

Interestingly, Africa has an impressive record of treaty practice. Egypt and Ethiopia are still in dispute over the allocation of the Blue Nile water. Despite a number of treaties, states continue to be involved in conflicts over water use, mostly because of non-pursuit of some terms and conditions of treaties.

There are increasing transboundary water quality and quantity problems in both North and South America, despite a long history of cooperation and a large number of international water agreements. The waters of the Colorado are shared by the USA and Mexico and provide an excellent example of cooperation over water sharing. Due to the demands of the green lobby, the dams on the Columbia River are being removed in the lower reaches.

Thirty-six of South America’s rivers flow through more than one country and about 100 million people live in the region’s shared river basins. However, the legacy of basin-wide watercourse agreements has been jeopardised by unilateral actions of some states.

Farakka Barrage: The Other Side of the Coin

It is often said that no river in the world plays a more important economic, social and cultural role in the lives of more people than the Ganges. The Ganges is not just a river, rather a symbol of life and purity to Indian Hindu society. The river basin is one of the most fertile and densely populated in the world. It runs for 2500 kilometres from the Himalayas all the way to the Bay of Bengal. Bangladesh lies at the end of the tributaries of the Ganges and the Brahmaputra rivers while almost ninety percent of the watershed rests outside its geographical territory, within the countries of China, India and Nepal.

The dispute over the Ganges erupted when India decided to construct a barrage in West Bengal, known as the Farakka Barrage, close to the point where the main flow of the river enters Bangladesh (about 11 miles from the then India-Pakistan border). The dam, India claimed, was needed to divert the water to the Hooghly river to make it navigable, and thus keep Kolkata port alive; this was important not only for India, but also for her land-locked neighbours: Nepal and Bhutan. The forthcoming problems of her eastern neighbour were understood, but never were considered.

The decision to construct a Barrage at Farakka was made in 1951. Despite continued protests of the then Pakistan government, the actual work was started in 1961 and was finished by 1971. The feeder canal from the Barrage to Hooghly was completed in 1975 and the barrage finally came into operation in April 21, 1975.

The Farakka Barrage has been the meaning of survival for the Kolkata Port on one hand, but has been threatening the existence of the people of Bangladesh on the other. The unilateral withdrawal of water during the dry season causes both long-term and short-term effects for people living along the lower banks of the river. Due to the shortage of irrigation water, agricultural production has been shrinking along the western part of the country. In addition, some of the tributaries of Ganges have already run dry; some have lost their natural courses, having hardly any water in the summer. This leads to many problems like transport lag, reduction in aquatic creatures and increase of salinity in the other rivers. As a result, the poor people of the adjacent area who have been making their bread and butter from these river resources find themselves somewhat like vulnerable wildlife.

The future is thought to be even more depressing. It is estimated that one fourth of the agricultural land could become wasteland due to continuous water scarcity. The industrial activities of the southwest part of the country could be hampered. The lives of almost thirty million people could be affected because of the probable environmental and economic damage. It is reported that the existence of a country named Bangladesh might face a serious blow in the near future.

Some measures, though hardly fruitful, were taken at different levels to get rid of the serious hazard. Between 1951 and 1971, negotiations between India and Pakistan delivered no meaningful outcome. India played a significant role in 1971 in Bangladesh's war of independence against Pakistan and therefore it was thought to be indecent to get involved in a squabble against such a trusted ally on an issue like Farkka. After 1975, the architect of the nation was murdered with his family members. The subsequent leadership put up the issue in the United Nations General Assembly in 1976. A five-year Agreement was signed in 1977 assuring Bangladesh of 34,500 cusec of water in the lean season. After several shorter extensions, the Treaty lapsed in 1989. Then in 1996, the friendly regimes of India and Bangladesh agreed on a comprehensive water sharing treaty for 25 years. The euphoria from the treaty eroded soon afterwards. According to observers, in the following years Bangladesh has not been getting the share of the water agreed upon in the Treaty especially during the season that water is much needed for agriculture.

Recently, reports say, India has planned a 120 billion dollar project that will re-channel 170 cubic metres of water a year to Uttar Pradesh and Karnataka states: this might cause even more serious problems for Bangladesh. It is now imperative for the government of Bangladesh to monitor the progress of the new project and take sensible action in this regard. Engaging the United Nations and other Inter-Government organisations might open path to some practical solutions for all concerned.

Conclusion

Water is a finite and renewable resource. The growth of world population means the decline of availability per head. The scarcity of freshwater can be addressed by both improving supply and by conservation technology. It requires cooperation among states to manage the amount of water and to have sympathy with the needs of other states that share the same river basin. The water sharing issue can make a 'win-win' situation instead of a 'win-loss' scenario for all the riparian states if proper management and cooperation can be ensured.

The end of Cold War has created a different global context for the conduct of hydropolitics in the third world. In the absence of superpower rivalry, the involvement of a third party can be of value if the concerned states find no agreeable solution by themselves. Finally, however, no matter how sophisticated the mediation techniques of the third party are, no matter how supportive and sympathetic they are, the peaceful conduct of hydropolitics depends upon the willingness, attitudes, efforts, mutual respect and understanding among the concerned parties.

References

Abbas, B. M. (1984) *The Ganges Water Dispute*, Dhaka: University Press Limited.

Clarke, R. (1991) *Water: The international crisis*, London: Earthscan.

Elhance, A. P. (1999) *Hydropolitics in the Third World: Conflict and Cooperation in the International River Basins,* Washington D. C.: United States Institute of Peace Press.

Hatami, H. and P. Gleick (1994) "Water, war, and peace in the Middle East." *Environment*, Vol. 36, No. 3. pp.6.

Salman, S. M. A. and K. Uprety (2002) Conflict and Cooperation on South Asia's International Rivers: A Legal Perspective, London: Kluwer Law International.

Shiva, V. (2002) Water Wars: Privatization, Pollution and Profit, London: Pluto Press.

Sirageldin, I. (1998) in an Interview with *Newsweek*, August 24, 1998.

The United Nations (1970) *GA Res. 2669 (XXV)* 1970.

The United Nations (1997a) UN Doc. A/C.6/51/NUW/L.3Add.1/CRP.94; Sixth Committee Meeting no. 62, 4 April 1997.

The United Nations (1997b) *UN Doc. A/51/869.*

The United Nations (1998) *World Population Prospects, The 1998 Revision*; and estimates by the Population Reference Bureau.

Wouters, P. 'The Legal Responses to International Water Scarcity and Water Conflicts: The UN Watercourses Convention and Beyond' in *Opinion*, March/June 2003.

Vinogradov, S. 'Transboundary Water Resources in the Former Soviet Union: Between Conflict and Cooperation' in *Natural Resources Journal*, vol. 36, 1996.

Thousand Years of Hydraulic Civilization
Some Sociotechnical Aspects of Water Management

H.A.H. Jayanesa[1] and John S. Selker[2]
1. Department of Geology, University of Peradeniya, Peradeniya, Sri Lanka.
cjayasena@pdn.ac.lk; jayasenh@engr.orst.edu; 94-81-2389156 (☏); 94-81-2224174(🖷)
2. Department of Bioengineering, Oregon State University, Corvallis, OR 97331, USA.
selkerj@engr.orst.edu; 541-737-6304 (☏); 541-737-2082(🖷)

Abstract

Sri Lanka had efficient hydraulic civilization for a period of thousand years from 200 BC till 1200 AD. Out of its 103 drainage basins, those underneath in the dry zone were successfully irrigated through system of tanks and diversion canals. Sociotechnical aspects of water management seem efficient and well performed in the construction and maintenance of these tank and canal systems. It is believed that the king and the regional chieftains perform very strong tight management. In addition strategic use of both top-down and bottom-up initiatives as well as private partnerships with their own tanks and maintenance systems were supported for the efficient maintenance and management. Though there are a number of contradictory points affecting the different ethnic and religious groups, the Dublin principles have been used at various decision-making stages by the present governments. However, the current political, economic and technical performances are not geared enough for such efficient water management. The religious, ethical and moral aspects interwove with the ancient civilization, were the basis for maintenance and management of the hydraulic systems and subsequent upheaval in the society. Therefore, we argued that for successful water resources development programs need community engagement, sound technology and timely resources.

Introduction

This paper aims to bring up some sociotechnical aspects of water management in Sri Lanka. It discusses several sections dealing with the establishment of hypotheses, general outline of water resources in Sri Lanka, some aspects of water management in the global context and sociotechnical aspects of water management in ancient and present periods in Sri Lanka. Then wind up with a discussion on future management of water resources. Sri Lanka is well known for its hydraulic civilization from the beginning of the 3rd century BC (Geiger - Mahavamsa, 1958). A period of more than thousand years of mostly uninterrupted sustainable water management was portrayed in the dry zone of Sri Lanka. This was largely obliterated by a number of invasions by South Indian races (Geiger–Chulavamsa, 1929; Basnayake, 1995) and later from the Portuguese, Dutch and English (Silva, 1998). There was some interest among the British administration towards renovating the tank and canal system as witnessed by the scholarly records on the Rajarata tank system (Brohier, 1935). The mechanism behind the Rajarata tank system has been later identified as evolved from a system of cascade tanks (Madduma Bandara, 1985). The script as recorded in the Chulavamsa (Geiger, 1929) stated a specific hydraulic principle. King Parakramabahu the great had stated “not even a little water that comes form the rain must flow into the ocean without being made useful to man” (Geiger – Chulavamsa, 1929; Nicholas, 1955). This has been used by many engineers and could use even in the future as a key principle for the sustainability of the dry zone hydraulic regime.

Hypotheses

The following statement regarding the present system of tanks and related hydraulic systems and it's effectiveness in the ancient period have been proposed as a hypothesis to be tested.

- Due to social aspects the technical performance of the current water management is much lower than ancient times.

Judging by the current water management and related irrigation efficiency and based on ancient chronicles, we believe that the overall performance of the ancient periods (200 BC – 1100 AD) could be relatively higher (Geiger – Chulavamsa, 1929; Nicholas, 1955). However, a mechanism is needed to examine and prove this in terms of agronomic and technical basis. Some believe that this has resulted due to a very strong tight management practice, which wound around the single political entity (King) or a number of regional chieftains. A tight top-down strategy (disciplined and responsible) or a strategic use of both top-down and bottom-up initiatives may improve such efficiency. It may start as a strong directives form the king while officials supported to him had participated in making his directions materialized. Parallel

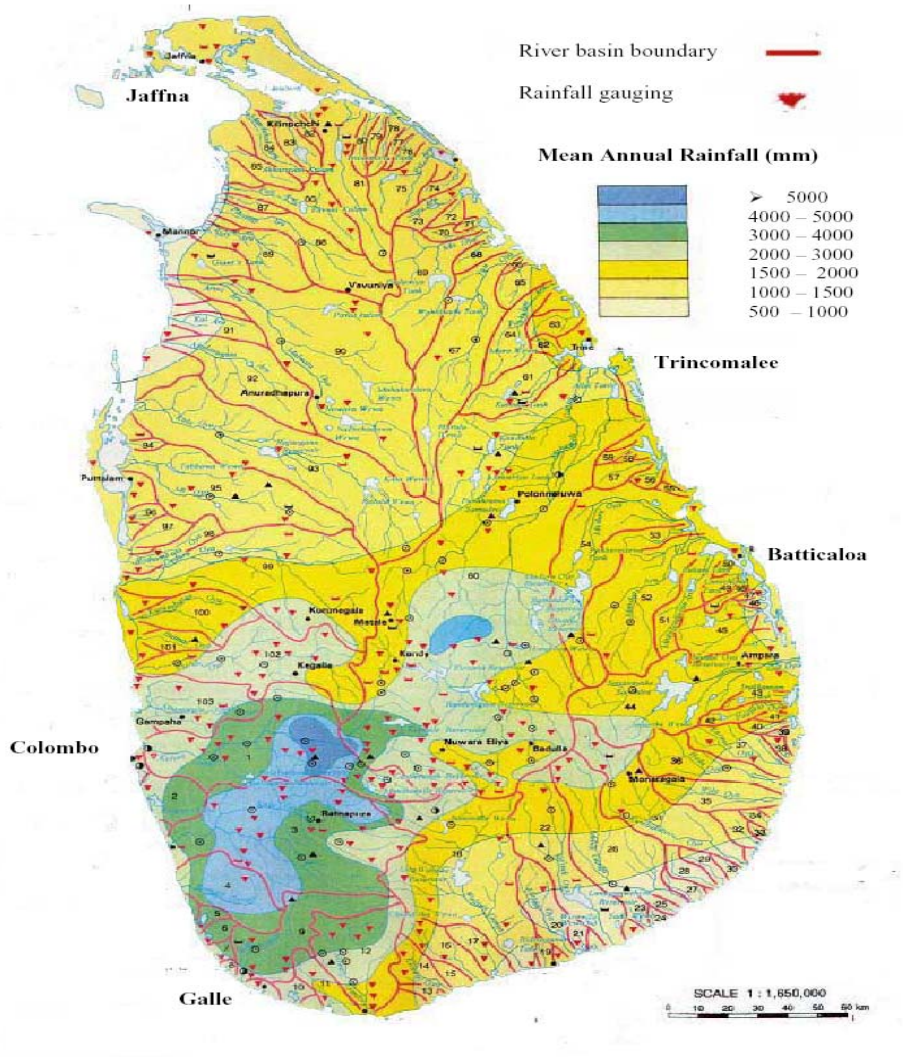


Fig. 1. Surface water resources in Sri Lanka (Somasekeram et al., 1997)

to this the farmers themselves may have organized in some form within the hamlets to absorb the routine as directed by the hierarchy. However, it can be argued that private partnerships having their own tanks and maintenance systems were also supported for the efficient maintenance and management system. Therefore, we believe that this efficiency may have resulted from collective “top-down” mandate and “bottom-up” initiatives.

Moreover, strong indications are present to show that the hydraulic regime in the dry zone must have been technically planned with a time tested remodeling activities for a period of more than thousand years. In this sense the water system evolved rather than being put in as an externally-conceived, untested complete system. The “technical planning” likely originated as minor irrigation activities started besides water bodies in the lower part of basins. Subsequent regulation of such water bodies took place by adding cascaded tank systems towards the upper parts of the basin. A more detailed description on these follows in a separate publication. The implementation of such activities must be maintained and managed by different levels of the society. Some chronicles indicate that they have adapted a willing to pay (WTP) or willing to work (WTW) criteria, which were strongly maneuvered by the society (Geiger-Mahavamsa, 1958; Liyanagamage and Gunawardhena, 1961).

Water Resources in Sri Lanka

Surface water resources in Sri Lanka, given in Fig.1, is highly influenced by the regional climatic pattern and island’s topography characterized by the central highlands and surrounding lowlands extending to coast. The rainfall, which is the only form of precipitation, can be considered under four distinct periods as a) First inter-monsoon period from March to April, b) South-West monsoon period from May to September, c) Second inter-monsoon period from October to November and d) North-East monsoon from December to February.

Although, Sri Lanka receives an annual rainfall of about 1800 mm, there is a significant spatial and temporal variation in the rainfall (Fig. 1). North-West and South-East parts of the island receive annual rainfall of 900mm with 70% of that is received during October to February of the year. On the other hand, some parts of the hill-country receives an annual rainfall of about 5000mm. Sri Lanka being a tropical country with different land use comprising of agriculture 27%, forest 30%, homesteads and services 16%. The potential evapotranspiration has been found to be in the range of 1500 – 1700 mm per annum (Kayane 1983).

Sri Lanka has 103 distinct river basins ranging from 10 - 10450 km^2 in size (Fig. 1). Most of the large basins are of broad leaf–like shape and originate from the central hill and extend to coastal plain area. Presently the island enjoyed an inland water storage capacity of 6 km^3 as fresh water reservoirs to regulate seasonal runoff (Amerasinghe et al., 1999, Weerakoon et al., 2001). The contribution from nearly 18000 small irrigation reservoirs scattered in the dry regions of the island receiving less than 1500 mm of rainfall is estimated to be about 0.5 km^3 (Weerakoon and Hearth, 2002). Though no detailed water balance study covering the entire island has been carried out, annual run-off generation in the island is estimated to be about 5 million ha m with a runoff ratio of 0.4. It is also estimated that 65% of the runoff escapes into the sea as stream runoff. Requirement for evapotranspiration and replenishment of ground water are estimated to be 40% and 20% of the runoff respectively (Manchanayake and Madduma Bandara, 1999). Some of these values are arbitrary and spatial and temporal variations could be high. Significant amount of groundwater escape through subsurface geological formations and structurally weak zones are also expected (Jayasena et al., 1986; Jayasena, 1989; 1993; 1995).

