

ZEF

Bonn 2007

Working
Paper
Series

19

Center for Development
Research

Department of
Political and
Cultural Change

Research Group
Culture, Knowledge and Development

Peter P. Mollinga

Water Policy – Water Politics:

Social Engineering and Strategic Action
in Water Sector Reform


universität**bonn**



Zentrum für Entwicklungsforschung
Center for Development Research

ISSN 1864-6638

ZEF Working Paper Series, ISSN 1864-6638
Department of Political and Cultural Change
Center for Development Research, University of Bonn
Editors: H.-D. Evers, Solvay Gerke, Peter Mollinga, Conrad Schetter

Authors' address

Peter M. Mollinga, Senior Researcher "Natural Resources and Social Dynamics"
Center for Development Research (ZEF), University of Bonn
Walter-Flex-Str. 3, 53113 Bonn, Germany
Tel. 0228-734918; Fax 0228-731972
E-mail: p.mollinga@uni-bonn.de

Water Policy – Water Politics: Social Engineering and Strategic Action in Water Sector Reform

Peter M. Mollinga
Center for Development Research (ZEF) University of Bonn

1. Introduction

The objective of this paper is to map the 'politics of water' as a field of research. Such mapping logically has two parts. The first is an explanation of what is meant by politics and what could be the overall conceptual approach for analysing the politics of water – the formal part of the mapping. The second part of the mapping is the substantive dimension: what are the concrete issues and questions around which research on water politics could be organised? While the first part can have a single answer, the approach one prefers to take, the second is an in principle endless list of relevant and interesting topics for concrete investigation, each with their own specific conceptual and methodological demands. Selection within that list follows primarily, at least in this paper, from an assessment of what are pertinent policy questions in (a certain part of) the real world of water resources management.¹ This paper focuses on the issue of water sector reform in developing and transition countries, particularly the reform of the public organisations that manage agricultural water. Agriculture is the dominant form of water use in most developing and transition countries, and changes in water resources management towards a more 'integrated' approach require quite fundamental changes in how agricultural water management is done. The need for a more integrated approach to water resources management is taken as the context for the argumentation in this paper, though 'integration' is by no means a clear, single 'thing', but a contested concept.²

Given this demarcation, I summarise the two main concerns and research foci regarding the politics of water that this paper wants to elaborate as follows.

- 1) The internalisation of 'new concerns', notably environment and human development, into the mainstream water sector organisations' professional practice.
- 2) The transformation of state-centred water resources policy processes into society-centred policy processes.³

The suggestion is that these are two crucial questions for those interested in furthering reform in the water sector, because they are 'sticking points': issues that hold up the reform process, where there is a need for new analysis to inform strategic action.

The mapping exercise is organised in three sections. The first presents a framework for water politics analysis (section 3), followed by two sections that discuss the two main foci mentioned above (sections 4 and 5). Preceding these three sections is an explanation of why

¹ The alternative approach for defining concrete research foci would be from an academic starting point: the pursuit of certain theoretical or methodological interests with the water resources domain as the area of enquiry. Water resources management is the generic term used in this paper as the broadest reference to all activities related to water governance, management (in the narrow sense), use, finance, and other aspects.

² Policy and research statements arguing the case for integration abound. See for instance GWP (2000), Rogers and Hall (2003), and the websites of the International Water Management Institute, www.iwmi.org, and the Comprehensive Assessment of Water Management in Agriculture, <http://www.iwmi.cgiar.org/Assessment/>; <http://www.bradford.ac.uk/acad/bcid/seminar/water/> for the 'Challenging the global water consensus' conference/seminar series and Mollinga et al. (2006) for critical engagements. In the European Union water policy context 'adaptive water management' is a concept that seems to be gaining currency, see for instance www.newwater.info/.

³ In a recent volume on the politics of irrigation reform, Mollinga and Bolding (2004) suggest the following three research fields as in need of more research attention: 1) the resilience of irrigation bureaucracies, 2) the role of international development funding agencies, and 3) the capture of irrigation reform policy in implementation (pp.302-306). The two foci of this paper are formulated at a higher level of abstraction, and include the three fields just mentioned, and more.

'politics' should be given special attention in the first place (section 2). The main argument of the paper is summarised in the concluding section 6.

2. Why Emphasise Politics?

We still, in 2005, live in an era in which it is necessary to explain that water resources management is an inherently political process. Ten years ago, in 1995, politics and the political were anathema in most circles of the water policy discourse.⁴ As discussed below, the social engineering paradigm reigned largely unquestioned. The rise of the theme of (good) governance brought in politics into the mainstream development discourse through the backdoor. When talking governance, good or bad, and associated ideas like accountability, transparency and legitimacy, it is rather difficult not to acknowledge that such processes and relations have political dimensions, and to stay confined within an instrumentalist perspective. As governance is about the exercise of authority and allocation of rights and resources, the issue of social power, generally excluded from social engineering rationales, becomes difficult to avoid.⁵ Nevertheless, it remains very difficult for those holding positions of authority, to acknowledge that the social fabric can not be understood and transformed without questioning existing social relations of power, and that, therefore, an explicit, scientific and professional discussion on social power and politics is desirable at all levels of decision making. As contributions like those of Ferguson and Harriss have argued, there may be compelling reasons for governments and other actors to depoliticise debates on development, reasons located in the way instrumental reason, which actively claims to exclude 'politics', assists in reproducing state

⁴ This statement derives from participation in policy related discussions on water management by the author since the early 1990s. However, in past years the politics word seems to have acquired some acceptability. On 25 February 2004 a double session on 'Driving the Political Economy of Reform' took place as part of the World Bank Water Week, the yearly gathering of World Bank staff and partners in Washington D.C. (see <http://www.worldbank.org/watsan/waterweek2004>, session 14). This was the first time that the political dimensions of water/irrigation reform processes were given such explicit space in the Water Week event. On 26 and 27 February 2004 the World Water Council (WWC) launched a 'Water and Politics' initiative by organising a workshop in Marseille – the site of its headquarters (see http://www.worldwatercouncil.org/water_politics/index.html). In the corporate sector, the RWE Thames Water company emphasises the importance of water politics on its website (http://www.thames-water.com/TW/division/en_gb/content/General/General_000101.jsp?SECT=General_000101). See Merrey et al. (2006) for further discussion.

⁵ See Hoebink (2006) for an interesting discussion of how the concept of (good) governance was taken up in West European bilateral development assistance programmes in recent years. In the global water discourse, the moment of 'closure' for establishing governance as a core theme seems to have been the Bonn Freshwater Conference in 2001 and the Johannesburg Summit of Sustainable Development in 2002. Much quoted is the phrase "The world water crisis is a crisis of governance – not one of scarcity." from the No Water No Future speech at the Summit by the Prince of Orange. Jenkins (2001a) argues that 'governance' as used in the mainstream international development discourse of the international development funding agencies tends to become a 'technical' issue: it, as it were, depoliticises the understanding of politics. I do agree with much of Jenkins' criticism of the global (good) governance agenda, but from the perspective of water sector reform, I find the acceptance of the importance of the issue of governance, after the acceptance of 'management' in the 1970s to improve upon 'operation', a step forward. Governance in this context refers to the allocation of rights (rights to water and technology, decision-making rights) and resources (water itself, but also maintenance and investment funds for instance), and thus brings in issues of interest groups and social power more forcefully than the notion of management, which has been the leading concept for the past decades in water policy reform discussions, tends to do. Hence my phrasing of 'politics through the backdoor'. There are other discursive trajectories leading to acknowledgement of the relations of social power. The most notable one is the participation discourse that often started from populist and instrumentalist perspectives but has produced the notion of 'empowerment' as a much more political understanding of 'involvement of stakeholders' (see Scoones and Thompson, 2004).

power and legitimacy, as well as the reproduction of development assistance programmes (Ferguson, 1994; Harriss, 2001; also see Scott, 1997).]

Another indication that 'politics' is not the most likely topic for detailed investigation within water resources management studies, is that despite the strong emphasis on 'rent-seeking' in the neo-liberal development discourse of the 1990s (see Repetto, 1986) there is virtually no follow-up research on Wade's seminal paper on 'the system of administrative and political corruption' (Wade, 1982). In most seminars and workshops on irrigation reform that the author has attended in India and elsewhere in the past fifteen years, the issue was not even mentioned – except sometimes in the corridors.⁶ Though there are domains of water politics that are well researched (see below), the importance of the political dimensions of water resources management still needs to be consolidated in global and national water policy discourses.

The English language, and Dutch, the other language that I commonly use, have two separate words for policy and politics. Till I started preparing this paper for a workshop on Wasserpolitik it had never occurred to me that this might be different in other languages. In German the word for both is Politik, in French it is politique, in Italian politica, in Spanish política, in Finnish politiikka⁷ and in Russian политика (politika).⁸ This use of a single word may reinforce that for most people 'politics' is often first and primarily associated with official, state politics, as practiced in the polity. In a dictionary definition, politics is "the art and science of directing and administering states and other political units" (The New Collins Concise English Dictionary, 1982:877). State governance is the substance of politics in this perspective. Politics is, however, a much broader term. In the same lemma in the dictionary quoted, politics is also defined as "the complex or aggregate of relationships of men [sic!] in society, especially those relationships involving authority or power", "any activity concerned with the acquisition of power" and "manoeuvres or factors leading up to or influencing (something)". Politics is a dimension or quality of many social processes, that is, all social processes in which interests of individuals or groups are mediated. This is, of course, conceptually well established in the social science literature, but needs to be incorporated into the analysis of water issues more systematically that it has been so far.⁹

For water, the basic idea that informs the approach presented in this paper is that water control should be conceived as politically contested resource use. In this formulation water control is the subject matter of water management. It is something that humans have done since time immemorial. Any human intervention in the hydrological cycle that intentionally affects the time and/or spatial characteristics of water availability and/or its qualities, is a form

⁶ The most striking example of this I found is a meeting convened in Delhi in February 2003 that brought together a large number of Indian water researchers and NGO water practitioners and activists, as well as government representatives to discuss the need for an India-wide dialogue on the massive 'interlinking of rivers' plan that shot to prominence in 2002 through a Supreme Court Order and a Presidential speech. This eminent collection of water experts managed to conduct the meeting without a single mention of the rent-seeking issue, while arguably lobbies for larger investment in water infrastructure are partly informed by this interest. At the global scale the issue of corruption in the water sector seems to slowly become a more acceptable topic. The Stockholm Water Symposium has had sessions on the topic in recent years.

⁷ Though for 'policy', a newer word, the plural form is sometimes used, politiikat (personal communication Erja Hänninen).

⁸ These are the languages for which I checked with colleagues. I thank Rutgerd Boelens, Tommaso Trevisani, Darya Zavgorodnyaya, Waltina Scheumann, Fabian Scholtes, Francois Molle and Erja Hänninen for their reflections on this issue.

⁹ A much quoted treatment of social power I find very helpful is Lukes (2005). On 'politics' see publications like Lasswell (1936), Leftwich (1984), and many others.

of water control.¹⁰ Water control has three dimensions: a technical/physical, an organisational/managerial, and a socio-economic and regulatory. These generic categories refer to, respectively, the manipulation of the physical flow and quality of water, the guiding of the human behaviour that is part of water use, and the socio-economic, legal, administrative and other structures in which water management is embedded and that constitute conditions and constraints for management and regulation (see Bolding, Mollinga and van Straaten, 1995 and Mollinga, 2003 for detailed discussion of the water control concept). These three categories coincide, for the case of irrigation, with three literatures that each use the category, but are largely separate: the engineering literature, the literature on irrigation management, and the literature on irrigation as part of the broader development process (see Mollinga, 2003 for references). Each of these literatures abstracts from water control in a different way, highlighting a different dimension of it. An important implication of this understanding of water control is that it constitutes the case for interdisciplinarity as a necessary requirement for comprehensive understanding of water management, but this point is not pursued in this paper.¹¹

The focus of this paper is on the second part of the formulation, the politically contested resource use that water control is. Contestation is another generic category. It is meant to refer to a range of interaction patterns in water management, including negotiation and struggle, and also less explicit and longer term disputations. The idea is to convey that there tends to be something at stake in water management, and that different individuals or groups involved have different interests. This is not meant to be a general theoretical statement, but an empirical one. The approach is interested to analyse those situations where water management is an issue. Because the societal issues around water management are proliferating, this seems to be a relevant perspective. The addition of the adjective political to contestation is simply meant to highlight that there is a political aspect to contestation and thus to water control.¹² As soon as the political would be a self-evident property of water control, it would become unnecessary to give it special emphasis: the adjective could be dropped and contestation understood to include it. How the political aspect of water control can be elaborated is discussed in the following section.