Water management in global context

Water scarcity in the world has been forecasted by many scientific studies. Based on a recent study (Wallace, 2000), Sri Lanka will face water scarcity in the next 50 years. It is interesting to note that most of these countries (Fig. 2), which show, water scarcity in the present were once among the most powerful countries in the world with specific hydraulic systems. Probably that power and wealth accumulated within these countries drew people from many different areas causing destabilization of governing systems and subsequent un-sustainability and disorganization. These alien communities could not understand the driving force of such individual hydraulic systems as one could witness in African continent with good examples form Egypt, Middle East and East Asian regions. This may cause problems in the decision making process while depriving of precious water resources needed for sustainability. The core problems of such global changes have been indicated below which might consider under anthropogenic and ecological basis.

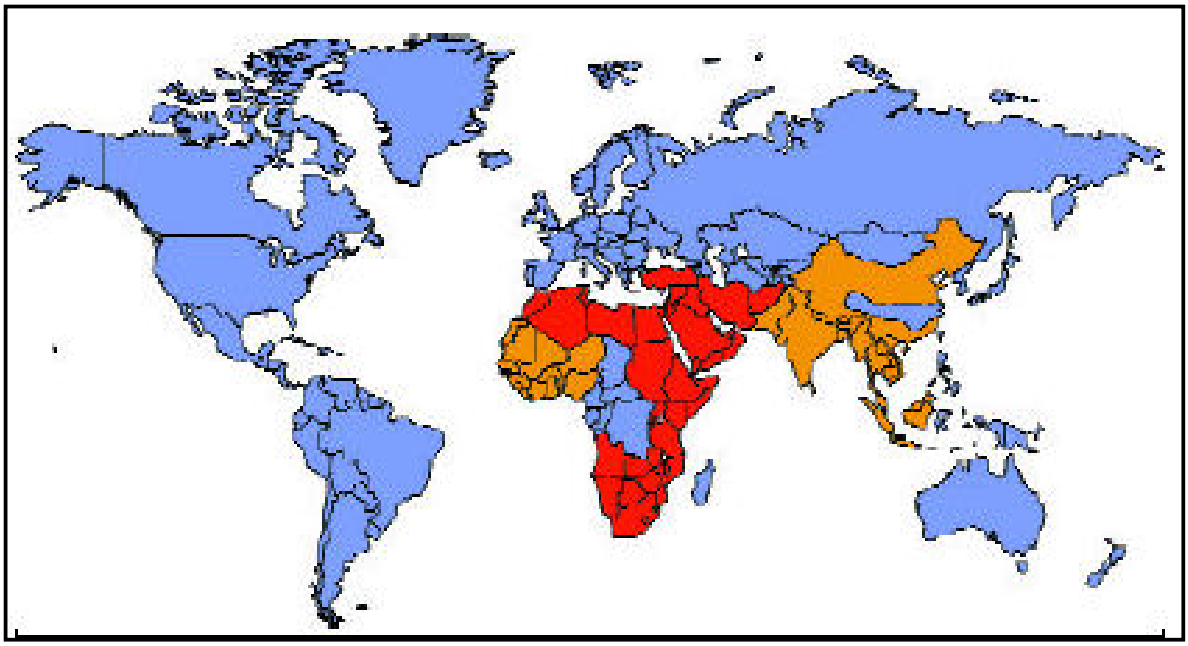


Fig. 2. Estimated global water scarcity in 2050 (after Wallace, 2000).
Red - < 1000 m^3 / person / year,
Orange - 1000 and 2000 m^3/ person / year
Blue - > 2000 m^3 / person / year

Anthroposphere:
- Population growth and migration,
- Threats to health,
- Threats to food security,
- Widening disparities in development worldwide,
- Spreading of non-sustainable lifestyles;

Ecosphere:
- Climate change,
- Loss of biodiversity,
- Soil degradation,
- Scarcity and pollution of freshwater resources,
- Pollution of the world's oceans,
- Human-induced natural disasters.

The globally accepted criteria for water resources assessment and development have been summarized by the UN resolution passed in 1992 at Dublin, UK has been a key practice for current water resources management. Though there are a number of contradictory points affecting the different ethnic and religious groups, these criteria in principle have been used at various decision-making stages. The 1992 Dublin Principles are itemized below

- Freshwater is a finite and vulnerable resource, essential to sustain life, development and the environment;
- Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels;
- Women play a central part in the provision, management, and safeguarding of water;
- Water has an economic value in all its competing uses, and should be recognized as an economic good.

These principles provided tight and clear phrases to establish the importance and significance of water resources. They stress the significance of human participation for sustainable water resource development, since it is a finite but very specific economically valuable resource. Some people think that some of these principles could precipitate wars between countries, but Wolf (1995, 1997) argues the opposite, that water stress has not historically lead to war, and further favors negotiation, presenting the possibility that these processes may provided the basis for broader international solutions.

The context of water resources plans must be addressed and the following terms have been discussed in the literature as central aspects of the socio-technical context to be considered. We may condense these issues to the following indices and definitions with their relations in the making of decisions on present programs.

- Stress: The demand for water exceeds the available amount during a certain period
- Strain: The ratio of Shortage/Availability; the shortage measured as the difference between requirement and availability (Haddadin, 2002)
- Demand versus Supply: Economic analyses, discount rates and risks of projects
- Poverty Indexes: depends on Resources, Access, Capacity Use, Environmental Impact
- Water Poverty: The ratio of the amount of available renewable water to the amount required to cover food production and the household uses, of one person in one year under the prevailing climate conditions (Salameh, 2000). On the basis of several criticisms (Sullivan, 2002) on such aggregate index, Feitelson and Chenoweth (2002) suggested a different definition. It is a situation where a nation or region can not afford the cost of sustainable clean water to all people at all times

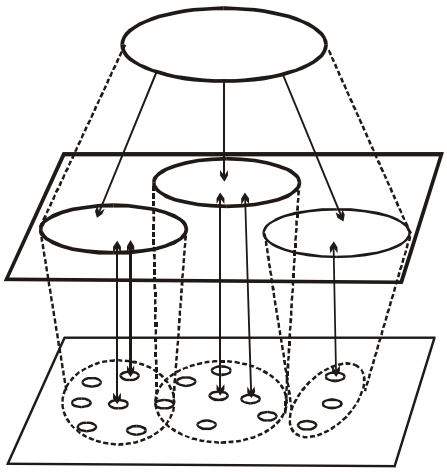


Fig. 3. The figure showing Macro, Meso and micro level actors interacting each other in the water Resource Development programs (Modified after Kemp et al, 2001)

- Pareto efficiency: Economic index guiding personnel gains
- Complexity of integrating diverse “Actor” perspectives and involvement (Fig. 3)
- Management objectives and plans
- Political decision-making structure

The technical setup of the Hydraulic system

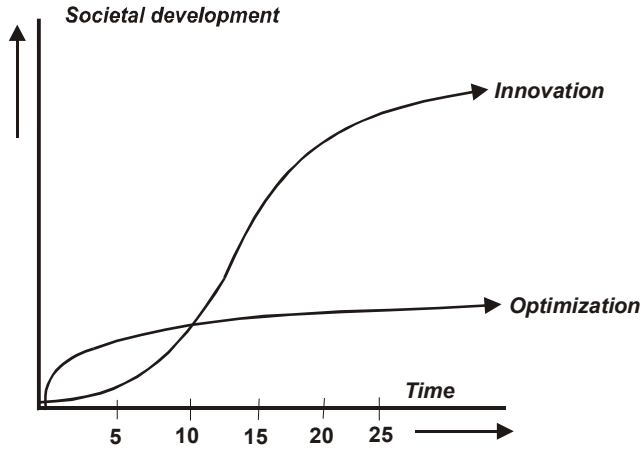


Fig. 4. The figure showing system optimization vs. system innovation in Water Resources development in the dry zone of Sri Lanka (Modified after Kemp and Rotmans , 2001)

It is clear that depression storages have provided a starting point for water management in newly civilized agriculture-dependent societies in ancient Sri Lanka. Those who visited from North India brought this new culture with the seeds of this technology, which they may have used at the beginning. As the figure 4 shows, the planning of building reservoirs initiated at a crude level however, innovations speeded it with the societal input. By virtue of the evolutionary development of the technology and infrastructure adapted as and when changes were necessary. In our case the cascade system of tanks evolved in parallel to the societal development as shown in the “Innovation” curve (Fig. 4). If we just consider the optimization, the development of the society may locate at a lower level. If we follow a pathway of innovation, we must employ proper maintenance and restore law and order in order to govern the system. Many developed nations have undergone such changes and good examples could be drawn form countries in Asia.

Figure 5 shows how normal, forested and regulated catchments would behave. The ancients had identified the easiness of regulating flow by cascaded tank system. The longevity of the flow could be maintained and which was a key to sustainability in the dry zone. The cascade system has been tested and even modeled (Jayatilake et al., 2002). It proves that it is even working under the present system and could be creating a sustainable system for the people.

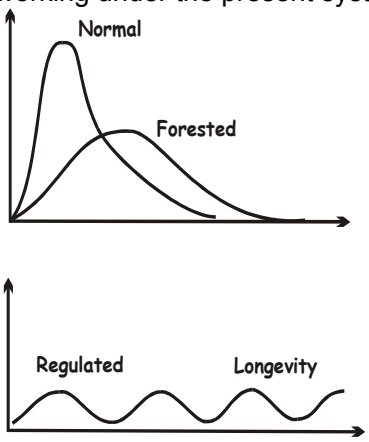


Fig. 5. Hydrographs showing normal, forested and regulated watersheds

The characteristics and trends of the present era in USA (Vonnahme, 1998)

"top down " mandates	→	"bottom up" initiatives
Command and control regulatory emphasis	→	Partnership oriented voluntary compliance emphasis
Federal funding driving program	→	Creative financing
Balancing economic and environmental issues	→	Integrating economic and environmental issues
Federal agency leadership oversight	→	Federal/state partnership
Acknowledgement of socio economic consideration and differing value systems in planning and management	→	Inclusion of socio economic considerations and differing value systems in planning and management
Single media emphasis	→	Multimedia ecosystem approach
Geopolitical boundaries as the basis for planning and management	→	Hydrologic boundaries as the basis for planning and management
Environmental ethics	→	Sustainability ethics

USA provide specific interests on a number of issues (Vonnahme, 1998). Based on written records, we believe that the ancient hydraulic civilization must have been undergone similar activities but the effects were oscillating between the extreme ends depending on the situation. Though we have had a tight top down approach in administering hydraulic systems in our country, effective solutions for water related issues and problems might have obtained through moderate approach. The person in charge or the peasants themselves have been using the irrigation waters with due responsibility that only at several occasions the code of ethics were breached by the people. However, the system had been undermined and become ineffective following a series of rulers disinterested in water resources activities, as occurred after 13th century (Geiger – Chulavamsa, 1929). Haphazard management was the central problem encountered by the British in early 19th century when they attempted to revive the tank-based irrigation system in Rajarata after some 500 years of neglect. These may provide how effective was the public participation component during the Parakramabahu period (Nicholas, 1955; Basnayake, 1995). The effectiveness of original hydraulic system was evident even with many breached tanks and diversion schemes within the hydraulic regime in the dry zone of Sri Lanka as seen in the early 19th century.

Sociotechnical Issues: Ancient

Selected pivotal issues related to ancient and modern period have been listed below to highlight key aspects of this evolution. Our aim is to focus upon several key issues within the hydraulic system in terms of its total environmental basis. This is a qualitative discussion that calls for renewed in-depth consideration in subsequent publications

1. Water management – The plans for such activities may have initially started by a proper technical process but maintenance of the system through social systems with some form of a public participation.

2. Lower population – Many have argued that there was lower population in the ancient period while some believe that the area between Polonnaruwa and Anuradhapura may have been heavily populated during Polonnaruwa period. Considering current conditions, it

is clear that with proper irrigation facilities and management, we could feed the present population as evidenced by recent bumper harvest (Daily News, 2003).

3. The historic technical solution was cascaded tanks for flood irrigation (rice) complemented by run-of-the-river diversion of major rivers to supplement dry zone irrigation.

Many of these cascade tank systems show linear basins as depicted in the above diagram (Fig. 6). The Drainage basin "A" usually shows a more subdued hydrograph while the "B" the leaf shape one shows a prominent peak. Dhanapala and Jayasena (1998) attempted to model several basins in the central highlands using maps and empirical formula. They found the same effect where subdued peaks were noted when the length of the basin is longer. Ancient hydraulic engineers may have understood this and used as to control the flow and regulate the system. This was effective in water conservation and sustainability of the people living within the system. The water usage was distributed along the paddy lands located in the fracture zones so that the subsurface water movement was effective in maintaining high water table (Jayasena et al., 1986; Jayasena, 1989, 1993, 1995). Figure 7 show how this may have happened during the flood irrigation and harvesting period. Since only one time that they have been using the flooding mainly during rainy periods, the availability of water for subsequent period is high and storage within the tanks replenishes the subsequent requirements. In addition it must be quickly flushed off after short period of rainfall during monsoon periods causing proper flushing and removing of salts. However, at present salt accumulation in the flow regime has been identified by many studies (Jayasena, 1989; Jayasena and Dissanayake, 1995; Jayasena et al., 2000).

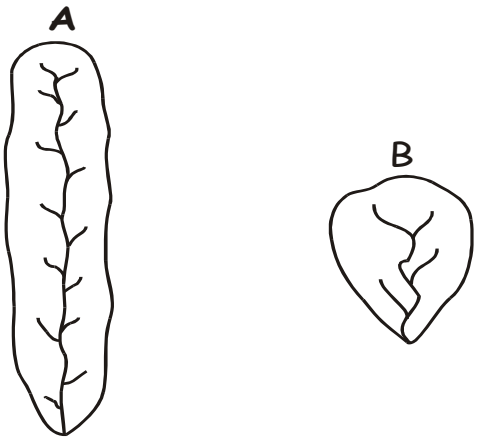


Fig 6. The linear and the leaf shape drainage basins

4. "Bethma": Irrigation according to supply, social objects; succeeded in increased food quantity and reliability

5. Traditional individual storehouses and large granary at "Vel Vidane" (Authority of irrigation and tanks in the village) provided increased reliability of food supply.

6. Was control wielded by a single political entity (King) in a tight top down strategy (disciplined and responsible) or both top down and bottom up initiative and community participation? In all likelihood some form of private partnerships was present at time when selected individuals had their own tanks and maintenance responsibilities. This issue requires additional investigation to truly understand the modes by which innovation and change entered the water management culture.

7. It is known that wind flow adjacent to major tanks was used for smelting iron (?) as documented at Naula, Samanalawewa, Tissawewa and other locations in Sri Lanka (Geiger – Mahavamsa, 1958; Basnayake, 1995). Was this industry a factor in tank design, or an opportunistic association? This is a question to be answered in a later publication.

8. "Tawalla" the upper periphery of the tank is the region where water was passing through a wetland. Since clay and sand were deposited in this region, it has been used in the dry periods to extract clay for the potter. This was recorded in Mahavamsa as shown by Tissawewa in Anuradhapura. How did these tanks contribute to this locally important industry? This is a question to be addressed in a future publication. Wetlands are effective in

maintaining appropriate BOD, N and P of the flowing waters. Especially NO_x contribution by cattle along the periphery could be removed in this method. The plants in these areas have been used for making mats and other household items for the benefit of the village peasant families.

9. Long duration paddy (Ma Wee) and variety of subsistence grains suitable for climatic situations and water availability was available. As seen in the figure 7, the soil is moistened for a longer period when compares with the short duration paddy. The water table is at a higher level that even a short period rainfall may initiate recharging on site. This could decrease the surface discharge; however since the current system with lower water table could take more time to recharge causing quick out flow of rainfall from the system.

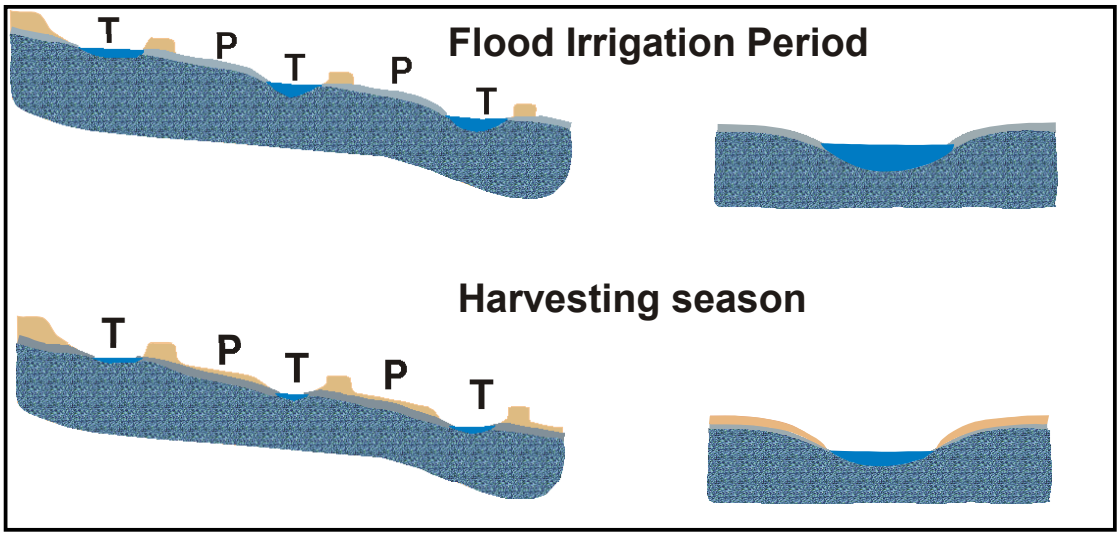


Fig. 7. Water table variation during flood irrigation and harvesting periods. T and P denotes a tank and a paddy field respectively

10. Variety of biological preservation techniques for food and grains.

11. Application of organic fertilizer- Organic farming

12. Traditional methods of controlling insects so that the biota preserved. Fish, worms and crabs in the paddy fields provide very well ventilated and porous upper soil and good quality water. This may hinder the outbreak of mosquito menace.

13. Closed but well integrated society. Many religious rituals – Individual is responsible for his doing –Integrity within the society

14. No public water supply schemes except for major monasteries and core of the kingdom – Water Conservation.

Sociotechnical Issues: Current

1. Systems of cascade tanks remain. Major constructions were added through government based implementing machinery - Dependence.

2. Increased water logging and salinization in the un-drained areas resulted from additional irrigation – Loss of irrigable lands

3. Short term paddy (3 - 4 month variety) with two seasons per year – excessive evaporation compared with a single season; more chemical fertilizers needed which resulted economic hardships and loss of interest among the farmers (Simple calculation of cost - benefit) - Dependence.

4. Large government storehouses (for paddy) out side the system. People do have mistrust with government officials due to ignorance and corruption - Farmer is not benefiting.

5. Chemical preservation techniques for food and grains – Dependence

6. Party politics (1-6 years). Political/Social system has more diffusive objectives. Members of the Parliament (MP) were appointed based on a chit system, which was wholly on personnel relations, and later reinvented a system based on district majority, which also created a severe competition among the prospective candidates. Both these systems created inefficiencies. The MP's were not responsible for the respective electorates and the people that created a self-serving political system. The political integrity was lost – Ineffective and Expensive.

7. Chemical preservation techniques for food and grains – Dependence

8. Application of chemical fertilizer, herbicides and fungicides created a mass destruction of the biological system and additional burden to the already deprived farmer– Dependence

9. Project funding responds to political power not citizens needs. No buy in (small segments get the benefits). International influence through donor agencies and later through NGO's create skepticism among the people - No partnership

10. Breakdown in Social cohesion. Very open system with diluted values within the society. No one is responsible except the weak government machinery – Moral values go down.

11. Still very few and unreliable water supplies for major cities. Hamlets and villages are depending on ephemeral wells, springs, streams, tanks and canals. Major concern

12. More mechanized farming system has been introduced. Traditional socially driven collective farming system was disrupted – Dependence

Discussion

The forgoing subtopics have revealed the significance of unique hydraulic civilization, which had been efficiently executed in a period from 200 BC – 1200 AD. Out of 103 drainage basins, the basins underneath the dry zone were successfully irrigated through system of tanks and diversion canals. Several sociotechnical aspects related to present and ancient hydraulic regime in Sri Lanka have been discussed. Mahavamsa (Geiger, 1958) indicated that religious, ethical and moral aspects interwove with the ancient hydraulic civilization. This was the base for maintenance and management of the hydraulic systems that caused subsequent upheaval in the society. Keep this in mind; we could argue that for successful projects need community engagement, sound technology and timely resources. In the present, usually resources are coming through out side as donor driven support. It is our belief that this should directly go to the relevant project, however, what we observe is a politically driven interest disorganizing such activities (Fig. 8). The necessities of the community could not be met by pure politically driven and manipulating activities. Due to some of these activities, the people's interests on proper governance have been challenged.

It can be seen that the key for successful water resources development and sustainability of such systems was public participation and/or community engagement. Maintenance of irrigation programs consequently provides efficient outcome and sustainability of the hydraulic system. At present we as engineers should concern on how we should do this and what step do we have to take in future to correct this?

It is necessary to develop an effective hierarchy with respected representatives from the local community. We believe the monks and priests, school principals, noble men and women within village level must encourage participating in such activities for the benefit of the society. We should initially provide them with family based or sector based responsibilities and encourage their authoritative participation for water supply and maintenance programs.

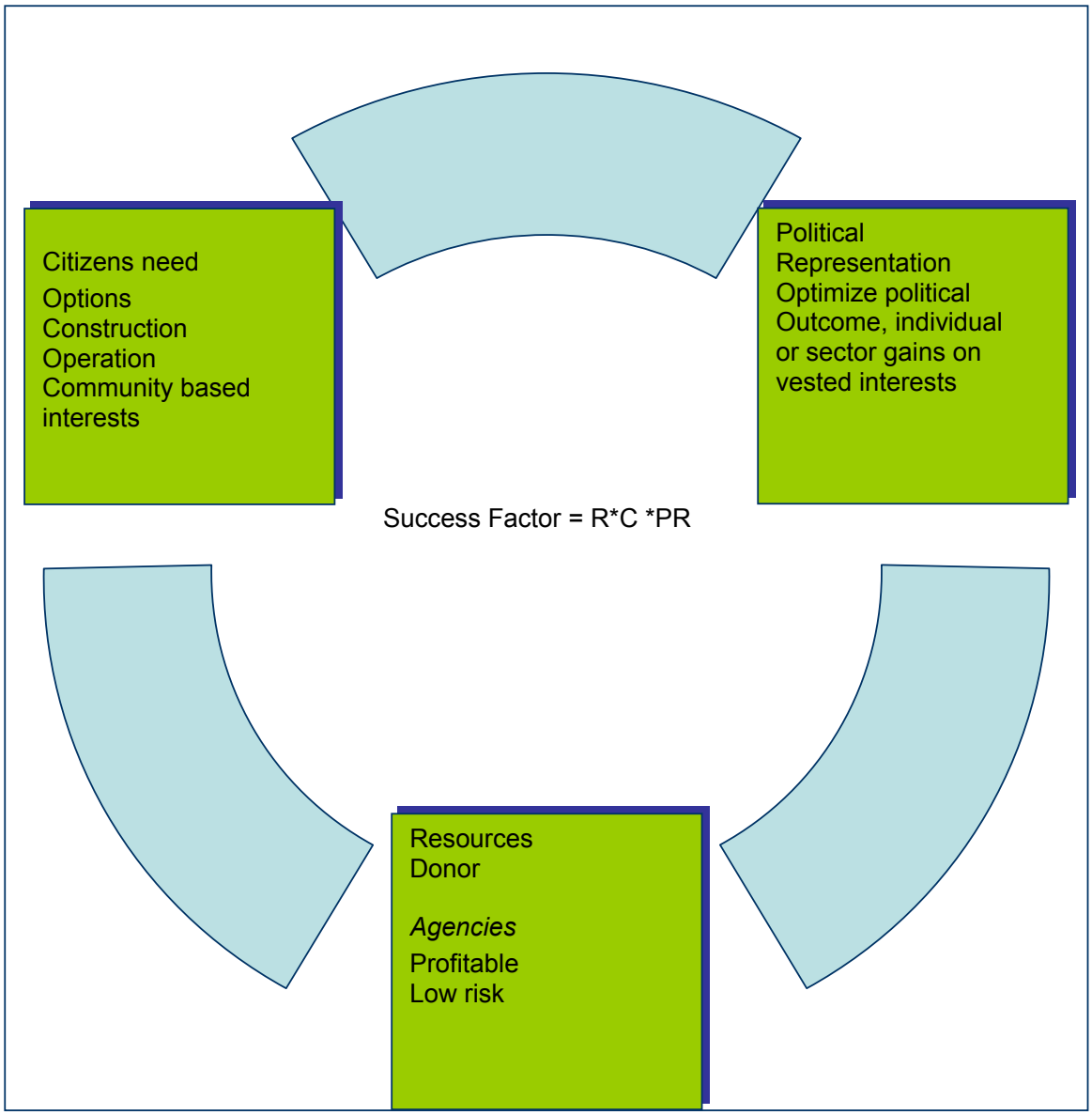


Fig 8. The interrelationships of Resources, Citizen and Politician in the Present water resources development

Let them build up mutually dependable local industries parallel with the above activities. We must minimize direct input of government machinery except for high tech advises and monetary supports. The committees comprised with such bodies must maintain strict measures and they must be responsible to maintain the longevity of the water supply and irrigation systems. Any mismanagement is to be taken in to a higher body and immediately solved with the participation of the community. We expect that the monks or priests could do a better judgment on such extreme cases while these committees could handle routine water related activities.

Acknowledgement

We are thankful to the IAEA for the support rendered to the first author to carry out his postgraduate study at the Oregon State University during which the paper was prepared. Constructive criticism by many graduate students of the hydrology program in the Bioengineering department is mentioned with gratitude. Special thanks goes to Miss Sunethra Kanumale for drafting of figures.

References

Amarasinghe U A, L. Mutuwatte and R. Sakthivadivel, 1999. Water scarcity variations within a country: A case study of Sri Lanka, Report 32, International Water Management Institute, Colombo, Sri Lanka. pp.32.

Brohier, R.L., 1934. Ancient Irrigation Works in Ceylon, Government Press, Colombo, 64p.

Dhanapala, T.R.W.S. and Jayasena, H.A.H. 1998. Hydrologic model for selected sub-catchments in the Mahaweli basin of Sri Lanka. National Conference on Status and Future Direction of Water Research in Sri Lanka. International Water Management Institute, Colombo, Sri Lanka. 17 pp.

Feitelson, E and Chenoweth, J., 2002. Water Poverty: Towards a meaningful indicator. Water Policy 4: 263-281.

Geiger, W.C., 1958. The Mahavamsa - The Great Chronicle of Sri Lanka– Translated from original versions written by Ven. Mahanama Thera, Pali Text Society, London.

Geiger, W.C., 1929. The Chulavamsa – Translated from original versions written by Mahathera Dhammakitti and Tibbotuwegama Sumangala Thero, Pali Text Society, London.

Haddadin, M, 2002. Water issues in the Middle East challenges and opportunities, Water Policy, 4: 205-222.

Jayasena, H.A.H., 1989. Hydrogeology of basement complexes - A case study from the Kurunegala District of Sri Lanka. M.S. Thesis. Colorado State University, Fort Collins, CO 80525, U.S.A. 121pp.

Jayasena, H.A.H., 1993. Geological and structural significance in variation of groundwater quality in hard crystalline rocks of Sri Lanka. In Hydrogeology of Fractured rocks (Eds. Sheila and David Banks), Memoirs of XXIVth IAH Congress Oslo, Norway. Section C8: 450-471.

Jayasena, H.A.H., 1995. An analysis of fluid flow through fractured rocks. In K. Dahanayake (Editor), Handbook on Geology and Mineral Resources of Sri Lanka, Second South Asia Geological Congress Souvenir Publication, Colombo, Sri Lanka. pp 87-90.

Jayasena, H.A.H., Balasooriya, N.W.B., Suhail, M.N.M. and Rajapakse, R.R.G.R., 2000. Seasonal effects on water quality variation in a crystalline terrain- A case study from the VRR sanctuary in Sri Lanka. Journal of the Geological Society of Sri Lanka., 9: 38-53.

Jayasena, H.A.H. and Dissanayake, C.B., 1995. Analysis of hydrochemistry in the ground water flow system of a crystalline terrain. In Memoirs of XXVIth IAH Congress - Edmonton, Canada. Top in the session on Tropical Hydrochemistry. pp12

Jayasena, H.A.H., Singh, B.K. and Dissanayake, C.B., 1986. Groundwater occurrences in the hard rock terrain of Sri Lanka - A Case Study. AQUA., 4: 214-219.

Jayatilaka C.J. Sakthivadivel R. Shinogi Y. Makin I.W. Witharana P. “A simple water balance approach for determining water availability in an irrigation tank cascade system” International Water Management Institute (IWMI) P.O. Box 2075, Colombo, Sri Lanka

Kayane, I and Nakagawa, S.,1983, Evaporation and water balance in Sri Lanka, Climatological Notes, No.33, Tsukuba, Japan. pp 85

Kemp, R. and Rotmans, J., 2001. The management of the co evolution of technical, Environmental and Social Systems. Proc. Int. Conf. on “Towards Environmental Innovation System”. Garmisch-Partenkirchen, Netherlands. 1-22pp.

Kumarasinghe, U, 2003 Aug 10, Bumper Yala harvest projected, Daily News, Colombo, Sri Lanka.

Liyanagamage, A and Gunewardhena, R., 1961. Anuradhapura Period, Kelaniya

Madduma Bandara, C.M. 1985. Catchment ecosystem and village tank cascade in the dry zone of Sri Lanka: A time-tested system of land and water resources management. In strategies for river basin management: Environmental integration of land and water in a river basin, ed J. Lundqvist, U. Lohm and M. Falkenmark, 99-113. Dordrecht: D. Reidel Publishing Company.

Manchanayake, P and Madduma Bandara, 1999. Water Resources of Sri Lanka, National Science Foundation, Colombo, pp.112.

Nicholas, C.W., 1960, A short account of the History of irrigation works up to the 11th century. History of the Ceylon, Jour. of Royal Asiatic Society, New Ser., VII (1960), 43-69.

Nicholas, C.W., 1954. The irrigation works of king Parakramabahu I”, The Ceylon Historical Jour., IV: 52-68.

Parker H. “Ancient Ceylon” Asian Educational services New Delhi, 1981

Salameh, E., 2000. Refining the water poverty index, Water International, 25(3): 469-473.

Silva, C.R. de, 1990. Sri Lanka a History. Vikas Publishing house limited, New Delhi. 316 pp

Somasekaram, T., Perera, L.A.G. Perera, M.P. de Silva M.B.G., Karunanayake. M.M and Epitawatta, D.S. eds. (1982) The National Atlas of Sri Lanka: Survey Department of Sri Lanka.

Sullivan, C. 2000. The development of water Poverty index: a feasibility study. Department for International development, Center for ecology and Hydrology.

Vonnahme, D.R., 1998. The emerging state role in planning and management, In Coordination: Water Resources and Environment ed by William Whipple, Jr., American Society of Civil Engineers, 1801, Alexander Bell Drive, Reston, Virginia 20191-4400, USA. 23-28.

Weerakoon, S.B., Herath, S. and Tamai, T., 2001. River basin based paddy extent estimation considering the irrigation systems in Sri Lanka, Int. Symp. LUCC contribution to Asian Environmental Problems, Tokyo.

Whipple, W, 1998. Guiding Principles for Coordination, In Coordination: Water resources and Environment ed by William Whipple, Jr., American Society of Civil Engineers, 1801, Alexander Bell Drive, Reston, Virginia 20191-4400, USA. 3-8.

Wolf, A.T. 1995. Hydropolitics along the Jordan River: Scarce Water and its Impact on the Arab-Israeli Conflict. United Nations University Press, Tokyo, Japan.

Wolf, A. T. 1997. “’Water wars’ and water reality: Conflict and cooperation along international waterways.” NATO Advanced Research Workshop on Environmental Change, Adaptation, and Human Security. Budapest, Hungary. 9-12 October.

Paradigmatic Change in the Indonesian Irrigation Development in Disarray [1]

Mochammad Maksum [2]

Introduction

It is indeed very worthwhile in discussing recent dynamics of the irrigation development in Indonesia by relating this subject with the political turmoil precipitated by the Indonesian economic crisis, following the depreciation of the Thai baht in 1997, which has resulted in a unique crisis in Indonesia. The uniqueness of the crisis can be seen in the multidimensional nature and the extent of the crisis. The latter has placed Indonesia in a serious political instability, and made the country's currency comparatively the most affected by the Asian crisis with the longest impact.