3. The Politics of Water: A Framework

Ubiquitous water politics is an assembly of domains and issues. Depending on the purpose of analysis and/or action, the structure of this sociotechnical practice can be

¹⁰ My usage of the term 'control' in this manner has been found problematic by some. In critical perspectives 'control' tends to a 'bad thing', associated with the excessive and arrogant desire or mastery over nature by humankind. As an actual description of what humans do with water, water guidance, direction or regulation would be better, as intervention in the hydrological cycle is basically that. However, all three terms are awkward and confusing as general categories, and I therefore stick to water control till a better term becomes available. In Elinor Ostrom's framework one would speak of 'water use and control' as she distinguishes two categories of rights: use rights and control rights.

¹¹ On the premise that the three dimensions of water control are internally related, that is constitute each other. As such, water control can be regarded as a 'boundary concept' that creates space for different perspectives to discursively meet for more comprehensive understandings of water resources management.

¹² This does not intend to suggest that water control can be reduced to its political nature, that is, that water control is only political or that its political aspect determines all other aspects. How and how strongly the mediation of actors' interests and the social relations of power shape the different properties and dimensions of water control processes is an empirical question, though my starting assumption is that it is always present and often important.

represented in different ways. Two ordering principles are relevant for the purposes of this paper: first, a distinction of different levels of water politics as relatively autonomous domains of interaction, and second, the identification of issue-networks encompassing processes of contestation within or across levels.

Levels and issue networks

Levels is a problematic metaphor for describing social structure (see Kitching, 1988), but it has empirical relevance in the case of water resources. The social dynamics of water control play out at different geographical levels – where geography has to be understood in a combined physical-spatial and socio-political sense.¹³

The hydrological and hydraulic behaviour of water has geographical boundaries in basins, in aquifers, and in human-created water control systems. Thereby, the social processes of water control are spatially situated and interlinked. This is obvious for basins, where very visibly the direction, magnitude, and timing of surface water flow constitute socio-geographical patterns, in terms of, for instance, settlement, mobility, and land-use patterns. The same applies to aquifers, though these are less visible because underground. Basins, aquifers, and water control systems together with climate (rainfall and snowmelt patterns particularly) and landscape characteristics shape quantity, quality and timing of water availability, and thus provide the fluid grid of human existence. Floods and droughts are among the phenomena that regularly bring home the message that these systems may have relatively clear and stable boundaries, but exhibit dynamic and sometimes erratic behaviour.

The institutions and organisations created by societies for accomplishing water control also have spatial reference, though the reach of these by no means necessarily coincides with the physical boundaries of water control practices. The organising principle is socio-political space rather than physiographical order. Two link-concepts are, for instance, ‘territory’ and ‘jurisdiction’. These are hybrid concepts that unite geographical and socio-political extent.

Water politics is organised in four different domains.¹⁴ In each domain the ‘main stake’ or subject matter of the interaction processes is different.

1) The everyday politics of water control

Everyday politics is a phrase coined by Kerkvliet (1991). Regarding water it refers to contestation of day-to-day water use and management. In many cases everyday politics is a relatively small scale phenomenon, including, for instance, how access to local groundwater markets is negotiated between community members, how maintenance obligations connected to water rights are enforced in a farmer-managed irrigation system, and many other examples. However, the management of a big reservoir distributing stored water to canals and areas hundreds of kilometres away from the dam is also ‘local’ in the sense of being a concrete, situated water use and management practice, with an everyday politics associated with it, for instance focused on the negotiation of gate settings and discharge monitoring, determining how much is released to whom at what time.

¹³ For a discussion of the concept of space, see for instance Massey (1999).

¹⁴ These can be seen as (territorial/jurisdictional) levels, (action) arenas, semi-autonomous fields, domains of interaction etc. depending on one’s purpose and focus of analysis. I settled for the general term ‘domain of interaction’.

2) The politics of national water policy

Politics of policy is a phrase coined by Grindle (1977, and subsequent work). It refers to the contested nature of policy processes. In the water resources domain I use it to refer to policy processes at the level of sovereign states, or states within a federation. The concept is a critique of linear views of policy formulation and implementation (Hill, 1997), and aims to 'demythologise planned intervention' (Long and Van der Ploeg, 1989). The idea is that water policies, like other policies, are negotiated and re-negotiated in all phases or stages and at all levels, and are often transformed on their way from formulation to implementation. The political contestation of water policies takes place within state apparatuses, but also in the interaction of state institutions with the groups directly and indirectly affected by the policies.¹⁵

3) Inter-state hydropolitics

Hydropolitics is a phrase that has been coined in the literature on international water conflicts, notably those in the Middle East (see Waterbury, 1979; Ohlsson, 1995). It there refers primarily to conflicts and negotiation processes between sovereign states on water allocation and distribution, particularly in relation to transboundary rivers or aquifers. Turton and Henwood (2003) propose to broaden the term to encompass all water politics, but I prefer to use it in its original meaning, including inter-state water conflicts in federal political setups. Hydropolitics is the part of water politics that has been well researched and documented, perhaps because it is a very public phenomenon, with sometimes high stakes and geopolitical relevance, and an interesting case for international relations studies (Zeitoun and Warner, 2006).

4) The global politics of water

Rather than being a phrase coined for long-existing practices, the global politics of water refers to a relatively new phenomenon: the recently, in the 1990s, invigorated international level of water discourse, policy and tentative regulation. The global politics of water contains several processes. These include the institutions and organisations set up as a follow up of the 1992 Dublin and Rio international conferences on water, environment and development, notably the World Water Forums, the World Water Council (WWC) and the Global Water Partnership (GWP). The GWP has become the international social carrier of the IWRM concept. The WWC has played an important role in the advocacy in recent years for more investment in water infrastructure. Another component of the global water politics is the World Commission on Dams' process, triggered by large political controversies around the effects of large dam building. A third component is the process related to the World Trade Organisation negotiations regarding water, notably around the issue of the privatisation of water and water service provision. A fourth relates to global advocacy for access to water as a human right. (See Klaphake and Scheumann in this volume.)

The four domains can be distinguished because they have different space and time scales, are populated by different configurations of main actors, have different types of issues as their subject matter, involve different modes of contestation and take place within different sets of institutional arrangements.

The categorisation of four domains of water politics provides a generic classification of the major action arenas, to use Ostrom's term (1992), of water control. However, the domains

¹⁵ An example of an approach addressing the issue how societal interest groups influence policy formulation and implementation is Sabatier's work on advocacy coalitions (Sabatier, 1988). Mooij and de Vos (2003) is an annotated bibliography of policy process literature.

are only semi-autonomous fields, to use Falk-Moore's phrase (Falk-Moore, 1973). Some of the most interesting and important questions in water policy and water politics involve the interlinkages between or across domains, for instance the abrogation of national sovereignty in water policy making by international development agencies and banks, the translation of global politics and policy ideas into national approaches and local impacts, and vice versa, and others. For instance the large dams issue is an example how local and national politics can be taken to the global level (see Klaphake and Scheumann in this volume).

All four domains and their interlinkages are hybrid spaces in which 'things happen' regarding water control. However, the vessels have no content as yet. The substance of contested water control is located in what I would call issue networks or problemsheds.¹⁶ These are configurations of actors, social relations and practices around certain subjects that matter. Issue networks have concrete bones of contention, actors involved in shaping the issues and their impacts, while applying their perceptions, pursuing their interests by implementing their strategies, while mobilising the variety of their resources, with certain transformative (and reproductive) outcomes. Societal concerns concretely configure actors and interests around essential themes and topics – essential from the perspectives of the actors involved. The issue and sub-issues around which an issue network or problemshed has emerged may (be) play(ed) out in or across one or more domains. Issue networks or problemsheds give life to the structural landscape of water control contestation (and constitute it recursively¹⁷). Issue networks or problemsheds are sometimes stable and persistent, but often adaptive and dynamic, even transient.

Choosing a focus

There is a plethora of issues and problems, issue networks and problemsheds. All are important in their own right. However, taking an overall look at reform in the water sector, several general observations can be made.

The boom in infrastructure investment in the water sector for irrigation/drainage, hydropower and flood control in the second half of the 20th century strengthened a quantitative 'harnessing' approach to water resources development. Allan (2006) has called this the phase of the pursuance of a 'hydraulic mission' by water resources agencies and by societies. For irrigation, for instance, this meant a supply enhancement approach, allocating available 'dependable flow' in rivers to new irrigation systems for boosting agricultural production. The approach was set in 'planned development' discourses of different varieties, with agricultural growth and national food security being the main drivers. The organisations responsible for creating and managing the infrastructure systems were predominantly populated by civil engineers. In countries where irrigation is very important for the national economy (like for instance in Pakistan, India, Indonesia, Mexico, Egypt, China, and several other countries), these have become very powerful organisations that occupy a large part of water resources public policy space.

This 'harnessing' approach to water resources development has been very successful in some respects. In a country like India there seems to be little doubt that the creation of large areas of surface irrigation systems in the 1950s-1970s has helped to achieve national food

¹⁶ I have taken the term 'issue network' from the literature on policy processes, and 'problemshed' from Viessman (1998); see also Merrey et al. (2006).

¹⁷ Or rather, develop it in a cyclic process of morphogenesis (see Archer, 1995).

security and contributed to overall economic growth significantly.¹⁸ Nevertheless, already in the 1960s, and prominently in the 1970s, the 'underutilisation' of the irrigation systems created started to be noticed and discussed. Even when making perhaps significant contributions, the systems performed below expectation.¹⁹ This challenge was addressed with a social engineering approach, to match the civil engineering approach that created the systems.²⁰ The 1970s and 1980s saw the rise of irrigation management policies and programmes, and research, that in a highly instrumentalist manner tried to 'get the institutions right'. The first focus was on law and order approaches to water management ('scientific' as against 'politicised' water management in the Indian discourse) focused on the implementation of the operational requirements of the systems, quickly followed by a focus on organising farmers in water users associations or other forms of cooperative management. The most recent proposal for the social engineering of water management forms is the establishment of river basin organisations (see Merrey et al., 2006, and Shah et al., 2006 for a summary and an extended discussion).

Though the insight that local water management in large-scale systems depended very much on the effectiveness of management at higher levels of the system, was articulated early on in the irrigation management policy discourse (Wade and Chambers, 1980), it would take till the late 1990s till reform of irrigation bureaucracies became a serious item on the international policy agenda, with the idea of irrigation management transfer (IMT) linking the on-farm water management ideas of the 1970s and early 1980s, with the bureaucratic reform emphasis that emerged in the 1990s.²¹ The 1990s saw an interlude in which much faith was put in engineering water markets and water rights, on the idea that tradable water rights would enhance both allocative efficiency and water use efficiency. Though such programmes, except in the case of Chile, were rarely introduced in a radical fashion, discursively they represented, and continue to represent, though with less support than before, the economic variant of social engineering 'institutional fix' approaches to irrigation management.