Months before the Asian crisis came, the Indonesian macro economy was disturbed by serious natural calamities in the forms of extensive forest fire destructing large forest area and very long drought destroying agricultural production. Before the country fully recovered from that natural crisis, Indonesia joined several Asian countries entered into the Asian financial crisis by the end of 1997. While the republic is still in the middle of facing the economic crisis, escalating public distrust to the state suddenly forced this Republic enter into its nationwide political crisis. Soeharto, who had governed Indonesia for more than three decades, was forced by the students to step down as the president of the country, two months after receiving the mandate of the People's Assembly[3].

The economic development model having no strong economic foundation adopted by the authoritarian government of Indonesia was blamed by many as the primary cause of economic crisis. Consequently, reformation movement following the economic crisis had to be politically anticipated by the *newly established* democratic government under Habibie, Wahid and Megawati as the third, the forth and the fifth Presidents of Indonesia, respectively, to review overall national development policies and conduct necessary policy reformation at all levels. Democratic movement started to significantly characterize the country's legislation and policy system.

The country's water resources development affairs were not an exemption. Irrigation development as its significant part experienced the most remarkable shift in political paradigm from being a strongly supporting factor of the rice-biased agricultural development for the sake of food self-sufficiency. Radical reformation of the national irrigation policy that has been well drafted and socialized strongly indicates the need for having more comprehensive and socially-sensitive development policies, otherwise agricultural sector would be dampened back more deeply into its sectoral and structural marginalization in the context of national development by disseminating more rural poverty in the *next possible crisis*.

---

[1] Presented at the International Workshop on: Water and Politics. Conducted by the World Water Council (WWC) in Marseille, French, February 26-27, 2004.

[2] Director and Agricultural Economist, Center for Rural and Regional Development Studies, Gadjah Mada University, Yogyakarta-Indonesia.

[3] Mochammad Maksum. 2001. Economic Crisis and Its Human-Social Cost in Indonesia. Paper presented at a conference on: Civil Society Response to the Asian Crisis in Three Countries: Indonesia, Korea and Thailand. Seoul, Korea, April 20-21, 2001. Cited in Maksum, M. and Sigit Supadmo Arif. 2001. Sectoral and Structural Poverty Syndrome in Irrigated Agriculture in Indonesia. Submitted in the Country Workshop on Pro-Poor Intervention Strategies in Irrigated Agriculture in Indonesia. Yogyakarta. May 23, 2001.

Structural Marginalization of Irrigated Agriculture

The political-economic crisis experienced by Indonesia meant many things for irrigated agricultural sector. It is now nationally accepted that agricultural sector of Indonesia has been impoverished within the country's economic development model characterized, among others, by: (i) the adoption of the top-down and authoritarian development model; (ii) foreign capital and foreign input based development; (iii) import-based industry biased development; and (iv) rice biased development in agriculture[4].

Such development model enabled the country successfully improve the living standard of the country but with a very limited attention to the need of attaining the *growth-equity-sustainability*[5] objectives of the country's development. The first three characteristics have been able to provide an average annual growth rate of about seven percent for the 1980-90s to the country's economy by abnormally concentrating on high-technology intensive industry (HTI), capital intensive industry (CII), and skilled-labor intensive industry (SLI). Abnormal biased in these industries has resulted in favorable economic growth at the expense of other industries, namely, natural resource intensive industry (NRI) and unskilled-labor intensive industry (ULI), the two industrial sectors shouldering the economy of the citizen majority.

Such political-economic bias to HTI, CII and SLI, which penalized NRI and ULI, could be observed in many cases. Industry-biased credit distribution, industrial development and local currency protection, among others, had made robust growth in the three industries but at the same time negatively made NRI and ULI to be extremely high cost, inefficient and less competitive industries. Trough this mechanism, the Indonesian agricultural sector has been structurally marginalized for the last decades[6]. Rural poverty incidence dominated by rural areas could be partly attributed to this policy bias.

Natural consequence of that political choice, extremely rice-biased and industry-biased development policy had made agricultural sector marginalized for the sake of rice production *at all cost*. Nation-wide agriculture development in the country before entering into its reformation era were completely designed and dedicated for delivering production-oriented rice development. Consequently, overall irrigation development systems were politically very rice-biasedly developed.

It was very clear that in terms of rice, agricultural and irrigation development was very successful in delivering the country's self-sufficiency in rice, which was significantly attained in 1984. However, this rice success was not very well accompanied by proportional improvement in the people's welfare in agricultural and rural areas.

Among other impacts easily observable at the ground were: (i) farm production approach has left the farmers remain poor; (ii) input dependent of rice farming made rice sustainability questionable; (iii) rice biased agricultural policy left almost no incentive to other agricultural commodities; (iv) non-rice economic development, including R&D, was very minimal; (v) crops diversification was discouraged; (vi) more MNCs dependent of non-rice production system; and (vii) food security profile tends to depend on a single staple food, which is rice, instead of diversified staple foods as previously practiced by Indonesians. In turns, due to

[4] Read Jung, Ku-Hyun; A. Poungsomlee; M.Maksum; and TK Park. 2003. Civil Society Response to the Asian Crisis: Indonesia, Korea and Thailand. Published by the East and West Studies, Yonsei University, South Korea in cooperation with the Asia Pacific Philanthropy Consortium (APPC).

[5] The critical triangle as cited by Mochammad Maksum. 1997. The Critical Triangle of Agricultural Development. In Maksum, M. et al. (eds.) 1997. People Based Sustainable Agricultural Development for a Global World. P3PK-UGM.

[6] Read Maksum, M and Sigit Supadmo A. 2001. Sectoral and Structural Poverty Syndrome in Irrigated Agriculture in Indonesia. –ibid-.

sectoral maldevelopment, agricultural sector in general, including forestry and fishery, hardly gain any global trade advantage during the crisis[7].

In criticizing this agricultural and irrigation development paradox, a national workshop on structural poverty in irrigated agriculture conducted in the Center for Rural and Regional Studies, Gadjah Mada University, 1999[8], concluded that the majority of poverty incidence in irrigated area in Indonesia was very much influenced by structural problems. Therefore, it must be considered as structural poverty[9] by any development intervention. Otherwise, any political and economic interventions formulated would never be very sensitive to poverty alleviation need.

The introductory part of this paper clearly mentioned that irrigation development policy was not exempted from the spirit of democratic and reformation movement. Though it will not solely guarantee the success of irrigation development in the country, people may hope that irrigation policy reform might serve as the basis to better develop the country's irrigated agriculture with a more democratic and humanistic consideration. It is very relevant, therefore, to review a short historical perspective of the Irrigation Management Policy Reform (IMPR).

Political History of IMPR

The downfall of the New Order Government in the second quarter of 1998 and the issuance of the Decision of the People's Assembly (TAP MPR) in 1998 on reform and community participation in development forced the government initiating the formulation of policy reform for irrigation development. Recommendations gathered from series of seminar conducted since 1990 were considered as very valuable reference in the preparation of the Irrigation Management Policy Reform (IMPR). Based on the TAP MPR and for neutrality reason, senior personnel from prominent universities (Universities of Gadjah Mada, Padjadjaran and Andalas) were recruited in the third quarter of 1998 to draft the original concept of IMPR[10].

In maintaining the neutrality and the acceptability of the concept at the community level, IMPR draft was being intensively socialized and consulted by the government through intensive public consultation. For the sake of objectivity and the transparency in public consultation, prominent NGOs (LP3ES and SKEPHI) were recruited to conduct such public consultation during the months of December 1998 - February 1999. Based on that public consultation and necessary revision, it could be concluded that the revised version of draft was then declared as IMPR concept publicly acceptable to reflect the need of farmers in irrigated agriculture development.

On April 13, 1999, Abdurrahman Wahid as the President of the Republic at that time declared IMPR concept in a national workshop of vice governors of the country. This Presidential declaration (*Maklumat Presiden*) was formalized by the issuance of Presidential Instruction (*Instruksi Presiden*) No. 3 1999 on IMPR composing of 5 principal policies: (i) redefinition of tasks and responsibilities of irrigation management institutions; (ii) empowerment of farmers via Water User Associations; (iii) transfer of irrigation management to Water User

[7] Export development of agricultural sector showed minimum growth in 1997 and 1998, while some industries in this sector showed even negative growth. When local currency depreciated, this negative or minimum growth of domestic based sector should have not been the case if sectoral development is normal.

[8] That workshop was conducted by the Center for Rural and Regional Development Studies (CRRDS) of Gadjah Mada University in cooperation with KIKIS, Percik and AUS-Aid. December, 1999.

[9] Several basic problems connected with structural poverty in irrigated agriculture recommended by the KIKIS workshop was summarized in Maksum, M and Sigit Supadmo Arif. 2001. Sectoral and Structural Poverty in Irrigated Agriculture in Indonesia. –ibid- please read Appendix 1.

[10] Maksum, Mochammad; et. al. 2003. Study on the Impact of Irrigation Management Policy Reform (IMPR) Implementation in Indonesia. A Final Report of the NGO-University Consortium for Water Resource Management Reform.

Associations; (iv) financial reform in irrigation management; and (v) sustainability of irrigation systems.

Box 1: Principal Components of IMPR

- redefinition of tasks and responsibilities
- empowerment Water User Associations (WUAs)
- irrigation management transfer to WUAs
- financial reform in irrigation management
- sustainability of irrigation systems

Based upon political commitment on IMPR as stipulated by the Inpres No. 3/1999, the Government of Indonesia (GOI) started to conceptualize the implementation plan of IMPR in 1999 through the establishment of Working Committee (*Kelompok Kerja, POKJA*) whose members composed of representatives of the government, NGOs and universities. Based on several experimentation and initial implementation of IMPR since 1999, that Working Committee on Irrigation was very successful in drafting the irrigation development management guidelines, which was finally strengthened through the issuance of the Government Regulation (*Peraturan Pemerintah*) No.: 77/2001 on Irrigation. Without nullifying the need to support its effectiveness, this Government Regulation has been able to highlight several paradigmatic change in irrigation development management.

The elements of paradigmatic changes marked by this regulation are, among others, the following shifts in irrigation development: (i) from rice-based to welfare-based and sustainability; (ii) from centralized to decentralized; (iii) from the top-down to bottom-up development process; (iv) from the state monopoly to participative development; and (v) from the authoritarian government to good governance accommodating participation of other stakeholders and adopting the principles of good governance.

At the ground level, such a Government Regulation has been intensively adopted as a duly official basis for the nationwide irrigation management. Starting from all provinces in Java, IMPR implementation started to be in effective use also for selected provinces outside Java, while some others has been also made ready for IMPR implementation. The achievement of IMPR implementation were very remarkable though it is still being constrained by the fact that adopting such a very extreme paradigmatic shift was proven to be requiring consistent political will to support. Box 2 clearly indicates several structural constraints of IMPR implementation.

Box 2 Among Structural Constraints are:

It must be kept in mind that IMPR has been newly issued and implemented. The shift in irrigation model from being very centralistic to the decentralized and participative one still requires necessary strengthening efforts;
Repositioning irrigation stakeholders related to the task redefinition seems to be a serious bureaucratic problem requiring time and transition adjustment.
Irrigated agriculture in Indonesia has been rice-biasedly developed. There are too many constraints must be faced in bringing the shift from the rice-based towards welfare-based agriculture in favor of the farmers.
Sectoral-based development model has been implemented for decades by the country has marginalized agricultural sector by positioning this sector as producer of cheap commodities. To support the decentralized, participative and people-based development, inter-sectoral synergy is indefinitely postponable.
It must be kept in mind that IMPR has been newly issued and implemented. The shift in irrigation model from being very centralistic to the decentralized and participative one still requires necessary strengthening efforts;
Repositioning irrigation stakeholders related to the task redefinition seems to be a serious bureaucratic problem requiring time and transition adjustment.
Irrigated agriculture in Indonesia has been rice-biasedly developed. There are too many constraints must be faced in bringing the shift from the rice-based towards welfare-based agriculture in favor of the farmers.
Sectoral-based development model has been implemented for decades by the country has marginalized agricultural sector by positioning this sector as producer cheap commodities. To support the decentralized, participative and people-based development, inter-sectoral synergy is indefinitely postponable.

IMPR Implementation: Lessons Learned

Lessons learned presented in this chapter are completely derived from the implementation evaluation conducted in several evaluation studies[11] primarily aimed at assessing the extent to which the effectiveness of IMPR implementation and at the same time identifying relevant problems at the ground constraining the IMPR implementation in attaining its objectives. This chapter is presented as partial citation of the findings and lessons learned relevant to be raised connected with the political issues concerned as the central theme of this WWC workshop.

Box 3 Relevant Questions

What and to what extent is the impact has been accrued from IMPR Implementation during the early years after IMPR issuance?
At what level is the readiness of the Government and other stakeholders concerned in supporting IMPR Implementation?
What intervention strategies could be recommended for the IMPR Implementation to be more effective?

As far as the first questions is concerned, it is in fact very promising in the sense that IMPR implementation has provided positive impacts in terms of agricultural, economic, physical, environmental and socio-political impacts. Without nullifying the need to have continuous improvement and empowerment during the earlier years of IMPR implementation, overall

[11] Among others are: (i) CRRDS. 2003. Pro-Poor Intervention Strategies in Irrigated Agriculture in Indonesia. A Final Report prepared by the Center for Rural and Regional Development Studies (CRRDS), Gadjah Mada University in cooperation with the International Water Management Institute (IWMI); and (ii) Maksum, M. et.al. 2003. Study on the Impact of the IMPR Implementation in indonesia. –ibid-

impacts guarantee that IMPR has been well functioning as appropriate movement towards better irrigation sustainability.

Qualitative responses raised by sample farmers significantly reported that agricultural impacts were presented, among others, by better cropping intensity, higher acreage of cropping area, higher land productivity, more acceptable harvest certainty, flexible cropping selection, and higher rural food security. However, as far as economic impact is concerned, significant improvement has not been presented very clearly due to the fact that agricultural improvement was not simultaneously accompanied by the improvement in market and economic infrastructure development in favor of farmers.

Sectoral model of the country's development does not provide conducive market condition for agricultural development. Market and pricing policy, trade, monetary and fiscal policies are still being set in a conventional way to provide cheap commodities for the people in large, with minimum consideration of the importance of promoting the welfare of the farmers, the majority group of the country's citizen. This sectoral development model constituted as the primary constraint of IMPR implementation in addition to many other constraining factors including rice-biased culture, limited availability of non-rice technology, extension and subsidy, and rice-based irrigation system development adopted for the last few decades.

IMPR implementation has been able to successfully revitalize and empower the capacity of water user associations (WUAs), in any aspect, in irrigation development affairs. The improvement of these social capitals[12] strongly indicates the most remarkable socio-political impacts of IMPR, considering the fact that stimulating social change process of the farmers from being net beneficiaries of irrigation development towards participative farmers is not an easy task. It is expected that such social capital strengthening efforts must be intensified to guarantee better prospect of irrigation system sustainability.

Direct impact of the improvement of social capital performance in the forms of better environmental awareness, participation, and togetherness, has been actualized in better self-reliance of the people in minor physical and environmental maintenance of the irrigation system. Physical works of the irrigation system has been better performed by WUAs than that being performed by engineering contractors. The stealing of irrigation equipments and the emergence of social conflicts in irrigation among the farmers have been significantly minimized through better communication developed through WUAs.

Although the socio-political impacts of IMPR implementation has been very significant, the readiness of the farmers need to be continuously advocated knowing the fact that the farmers used to be positioned as net beneficiaries of irrigation for decades without being invited to participate in the previous development models. The limited readiness of bureaucratic personnel and other stakeholders concerned was strongly considered as one among the most constraining factors. Shifting from the previous irrigation development model with the State as the only development monopolist requires serious effort for a good governance promoting balanced participation among stakeholders.

To conclude, the weaknesses found out during the earlier period of IMPR implementation still characterized overall constraints that could be summarized, among others, in the followings: (i) limited support of macro level policy; (ii) human resources constraints; (iii) socio-cultural diversity; (iv) limited availability of data and information; (v) weaknesses in management function particularly connected with the coordination of institutions concerned; and (vi) limited financial availability13.

---

[12] Social capital has been also well working in protecting the dam safety. See a case shown in Appendix 2

13 For further discussion of this, read Arif, Sigit Supadmo. 2000.New Paradigm in Irrigation Development and its Possible Implementation. Presented in PPKP Training. Yogyakarta, 12-14 June, 2000.

Above all, it is ultimately necessary for IMPR implementation to have stronger political will of the Government in seriously promoting the decentralized, participative, bottom-up, and people-based irrigation management policy as has been demonstrated by IMPR. Moreover, such a political will is needed to strengthen development values have been adopted and operationalized as the rule of conduct and the rule in use by the farmers at grass root level. Political protection of farmers' welfare and development values they have adopted from any possible violation must be places as a primary duty of the State.