The achievements of management reform programmes in the irrigation sector have generally been very limited, with some exceptions, like for instance the Mexican and Turkish reforms of the early 1990s (on Mexico see Kloezen, 2002; Rap, 2004). Instrumentalist approaches to management transformation have proven to be not very effective in reshaping the institutional fabric and dynamics of the water sector. In Merrey et al. (2006) it has been argued that social engineering approaches need to be replaced by self-conscious concepts of

¹⁸ This point is not uncontested. For India, see for instance Dhawan (1988), Sengupta (1985), and Nadkarni (1984). Another question to be asked is whether there would have been other ways to spend the budgets involved that could have achieved better results. I do not enter into discussion on this issue in this paper. Historically, the choice for the development trajectory as just sketched has been made in many places, and we have to face the impacts and consequences – whatever they are.

¹⁹ For India, some of the relevant documents that mark the emergence of this growing awareness are GOI/PC/PEO (1965), GOI/MOIP (1972) and GOAP (1982).

²⁰ For a more detailed critique of the social engineering paradigm in agricultural water management see Merrey et al. (2006).

²¹ For India, I have suggested in Mollinga (2003) that 'pushing' the water management issue to the farmers level initially was not so much based on a lack of understanding of water management dynamics, but a quite conscious effort to position such interventions outside the domain of the Irrigation Department. The focus on the farm level should thus, in part at least, be seen as an effort of irrigation bureaucracies to reproduce and defend the orientations of their organisations: infrastructure creation and operation by hierarchically organised centralised civil engineering bureaucracies. The positioning of discussions on 'participation' almost exclusively at the local level, is another instance of this perspective. I have argued elsewhere that participatory irrigation governance is the core issue rather than participatory irrigation management (in the narrow sense of management), as participatory governance would be about sharing power (over allocation of rights and resources, over inclusion/exclusion and rule making; cf. Ostrom's (1990) 'constitutional choice' and 'collective choice' levels of rule making and enforcement vs. the 'operational' rule making and enforcement, while participatory management can easily be conceived in a 'technical' manner, aimed at enhancing 'system performance'.

strategic action to be able to engage effectively with the dynamics of inherently political water policy processes.

Instrumentalism is not just a civil engineering predilection. It also fits the concerns of bureaucratic and political decision-makers. These prefer simple, single or limited point, standardised solutions to policy problems, rather than emphasis on context-specificity, and the open-endedness, complexity and uncertainty of intervention processes. Instrumentalism is a general feature of prescriptive, linear approaches to policy making and implementation. In the literature on policy processes this linear, prescriptive approach to planning has been fundamentally criticised (Hill, 1997), the real world being complex and non-linear. However, as a policy format, instrumentalism is very tenacious. It may be hypothesised that this tenacity has to do with the political and practical purposes it serves, in the water sector enhanced by the technical instrumentalism of the dominant professional group in the sector, i.e. the civil engineers.²²

The instrumentalist engineers-bureaucrats configuration in the water sector has been challenged in different ways. The internal challenge of acknowledgement within the sector of the under-performance of existing water infrastructure mentioned already is one such challenge, and a problem that has not been willing to go away, despite a series of models, toolboxes and identification of best practices to be emulated. More profound challenges have come from outside the sector. The controversies around large dams have brought two issues to the fore: firstly, the displacement of people living in the areas to be submerged by new dam reservoirs, and the problems associated with resettlement and rehabilitation of these groups, and secondly, the negative ecological consequences of dams. Also in a broader sense the negative environmental 'externalities' of large-scale water infrastructure development have gained prominence in public debates: the effects on coastal and freshwater fisheries by changes in river and flood plain hydrology, the waterlogging and salinisation problems related to large-scale irrigation, the polluting effects of high external input agriculture (nutrients and pesticides/herbicides), the effects of reduced or increased sediment deposition in reservoirs, river alignments and delta formation, and several others. Challenges have also come from the budget/financial front: governments have become less willing and/or able, for different domestically and internationally generated reasons, to invest the same amounts of money in large-scale water infrastructure as in the past, and support the rehabilitation and maintenance of the infrastructure without higher user contributions. Yet another challenge to the system is that which calls for more democratic forms of resource management, as part of overall decentralisation and democratisation agendas and processes.²³

This rather mixed bag of pressures on the water sector together constitutes a demand for reform. The sector is being asked to change its ways in the management of water, and move towards approaches that incorporate a broader set of concerns and objectives than was the case in the past. As part of the global politics of water, international dialogues and assessments are held on how the environmental, human development and other broader concerns could be incorporated in water management more effectively.²⁴

²² This phrasing homogenises the categories of bureaucrats and civil engineers far too much of course for concrete analysis. Discussing the issue of 'internalisation' below, a more nuanced position will be presented. The statement made here should not be read as an empirical generalisation regarding these categories of people, but as a description of the 'structural configuration of dispositions' within which social engineering is practised and contested.

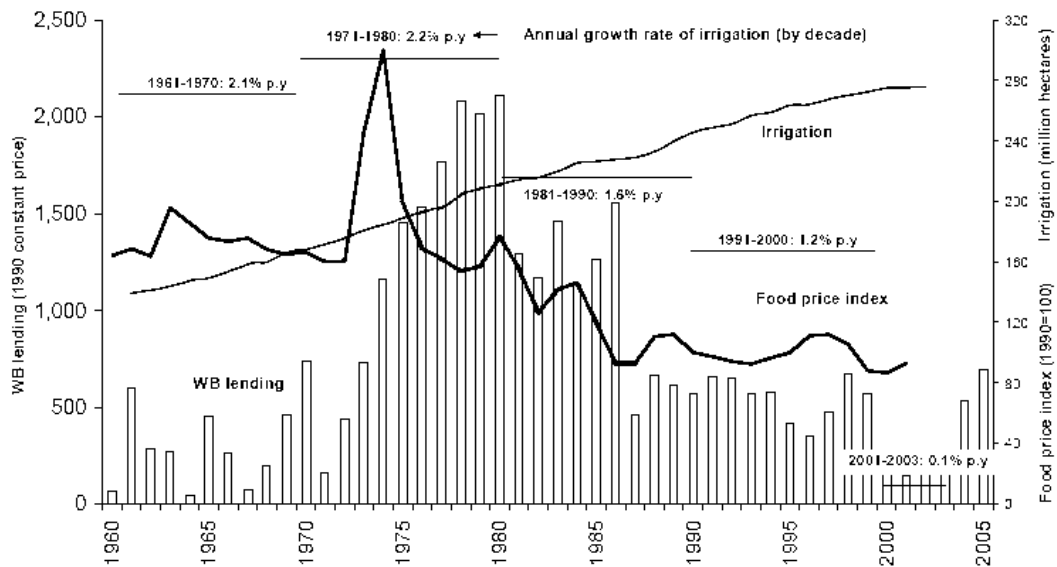
²³ In South Africa post-apartheid social and political reform objectives translated into water sector reform. In Indonesia the decentralisation drive following the fall of the Suharto regime had important implications for water sector reform.

²⁴ For detailed argumentation and evidence I refer to the website of the Comprehensive Assessment of Water Management in Agriculture (<http://www.iwmi.cgiar.org/Assessment>).

However, despite an enormous amount of text produced in global and national policy discourses on the need for and desirable features of 'integrated approaches', reality on the ground seems quite far removed from such ideas in many cases. Methodologically the 'integrated' approaches place emphasis on 'adaptive management' and 'social learning' (see Pahl-Wostl (2002) for discussion of these concepts in the European context). In many cases entrenchment, polarisation, defensiveness and even a refusal to learn seem to be more characteristic features of the water bureaucracies and the policy processes they are involved in. There are very few cases indeed where environmental, equity and democracy concerns have effectively translated into new objectives and activities and new styles of management. The only front at which there has perhaps been noticeable change is that of the financial sustainability of the water infrastructure, notably the level of financial contributions by users, but even in this area very little has changed in the past 10-15 years in many cases.

As a result of all the 'bad press' for large-scale water infrastructure development the investment of institutions like the World Bank in the sector were at a historical low in 2000-2003. However, that trend seems to have been reversed, and in recent years investments have grown substantially again (see figure 1).

Figure 1 World Bank lending (bars) for irrigation and drainage, area under irrigation and world food price index (of 1990 constant US\$) Source: World Bank, FAO



Source: taken from Faures, Svendsen and Turrall 'Reinventing Irrigation', Chapter 9 of Molden (ed.) *Water for Food, Water for Life*. Earthscan, 2007 (in press)

How this trend change should be interpreted is not fully clear: as the result of successful lobby work of the pro-infrastructure investment network (following the Camdessus report and on the wings of the Millennium Development Goals achievement priority), as the result of a recognition within the World Bank that the water/agricultural sector is finally acknowledging environmental and other concerns as part of its core business, as the result of effective pressure

by recipient countries, as a response to a perceived world food shortage, or something completely different?²⁵

My concluding assessment is that since the early 1990s, first slowly, then with more momentum, new international and national policy discourses have been created around the need for 'integrated approaches', with IWRM, Integrated Water Resources Management, as the main brand name.²⁶ The discourses not only involve debates and documents, but also a new set of institutions and organisations, as noted above. Quite a few of the ideas regarding IWRM are drawn from developed country experiences (notably Australia, the USA and the European Union²⁷), and in this sense a discourse is being imposed on developing and transition countries that may be partly misdirected and that may find little local resonance.

However, the need for 'integrated approaches' in developing countries does not only emanate from global policy imposition or assimilation. Real 'integration' issues are proliferating on the ground and are increasingly finding their way into national and regional policy debates. Examples are the increasing problems regarding water quality (water pollution), and the increasing pressure of cities and industries to move water out of agriculture, both frequently leading to conflicting situations. Such problems are set against a background of more and more basins reaching closure, liberalising and urbanising economies, and a continuation of large-scale rural poverty. The IWRM discourse provides a space in which such issues can be more legitimately raised than in the earlier sectoral and productivist discourses on (agricultural) water management and development.²⁸

However, this said, the second part of my assessment of the state of the art as regards 'integrated approaches' in developing and transition countries is that very little has been achieved so far in concrete terms.²⁹ The 'new discourse' has hardly been internalised by the mainstream water bureaucracies: their organisational concerns and styles of management have largely remained unaltered. In my observation there is a large mismatch between the

²⁵ Another reason for reduced investment in irrigation development commonly suggested by economists is the lower need for increasing cereal production at the global scale, as evident in surpluses existing at the world market level (Rosegrant and Svendsen, 1993) In the lobby for the recent increase in investment the need to feed the increasing world population has also played a role. Evidencing of such analyses/statements would involve looking at the details of water and agricultural policy decision-making processes, something that has hardly been done.

²⁶ As suggested above, there are also other currents in global water politics. How these different strands in the discourse articulate, supporting or contradicting each other, is not the subject of this paper.

²⁷ With a tendency to glorify these experiences, like the Murray-Darling case example, and the European Water Framework Directive policy approach. Problems in the 'home' of implementing these concepts are often lost in translation to other places.

²⁸ In that sense IWRM's relevance as a concept should primarily be understood as a boundary concept in international, national, regional and local policy debates on the future of water management, rather than a definite approach or model. Its 'looseness' is its strength, as that provides discursive space (and policy and political space if institutionally consolidated) based on a minimum agreement that there is some need of bringing concerns together that used to be separately treated or ignored. Complaints that the concept is vague and should be operationalised are, therefore, in my view partly misdirected. Closing the discursive space at the general, abstract level by some authoritative definition/operationalisation would be counter-productive. What is relevant is how the concept is concretely and dynamically deployed in specific contexts, and through which kind of process this happens.