Irrigation Policy in Disarray

Paradigmatic changes has been mandated IMPR as well as IMPR implementation evaluation proven the fact that IMPR has been very successful in revitalizing local capacity to better manage irrigation system management. However, the evaluation finding found out very clearly that the most constraining factor was structural bottlenecks reflected in many aspects including: poor inter-sectoral synergy and coordination, poor readiness of bureaucratic people to adopt IMPR implementation, as well as limited political will and consistency of the Government to protect IMPR and its development values, the values adopted based on decentralized governance system as has been stipulated by the Law Number 22/1999 on Regional Autonomy.

Moreover, recent development shows an extremely contradictory phenomenon. The Government, who initiated the formulation of IMPR concept and is supposed to be the primary supporter of IMPR, clearly demonstrated its inconsistency and serious ambiguity against IMPR. The same Government who proposed the stronger formalization of IMPR, is currently observed as has been very enthusiastic in fighting against IMPR. IMPR moratorium has been primary campaign issue raised by bureaucratic elites in irrigation.

More than that, the draft law on water resources (RUU-SDA), which has been formally approved by the Parliament (DPR) as a law still contain the most controversial issues on irrigation, covering the issues of people participation, people right in irrigation management, decentralized irrigation, and the issue of privatization. The law has been criticized by many as a very political laden legislative product nullifying the important of public participation and criticism, and disregarding development values has been promoted by IMPR and has been adopted by the farmers as their rule in use. The Law has also been blamed as very poorly processed without being accompanied by intensive public consultations and nullifying the criticism raised during public consultations.

The implication at the grass root level would be very clear. The Formal issuance of the Law on Water Resources would seriously threaten the development values have been adopted. In addition to that, the limitation of public participation and farmers' right in irrigation management as being promoted by IMPR, might reshuffle the right in irrigation management has been turned over to the farmers in favor of government monopoly, at least for the larger, secondary and primary schemes.

The issuance of that Law has also reflected serious political ambiguity and inconsistency of the Government in irrigation management policy. It has been seriously criticized as very potential in disseminating public distrust of the farmers against the ruling Government. It must be kept in mind that escalating public distrust to the Government might be reflected in unexpected political movement especially facing the 2004 election.

This Republic has been in trouble since the financial crisis in 1997. It has been criticized as the failure of the Government in adopting development model. Many more structural problems have been created by the Government penalizing farmers in rural areas. The Law

on Water Resources could be listed as structural problem marginalizing farmers and discouraging the farmers to participate in development and revitalize their social capital.

Concluding Remarks

Former irrigation development has been totally developed to support rice-self sufficiency without proportional consideration to the farmers. It has been significantly reoriented towards welfare-based irrigation development through the issuance of IMPR following the political reform experienced by the country since 1998. It is the real answer to political needs of the farmers assessable at the grass root level requiring the decentralized, participatory, bottom-up, and people-based irrigation development.

However, the most recent development of irrigation policy adopted by the Government seems to be significantly insensitive in accommodating such development values have been adopted by the farmers as the new rule in use in irrigation development. It is very clear that such recent policy formalized through the approval of the Law on Water Resource seems to be politically against the values promoted by IMPR.

We may conclude that Irrigation management policy in Indonesia is in a very serious disarray due to political inconsistency and ambiguity. Such disarray is very political in nature. Irrigated agriculture is again being marginalized. It is very unfortunate if such a political inconsistency would be followed by the escalation of public distrust, which could be reflected in any possible political movement of the people at the grass root level.

Appendix 1: Basic problems connected with structural poverty in irrigated agriculture

No	Basic Problems	Observed Problems
1	Power Relation	Top-down development Low bargaining power in input and output market Input dependent farming Low profitability Unclear right on production input (water)
2	Institutional Infrastructure	Government oriented rural institutions Village Unit Cooperative (KUDs) functioning more in favor of input companies and local capitalist Low credit availability, Bank Plecit is more favorable Farmer union is wrong representation of the farmers Low agriculture and irrigation research
3	Constraining Policies	Industrial biased economic policy Rice-biased agricultural development Pricing policy in favor of urban community Capitalist oriented export policy Diversification technology availability Production based agriculture and irrigation
4	Environment	water availability, certainty, reliability Higher input dependent of agricultural land High land conversion Lower carrying capacity Higher population pressure and rural dependency of the economy
5	Cultural Constraints	Apathy of the farmers majority More fragmented land Women's role is limited Subsistent oriented farming

Dam Safety Protection Through Community Participation: the Case of Sermo Dam, Yogyakarta, Indonesia[14]

The Sermo Dam is the only dam in Yogyakarta Special Province. Its effective operation is started in 1997 to satisfy a multipurpose function for an expected life expectancy of 50 years, a technical life initially set. However, after a few years of operation its life expectancy was found out to be much shorter that that being targeted. At that point in time, the remaining lifetime was estimated to be 35 year only, instead of 45 years according to its design plan. The dam lost ten years of life expectancy for nothing.

Serious decrease in life expectancy could be fully attributed to extremely high erosion rate of its catchments area strongly characterized by extremely high land slide potential. Limited upstream conservation management and limited size of green-belt area controllable by the dam management, could hardly contribute meaningful protection capacity to the dam.

Knowing the fact that the government capacity in dam protection is very limited, the Center for Rural and Regional Development Studies, Gadjah Mada University promoted what the Center calls as the dam safety community in a specific perspective, primarily due to the life expectancy dependency on them.

Populated nature of upstream area is a serious problem. This problem has been intensified by the fact that they are dominated by those below poverty line and characterized by malaria disease. Though expecting their participation in protecting the dam safety is clearly impossible when they hardly get any benefit from the dam, the Center still believed that there is no other way to protect but promoting the upstream community participation in it. Such participation could only be mobilized through an integrated upstream community empowerment promoting the dam safety community.

An integrated modeling has been taking effect in the field since 2002 supported by a simultaneous movement of the district government. Malaria eradication, people-based green-belt management, adoption of highly commercial crops for green-belt and upstream area, community forest development, animal husbandry development, and the issuance of regional regulation in quartz quarry, are among integrated programs have been taking place.

Although the dam safety impact is still in waiting, intermediate impact indicators, covering economic, social, institutional and environmental impacts, have been very promising and remarkable to consider. It is expected that, in turns, the dam life expectancy could be lengthened appropriately in satisfying the originally set technical lifetime.

[14] An Abstract cited from CRRDS. 2003. Dam Safety Modelling: the Case of Sermo Dam, Yogyakarta, Indonesia. Final Report of the Center for Rural and Regional Development Studies Gadjah Mada University (CRRDS-GMU) in cooperation with the Ministry of Infrastructure and Regional Settlement, the Republic of Indonesia.

Unbundling 'Lack of Access' to Water in Rural India

By: Nayanika Mathur, The Energy and Resources Institute (TERI), India

A defining feature of rural India has remained its limited access to information and basic services – energy, water, sanitation, health and education – despite the relative growth in economic terms and the investments in public services. There has been a dawning realisation of the neglect suffered by rural India due to this lack of access. Access to services and resources can be studied in a variety of ways. The way one defines it has critical implication for policy. This particular paper demarcates and studies 4 predominant ways in which 'access' to water in rural India has been studied - access in terms of conditions of 'scarcity'; lack of access as being symptomatic of poverty; access as a redistribution issue; and most recently, access in terms of capabilities.

Access to Water in Rural India

Although India is endowed with sufficient water[1], there are significant variations in the spatial and temporal availability of this resource[2]. Consequently, at any given time, there are areas of both water excess and water stress in the country. There are significant variations in water availability even within a river basin. For instance, the availability of water within the Ganga basin varies from 740 cubic metres in the Yamuna to 3,379 cubic metres in the Gandhak.

Indicators of water stress and scarcity are used to reflect the overall water availability in a country or region. When the annual per capita water availability of renewable fresh water in a country or region falls below 1700 cubic metres, it is considered to be a situation of water stress. When the availability falls below 1000 cubic metres, it is known to be a situation of water scarcity. When the per capita water availability falls below 500 cubic metres, it is said to be a situation of absolute scarcity[3]. The annual per capita availability of renewable freshwater in the country has fallen from around 5,277 cubic metres in 1955 to 2,464 cubic metres in 1990. Given the projected increase in population by the year 2025, the per capita availability is likely to drop to below 1,000 cubic metres. The present per capita water availability in India comes to be around 1250 cubic metres, which puts India in the category of "Water stressed" countries. By the year 2050 this is projected to be around 750 cubic metres. Even if the total available water is taken into account the per capita water availability is estimated to be around 1400 by the year 2050. The country will thus still be water stressed.

At present, agriculture is the single largest user of water, accounting for about 85% of the total water demand in the country. In the coming years, there will be an increase in the demand for water from among all the competing sectors. Studies done by the IWMI (International Water Management Institute) have shown that much of western and peninsular India will suffer from acute scarcity in the coming 25 years.[4] Agriculture will progressively lose its share of irrigation water to industry and municipal uses.

Providing water for domestic consumption in rural India is mired with complications. Rural water schemes have remained an extremely complex issue for Indian planners since Independence. Despite massive resource allocation during the last nine Five-Year Plans, there were as many as 61,747 problem villages in the country towards the end of 1997.

[1] With an average annual rainfall of 1,170 mm, India is one of the wettest countries in the world

[2] At one extreme are areas like Cherrapunji, in the north-east, which is drenched each year with 11,000 mm of rainfall, and at the other extreme are places like Jaisalmer, in the west, which receives barely 200 mm of rain. Nearly three-quarters of the rain pours down in less than 120 days, from June to September.

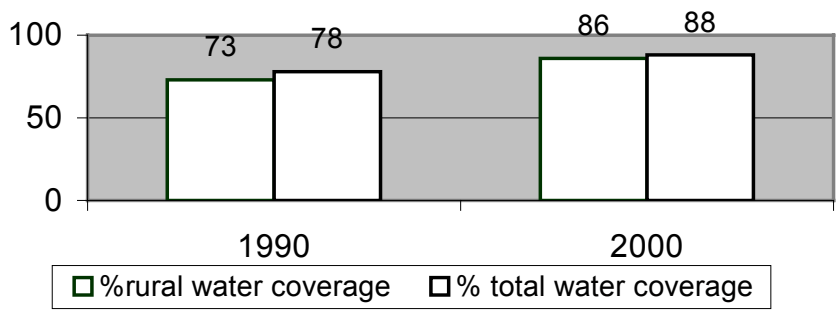
[3] Engelman, R and Roy, P (1993).Sustaining water: population and the future of renewable water supplies. Washington, D.C: Population and Environment Programme, Population Action International. 56 pp

[4] http://www.1worldcommunication.org/indianfoundation.htm

Interestingly, the country started out with a figure of 150,000 problem villages in 1972; this rose dramatically to 231,000 in 1980. According to the latest statistics, about 15,000 habitations in the country were reported to be without any source of potable water; some 200,000 villages were partially covered by drinking water schemes; and 217,000 villages reported problems with the quality of water.

It is difficult to estimate the proportion of population that has access to clean drinking water. At the time of the First Five-Year Plan, 6% of the rural population and some 48% of the urban population had access to safe drinking water. There has been a phenomenal increase in coverage, and by 1994-95, as much as 82% of the rural population was covered[5]. As per the latest figures, approximately 90 percent of rural habitations have been fully covered with drinking water facilities and 20 percent of rural habitations have been covered by sanitation facilities[6]. The WHO's Global Water Supply and Sanitation Assessment 2000 Report showed an increase in rural water supply coverage from 73% in 1990 to 86% in 2000 (Figure 1).

Figure 1. Water Supply Coverage (1990 and 2000)



Source: Global Water Supply and Sanitation Assessment Report 2000. World Health Organisation.

There exists, as is evident from the various figures above, a discrepancy between estimates arrived upon by different sources on the water and sanitation coverage in rural India. This discrepancy can be ascribed to difficulty in data gathering in rural India as well as different methodologies adopted by different agencies. The broad consensus, which does emerge in all discussions on rural water supply in India, is that while access to drinking water in India has increased over the past decade, the tremendous adverse impact of unsafe water on health continues. The World Bank estimates 21% of communicable diseases in India are water related. Of these diseases, diarrhoea alone killed over 700,000 Indians in 1999 (estimated) – over 1,600 deaths each day[7].

Unbundling `Lack of Access'

Broadly, four different approaches to the study of access or the lack thereof to water can be distinguished[8]. The four approaches shall be studied with particular reference to access to water for domestic consumption in rural India. It is to be noted that though we are specifically

[5] www.infochange.com accessed on 30/10/03
[6] Ministry of Rural Development, India. 2003. Annual Report – 2002-03.
[7] http://www.who.int/multimedia/indiawhosuccessfull/sanitation/photo_underpage.html accessed on 11/12/03
[8] This typology has been drawn from P.B. Anand, 2001, *Water Scarcity in Chennai, India – Institutions, Entitlements and Aspects of Inequality in Access*. Discussion Paper No. 2001/140. United Nations University, WIDER.

studying the domestic sector, the issue of access spawns it to include agriculture and industry as well.

Lack of Access due to 'Scarcity'

The predominant approach to lack of access revolves around issues of **'scarcity'.** In this case, the problem is interpreted as one of there not being enough of the resource in aggregate terms (e.g. water scarcity in the case of arid regions such as Rajasthan) or in per capita terms (e.g. water measured in cubic metres per capita, CPMC, falls below the required level). Reports such as: 'the next world war may be over water'; 'about 40 countries will not have adequate water supplies in the near future'; 'the drought affected area in Africa is spreading at a rate of 2.3 million sq. miles a year' are now commonplace. The aspect of scarcity and the drastic need to conserve water is not disputed in this paper. Rather, the aim is to move beyond gratuitous comments on water scarcity and understand the politics of accessing this scarce resource by a traditionally fragmented and weak section of Indian society – its over 700 million strong rural populace.

Lack of access in this approach is a result of providence (in terms of water as a natural resource) and population. The social and political construction of scarcity on the basis of the prevailing power relations is completely obscured in this approach. Lyla Mehta[9] in her study of the famously 'water scarce' Kutch region in the state of Gujarat argues that access to and control over water is usually linked to prevailing social and power relations, which influence how it is used or abused. She argues that water scarcity can be constructed differently by different political and social actors, often to meet political ends. Through a detailed empirical and multi-sited examination of both actual practices and discourses around scarcity in the Kutch region of western India, she argues that scarcity is both 'real' and 'constructed'. The 'real' aspects of water scarcity relate to dwindling groundwater aquifers, increased salinity and so on, while the 'constructed' aspects refer to the state discourses which portray scarcity as natural (rather than human induced) and chronic (rather than cyclical). These external essentialised notions of scarcity generated by state discourses and state programmes are more often than not quite different from local people's knowledge systems and livelihood strategies that allow them to adapt to the unpredictability and temporary scarcity of water.

Lack of Access symptomatic of Poverty

In yet another approach, lack of access is seen as being a symptom of poverty. Not having adequate water or sanitation is thus, seen as a characteristic of lower levels of development and deprivation. For e.g. the World Bank reports negative relationships between per capita GDP and percentage of population not having access to water supply and sewerage[10]. In this approach, there is an in built assumption that economic development will, in due course, lead to improvements in water supply and other such basic services. As already stated earlier, it has now been comprehensively proven that there is no direct co-relation between economic development and social development in terms of provisions of access to basic services to **all** sections of society[11].

For instance, the Panos Environment briefing12 studying access to water directly exhibits this approach, by comparing water consumption between an average British citizen and "many

[9] Lyla Mehta, 2003, 'Contexts and Constructions of Water Scarcity', *The Economic and Political Weekly*, November 29, 2003.
[10] World Development Report 1992: Development and the Environment, Oxford University Press, New York.
[11] And then again, there are unique developmental models such as the 'Kerala Model'. The Kerala model refers to the paradoxical co-existence of very high levels of social development with low and even stagnating economic growth in this south Indian state. In 2001, Kerala ranked first among the major states in India in the Human Develoment Index, though the state stood only ninth in terms of per capita net state domestic product (NSDP).
[12] Panos Environment Briefing, 1998, *Liquid Assets: Is Water Privatisation the Answer to Access?*

people in the developing world". It illustrates this through the usage of certain WaterAid, figures: the average person in Britain consumes about 150 to 200 litres of water a day – for gardening, washing the car, showering and bathing, washing clothes, drinking, cooking, personal hygiene, cleaning the house and so on. The average British person – and the more affluent in the developing world – flushes the toilet more than five times a day, using up to 50 litres of water for that purpose alone. By contrast, many people in the developing world have less than 10 litres of water a day to cook, wash and drink. The briefing goes on to state what is by now a well-established fact – the poor pay more for accessing water. Quoting from World Bank studies such as the one conducted by Ismail Serageldin13 it asserts that, " the very poorest…are often forced to pay the highest fees for water, primarily because of politicised inefficient bureaucracies." This aspect of the poor missing out on access to basic services and having to pay much higher rates than the rich to gain access has been much discussed as a failure of institutions and proof of the corrupt, inefficient Third World bureaucracies. This approach to studying lack of access as being symptomatic of poverty is closely linked to the next one that highlights the inequities in the system of distribution due to poor institutional arrangements and governance.