²⁹ I do not discuss the issue how much has been achieved in the context of developed nations. Uncritical success stories are, I feel, unwarranted, even when there is a lot of interesting experience to learn from. Water control is not only contested in developing and transition countries. Jaspers (2003) (quoted in Bruin, Jaspers and Gupta, 2006) identifies the following five criteria (called 'triggers for change' in the paper) along which the level of IWRM can be assessed: 1) water management based on hydrological boundaries; 2) integration of quantity, quality and ecological issues for both surface and subsurface water; 3) stakeholder participation in decision-making; 4) cost recovery, and 5) subsidiarity. These criteria are perhaps debatable, but they do refer to important aspects of more 'integrated' forms of water management. Most countries would score low on at least 2, 3 and 5, and many also on the other two criteria.

(international) research and policy notions and discourse on one hand, and the realities of water management practices and projects on the ground on the other.³⁰ Water bureaucracies seem to be extremely resistant to change,³¹ and very good at maintaining their professional pre-occupation with the physical/technical dimension of water control, legitimated with reference to modernist views of development that focus on technological improvement enhancing economic growth. Associated with this are hierarchical and centralised expert populated organisational structures and styles (for evidence see the case studies in Mollinga and Bolding, 2004).

From this assessment I derive two main issues for water politics research that I want to discuss in more detail in this paper: 1) how does/can it happen that water bureaucracies make environmental and human development (poverty) concerns part of their 'core business', and 2) how does/can it happen that water bureaucracies adopt or get engaged in more participatory planning processes, in which different actors involved in issue networks can co-shape policy formulation and implementation?

4. Internalising New Concerns: Environment and Human Development

To understand the process of internalisation of concerns like ecology and human development (poverty particularly) into water bureaucracies' mandates, policies and professional orientation, it is instructive to look at cases where such internalisation has happened, and where the process has been documented from a socio-political perspective. Well documented cases are only available for the internalisation of ecological concerns. This is not so surprising, as environmental concerns have been the major trigger for water sector transformation in the West European, North American and Australian contexts, where the documented cases come from.³²

Case 1: Environment and flood protection in the Netherlands

³⁰ This observation follows from the difficulty of finding other than very modest examples of really existing IWRM, and my long term study of the Indian water policy and practice situation.

³¹ I say extremely, because my impression is that they may be more so than other technical state organisations, like agriculture or forestry, though I cannot substantiate this. The impression derives from the observation that the irrigation/energy/flood part of the water sector seems to be a late comer compared to agriculture and forestry bureaucracies as regards participatory approaches and poverty alleviation programmes. My hypothesis is that the explanation of this lies in the strongly disciplinary population of the organisations (mainly civil engineers and hydrologists), and the high status accorded to water engineering organisations and their staff in the second half of the 20th century as (literally) nation-builders. This, however, is an untested hypothesis. A factor suggested to me by Roel Slootweg (personal communication) is the absence of a strong private sector presence as opposed to for example the energy sector.

³² To my knowledge there is no systematic review of the internalisation of environmental/ecological issues by water bureaucracies. For reasons of space I only briefly discuss a Dutch and a USA case. For the processes around restoring environmental flows in the Murray-Darling basin in Australia, see for instance, www.mdbc.gov.au/nrm/water_issues/environmental_flows, and www.rivermurray.sa.gov.au/major/water_flow.html, and numerous other sites and publications. Other cases that would be interesting to explore are the impact of the Flood Action Plan (FAP) related debates and controversies in Bangladesh, which has brought ecology, fisheries and livelihoods concerns more into the mainstream of water resources policy and the professional orientation of the Bangladesh Water Development Board (BWDB; www.bwdb.gov.bd/). In the USA and Australia rights and livelihoods concerns of American Indians and Aboriginal peoples, respectively, have played an important role as well in rethinking approaches to water management.

In Dutch water management there has been an 'ecological turn' in water management in response to the 'environmentalist wave' of the 1970s (Disco, 2002). With environmental critiques of modernisation proliferating, the Dutch "had to face up to the fact that ecological damage was a precondition of survival and prosperity", with the one-third of the country that is below sea level being the location of the most important economic activities and the habitat of most of the population. A massive national flood protection plan (the Delta Works) had been started after a damaging flood in 1953; by the 1970s the ecological damage of closing of large parts of the unique brackish estuarine delta system had gained recognition in the polity. The issue played out around a large infrastructural intervention, the closing of the Oosterschelde, a deep and elongated maritime intrusion. The closure would reduce the length of coastline to be protected against severe storms and high floods enormously, and thus provided highly increased safety to the inhabitants of that part of the country. It would also destroy an ecosystem, and the shellfish industry that depended on it. The 'old' regime of water management exclusively emphasised 'safety'; the 'new' regime tried to find a balance between safety and other concerns, notably 'ecology'. A long-drawn political struggle ensued, technologically resolved by the design of a permeable storm surge barrier that can close off the 8 km wide opening of the Oosterschelde by lowering a series of gates in the case of dangerous flood levels, but normally lets through most of the tidal fluctuation, and thus preserves most of functions of the original ecosystem. First resisted heavily and considered technically impossible, the storm surge barrier is now the pride of Dutch hydraulic civil engineering. The dominance of the civil engineering profession in water resources development and planning reduced, at the cost of increased influence of ecologists and biologists. Institutionally, the decision-making involved a process of civil society agitation, government committees, and discussion in/by political parties in parliament. The event triggered a still ongoing process of reconsidering the basic premises of water management policy, and the expertise needed for it. In the 1990s two years with very strong inland flood threats, and some flooding, through extraordinarily high river discharges, provided another important trigger for such reconsideration. There is an ongoing, contested, process of ecological modernisation taking place.³³

Case 2: Environment, rationality and submergence in the United States of America

The USA was once the largest and leading dam builder in the world; it is now systematically decommissioning dams, and regenerating river regimes. Like the process in the Netherlands described above, this was, and is, a politically highly contested process, with the rethinking of the 'hydraulic mission' beginning in the 1970s with the environmental movement. How environmental concerns got internalised into the United States Bureau of Reclamation (USBR) is described by Espeland (1998). The case she discusses, playing out from about 1980, is the planned building of the Orme Dam, part of the Central Arizona Project to bring Colorado River water to Arizona's desert. The dam would submerge most of the Fort McDowell reservation of the Yavapai, an Indian community. The Yavapai, despite their poverty, rejected the financial offer of the agency to buy their land, for many reasons, including their belief that it was not their right to sell ancestral land. The aspect highlighted here of this sophisticated case study of modern water politics in an arid region, the nature of state power, and many other things³⁴, is

³³ Other sources on the Oosterschelde case and changes in the orientation of Dutch and European water management policy and practice are Lintsen (2002), Bijker (2002), Kuks (2005) and Bressers and Kuks (2005).

³⁴ Espeland describes the theoretical thrust of her case study as follows. "(...) in trying to analyze the complex set of conditions that produced this outcome [the decision not to build the dam, PPM], I came to reengage some old and

the internalisation of environmental concerns into the USBR through the process of conducting environmental impact studies, including a valuation of the different functions/ecosystems services of the river system, and the effects of the dam on that. Espeland describes how a 'New Guard' of professional environmental and social scientists, hired in response to external pressure on the agency and with the political wind of the Carter administration's pro-environment policies in the back, enters the USBR bureaucracy, managed to become a powerful force in that bureaucracy changed planning procedures for dam building, and brokered the Orme Dam controversy successfully, with the rational decision models that they developed as the main instrument. This valuation instrument became the main tool for negotiating the trade-offs in the dam building. The major problem in this exercise was that of commensuration: to express different values of different costs and benefits in a single vocabulary – that of price – to be able to compare alternative plans. Espeland discusses these problems in detail, showing that despite the attraction of such instruments and methods as seemingly objective, the tool involves a process of social construction of what constitutes a value, and which values get included and excluded. Despite this, the tool was instrumental in taking the decision – not to build the dam in this case – and also boosted the status of the 'New Guard' facilitating a reinvention of the agency into an more environment-sensitive and participatory direction. However, the Yavapai were of the opinion that they had won the case for the wrong reasons – their view of things had not found, and perhaps could not find, a place in this rational decision-making tool.

A number of things can be learnt from these experiences:

- 1) How non-replicable, that is situation-specific they are. Each has its own specific and unique trajectory.
- 2) However, what they do have in common is firstly, that the pressure for policy transformation was to a large extent based in broader changes in society in terms of consciousness of and support for environmental political agendas, and secondly, partly related to this, a weakening of the agricultural constituency as a political force was an important enabling factor. It might be argued that if this is the condition for transformation, then transformations in developing and transition countries are still a long way off.³⁵ I do not think that this is a fully correct inference. What the examples show in a more general sense, is that bureaucratic transformation depends on sufficient political clout/momentum in the society at large for sustained pressure. What the coalitions that exert such sustained pressure (should) look like is not necessarily the same across countries. Though agriculture is a very prominent concern in most developing countries, the relative balance of forces among sectors/constituencies is not unchanging. Globalisation and urbanisation processes may imply new political priorities in which agriculture's predominance declines. Each situation requires its own strategic analysis of the socio-political dynamics through which change processes are happening or could happen. What the cases suggest is that

formidable questions: the uneasy and sometimes volatile, relation between instrumental reason and substantive values; the conditions that propel commensuration – the transformation of qualities into quantities - and the difference that this makes for how we create and unmake boundaries, attach ourselves to categories, and negotiate identities; the consequences attendant on different modes of valuing; and the capacity of ordinary citizens to participate in decisions that affect their lives, especially when these are brokered by powerful bureaucracies. In the end I came to see this decision as a forum for analyzing competing concepts of rationality and how these shape our understanding of political participation. The debate about a dam site became, for me, a theoretical site to consider the politics of rationality in relation to democratic practice; a place to examine relations between our ideas for how to be rational, how to do politics, and what sort of people count as political actors." (Espeland, 1998:xi)

³⁵ Cf. the environmental Kuznets curve argument discussed in Shah et al. (2006).

broader socio-political processes are likely to have to provide the setting for water sector reform (rather than water sector reform being internally generated in and by the sector), and that qualitative change like the described does not happen easily and overnight. Furthermore, we may not want to accept the agriculture-environment and environment-poverty oppositions that inform much discourse on this matter. When the issue is primarily conceived as a trade-off, we miss out on options for productive and remunerative agricultural production that is ecologically sustainable and does generate employment.³⁶

- 3) In both cases new professional groups, with new environmental expertise, were inducted into the water bureaucracies. This provided an important consolidation of the 'new concern' in the business as usual of the water bureaucracy.³⁷
- 4) We also learn that a new approach addressing new concerns may provide new technical challenges to engineers. This seems to be how the incorporation of new concerns in the knowledge systems of the civil engineering and hydrology disciplines happens: by having to solve problems forced upon the discipline, rather than by a process of abstract 'increased awareness' and then self-redesign of technology.
- 5) Finally, the outcome of the processes is ambiguous. In the Dutch case the ecological concern was incorporated in an eco-modernist approach, and left several issues unaddressed. In the US-case the American Indians thought they had won the case for the wrong reasons. The changes are not revolutionary 'world-view' changes, but gradual processes of partial, but qualitative, transformation.

All five elements seem to have relevance in the context of developing and transition countries. The first two points imply a need for situation-specific strategic coalition- and alliance-building around certain issues to advocate policy and institutional transformation. Regarding irrigation reform in India, Bottrall in the early 1990s opined that there could possibly be a coalition for irrigation reform.

Those currently opposed to the status quo, or with good reasons to oppose it, include finance ministries (concerned about ID's [Irrigation Departments, PPM] never-ending demands on public funds); politicians and their constituents in regions disadvantaged by present patterns of water development (either through direct damage, as in waterlogged areas, or through long neglect, as in tank areas); environmental action groups; local issue-based groups (such as opponents of state water policies in Maharashtra); and non-agricultural water users, including urban domestic and industrial users, who suffer from the absence of efficient methods of inter-sectoral water allocation. (Bottrall, 1992: 244)

This alignment of interests has not happened so far, but the question to be answered remains the same: which, in Sabatier's (1988) terms, advocacy coalitions can further policy and

³⁶ This issue is as relevant for Western/European contexts as it is for that of developing countries. For a concept of sustainable development along these lines developed in Maharashtra, India, see Datye (1997), and Paranjape and Joy (1995).