Lack of Access a 'redistribution failure'

As a response to the much-publicised falsity of the above 'trickle down effect of economic development', there has been a growing realisation of the need to ensure equitable redistribution. Thus, lack of access to a resource (in this case, water) is interpreted as there being enough water but not enough money or technology or human resources or political will to bring that water to the weaker sections of society (in this case the rural sector). Much international financing of water resources and water supply projects during the period 1950 to 1990, reflects this thinking[14.]

The aspect of redistribution is increasingly focusing on the study of institutions. Various studies of institutions focused on the question why villagers in certain developing countries engage in collective action and develop institutions to allocate and manage natural resources and whether such institutions can be created and sustained elsewhere[15]. Since water supply is a private good, others have focussed more on property rights issues than on the question of collective action [16]. Another strand of studies relating to institutions focused mainly on privatisation of infrastructure and dealt with questions such as whether the British, French or other models of privatised water utilities can be applied in the context of developing countries[17]. Though water supply is a private good, it is publicly provided in India, mainly because of two reasons: (1) Water supply infrastructure is capital intensive with natural monopolies; and (2) that the needs of the poor can be best protected by keeping water supply in the public sector. In recent years, both these arguments have been questioned. The need to evolve institutions to strike a balance between insulating infrastructure provisions from political control and capture on the one hand and the need to maintain accountability on the other has been widely recognised. Depending on how much faith one has in state and market institutions, the various generic arrangements for water supply have been shown in Figure 2. Experiments with the provision of water to different regions in India have been on for some time now. A particularly well known one is the World Bank initiated Swajal programme (see Box 1.)

---

[13] Ismail Serageldin, 1996, *Our Planet*, World Bank

[14] P.B. Anand, 2001*, Water Scarcity in Chennai, India – Institutions, Entitlements and Aspects of Inequality in Access*. Discussion Paper No. 2001/140. United Nations University, WIDER.

[15] Wade R. (1988), Village Republics, Cambridge University Press, Cambridge.

[16] P.B. Anand, 2001*, Water Scarcity in Chennai, India – Institutions, Entitlements and Aspects of Inequality in Access*. Discussion Paper No. 2001/140. United Nations University, WIDER

[17] Government of India. 1996. India Infrastructure Report, Report of the Committee of Commercialisation of Infrastructure, National Council of Applied Economic Research, Government of India, New Delhi.

Box 1. Experiments with rural water supply and sanitation - the state of Uttar Pradesh.

The existing water supply service delivery in the northern state of Uttar Pradesh is undertaken through a large state-level public sector organisation, the *Uttar Pradesh Jal Nigam*. Funded mainly by government grants, the Jal Nigam constructs and maintains water supply schemes in most parts of the state. Its approach has been widely described as top-down as it rarely takes consumer preferences into account. There is no capital cost recovery, and operation and maintenance costs are seldom collected. The poor sustainability of investments in the rural water supply sector encouraged the UP government to adopt two major policy reforms through the World Bank assisted Swajal project: (1) Partial cost recovery and full operation and maintenance cost recovery from user communities; and (2) The creation of an alternative service delivery mechanism for rural water supply and sanitation.

The new institutional model is specially designed to serve as a vehicle for the community based, demand responsive approach envisaged in the project. This consists of a close inter-relationship between three distinct social actors: village communities (represented by their water and sanitation committees), NGOs and the Project Management Unit, an autonomous State-level society.

Source: Water and Sanitation Program, South Asia Region, World Bank (2001). Field Note – Community Contracting in Rural Water and Sanitation: The Swajal Project, Uttar Pradesh, India.

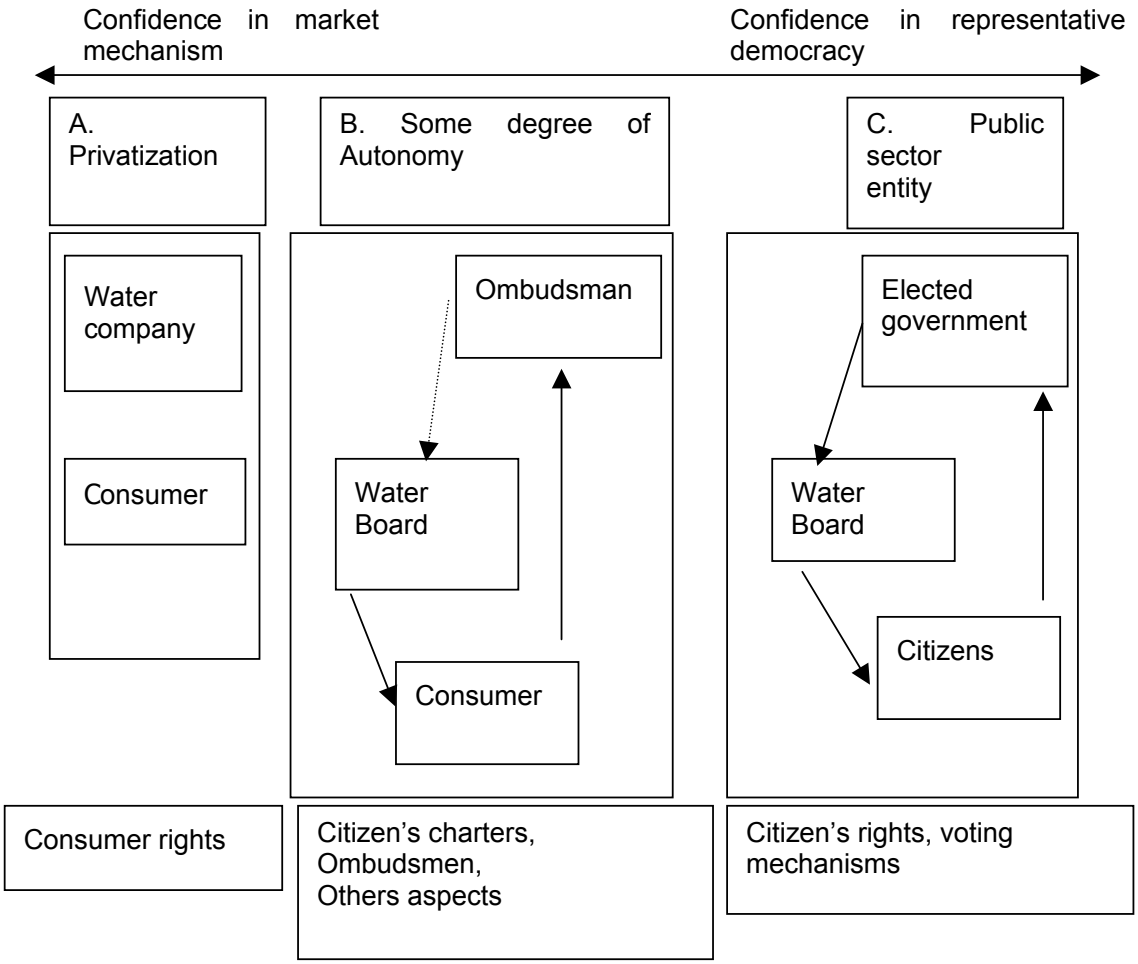


Figure 2. Alternative Approaches to Reforming Water and Sanitation Provision in India

Lack of Access a Capability Deprivation

A fourth approach is to consider access an important ingredient of quality of life and lack of access to the resource/service a capability deprivation. Attention to poverty is shifting from income-based measures of poverty to inequality and capability deprivation18. Sen's capability deprivation argument has its genesis in his entitlements concept19. Arguing with regard to famine and starvation, Sen
had said that they are matters of "…some people not having enough food to eat, and not a matter of there being not enough food to eat". For Sen the expression entitlement connotes "…the legal, political, economic and social characterisitcs of the society in question" and the individual/community's position on it. Entitlements approach helps us to see famine and starvation as an acquirement problem in relation to specific institutions and as "economic disasters, not just as food crises". Sen argues that a policy response such as rushing more food to famine stricken areas may not alleviate starvation, when the main cause of famine is one of entitlement failure20. A similar argument can be culled out for access to water21.

Thus, individuals have various endowments (either in the form of things they have acquired such as land, or a capacity that enables them to acquire, such as labour or knowledge and certain rights). These endowments combined with institutional arrangements determine the individuals entitlements, which in turn determine the various functioning's which can be achieved. "The totality of all the alternative functioning vectors a person can choose from…reflects the person's capabilities." These functioning's reflect well being because "…how well a person is must be a matter of what kind of life he or she is living, and what the person is succeeding in "doing" or "being". Sen's entitlements thesis has been much discussed and proves to be extremely helpful when studying access issues.

Present Water Policy Environment in India

'Access' the key to development. In 1992, Principle 10 of the Rio Declaration articulated public access to information, participation in decision-making, and access to justice as key principles of environmental governance. A decade later, one hundred governments reaffirmed these goals during the World Summit on Sustainable Development. Agenda 21 elaborated on these principles and acknowledged their essential role for sustainable development. The United Nations' Millennium Declaration emphasized the importance of "creat[ing] an environment - at the national and global levels alike - which is conducive to development and to the elimination of poverty." This year the World Bank's World Development Report (WDR 2004) addresses the challenges of making essential public services reach the poor. Mirroring the international realisation of the vital need provide access to a variety of resources and services – information, justice, basic to serivces - to the poor, it develops a framework for understanding the political economy of institutional failure, of anti-poor bias, in public services. In particular, it attempts to understand how accountability relationships are affected by uneven power relationships and elite interference in the relationships between public service clients and providers, citizens and policy-makers, and policy-makers and providers.

Sources: http://www.accessinitiative.org/ - World Development Report 2004

The National Water Policy (1987) of India provided a broad direction and set of guidelines that reflected the central governments' approach to the water sector. However, it had been argued from several quarters – in particular the World Bank - that this policy needed to be revised further in light of major national and international developments since then. The National Water Policy was revised in 2002. Some of the thrust areas of the National Water Policy are the emphasis on participation among users, improving water quality, emphasis on

18 Sen A.K. 1999. *Development as Freedom*, Oxford University Press, Oxford.
19 Sen A.K.1990. Food, economics and entitlements, in Dreze J. and Sen A. K. (eds). *The Political Economy of Hunger*, Clarendon Press, Oxford.
20 *Ibid.*
21 See, for instance, P Sainath's 'Everybody Loves a Good Drought', 1996, Penguin.

rehabilitation and resettlement in large-scale irrigation projects, the need for an integrated approach within the water sector, revamping institutional mechanisms and improving sustainability of water projects. While these areas of thrust are significant and noteworthy, given India's federal structure, the National Water Policy remains a mere statement of intent in the absence of state level programmes to translate these intentions into concrete action.

India had formally embarked on reforms in the water sector after 1999 with some guiding principles. The most important of these was to view water not only as a social good but as an economic good that has to be priced. This has resulted in the Central government's recent *Swajaldhara* initiative, which seeks to complement drinking water needs with sanitation, and mandates a decentralised approach with the government switching its role from that of a provider to a facilitator of water market. Under this system, the Panchayati Raj institutions will bear all operation and maintenance costs; they will bear 10 per cent of the total capital cost by collecting funds from the people. The rest of the money for the project, which follows the market-centric World Bank model, comes from international donors. It has been argues that this policy move effectively rules out the poor, particularly women, from having any say, leave alone control, over water[22].

In the past, many such schemes for drinking water did not succeed because they failed to build an institutional mechanism at the level of the users to ensure service delivery. To that extent, the emphasis in such schemes on involving users is well placed. In the last ten years there has been increasing policy level acceptance that natural resources such as water shall be best managed through the active participation of the users, viz. the local community. The emphasis on community has been seen as a superior alternative to nationalization and privatization of natural resources[23]. It is seen as a way of reducing the role of the state, sharing management responsibilities and generating resources. This reasoning comes with a long pedigree, dating at least from The Ecologists (The Ecologist, 1972) "Blueprint for Survival," Schumachaer's "Small is Beautiful" (1972) and, more recently, the Brundtland Commission (WCED 1987). Statements of intent on global environmental problems issued following the 1992 Earth Summit, including Agenda 21 and the Desertification Convention, strongly advocate as solutions a combination of government decentralisation, devolution to local communities of responsibility for natural resources held as commons and community participation. Such approaches – evident in the policies and programs of national governments, donor agencies[24] and non governmental organisations- argue for an appropriate sharing of responsibilities for natural resource management between national and local governments, civic organisations, and local communities[25]. In the case of rural India it still remains to be seen how well local level governance responds to the challenges that ambitious schemes such as the *Swajaldhara* programme imposes and how well local level mechanisms are able to represent the collective interests of the users at large, without being hijacked by the dominant few.

---

[22] Sara Ahmad. *Mainstreaming Gender Equity in Water Management in India: Policies, Institutions and Practice*. Procedings to conference on right to water at the M.S. Swaminathan Research Foundation, Chennai

[23] Bardhan, P.1993. Symposium on management of local commons. *Journal of Economic Perspectives* 7 (4): 87-92

[24] See Box 1 on community-based approach to water and sanitation scheme for the state of UP,initiated by the World Bank.

[25] Baland, J., Platteau J. P. 1996. *Halting degradation of natural resources: Is there a role for rural communities?*, Clarendon Press for FAO, Oxford.

Water and Related Energy Politics in the Syrdarya Basin: Current Challenges and Future Prospects

Anatoliy Sorokin, Larisa Averina, Bakhtiyor Mukhamadiev1

Introduction

Water in Central Asia is a scarce and shared resource. Since countries of the region became sovereign nations in 1991, its management and development has been subject to the rules of interstate agreements. Conditioned by some of the newly emerged national priorities with respect to water utilization, transboundary water management in Central Asia had to reflect a changing pattern in management, development and allocation of shared water resources among the riparian countries. This paper outlines peculiarities of recent developments in the Syrdarya River Basin of Central Asia and analyzes on-going interstate controversies over water and related energy resources sharing and management in the basin.

The main transboundary issue in the Syrdarya basin involves a seasonal operation of the Toktogul Reservoir located on the upper tributary of the Syrdarya in Kyrgyzstan. Demands of the downstream countries, Kazakhstan and Uzbekistan, for the waters of the Syrdarya River dictate the operation of the reservoir to be in "irrigation mode",2 whereas the economic interests of the upstream countries, Kyrgyzstan and partly Tajikistan, drive these countries to regulate the Syrdarya River flow, most of all, to meet their demands for energy. To balance the conflicting interests of both upstream and downstream states for the Syrdarya waters, since 1994 the countries in the basin have entered into an ad-hoc annual water and related energy exchange agreements, which subsequently led to the signing of the Syrdarya Framework Agreement in 1998. The practice with an implementation of the 1998 Syrdarya Agreement has revealed that the provisions lack a compliance mechanism in the context of infrastructure and economic problems that have weakened the capacities of the Parties to fulfill their treaty obligations. As a result, there is still a shortage of fuel for winter electricity generation in upstream countries and the downstream countries still report serious irrigation water shortages, and water losses into natural depressions remain high. Nevertheless, the agreement can not be regarded as a complete failure but as an obvious evidence of evolution of transboundary water sharing practice towards the integrated basin-wide management of water and related energy resources.

Water and Energy Inter-relationship in the Aral Sea Basin

Prospects for sustainable economic growth and social progress in each of the Central Asian countries, and in the region as whole, to a great extent are predetermined by the availability of water resources. As it is elsewhere, they are unequally distributed in time and space, and Central Asia is not an exception. Kyrgyzstan and Tajikistan (hereinafter – upstream countries) are rich in water but do not possess fuel resources. In contrast, in Kazakhstan, Turkmenistan and Uzbekistan (hereinafter – downstream countries) this correlation turns out in a reverse order: they are the largest regional exporters of hydrocarbon resources but poor in water. Hydropower, for instance, accounts for about 80% of the total energy production in the upstream countries. Nevertheless, this is not enough and in order to meet their energy demands, upstream countries have to import fuel resources from downstream countries.