³⁷ This is in line with arguments about the importance of 'strategic groups' in knowledge system management (Menkhoff and Evers, 2005).

institutional transformation? Also the fifth point is relevant in this context: the process is never completed.³⁸

The third and fourth points suggest that the habitus of technical professionals should be taken very seriously. At a practical level, reform of education and training programmes is a necessary long-term investment.³⁹ However, perhaps more important or effective may be the enrolment of technical professionals in the solution of the new technical challenges that an environment and poverty focus generates.

Despite this sketch of potential transformation options and avenues, the empirical observation has to be that most water bureaucracies have internalised the issues of environment and poverty only to a very limited extent, if not outright resisted it. The types of explanation for the resistance of water bureaucracies to societal demands to adopt new, 'integrated' or otherwise alternative approaches to water management, can be classified in three types.

- 1) The 'vested interests' explanation, strongly popularised in international policy circles by Repetto's 'skimming the water' perspective (Repetto, 1986).
- 2) Explanations focusing on the institutional characteristics of water bureaucracies, and their resultant 'inertia' and 'rigidity'. Such states may be due to the inheritance of colonial administrative structures (see for India for instance Kaviraj, 1997; on Uzbekistan for instance Yalcin and Mollinga, 2007).
- 3) What I tentatively call 'knowledge system' explanations, that is explanations that look beyond direct day-to-day concerns and practices of technocrats, but try to read the 'mental maps' of technocrats. Very little analysis of this exists for the water resources sector.

Where explanations one and two require changes in governance and management structures and styles of water organisations, the third addresses the professional identity of water bureaucrats most directly.

5. State-centred, Society-centred and Donor-centred Water Policy Processes

The second major 'sticking point' in water sector reform seems to be the unwillingness of water bureaucracies to share power with other interest groups, that is, adopt more inclusive policy formulation and implementation processes. Policy is used here as a generic term that includes all forms of state planning and public policy formulation and implementation for water resources management.

³⁸ This despite the suggestion strongly embedded in development assistance and government programmes alike, that (fixed duration) projects are the desirable instrument for solving such problems.

³⁹ Efforts to establish and support more 'integrated' water resources engineering education and training programmes include the Centro Agua project in Bolivia, the WATERnet project in Southern Africa, and the Crossing Boundaries project in South Asia, see: <http://www.centroagua.org/>, <http://www.waternetonline.ihe.nl/>, and http://www.saciwaters.org/crossing_boundaries.htm.

A short discussion of the Indian state of Andhra Pradesh's irrigation reform process can illustrate the power-sharing issue. The Andhra Pradesh Farmer Management of Irrigation Systems Act of 1997 is the largest scale effort at irrigation reform so far in India. The Act states that the Irrigation Department that used to have full jurisdiction over irrigation management will be transformed into a service providing agency, while for the management of the large-scale systems management bodies elected by and composed of irrigators (or more precisely, users of irrigated land) will be formed. At the local level these would be Water Users Associations, at the secondary canal level these would be Distributary Committees, and each system would have a Project Committee. The first two bodies were established through state-wide elections in 1997. The third, project level committee has not been established till 2005. The explanation for this is resistance to the idea on both the Irrigation Department side and on the side of politicians (parliamentarians). The main issues that Project Committees would deal with would be allocation of water at system level, and the allocation of the funds for executing larger physical works in the system. It would be a governing body setting the rules of the game for water distribution and physical maintenance of the system. If established with such authority, the Project Committees would become very powerful bodies at a regional scale (the large-scale systems usually spread across several districts). There would be serious competition in terms of resource brokerage with parliamentarians in their constituencies, and the domain of authority of the Irrigation Department would be seriously curtailed. This, so far, has been a bridge too far for the irrigation reform to allow irrigators/farmers this level of control/governance power, despite strong political support for the process from the Chief Minister of the state in the first phase of the process. A recent development is that the Act has been amended in such a way that the envisaged shift to a governance and management system with strong irrigator participation has become more unlikely. In Grindle's terminology, irrigation policy, governance and management in the Andhra Pradesh case is highly state-centred, and efforts at making it more society-centred will meet with resistance from the state itself, both its administrative and political sections. (See Nikku, 2006 for an analysis of the Andhra Pradesh irrigation reform process.)

Grindle (1999) discusses two major approaches to the analysis of policy processes, as summarised in Table 1.

Table 1: Rational choice and comparative sociological approaches to the analysis of policy processes

	Approaches based on economic frameworks (rational choice theory)	Comparative sociological approaches (comparative institutionalism)
Why and how are politicians interested in shaping policy change?	<ul style="list-style-type: none"> - Rational choice explanations of politicians behaviour in a 'political market' with votes as the currency and access to public resources as benefits - Capture of politicians by interest groups and rent seeking - 'Context' is a strategic decision making arena 	<ul style="list-style-type: none"> - Strong emphasis on institutions and collectivities, rather than individual choice ('statecraft' as theme) - Larger role of contingency - Conflict over policy is the 'normal stuff' of politics; emphasis on social interaction in economic, social and policy arenas in relation to social power - 'Context' is a complex environment with history, shaping perspectives, references and values
How do political institutions affect the choices made by politicians?	<ul style="list-style-type: none"> - Institutions are strategic arenas for individual choice 	<ul style="list-style-type: none"> - Institutions have histories, which shapes preferences, orientations, values, and strategies of collective actors
How are new institutions created or transformed?	<ul style="list-style-type: none"> - Intrigued by the creation of new institutions that constrain the power of politicians - The behaviour of reformist politicians: how long-term interest and short-term interest relate - Transaction costs in political life to explain change - Principal-agent problems; role of institutional designers 	<ul style="list-style-type: none"> - Criticise apolitical explanations of institutional change; new institutions are the result of historically embedded conflicts about the distribution of power and benefits in society
What are the consequences of new rules of the game for economic and political interaction?	<ul style="list-style-type: none"> - Consequences generate new strategies for achieving first order preferences, towards a new equilibrium 	<ul style="list-style-type: none"> - More dynamic approach: institutional change creates new sources of conflict, new claims for resources, new spaces for contestation

Source: based on Grindle (1999:3-11).

Grindle also observes that adherents of the two schools “have been outspokenly harsh about the other”:

“Those who favor the elegance and parsimony of economic models of political behavior accuse comparative institutionalists of avoiding rigorous theory and scientific methodology and of producing primarily descriptive studies. Those who work from within the sociological tradition retort that economic models produce political banalities and historically inaccurate analyses that ignore empirical evidence.” (1999: 11)

Grindle is of the view that both schools are deficient in important ways. The ‘political economy of public policy’ perspective has been developed particularly, though not exclusively, with reference to European and North American policy processes. It carries several biases as a result, one being strong assumptions about societal groups actively contesting government policy and thus being involved in policy formulation. Grindle shows that developing countries may be characterised by state-centred policy processes, while these analytical approaches are society-centred. In developing and transitional countries policy may be generated primarily in elite (government) circles. Also the institutional setting of developing and transitional countries may be very unstable, and institutional and policy evolution a different process as a result. Another strong assumption is the sovereignty of the voter in electoral processes, which may not apply elsewhere. Such differences suggest a general point in terms of analytical approach: that the study of the process of policy needs to be contextualised historically and geographically.⁴⁰ She concludes her review and assessment with a call for more ‘grounded’ research on actual processes of institutional transformation while “seeking to stretch theoretical models” (1999:21).

Formulated in this terminology, a major challenge facing the water sector is to transform the highly state-centred policy processes that exist in many countries into more society-centred processes. It could also be observed that the global IWRM-focused water policy discourse is highly normative in its emphasis on establishing society-centred governance and management structures.⁴¹ If Grindle’s analysis of the bias in existing frameworks of policy analysis is correct, and I think it is, then we don’t have much conceptual grasp on existing state-centred water policy processes, and the normative proclamations of the global water resources discourse become somewhat vacuous as a result.⁴²

I propose that to the two categories, or ideal types, of state-centred and society centred policy processes a third category needs to be added which could be tentatively called ‘donor-centred’ policy processes. The notions of both state and society centrism implicitly assume the existence of sovereign states within which these processes occur. As Jenkins (2002) discusses, the sovereignty of developing countries has been undermined or otherwise become weak or eroded in two senses. Firstly, since the introduction of structural adjustment policies in the 1980s, there has been increasing influence of development funding agencies on not just the

⁴⁰ Grindle also identifies three factors that are, in her view, under-explained: leadership, the role of ideas, and successful policies. She makes no reference to the literature on policy discourses and policy narratives, which in my view have a lot to say on the power of ideas in policy processes. She does make the observation that “ideas may be important means through which international actors become players in domestic policy debates.” (1999:17). This seems to be very applicable to the water resources domain, and is perhaps what the global politics of water is largely about.

⁴¹ And in Jenkins’ terms, employs highly ‘sanitised’ understandings of civil society, that are idealistic and unrealistic (2001).

⁴² This argument also implies that, for instance, the European and USA literature on changing water policy regimes in these relatively society-centred regions may not be of extremely great value for analysing the relatively state-centred situations in many developing and transition countries, and neither for the category of ‘donor-centred’ policy processes proposed below. Our analysis of the institutional transformation in the Uzbekistan context seems to confirm this (Yalcin and Mollinga, 2006). Society-centred policy processes seem to be the exception rather than the rule.

content of policies but the policy making and implementation structure as a whole ('good governance reforms'). Secondly, the actual capacity to govern that is part of the concept of sovereignty may or may not exist for a variety of reasons (cf. the debate on 'failed states'). No country is without external influence on its policies and policy institutions, but the degree and impact of that influence varies strongly. When external influence on policy making becomes dominant as compared to the domestic generation of policy dynamics, one could perhaps speak of a 'donor-centred' policy process.

Small countries with small economies are, logically, more vulnerable to 'donor centrism'. One indicator that might provide a signpost to donor-centred policy regimes is the percentage of the government (development) budget that is financed from loans and grants of international development funding agencies. In South Asia, Bangladesh's, Nepal's and Sri Lanka's water policy formulation and prioritisation have in periods been very strongly donor-influenced (though this has not necessarily translated into donor influence on policy implementation), but the much smaller country of Bhutan has avoided such influence. India is too large an economy and country to be very prone to donor centrism, as became clear in the unrolling of the controversy around the Sardar Sardovar project, where many observers opine that if the World Bank had not withdrawn its funding for the project itself, they would probably have been invited to do that by the Indian government. Pakistan is a case of strong donor influence, but its geo-political significance implies that it can relatively easily get away with poor or non-implementation of conditionalities for development loans (see VanderVelde and Tirmizi, 2004). Concrete analysis of such water resources policy regimes would undoubtedly produce a more refined categorisation than that of society, state and donor centred regimes.⁴³ This discussion amounts to a call for the undertaking of such comparative institutional and policy regime analysis, with an open mind as regards the conceptual frameworks that might be most useful in such an endeavour.

6. Summary and Conclusion

This paper has emphasised the importance of squarely addressing the political dimension of water resources use, management and governance (water control). The development of technical infrastructure for surface irrigation, flood control and hydropower generation is the 'core business' of (government) water agencies in many countries, and definitive of the professional identity of the civil engineers and hydrologists that staff these organisations – the social carriers of the 'hydraulic mission' (Allan, 2006). Calling these organisations hydrocracies (Rap et al., 2004) expresses their dominant role in water policy making and implementation in those countries where water control is a strategic dimension of development. Addressing the political dimensions of water resources management self-consciously and analytically is a relatively recent phenomenon, at least in the 'dominant discourse' (Allan, 2006). It has partly come in 'through the backdoor' as a consequence of the emphasis on 'governance' in the global development policy debates. Whatever the currents and fashions in global water resources discourse are, the relevance of the issue of water politics follows from the concrete contestations over and around water resources in many places around the world. On that front it can be safely stated that water in many cases, though not necessarily, is a highly contested resource, and that in all likelihood conflicts and disputes over water will increase in the coming decades. The objective base for emphasising attention to the political dimension of water

⁴³ For instance, India provides an interesting case in that it exhibits the paradoxical situation of strongly state-centred policy processes in the water resources sector, set in an overall very vibrant and long-standing democratic regime, with a very active civil society (see Mollinga (2004) for discussion of the paradox, and a first attempt to explain it; also see the Indian case studies in Mollinga et al., 2006).

resources management thus lies in the day-to-day reality of its use, and the effects and impacts of that.

The framework presented divides the politics of water into four domains of interaction: the everyday politics of water, the politics of national water policy, hydropolitics and global water politics. These are different domains in the sense that different configurations of actors populate them and interact around different subject matters and issues. However, these domains are only semi-autonomous fields, and some of the most important questions regarding water resources management span across and through them.

After this formal conceptualising of the field of water politics, the second step in elaborating it as a research field is to identify the issues and problems, and their issue networks and problemsheds. This can be done in many different ways, depending on the purpose of the study and the characteristics of the setting in which it will take place.

The present paper identifies two major issues to be the 'sticking points' in the unrolling of water sector reform processes in situations where powerful hydrocracies dominate the water resources terrain. It is observed that in most of the larger irrigation, flood control and hydropower countries, there is a deadlock in water sector reform. The two sticking points identified are the following.

- 1) The internalisation of the 'new' environmental, poverty and democratic governance related concerns into the professional identities, approaches, and institutional frameworks of water resources professionals and their organisations seems to happen rarely and with great difficulty. Existing identities and approaches, characterised by a focus on increasing production, supply enhancement, 'harnessing' of water resources, and with a social engineering (Merrey et al., 2006) approach to policy implementation, are tenaciously defended against societal pressures to rethink and change the paradigm.
- 2) The 'unlocking' of the process of institutional and organisational transformation of hydrocracies, in order to establish more balanced and productive relationships between water managers and water users is the second sticking point. This is about changing the social relations of power between the different actors involved in water resources management, with or without the internalisation of the concerns mentioned under point 1). These power relations are always implicit in reform, if not explicitly contested, but rarely self-consciously addressed and analysed as part of a 'strategic action' perspective on institutional transformation. Despite emphasis on issues like governance and accountability in the water policy discourse, most reform initiatives remain set in conventional 'policy as prescription' (Mackintosh, 1992) frameworks, often with a 'single solution' approach, be this Water Users Associations, water markets, public-private partnerships or river basin organisations (Merrey et al., 2006).

The main observations on the first theme of internalisation of 'new' concerns are the following.

- 1) Internalisation processes are highly situation specific (they have a history, and are therefore particular and path-dependent), and they are non-linear. They involve a lot of strategic action with inherently uncertain outcomes.
- 2) The internalisation processes that have taken place and have been documented, seem to have been primarily driven by broader socio-political processes and

forces, rather than having emerged from internal dynamics and learning within the sector.

- 3) New professional groups being the carriers of 'new' concerns and approaches are playing an important role in internalisation processes.
- 4) 'New' concerns, notably environmental ones, provide technical challenges for water professionals, which may be instrumental in inducing internalisation and transformation processes.
- 5) Outcomes of internalisation and transformation processes tend to be ambiguous. The route towards a 'paradigm shift' is not likely to be a revolutionary 'big bang' one, but more likely to be a gradual, step-by-step, backwards and forwards, process.

The main point raised regarding the second 'sticking point' is the appropriateness of the analytical frameworks for policy process analysis, largely developed as 'society-centred' approaches suited for democratic regimes with some level of organised and regularised public contestation and shaping of public policy. In many developing countries, but not only there, and more significantly for this paper, in many national water sectors, policy making and implementation processes are highly 'state-centred'. To understand the policy dynamics in such settings different policy analysis frameworks are needed. A third category of situations or policy regimes are those where international development (financing) agencies have a strong role in national water policy making, to the point that national sovereignty is put into question. For such cases one would need a 'donor-centred' framework of analysis. This is admittedly a very crude typology of policy regimes, and mainly meant to 'open up' the debate on appropriate approaches, and a call for comparative research on water policy regimes and transformation processes.

It is evident throughout the paper that the author's driving concern for unpacking the politics of water is the desire to contribute to a paradigm shift in water resources management. Such a shift would involve a transformation of the policy regime dominated by technocratic, social engineering disposed hydrocracies implementing their 'hydraulic missions', towards an inclusive, polycentric system of water governance and management having a focus on sustainable human development addressing the complex mix of economic growth, welfare, equity, sustainability and democracy concerns. In terms of the typology of policy regimes – how does one move from state- and donor-centred into the direction of society-centred situations? This is a strongly normative and political driver to which I gladly plead guilty. The emphasis on 'politics' is not only the addition of another extra dimension to the list of already recognised dimensions of water resources management, nor does it only have implications for the diversity of policy analysis frameworks that need to be deployed. It is a standpoint that critiques the dominant social engineering approaches to institutional transformation, and which states that unless a self-consciously political strategic action approach to institutional transformation is taken, the deadlock in water sector reform may continue for some time.

Abbreviations

BWDB	Bangladesh Water Development Board
FAP	Flood Action Plan
GWP	Global Water Partnership
IWRM	Integrated Water Resources Management
USA	United States of America
USBR	United States Bureau of Reclamation
WB	World Bank
WUA	Water Users Association
WWC	World Water Council
ZEF	Zentrum für Entwicklungsforschung

References

- Allan, J.A. (2006): 'IWRM: the new sanctioned discourse?' In: Peter P. Mollinga, Ajaya Dixit and Kusum Athukorala (eds.) *IWRM in South Asia: Global Theory, Emerging Practice and Local Needs*. Water in South Asia Series 1. Sage, New Delhi, pp.38-63.
- Archer, Margaret (1995): *Realist Social Theory: The Morphogenetic Approach* Cambridge University Press, Cambridge.
- Bijker, Wiebe E. (2002): 'The Oosterschelde Storm Surge Barrier. A Test Case for Dutch Water Technology, Management, and Politics'. *Technology and Culture* Vol.43, July, pp.569-584.
- Bolding, A., P.P. Mollinga and K. van Straaten (1995): *Modules for Modernisation: Colonial Irrigation in India and the Technological Dimension of Agrarian Change*, *Journal of Development Studies*, Vol. 31, No. 6, pp. 805-844.
- Bottrall, Anthony (1992): "Fits and misfits over time and space: technologies and institutions of water development for South Asian agriculture". *Contemporary South Asia*, Vol. 1, No. 2, pp. 227-247.
- Bressers, Hans Th.A. and Stefan M.M. Kuks (2005). *Integrated Regimes on Sustainable Use of Natural Resources: A Multiple Case Study Analysis*. Paper for the Conference on "Sustainable Water Management: Comparing Perspectives from Australia, Europe and the United States", National Europe Centre, The Australian National University, Canberra, Australia, 15-16 September 2005.
- Bruin, Erwin F.L.M. de , Frank G.W. Jaspers and Joyeeta Gupta (2006): 'The EU Water Framework Directive: Challenges for institutional implementation'. In: J. Vermaat, L. Bouwer, K. Turner and W. Salomons (eds.) *Managing European Coasts. Past, Present and Future*. Springer, Berlin, pp. 153-171.
- Datye, K.R. (1997) (assisted by Suhas Paranjape and K.J. Joy): *Banking on biomass. A new strategy for sustainable prosperity based on renewable energy and dispersed industrialisation*. Environment and Development Series. Centre for Environment Education, Ahmedabad.
- Dhawan, B.D. (1988): *Irrigation in India's Agricultural Development, Productivity, Stability, Equity*, Sage, New Delhi.
- Disco, Cornelis (2002): 'Remaking "Nature": The Ecological Turn in Dutch Water Management'. *Science, Technology and Human Values*. Vol.27, No.2, pp.206-235.
- Espeland, W.N. (1998): *The Struggle or Water, Politics, Rationality, and Identity in the American Southwest*, University of Chicago Press, Chicago.
- Falk Moore, Sally (1973): 'Law and Social Change: The Semi-Autonomous Social Field as an Appropriate Subject of Study' *Law & Society Review*, Vol. 7, No. 4, pp. 719-746.
- Faures, Jean-Marc, Mark Svendsen and Hugh Turrall 'Reinventing Irrigation', Chapter 9 of David Molden (ed.) *Water for Food, Water for Life*. Earthscan, 2007 (in press).

Ferguson, James (1994): *The Anti-Politics Machine. "Development", Depoliticization, and Bureaucratic Power in Lesotho.* University of Minnesota Press, Minneapolis and London.

GOAP (Government of Andhra Pradesh) (1982): Report of the commission for irrigation utilisation. Volume I. Volume II. Hyderabad.

GOI/MOIP (Government of India/Ministry of Irrigation and Power) (1972): Report of the Irrigation Commission. Volume I. New Delhi.

GOI/PC/PEO (Government of India/Planning Commission/Programme Evaluation Organisation) (1965): Evaluation of major irrigation projects - some case studies.

Grindle, Merilee S. (1977): *Bureaucrats, politicians and peasants in Mexico. A case study in public policy.* University of California Press, Berkeley.

Grindle, Merilee S. (1999): *In Quest of the Political: The Political Economy of Development Policy Making.* CID Working Paper No. 17. Center for International Development at Harvard University.

GWP (Global Water Partnership) (2000): *Integrated water resources management.* GWP Technical Committee Background Paper 4. Stockholm: GWP.

Harriss, John (2001): *Depoliticizing Development : The World Bank and Social Capital.* New Delhi, Leftword.

Hill, Michael (1997): *The Policy Process. A Reader.* (second edition) Pearson Prentice Hall, London.

Hoebink, Paul (2006): 'European Donors and 'Good Governance': Conditions or Goal?' *European Journal of Development Research* 18 (1): 131-161.

Jaspers, F. G. W. (2003): 'Institutional arrangements for integrated river basin management.' *Water Policy*, 5, pp.77-90.

Jenkins, Rob (2001): 'Mistaking "Governance" for "Politics": Foreign Aid, Democracy and the Construction of Civil Society' In: Sudipta Kaviraj and Sunil Khilnani (eds.), *Civil Society: History and Possibilities.* Cambridge: Cambridge University Press, pp. 250-268.

Jenkins, Rob (2002): 'The Emergence of the Governance Agenda: Sovereignty, Neo-Liberal Bias and the Politics of International Development' In: Vandana Desai and Robert Potter (eds), *The Companion to Development Studies* New York: Oxford University Press, pp. 485-488.

Kaviraj, Sudipta (1997): 'The modern state in India'. In: Martin Doornbos and Sudipta Kaviraj (eds.) *Dynamis of State Formation. India and Europe Compared.* Indo-Dutch Studies on Development Alternatives 19. Sage, New Delhi, pp. 225-250.

Kerkvliet, Benedict J. Tria (1990): *Everyday politics in the Philippines. Class and status relations in a Central Luzon village.* University of California Press, Berkeley.

Kitching, Gavin (1988): *Karl Marx and the Philosophy of Praxis.* Routledge, London.

Kloezen, Wim H. (2002): Accounting for water. Institutional viability and impacts of market-oriented irrigation interventions in Central Mexico. Wageningen University (Ph.D. thesis).