---

1 Scientific Information Centre of the Interstate Commission for Water Coordination of Central Asia (SIC ICWC)

2 Irrigation mode is defined as the regulation of water facilities to accumulate water in the storage reservoirs during winter and spring and to meet the demands of irrigated agriculture with large releases made from the Toktogul Reservoir during summer periods. In contrast to "irrigation mode", operation of Toktogul Reservoir in "energy mode" means that the water releases from the reservoirs are dictated by the energy demands of the upstream countries for hydropower generation.

Availability of water and hydropower resources and lack of other fuel resources generate a need for the upstream countries to develop their hydropower potentials. However, meeting the demands of the upstream countries in energy through increase in the rate of hydropower production de-emphasizes existing uses in the downstream countries that are dependant on transboundary water resources. Therefore, any future plan with respect to development of water and energy resources must take into account economic variances in each of the countries, which in turn, requires a necessity to develop a clear mechanism for economic integration in the sphere. If this integration process will lack cooperation among Central Asian countries, it may lead to negative social, economic and environmental consequences.

The region has closely interconnected water and energy infrastructure. This consists of cascades of dams, hydropower stations and storage reservoirs. Rules of water allocation between Central Asian countries were established based on the seasonal exchanges of water resources, electric energy and fuel resources. Under a single jurisdiction, this arrangement has proved itself sufficiently effective mechanism, and it is still the case for the region as a whole, but changes of geopolitical and economic nature that have taken place since 1991 require newer approaches of cooperation in utilization of water and energy resources of the region. Gradual disintegration of sustainable linkages that were in place during the pre-independence water-energy scheme for the region, economic and financial difficulties, deteriorations of technical conditions of water management and energy infrastructure, unevenness of economic reforms in each of the region's countries, resource-absorptive style of management have brought a number of challenges for the joint utilization of water and energy resources and worsened the technical capacities of the water management and fuel energy infrastructure. The situation is further exacerbated by reductions of effective system of observations and control over the transboundary water facilities, water diversions and distributions, forecasting and monitoring. It is obvious that current efforts towards restoration of former monitoring system are not enough. Moreover, protection of transboundary water pollution and deltaic ecosystem are not yet adequately represented in regional arrangements and the Aral Sea itself has broken into several distinct water bodies. These very backgrounds undermine the execution of regional initiatives provided by the interstate agreements on the use of water and energy resources, and hence, weaken economic, energy and environmental security in the region.

During the former-USSR times, the annual demands of the Syrdarya riparians for water were satisfied through operation of the Naryn-Syrdarya cascade of reservoirs mostly dictated by the irrigation demands of the downstream countries. During the first half of the 1990s, a gradual increase of hydropower generation by upstream countries have brought conflicts with the existing uses located downstream. Starting since 1993, the operation of the Kyrgyzstan's Toktogul cascade has been transformed into energy mode with accumulation of water during summer periods and large winter releases. Since 1994, the Syrdarya flow regulation has become a major subject of interstate negotiations between Kazakhstan and Uzbekistan, on the one side, and Kyrgyzstan on the other. In order to meet the demands of Kyrgyzstan in increased supply of thermal-power resources and to satisfy the demands of Kazakhstan and Uzbekistan for irrigation water during summer, it was decided to define the riparian states rights and obligations with respect to fuel and energy exchange. This has led to signing of the Syrdarya Framework Agreement on the use of water and energy resources in 1998. The Agreement was designed to meet different riparian interests through integration of respective state claims to the waters of the Syrdarya River and balancing the competing uses of water through inter-state trade-offs between the competing uses of water for energy and agricultural production in the basin. It has created the principles of compensation of fuel for water between downstream and upstream countries whereby the downstream countries, Kazakhstan and Uzbekistan, agreed to purchase in equal portions the excess power (beyond the needs of the Kyrgyzstan's demand in electricity) generated by the Toktogul hydropower plant during the summer, and provide compensation to Kyrgyzstan in the form of equivalent volumes of electricity and fuel (coal, natural gas) during the winter seasons.

Although the agreement has brought some stability in the transboundary water relations in the basin, it could not completely eliminate some of the pressing concerns. It became clear that the interests of the downstream countries in irrigation water supply can be met only when all Parties to the agreement strictly follow their obligations towards the fulfillment of the provisions of the agreement concerning the supplies of fuel, electricity and purchase of excess powers. It appeared that even the slightest violation of the provisions of the agreement could increase insecurity in water supply and undermine the shared execution of the agreement. During the implementation phase of the agreement it has been revealed that the conflicts between irrigation and energy interests of the Parties generate complications while executing the agreed provisions of the agreement concerning the water allocation and therefore require further development.

Establishing fixed operating rules for the Toktogul Reservoir and the use of the decision support system for managing the Syrdarya flow will simplify and stabilize river management, reduce annual winter releases from the Toktogul dam in Kyrgyzstan, make more water available for the ecosystems needs, and provide greater energy security to Kyrgyzstan and water security to Uzbekistan and Kazakhstan. One of the alternative solutions towards resolution of the issue is seen in creation of the Water and Energy Consortium in the Syrdarya Basin.

New Approaches: Creation of the Syrdarya Water and Energy Consortium

An idea to create the Water-Energy Consortium (hereinafter, the Consortium) in the Syrdarya River Basin has been under consideration among the riparian community for the past several years. The subject has also being attended in intergovernmental level; however, a common point of view about what is meant by the Consortium has not been reached. The Kyrgyz side would like the Consortium to act as an institution, which would attract, first of all, funds from concerned countries and development banks for completion of the constructions of the Naryn Cascade Hydropower Stations, and criticizes its opponents (Uzbekistan and Kazakhstan) for their tendencies to attaché the Consortium functions of transboundary water resources management. In reality, no party proposes to duplicate existing institutional structure of management but intends only to strengthen interactions among them, using newer and more effective mechanisms for cooperation.

The ICWC agencies[3] promoted the creation of the Consortium with a purpose to create a financial mechanism, which would ensure established order of water-energy exchanges between countries. In this context, the Consortium can be regarded as a mechanism to prevent potential water and related energy disputes. Securing the coordinated policies in the field would be one of the main tasks of the Consortium. The Consortium would be involved in developing and promoting efficient methods of joint actions and propose to where the resources must be allocated that would generate maximum profits. Potential participants of the Consortium should represent a union of participants of the water-energy exchanges of the four Central Asian countries – Uzbekistan, Kazakhstan, Tajikistan and Kyrgyzstan, members of which are entitled to have an access to the financial sources assigned for rendering assistance in supplying of fuel and energy resources. Participants of the Consortium can be: governmental management structures (guarantors), commercial banks, enterprises, manufacturers and energy consumers, consumers of irrigation water, and manufacturers, suppliers and consumers of fuels.

[3] The ICWC (Interstate Commission for Water Coordination) was established by an agreement between the five states of the Aral Sea Basin. It has a jurisdictional competence over the management and development of transboundary waters of the Aral Sea Basin. The ICWC operates through a Ministerial-level Commission, Secretariat, Scientific Information Centre and the two River Basin Organizations. The ICWC has an overall responsibility to act as a basin-wide water policy-maker and to develop a long-term water supply program for the region.

The Consortium should become an organization for cooperation establishing well-ordered system of payments and cash deposits among the countries and securing sustainable functioning of the water-fuel-energy facilities (timely execution of the interstate agreements, the ICWC Resolutions on the reservoir operational modes), as well as introduction of newer opportunities: searching and setting the optimal monopoly price, which would secure the interests of the parties and efficiency of inter-supplies, banking services, insurances (from damages of natural character), introduction of penalty provisions (for damages caused by irregular actions of the operational services of the water facilities and organizations that provide compensational supplies). At that, it is necessary that guarantors would have determined limits of annual cross-flows and supplies and take responsibility on forming a minimum starting capital and ensuring necessary subsidies. A wok of the Consortium on providing of the sustainable functioning of water-energy system comes to the following actions: (1) situation analysis (water management, economic, commercial); (2) development of actions and their coordination with all countries and the ICWC bodies (on disputed issues); organizational and financial operations. A subdivisions of the Consortium may carry out a comparative assessment of predictable and actual hydrologic situation and modes of reservoir releases (applying existing at their disposal instruments – economic-mathematic methods and modeling), develop and adjust schemes of main flows of fuel transportation (on alternative options), carry out assessment of agreement executions at conditions of natural and human-made deficits – in case of disregard of adopted resolutions, perform economic estimations on damages and their compensations from insurance fund.

Strengthening the Legal Base

Cooperation of the Central Asian countries in the field of rational and effective utilization of water and related energy resources should be based on certain principles which must be derived from the acknowledgements of legitimate rights of both downstream and upstream countries to use of their own shares of water and energy resources. Their legitimate shares need to be in line with national interests, but equally important, they need to take into account the interests of neighboring countries and sustainability of the ecosystems. It is also important to acknowledge priority of legal provisions in the interstate agreements over national laws and regulations and there must be closer harmonization of legal bases in the field of water and energy use and protection. One of the important pillars on which the foundation of interstate should be built among the countries is the principle of not to cause significant harm in utilization of water and energy resources. Information exchange and timely notification of planned measures that could impact on the interests of other countries need to be established to avoid major economic and environmental costs. Joint management of water and energy resources in the region must be based on sound principles of river basin management. Only close cooperation and trust and adherence to the principles of basin management would enable to develop coordinated actions for agreed regimes of the water and energy infrastructure in the basin. This in turn would allow considering collective cost sharing and investments for the construction and operation and maintenance of interstate water and energy facilities and access to the markets of third countries. In order to ensure the realization of these measures and to guarantee sustainable operation of water and energy infrastructure, it is important to develop dispute settlement mechanisms. These may include obligations to notify on planned measures, consultations and negotiations between authorized state representatives, establishment of ad-hoc joint commissions or arbitration.

Implications of Hydropower Markets for Regional Water Management

One of the recent developments in water and energy sphere in the region has been an appearance of a new player – the Russian energy giant the RAO UESR (Joint Stock Company – Unified Energy System of Russia). The RAO UESR and the Government of Kyrgyzstan have concluded an agreement to supply hydroelectricity from Kyrgyzstan's Toktogul Hydropower Station (HPS), located on the upper reaches of the Syrdarya Basin, to

the Russian Siberia.[4] In other words this implies that there will be greater variations in the regime of the hydropower stations which generally tend to boost electricity generation for the interests of out-of-basin consumers, which, hence, are not really concerned with the issues of water resources management and environmental situation in the region. These arrangements also extend to the reconstruction and completion of additional HPSs in Kyrgyzstan and also in Tajikistan. Whatever the plans, the Russian RAO UESR will become one of the key decision-making bodies in electricity transmission operations in the future, and this may be dictated by the growing energy demands in Siberia, and in the near future, similar markets in other neighboring countries, where the price of energy is much higher, may become attractive for water rich upstream countries.

Growing extra-regional markets for the Central Asian hydropower may intensify upstream versus downstream relationships. For these reasons, adherence to the agreed interstate water allocation rules and seasonal and long-term regulations of transboundary water flows appear to be the key tasks of regional cooperation. However, decisions at the regional level need to be made following recent changes and newer priorities. It could be useful to introduce liability rules for compensation of incurred damages caused by the failure or violation of interstate obligations.

Sustainable future would be largely dependent on to what extent each riparian state in the basin is willing to respect and fulfill its rights and obligations in the use and protection of water and related energy resources. Irrespective of the fact that whether a state considers water resources in its territory as its own property and extents its full national jurisdiction or not, it cannot benefit from ambitiously formulated controversial plans on its own. In addition, international practice in utilization of shared water resources dictate that neither of the basin states possess the right to take unilateral actions on a watercourse that will cause or substantially interfere with existing downstream uses, at least without any notice and consent of the states whose interests are at stake. In this respect, it also should be stated that the maximum benefit from utilization of shared water resources can be possible only if decisions are taken with full participation of all concerned parties.

Outcomes of regional and international high-level meetings put emphasis on closer economic, social and political integration in Central Asia. This would in turn enable to increased benefit gaining from participation in the processes of global economy and protect their small and vulnerable markets from extra-regional market powers. Collective decision-making in joint utilization of water and energy resources is the basic prerequisite for further economic integration in other sectors. Without careful consideration and resolution of problems facing water sector in the basin countries it is not possible to progress in regionalization.

Penetration of extra-regional parties into the power market of the Central Asian states have a tendency to detach further energy sector from the water sector. The evidence suggests that only a combination of water and energy will be profitable for both upstream and downstream states. A more complex scheme incorporating interests of each state is needed for the regional benefit. Hydropower sector cannot be separated from the water and other sectors. Utilization and management of water and related energy resources are only a part of the larger framework of interdependent region and therefore should be viewed in an integrated manner.

---

[4] *See* RAO-UESR Press Release from 18.09.03, available at http://www.rao-ees.ru/ru/news/pr/pr180903post.htm. The agreement was signed between the Subsidiary of the RAO-UESR, the Inter RAO UES, and the Kyrgyz Joint-Stock Company "Energy Stations of Kyrgyzstan". This source also adds that realization of the project became possible owing to integration and parallel operation of energy systems of Russia with other CIS countries and Baltic States. It further exerts that the import of cheap electric energy from the Toktogul HPS to Russia will further promote improvement of the balancing cost of the Federal wholesale market of electric energy and its capacity.

If cooperation will fail to address these issues, it is possible to predict an appearance of various speculations in the water agenda of the Aral Sea basin politics. One of such promising factors is the interests in reviving an old plan of transfer a part of Siberian river water to the basin. A rationale behind the plan for the recipient downstream countries is seen to access to additional water resources, and for the Russian government it could mean a new lever of influence in the region. However, it is still questionable, taking into account the enormous investment costs and possible environmental impacts.

Water in the Aral Sea Basin has become a limiting factor for further economic growth and social progress. At the national level, the significance of water's role in the economy is readily illustrated by the comparison of the gross figures for the proportions of water used in various sectors of an economy and the relevant GDP figures. In the Aral Sea Basin, agricultural sector consumes 85% of water and generates close to 30% of the GDP.[5] Moreover, it creates jobs for overwhelming majority of the working population whose very livelihoods and their quality depend on incomes generated in the sector. When such vital concerns are at stake, Central Asian leadership should recognize the limitations to the extra-regional forces in the dynamics of water politics and must give consideration to them in their strategic planning and decision-making.

Conclusion

The Aral Sea Basin shared water resources are becoming increasingly vulnerable to the interests of the external economic forces. In the context of Aral Sea Basin water politics, these include individually followed trends towards creation of export-oriented hydropower markets and re-emerged plans for Siberian River flow transfer to the basin. Nonetheless, these factors will continue to contribute shaping the future of water politics in the basin. But it is crucial to achieve and ensure that any decisions regarding major water management investments affecting overall water management regime must be made with the full participation of all riparian countries; otherwise this will undermine trust and the foundation of regional cooperation in the sphere. Central Asian leadership should recognize the limitations to the extra-regional forces in the dynamics of water politics and must give consideration to them in their strategic planning and decision-making.

[5] The World Bank Group Data: Countries at a Glance, available at http://www.worlbankgroupd.org. Respective figures by country are as follows: Kazakhstan – 8.5%, Kyrgyzstan – 38.6%, Tajikistan – 30%, Turkmenistan – 28.8%, and Uzbekistan – 34.6%.

Appendix

Appendix 1: What should be next? – Ideas and suggestions of the participants

During the workshop, participants were asked to write down and discuss their ideas. The following is a list of unedited and unstructured ideas and suggestions made during the workshop.

Information and research

- Water as most utilities, environment and social goods is not considered as driver of development, contrary to health and education. We should go back and research in our own history of development to establish: the long-term effects and economic impact of major water – development. How we aid those major developments politically, socially, financially, planning and technically?
- We should get more reliable information and economic value of irrigation uses, with a distinction between surface and groundwater irrigation.
- Understand the cultural dimension of water interactions: include study of the underlying cultural patterns in case studies on water politics.
- Information dissemination of all the current models of tools to enhance participatory approaches to conflict resolution on water.
- Structure the debate on water issues (different levels: international, national, local, watershed, etc.).
- There are a lot of research and tools available so: Make an inventory of the most interesting research about water and politics and communicate findings in a way that appeals to all; Also do the same with existing tools to improve participation / negotiation (make an inventory and then try to promote its use).
- It is crucial to obtain reliable information on the volumes of water applied for irrigation separating surface and groundwater. Also it is crucial to assess the social (jobs) and economic (value in $) efficiency of both types of irrigation.
- Create: Information / knowledge meta-network
- Promote: Development of Hydropolitics analytical framework glossary.
- Develop analysis of specificity of historical, political, economic and cultural contexts.
- Reforms suggested by academics or international development agencies are seldom tested in context. Needs to be more practical testing.
- The role of international rivers is relatively unexplored as a security complex. Dependencies are created between countries, how can you transfer these to relationships? We should look at evolution of transboundary water agreements.
- Document customary traditional water rights in rural areas.
- Three titles of issues that could be explored: water transparency, both physical and societal; water and history can be well used to document that; water and demography.
- Explore the cultural dimensions of water politics: take into account the diverse cultural functions of water – societies and social groups.
- Integrate history (long term perspectives) in water politics issues with recognised historians, professional/ academics, and social anthropologists?