Kuks, Stefan M.M. (2005): The Evolution of National Water Regimes in Europe. Transitions in Water Rights and Water Policies. Paper for the Conference on "Sustainable Water Management: Comparing Perspectives from Australia, Europe and the United States" 15-16 September 2005 at The National Museum of Australia, Canberra, Australia. Hosted by the National Europe Centre at The Australian National University, Canberra, Australia.

Lasswell, Harold D. (1936): *Politics: Who Gets What, When, How* McGraw-Hill, New York.

Leftwich, Adrian (ed.) (1984): *What is Politics? The Activity and its Study*. Basil Blackwell, Oxford.

Lintsen, Harry (2002): 'Two Centuries of Central water Management in the Netherlands.' *Technology and Culture*. Vol.43, No.3, pp. 549-568.

Long, Norman & J.D. van der Ploeg (1989): 'Demythologizing Planned Intervention: An Actor Perspective'. *Sociologia Ruralis* 29 (3/4): pp. 226-249.

Löwy, Ilana (1992): 'The Strength of Loose Concepts – Boundary Concepts, Federative Experimental Strategies and Disciplinary Growth: The Case of Immunology.' *History of Science* 30, 4, 90: 371 –396.

Lukes, Steven (2005): *Power: A Radical View*, Second Edition. Palgrave Macmillan.

Mackintosh, Maureen (1992): 'Introduction', In: Marc Wuyts, Maureen Mackintosh and Tom Hewitt (eds.) *Development Policy and Public Action*. Oxford University Press, Oxford in association with the Open University, Milton Keynes, pp. 1-9.

Massey, Doreen (1999): *Philosophy and Politics of Spatiality: Some Considerations*. In: *Power-Geometries and the Politics of Space-Time*. Heidelberg: Department of Geography, University of Heidelberg, pp. 27-42.

Menkhoff, Thomas and Hans-Dieter Evers (2005): *Strategic Groups in a Knowledge Society: Knowledge Elites as Drivers of Biotechnology Development in Singapore*. ZEF Department of Political and Cultural Change Working Paper Series 7.

Merrey, Douglas, Ruth Meinzen-Dick, P.P. Mollinga and Eiman Karar (2006): 'Policy and Institutional Reform Processes for Sustainable Agricultural Water Management: The Art of the Possible' Chapter 5 In: *Water for Food, Water for Life. The Comprehensive Assessment of Water Management in Agriculture Synthesis Report* (in press).

Mollinga, P.P. (2003): *On the waterfront. Water distribution, technology and agrarian change on a South Indian canal irrigation system*. Wageningen University Water Resources Series. Hyderabad, India: Orient Longman (orig. 1998).

Mollinga, P.P. and Alex Bolding (eds.) (2004): *The politics of irrigation reform. Contested policy formulation and implementation in Asia, Africa and Latin America*. Global Environmental Governance series. Ashgate.

Mollinga, P.P., Ajaya Dixit and Kusum Athukorala (eds.) (2006): *Integrated Water Resources Management. Global Theory, Emerging Practice and Local Needs. Water in South Asia series 1.* Sage, New Delhi.

Mooij, Jos and Veronica de Vos (2003): *Policy Processes: An Annotated Bibliography on Policy Processes, with Particular Emphasis on India.* Working Paper 221. Overseas Development Institute, London.

Nadkarni, M.V. (1984): 'Irrigation and Rural Development – A Sceptical View', *Economic and Political Weekly, Review of Agriculture*, Vol. 19, No.26, pp. A67 - A73.

Nikku, Bala Raju (2006): *The Politics of Policy. Participatory Irrigation Management in Andhra Pradesh.* Wageningen University (Ph.D. thesis).

Ohlsson, L. (1995): *Hydropolitics: conflicts over water as a development constraint.* Zed Books, London.

Ostrom, Elinor (1990): *Governing the commons. The evolution of institutions for collective action.* Cambridge University Press, New York.

Pahl-Wostl, Claudia (2002): 'Towards Sustainability in the Water Sector – The Importance of Human Actors and Processes of Social Learning'. *Aquatic Sciences* 64: 394-411.

Paranjape, Suhas and K.J. Joy (1995): *Sustainable technology. Making the Sardar Sarovar project viable. A comprehensive proposal to modify the project for greater equity and ecological sustainability.* Environment and Development Series. Centre for Environment Education, Ahmedabad.

Rap, Edwin (2004): *The Success of a Policy Model. Irrigation Management Transfer in Mexico.* Wageningen University (Ph.D. thesis).

Repetto, R. (1986): *Skimming the Water: Rent Seeking and the Performance of Public Irrigation Systems.* World Resources Institute, Washington DC, United States.

Rogers, P. and Alan. W. Hall (2003): *Effective Water Governance.* TEC Background Papers No. 7. GWP, Stockholm (<http://www.gwpforum.org/servlet/PSP?iNodeID=215&itemID=197>).

Rosegrant, M. W. and M. Svendsen (1993): 'Asian food production in the 1990s: irrigation investment and management policy.' *Food Policy*. 18: 1, pp. 13-32.

Sabatier, Paul A. (1988): 'An Advocacy Coalition Framework of Policy Change and the Role of Policy-Oriented Learning Therein'. *Policy Sciences*, Vol.21, No.2-3, pp. 129-168.

Scoones, Ian and John Thompson (eds.) (1994): *Beyond Farmer First.* IT Publications, London.

Scott, James C. (1997): *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed.* Yale University Press.

Sengupta, Nirmal (1985): "Irrigation: traditional vs. modern". *Economic and Political Weekly*, Vol. 20, No. 45, 46 & 47, pp. 1919-38.

Shah, Tushaar, Ian Makin and R. Sakthivadivel (2006): 'Limits to Leapfrogging: Issues in Transposing Successful River Basin Management Institutions in the Developing World'. In: P.P. Mollinga, Ajaya Dixit and Kusum Athukorala (eds.), *IWRM in South Asia: Global Theory, Emerging Practice and Local Needs*. Water in South Asia Series 1. Sage, New Delhi, pp. 109-144.

Star, S.L. & J.R. Griesemer (1989): 'Institutional Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39' *Social Studies of Science*, 19: 387-420.

Turton, Anthony and Ronald Henwood (eds.) (2002): *Hydropolitics in the Developing World. A Southern African Perspective*. AWIRA, University of Pretoria; URL: www.internationalwaterlaw.org/Articles/hydropolitics_book.pdf.

VanderVelde, Edwin and Jamshed Tirmizi (2004): 'Irrigation Policy Reforms in Pakistan: Who's Getting the Process Right?' In: Peter P. Mollinga and Alex Bolding (eds.) *The Politics of Irrigation Reform. Contested Policy Formulation and Implementation in Asia, Africa and Latin America*. Global Environmental Governance series. Ashgate, Aldershot. Pp. 207-239.

Viessman, W. (1998): 'Water policies for the future: an introduction' *Water Resources Update*. Universities Council on Water Resources. Issue No. 111, pp. 4-7.

Wade, R. (1982): 'The System of Administrative and Political Corruption: Canal Irrigation in South India', *Journal of Development Studies*, Vol. 18, No. 3, pp. 287-328.

Wade, R. and R. Chambers (1980): 'Managing the Main System: Canal Irrigation's Blind Spot', *Economic and Political Weekly*, Vol. 15, No. 39, pp. A107-112.

Waterbury, J. (1979): *Hydropolitics of the Nile valley*. Syracuse University Press, New York.

Yalcin, Resul and Peter P. Mollinga (2007): *Institutional Transformation in Uzbekistan's Agricultural and Water Resources Administration: The creation of a new bureaucracy*. ZEF Working Paper (in press).

Zeitoun, Mark and Jeroen Warner (2006): 'Hydro-hegemony – a framework for analysis of trans-boundary water conflicts'. *Water Policy* Vol 8 No 5 pp. 435–460.

- 1 Evers, Hans-Dieter and Solvay Gerke (2005). Closing the Digital Divide: Southeast Asia's Path Towards a Knowledge Society.
- 2 Bhuiyan, Shajahan and Hans-Dieter Evers (2005). Social Capital and Sustainable Development: Theories and Concepts.
- 3 Schetter, Conrad (2005). Ethnicity and the Political Reconstruction of Afghanistan.
- 4 Kassahun, Samson (2005). Social Capital and Community Efficacy. In Poor Localities of Addis Ababa Ethiopia.
- 5 Fuest, Veronika (2005). Policies, Practices and Outcomes of Demand-oriented Community Water Supply in Ghana: The National Community Water and Sanitation Programme 1994 – 2004.
- 6 Menkhoff, Thomas and Hans-Dieter Evers (2005). Strategic Groups in a Knowledge Society: Knowledge Elites as Drivers of Biotechnology Development in Singapore.
- 7 Mollinga, Peter P. (2005). The Water Resources Policy Process in India: Centralisation, Polarisation and New Demands on Governance.
- 8 Evers, Hans-Dieter (2005). Wissen ist Macht: Experten als Strategische Gruppe.
- 8a Evers, Hans-Dieter and Solvay Gerke (2005). Knowledge is Power: Experts as Strategic Group.
- 9 Fuest, Veronika (2005). Partnerschaft, Patronage oder Paternalismus? Eine empirische Analyse der Praxis universitärer Forschungskoooperation mit Entwicklungsländern.
- 10 Laube, Wolfram (2005). Promise and Perils of Water Reform: Perspectives from Northern Ghana.
- 11 Mollinga, Peter P. (2004). Sleeping with the Enemy: Dichotomies and Polarisation in Indian Policy Debates on the Environmental and Social Effects of Irrigation.
- 12 Wall, Caleb (2006). Knowledge for Development: Local and External Knowledge in Development Research.
- 13 Laube, Wolfram and Eva Youkhana (2006). Cultural, Socio-Economic and Political Constraints for Virtual Water Trade: Perspectives from the Volta Basin, West Africa.
- 14 Hornidge, Anna-Katharina (2006). Singapore: The Knowledge-Hub in the Straits of Malacca.
- 15 Evers, Hans-Dieter and Caleb Wall (2006). Knowledge Loss: Managing Local Knowledge in Rural Uzbekistan.
- 16 Youkhana, Eva, Lautze, J. and B. Barry (2006). Changing Interfaces in Volta Basin Water Management: Customary, National and Transboundary.
- 17 Evers, Hans-Dieter and Solvay Gerke (2006). The Strategic Importance of the Straits of Malacca for World Trade and Regional Development.
- 18 Hornidge, Anna-Katharina (2006). Defining Knowledge in Germany and Singapore: Do the Country-Specific Definitions of Knowledge Converge?
- 19 Mollinga, Peter M. (2007). Water Policy – Water Politics: Social Engineering and Strategic Action in Water Sector Reform.
- 20 Evers, Hans-Dieter and Anna-Katharina Hornidge (2007). Knowledge Hubs Along the Straits of Malacca.
- 21 Sultana, Nayeem (2007). Trans-National Identities, Modes of Networking and Integration in a Multi-Cultural Society. A Study of Migrant Bangladeshis in Peninsular Malaysia.
- 22 Yalcin, Resul and Peter M. Mollinga (2007). Institutional Transformation in Uzbekistan's Agricultural and Water Resources Administration: The Creation of a New Bureaucracy.
- 23 Menkhoff, T., Loh, P. H. M., Chua, S. B., Evers, H.-D. and Chay Yue Wah (2007). Riau Vegetables for Singapore Consumers: A Collaborative Knowledge-Transfer Project Across the Straits of Malacca.
- 24 Evers, Hans-Dieter and Solvay Gerke (2007). Social and Cultural Dimensions of Market Expansion.
- 25 Obeng, G. Y., Evers, H.-D., Akuffo, F. O., Braimah, I. and A. Brew-Hammond (2007). Solar PV Rural Electrification and Energy-Poverty Assessment in Ghana: A Principal Component Analysis.
- 26 Eguavoen, Irit; E. Youkhana (2008). Small Towns Face Big Challenge. The Management of Piped Systems after the Water Sector Reform in Ghana.
- 27 Evers, Hans-Dieter (2008). Knowledge Hubs and Knowledge Clusters: Designing a Knowledge Architecture for Development
- 28 Ampomah, Ben Y., Adjei, B. and E. Youkhana (2008). The Transboundary Water Resources Management Regime of the Volta Basin.
- 29 Saravanan.V.S.; McDonald, Geoffrey T. and Peter P. Mollinga (2008). Critical Review of Integrated Water Resources Management: Moving Beyond Polarised Discourse.
- 30 Laube, Wolfram; Awo, Martha and Benjamin Schraven (2008). Erratic Rains and Erratic Markets: Environmental change, economic globalisation and the expansion of shallow groundwater irrigation in West Africa.
- 31 Mollinga, Peter P. (2008). For a Political Sociology of Water Resources Management.
- 32 Hauck, Jennifer; Youkhana, Eva (2008). Histories of water and fisheries management in Northern Ghana.
- 33 Mollinga, Peter P. (2008). The Rational Organisation of Dissent. Boundary concepts, boundary objects and boundary settings in the interdisciplinary study of natural resources management.
- 34 Evers, Hans-Dieter; Gerke, Solvay (2009). Strategic Group Analysis.
- 35 Evers, Hans-Dieter; Benedikter, Simon (2009). Strategic Group Formation in the Mekong Delta - The Development of a Modern Hydraulic Society.
- 36 Obeng, George Yaw; Evers, Hans-Dieter (2009). Solar PV Rural Electrification and Energy-Poverty: A Review and Conceptual Framework With Reference to Ghana.
- 37 Scholtes, Fabian (2009). Analysing and explaining power in a capability perspective.
- 38 Eguavoen, Irit (2009). The Acquisition of Water Storage Facilities in the Abay River Basin, Ethiopia.
- 39 Hornidge, Anna-Katharina; Mehmood Ul Hassan; Mollinga, Peter P. (2009). 'Follow the Innovation' – A joint experimentation and learning approach to transdisciplinary innovation research.
- 40 Scholtes, Fabian (2009). How does moral knowledge matter in development practice, and how can it be researched?
- 41 Laube, Wolfram (2009). Creative Bureaucracy: Balancing power in irrigation administration in northern Ghana.
- 42 Laube, Wolfram (2009). Changing the Course of History? Implementing water reforms in Ghana and South Africa.

- 43 Scholtes, Fabian (2009). Status quo and prospects of smallholders in the Brazilian sugarcane and ethanol sector: Lessons for development and poverty reduction.
- 44 Evers, Hans-Dieter, Genschick, Sven, Schraven, Benjamin (2009). Constructing Epistemic Landscapes: Methods of GIS-Based Mapping.
- 45 Saravanan V.S. (2009). Integration of Policies in Framing Water Management Problem: Analysing Policy Processes using a Bayesian Network.
- 46 Saravanan V.S. (2009). Dancing to the Tune of Democracy: Agents Negotiating Power to Decentralise Water Management.
- 47 Huu, Pham Cong, Rhlers, Eckart, Saravanan, V. Subramanian (2009). Dyke System Planing: Theory and Practice in Can Tho City, Vietnam.
- 48 Evers, Hans-Dieter, Bauer, Tatjana (2009). Emerging Epistemic Landscapes: Knowledge Clusters in Ho Chi Minh City and the Mekong Delta.
- 49 Reis, Nadine; Mollinga, Peter P. (2009). Microcredit for Rural Water Supply and Sanitation in the Mekong Delta. Policy implementation between the needs for clean water and 'beautiful latrines'.
- 50 Gerke, Solvay; Ehlert, Judith (2009). Local Knowledge as Strategic Resource: Fishery in the Seasonal Floodplains of the Mekong Delta, Vietnam
- 51 Schraven, Benjamin; Eguavoen, Irit; Manske, Günther (2009). Doctoral degrees for capacity development: Results from a survey among African BiGS-DR alumni.
- 52 Nguyen, Loan (2010). Legal Framework of the Water Sector in Vietnam.
- 53 Nguyen, Loan (2010). Problems of Law Enforcement in Vietnam. The Case of Wastewater Management in Can Tho City.
- 54 Oberkircher, Lisa et al. (2010). Rethinking Water Management in Khorezm, Uzbekistan. Concepts and Recommendations.
- 55 Waibel, Gabi (2010). State Management in Transition: Understanding Water Resources Management in Vietnam.
- 56 Saravanan V.S., Mollinga, Peter P. (2010). Water Pollution and Human Health. Transdisciplinary Research on Risk Governance in a Complex Society.
- 57 Vormoor, Klaus (2010). Water Engineering, Agricultural Development and Socio-Economic Trends in the Mekong Delta, Vietnam.
- 58 Hornidge, Anna-Katharina, Kurfürst, Sandra (2010). Envisioning the Future, Conceptualising Public Space. Hanoi and Singapore Negotiating Spaces for Negotiation.
- 59 Mollinga, Peter P. (2010). Transdisciplinary Method for Water Pollution and Human Health Research.
- 60 Youkhana, Eva (2010). Gender and the development of handicraft production in rural Yucatán/Mexico.
- 61 Naz, Farhat, Saravanan V. Subramanian (2010). Water Management across Space and Time in India.
- 62 Evers, Hans-Dieter, Nordin, Ramli, Nienkemoer, Pamela (2010). Knowledge Cluster Formation in Peninsular Malaysia: The Emergence of an Epistemic Landscape.
- 63 Mehmood Ul Hassan, Hornidge, Anna-Katharina (2010). 'Follow the Innovation' – The second year of a joint experimentation and learning approach to transdisciplinary research in Uzbekistan.
- 64 Mollinga, Peter P. (2010). Boundary concepts for interdisciplinary analysis of irrigation water management in South Asia.
- 65 Noelle-Karimi, Christine (2006). Village Institutions in the Perception of National and International Actors in Afghanistan. (Amu Darya Project Working Paper No. 1)
- 66 Kuzmits, Bernd (2006). Cross-bordering Water Management in Central Asia. (Amu Darya Project Working Paper No. 2)
- 67 Schetter, Conrad, Glassner, Rainer, Karokhail, Masood (2006). Understanding Local Violence. Security Arrangements in Kandahar, Kunduz and Paktia. (Amu Darya Project Working Paper No. 3)
- 68 Shah, Usman (2007). Livelihoods in the Asqalan and Sufi-Qarayateem Canal Irrigation Systems in the Kunduz River Basin. (Amu Darya Project Working Paper No. 4)
- 69 ter Steege, Bernie (2007). Infrastructure and Water Distribution in the Asqalan and Sufi-Qarayateem Canal Irrigation Systems in the Kunduz River Basin. (Amu Darya Project Working Paper No. 5)
- 70 Mielke, Katja (2007). On The Concept of 'Village' in Northeastern Afghanistan. Explorations from Kunduz Province. (Amu Darya Project Working Paper No. 6)
- 71 Mielke, Katja, Glassner, Rainer, Schetter, Conrad, Yarash, Nasratullah (2007). Local Governance in Warsaj and Farkhar Districts. (Amu Darya Project Working Paper No. 7)
- 72 Meininghaus, Esther (2007). Legal Pluralism in Afghanistan. (Amu Darya Project Working Paper No. 8)
- 73 Yarash, Nasratullah, Smith, Paul, Mielke, Katja (2010). The fuel economy of mountain villages in Ishkamish and Burka (Northeast Afghanistan). Rural subsistence and urban marketing patterns. (Amu Darya Project Working Paper No. 9)
- 74 Oberkircher, Lisa (2011). 'Stay – We Will Serve You Plov!'. Puzzles and pitfalls of water research in rural Uzbekistan.
- 75 Shtaltovna, Anastasiya, Hornidge, Anna-Katharina, Mollinga, Peter P. (2011). The Reinvention of Agricultural Service Organisations in Uzbekistan – a Machine-Tractor Park in the Khorezm Region.
- 76 Stellmacher, Till, Grote, Ulrike (2011). Forest Coffee Certification in Ethiopia: Economic Boon or Ecological Bane?

ZEF Development Studies

edited by Solvay Gerke and Hans-Dieter Evers

Center for Development Research (ZEF),
University of Bonn

Shahjahan H. Bhuiyan

Benefits of Social Capital. Urban Solid Waste Management in Bangladesh

Vol. 1, 2005, 288 p., 19.90 EUR, br. ISBN 3-8258-8382-5

Veronika Fuest

Demand-oriented Community Water Supply in Ghana. Policies, Practices and Outcomes

Vol. 2, 2006, 160 p., 19.90 EUR, br. ISBN 3-8258-9669-2

Anna-Katharina Hornidge

Knowledge Society. Vision and Social Construction of Reality in Germany and Singapore

Vol. 3, 2007, 200 p., 19.90 EUR, br. ISBN 978-3-8258-0701-6

Wolfram Laube

Changing Natural Resource Regimes in Northern Ghana. Actors, Structures and Institutions

Vol. 4, 2007, 392 p., 34.90 EUR, br. ISBN 978-3-8258-0641-5

Lirong Liu

Wirtschaftliche Freiheit und Wachstum. Eine internationale vergleichende Studie

Vol. 5, 2007, 200 p., 19.90 EUR, br. ISBN 978-3-8258-0701-6

Phuc Xuan To

Forest Property in the Vietnamese Uplands. An Ethnography of Forest Relations in Three Dao Villages

Vol. 6, 2007, 296 p., 29.90 EUR, br. ISBN 978-3-8258-0773-3

Caleb R.L. Wall, Peter P. Mollinga (Eds.)

Fieldwork in Difficult Environments. Methodology as Boundary Work in Development Research

Vol. 7, 2008, 192 p., 19.90 EUR, br. ISBN 978-3-8258-1383-3

Solvay Gerke, Hans-Dieter Evers, Anna-K. Hornidge (Eds.)

The Straits of Malacca. Knowledge and Diversity

Vol. 8, 2008, 240 p., 29.90 EUR, br. ISBN 978-3-8258-1383-3

Caleb Wall

Argorods of Western Uzbekistan. Knowledge Control and Agriculture in Khorezm

Vol. 9, 2008, 384 p., 29.90 EUR, br. ISBN 978-3-8258-1426-7

Irit Eguavoen

The Political Ecology of Household Water in Northern Ghana

Vol. 10, 2008, 328 p., 34.90 EUR, br. ISBN 978-3-8258-1613-1

Charlotte van der Schaaf

Institutional Change and Irrigation Management in Burkina Faso. Flowing Structures and Concrete Struggles

Vol. 11, 2009, 344 p., 34.90 EUR, br. ISBN 978-3-8258-1624-7

Nayeem Sultana

The Bangladeshi Diaspora in Peninsular Malaysia. Organizational Structure, Survival Strategies and Networks

Vol. 12, 2009, 368 p., 34.90 EUR, br. ISBN 978-3-8258-1629-2

Peter P. Mollinga, Anjali Bhat, Saravanan V.S. (Eds.)

When Policy Meets Reality. Political Dynamics and the Practice of Integration in Water Resources Management Reform

Vol. 13, 216 p., 29.90 EUR, br., ISBN 978-3-643-10672-8

Irit Eguavoen, Wolfram Laube (Eds.)

Negotiating Local Governance. Natural Resources Management at the Interface of Communities and the State

Vol. 14, 248 p., 29.90 EUR, br., ISBN 978-3-643-10673-5

William Tsuma

Gold Mining in Ghana. Actors, Alliances and Power

Vol. 15, 2010, 256 p., 29.90 EUR, br., ISBN 978-3-643-10811-1

Thim Ly

Planning the Lower Mekong Basin: Social Intervention in the Se San River

Vol. 16, 2010, 240 p., 29.90 EUR, br., ISBN 978-3-643-10834-0