Awareness raising

- Make an appeal to governments, politicians and parliamentarians to take account of certain factors for water resources management, based on the findings of this meeting.
- Involve media in processes.

- Build awareness of water scarcity issues: Publicly through media (international, national, local); and through professional meetings, seminars, workshops for the purpose of building the momentum required to induce change.
- Get water higher on the agenda of financing ministers, demonstrating economics & financial benefits of water services improvements with specific cases.

Training and networking

- Organise networking in order to allow the share of experiences among countries successful experiences) and organising a databank in order to favour this networking.
- Given the increasing emphasis on public and community management of water resources and the participation in decision-making, training for water user associations could help in effective water administration.
- Training packages could include training in management, technical and environmental issues, finances for infrastructure and training in legal and regulatory frameworks. How to achieve distribution of such packages given the number of institutions working on capacity-building internationally and nationally?
- Change the training system of civil/hydro-agricultural engineering: make it more multidisciplinary; cutting of with the colonial roots of large hydraulics in the 3rd world and put emphasis on intermediate technicians training (in contact with users).
- Build a capacity in participatory approaches to water management (decision making).
- Training in power structure analysis and actions for stakeholders.
- Help in building capacities in groundwater assessment for developing countries. This could include human and institutional capacities.
- Strengthen political advocacy for irrigated farmers in least developed countries, so that they can improve their political bargaining power vis-à-vis the politicians.
- Help the stakeholders articulating their values and trading of costs and benefits.
- Training systems reform taking in account IWRM in an inter-disciplinary way targeting key countries (ex: China, India), because adapting / changing systems need one generation (rather than short term lobbying).
- Develop political advocacy for water users (improve bargaining power of users).
- Improve networking with WWC members.

Increase links between politicians and water actors

- Need to have theoreticians and practitioners in the room. Maybe the theoreticians can help practitioners to understand what to expect. The Council can help that tool development.
- The role of politics and politicians differ very much from country to country. Could we have a sort of “classification” of the situations? What are the evolutions?
- Find social political scientists who understand water and have good communication skills to “translate” the words of the social and natural sciences of theorists and practitioners.
- Try to understand what are the needs requests from politicians regarding water issues.
- Prepare information material on key water issues for policy, lawmakers and politicians.
- Initiate further action on “local politics” such as to generate confidence between the actors.
- Make a strategy of intervention for policy change in a specific national context: how to deal adequately with existing institutions and political history to find the most efficient change in policy (role of international experts and forums)?
- Work with political leaders in national and international forums to build confidence, showcase success and leverage resources.
- Increase the involvement of political decision makers and bring them into future workshops and trainings. The facilitating role of WWC is to be developed so as to linking with political level.

- Improve communication with politicians by preparing and providing them with information on key issues.
- Make politics and political analyses an important topic for water management. Improve their understanding and make them value the "political game".
- Bring elected officials into water resource planning.

Facilitate multi-stakeholder dialogue and cross-cutting between sectors

- Promote interdisciplinary relationships between the sectors (ex. water and energy), within and between governments, civil society and businesses.
- Involve all sectors of society involved in the decision-making programming & water reform implementation in the negotiations preceding the Fourth World Water Forum and the Forum itself.
- Involve all levels of decision makers in preparation for the 4th Forum.
- Facilitate local experts and multi-stakeholders platforms in high-profile small or medium scale watershed management pilots.
- Help countries to set up mediation between governments, water users and interdisciplinary knowledge holders so as to build confidence and interdependencies, which are the prerequisite to obtain low interest loans and sustainable financing.
- Organise a think-tank about dialogues on water in the world (politicians – governance).
- Link water with other sectors.
- Establish links between cooperation and development by creating non-zero sum options (other than rigid water rights) for the concerned parties in transboundary river basins.
- Build mutual trust and interdependence between actors and sectors.
- Re-conceptualise policymaking process to encourage broader participation in order to find a safety net for the poor.
- Seek the participation of the public through the media / international / national / local meetings.

Improve the political process and institutions

- Try to find models of local institutions that have successfully adapted.
- Try to look at what is needed to assist the political process.
- Overcome entrenched resistance to change: Find examples of successful institutions reforms (water utilities, irrigation boards, etc.) and see how far they offer unusual models.
- Identify regions that could benefit from private sector participation, create guidelines for effective cooperation between government and private sector.
- Use alternative intervention strategies: transfers; conservation; recycling, desalinisation, etc.
- If transboundary hydropolitics were to be considered an opportunity for blocked national water policy contexts, this would make policy reforms possible because political changes are unavoidable and imposed by international issues.
- Encourage transparency in monitoring and reporting.
- Need for supporting dialogue on water at the local (basin) level.
- Redefine the roles of public water service agencies in the light of modern demands placed on the water sector.
- Work on an institutional configuration that accommodates both formal and informal institution for the water sector.
- Focus "Water & Politics" input to the 4th World Water Forum in Mexico.
- Focus on key issues: ex: politics of irrigation and politics of access to water.
- You can only change things with trust, so should work on building that.
- Internalise political considerations in water policy formulation and implementation instead of treating them as externalities.

- Maximise transparency and minimize corruption at all levels of public and private sectors.
- Start from a more global analysis of social composition of cities and who can pay for what service.
- Promote mediation structures between governments – parliaments, users and experts (better articulate knowledge with decisions).
- Draw up code(s) of conduct for reaching the MDGs based on multi-stakeholders dialogues.
- Provide concrete action plans that could be implemented by various stakeholder groups & could be used by them as potential implementation models.
- A charter of ethics to be respected by governments for water resources management, even in times of war or civil unrest, to protect the existing infrastructures.

Appendix 2: Programme

Thursday, February 26, 2004

8:00-09:00
Registration of participants

09:00-09:30
Welcome and opening

Loïc Fauchon, Chairman and C.E.O. of the Water Supply Company of Marseilles

William J. Cosgrove, President of the World Water Council

Ger Bergkamp, Coordinator, Water & Nature Initiative, IUCN - World Conservation Union

09:30-10:45
Session I: What can we learn from political science? What are the power structures & coalitions: how do they develop, act and influence the debate, decisions and action related to water?

Chair and Moderator: Anthony Turton, African Water Issues Research Unit and the GIBB-SERA Chair in IWRM at the Council for Industrial and Scientific Research

Bernard Barraqué, Laboratoire Technique, Territoire et Société – École Nationale des Ponts et Chaussées – Université de Marnes la Vallée: *A few theoretical elements on legal institutional and sociological issues in Water & Politics*

Jerry Delli Priscoli, U.S. Army Corps of Engineers: *Bridging the Gaps between Technical and Political: Training Senior Water Managers What They Need to Know about Conflict Management, Consensus Building and Participation*

Jeroen Warner, Wageningen University: *The Need for Politics: Three Narratives of Security, Conflict and Participation in International Water Policy*

Discussion

Coffee break

11:15-13:00
Session I (continued)

Chair and Moderator: Anthony Turton, African Water Issues Research Unit and GIBB-SERA Chair in IWRM at the Council for Industrial and Scientific Research

Stéphane Labranche, EPE-EPII, Grenoble: *The issue of sustainable and participatory norms in dams: from the international to the individual level and back*

Itay Fischhendler, University of California, Berkeley; Department of Resource Economics: *The role of a policy package in reforming the water sector: the case of the Californian drought and the Central Valley Project Improvement Act*

Eric Mollard, Institut de Recherche pour le Développement, France and Sergio Vargas Velásquez, Instituto Mexicano de Tecnología del Agua, Mexico: *"Liable but not guilty": About the use of climatic and political circumstances by stakeholders in a river basin council (Mexico)*

Discussion

Lunch

14:00-16:00

Session II: Better understanding important water management issues from a political perspective. What are the issues related to water management and reforms which understanding could be improved by political analysis?

Chair and Moderator: Bernard Barraqué, Laboratoire Technique, Territoire et Société – École Nationale des Ponts et Chaussées – Université de Marnes la Vallée

Anthony Turton, African Water Issues Research Unit and the GIBB-SERA Chair in IWRM at the Council for Industrial and Scientific Research: *An Assessment of Strategic Issues in the Policy Field Relating to Water Resource Management in Southern Africa*

Ayşegül Kibaroğlu, Department of International Relations, Middle East Technical University: *Contending Approaches to Water Disputes in Transboundary River Basins: What can International Relations Discipline Offer?*

Sophie Allain, Institut National de la Recherche Agronomique and Groupe d'Analyse des Politiques Publiques (ENS Cachan / CNRS): *French river-basin participatory planning challenged by dam-projects: A Negotiated Public Action perspective*

Ashok Swain, Swedish Water House / Uppsala University: *Political Structure and 'Dam' Conflicts: Comparing Cases in SE Asia*

Discussion

Coffee Break

16:30-18:00

Session II (continued)

Chair and Moderator: Bernard Barraqué, Laboratoire Technique, Territoire et Société – École Nationale des Ponts et Chaussées – Université de Marnes la Vallée

Stephen Tyler, International Development Research Centre: *Governance and Water Management in Asia: What do we need to learn?*

Raouf Khouzam, Independent Consultant: *Forces Behind Accepting/Rejecting Water Pricing*

Amy Stewart, University of Newcastle Upon Tyne: *The Politics of Multi-Stakeholder Partnerships for Water and Sanitation: The Significance and Worth of the World Summit Type Two Partnerships.*

Discussion

18:00-18:30

Discussion

Moderator: Jerry Delli Priscoli, U.S. Army Corps of Engineers

20:00

Dinner

Friday, February 27, 2004

09:00-10:30
Session III: Case Studies: Learning from on-going projects

Chair and Moderator: Brett Orlando, IUCN – World Conservation Union

John Dore, Chiang Mai University: *Mekong Water Politics*

Froilan Esquinca Cano, Sociedad de Historia Natural del Soconusco: *The Importance of the Ecoregion Sierra - Costa of Chiapas and the Water and Nature Iniciative in The Tacana Volcano with the IUCN*

Peter Kangwa, Pangani Water Dialogues project - PAMOJA Trust: *Towards Good Water Governance in Tanzania: Lessons and Desired Action*

Discussion

Coffee Break

11:00-13:00
Session III (continued)

Chair and Moderator: Ger Bergkamp, IUCN – World Conservation Union

Kwame Odame Ababio, Water Resources Commission, Ghana: *Water Politics in the Volta Basin - Defusing conflict Risks and Promoting Bi-National Cooperation through Informed Dialogues and Negotiations*

Sébastien Treyer, Research Department - Ministry of Ecology and Sustainable Development, France and ENGREF (Recherche en gestion sur les territoires et l'environnement): *Introducing political issues in the debate on water resources planning in Tunisia : a necessity for the implementation of water demand management policies*

Ramón Llamas, Department of Geodinamics, Complutense University, Spain: *The silent revolution of groundwater intensive use and its influence in the current social and political conflicts in Spain*

Anna Gekht, Parliamentarians for Global Action: *Parliamentarians in water management: water and politics and the Caucases and Mediterranean*

Discussion

Lunch

14:00-16:30
Session IV: Plenary: What type of action the World Water Council and its members can initiate?

Chair and Moderator: Jerry Delli Priscoli, U.S. Army Corps of Engineers

Discussion amongst the participants

Coffee Break

17:00-17:30
Wrap-up and closing

William J. Cosgrove, World Water Council

Appendix 3: List of Participants

Sophie Allain
Institut National de la Recherche Agronomique / Groupe d'Analyse des Politiques Publiques (École Normale Supérieure Cachan / Centre National de la Recherche Scientifique)
France

Véronique Balestra
Institut Méditerranéen de l'Eau
France

Bernard Barraqué
Laboratoire Technique, Territoire et Société
École Nationale des Ponts et Chaussées
Université de Marnes la Vallée
France

Ger Bergkamp
IUCN - World Conservation Union
Switzerland

Olivier Bommelaer
Agence de l'eau Seine-Normandie
France

Jean Bonomo
Graduate Intern, Société des Eaux de Marseille
France

Dale Campbell
International Water Law Research Institute
Dundee University
United Kingdom

Katherine Cinq-Mars
McGill University
Canada

William Cosgrove
World Water Council
France

René Coulomb
Société Hydrotechnique de France
France

Jean-Louis Couture
Institutional and Social Innovations in Irrigation
Mediterranean Management Project, Agropolis
France

Jerome Delli Priscoli
U.S. Army Corps of Engineers Civil Works
USA

John Dore
Unit for Social and Environmental Research
Faculty of Social Sciences
Chiang Mai University
Thailand

Michel Drain
Centre National de la Recherche Scientifique
France

Guy Duchossois
Agence Spatiale Européenne
France

Froilan Esquinca Cano
Sociedad de Historia Natural del Soconusco
Mexico

Loïc Fauchon
Groupe des Eaux de Marseille
France

Itay Fischhendler
Department of Resource Economics
University of California, Berkeley
USA

Anna Gekht
Parliamentarians for Global Action
USA

Thierry Giordano
Institut du Développement Durable et des Relations Internationales
France

Raphaël Jozan
École Nationale du Génie Rural des Eaux et des Forêts (ENGREF)
France

Peter C. Kangwa
Pamoja Trust
Pangani Water Dialogues Project

Raouf Khouzam
Independant Consultant
Egypt

Aysegül Kibaroglu
Department of International Relations
Middle East Technical University
Turkey

Juergen Krombach
Transparency International
Germany

Stéphane La Branche
Centre de recherche sur le Politique, l'Administration, la Ville et le Territoire (CERAT-PACTE) - Département Énergie et Politiques de l'Environnement (LEPII-EPE), Grenoble
France

Jean-Pierre Le Bourhis
France

Ramon Llamas
Department of Geodinamics
Complutense University
Spain

Samuel Luzi
Center for Comparative and International Studies CIS - Swiss Federal Institute of Technology ETH Zürich &
Swiss Federal Institute for Environmental Science and Technology EAWAG Dübendorf
Switzerland

Mochammad Maksum
Center for Rural and Regional Development Studies - University of Gadjah Mada
Indonesia

Eric Mollard
Institut de Recherche pour le Développement
France

Jean-Jacques Honore Nsoh
NGO FADES-ACP
Cameroon

Kwame Odame Ababio
Water Resources Commission
Ghana

Brett Orlando
IUCN - World Conservation Union
Switzerland

Alexander Otte
UNESCO
France

Adeline Park
LBJ School of Public Affairs
University of Texas at Austin
USA

Murielle Radix
ATTAC
France

Pierre-Alain Roche
Agence de l'eau Seine-Normandie
France

Madar Samad
International Water Management Institute
Sri Lanka

Jurgen Schmandt
Houston Advanced Research Center
& University of Texas at Austin
USA

Marlies Schuttelaar
France

Amy Stewart
University of Newcastle Upon Tyne
United Kingdom

Ashok Swain
Swedish Water House / Uppsala University
Sweden

Pierre-Frédéric Ténière Buchot
Cercle Français de l'Eau
France

Sébastien Treyer
Ministère de l'écologie et du développement durable & École Nationale du Génie Rural desEaux et des Forêts (ENGREF)
France

Anthony Turton
African Water Issues Research Unit & GIBB-SERA Chair in IWRM at the Council for Industrial and Scientific Research
University of Pretoria
South Africa

Stephen Tyler
International Development Research Centre
Canada

Jeroen Warner
Wageningen University
The Netherlands

James Winpenny
Global Water Partnership
Sweden

Daniel Zimmer
World Water Council
France

Sonia Briki
World Water Council
France

Colin Herron
World Water Council
France

Marie Lagier
World Water Council
France

Stéphanie Porro
World Water Council
France

Carine Sirou
World Water Council
France

Françoise Touchard
World Water Council
France

ISBN: 92-95017-09-9
Price: 10 Euros

World Water Council
10, Place de la Joliette - Les Docks de la Joliette, Atrium 10.3 - 13002 Marseille - France
Phone: +33 (0)4 91 99 41 00 - Fax: +33 (0)4 91 99 41 01
Email: wwc@worldwatercouncil.org
Website: http://www.worldwatercouncil.org

World Water Council
4th World Water Forum