Improving effectiveness and efficiency in the water sector: institutions, infrastructure and indicators

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Abstract

This special edition is devoted to the theme of water institutions, infrastructure and performance indicators and how they matter to the effectiveness and efficiency of the water sector. It explores many questions which have not been adequately addressed in the literature. For example, what do we know about institutional reforms in the water sector? Can regulation improve the performance of government-controlled water utilities? What explains the choices amongst governance mechanisms in the water sector? How do political institutions affect water sector performance? How do we construct an index of drinking water adequacy? Can the media influence the formation of beliefs about the “yuck” factor in water reuse? Empirical examples are drawn from various countries and regions around the world. Contributors include economists, sociologists, political scientists, consultants, water policy professionals and staff of donor agencies. The methodological approaches employed range from meta-analyses, comparative analyses, content analyses, statistical and econometric analyses, as well as single case studies.

Keywords: Effectiveness; Efficiency; Indicators; Infrastructure; Water institutions

1. Introduction and rationale

This special edition is devoted to the theme of water institutions, infrastructure and performance indicators, and how they matter to the effectiveness and efficiency of the water sector. Little research has been done to bring together comparative experience in the water sector from different countries at varying stages of development. Likewise, little research has been done on the similar and parallel roles of water institutions and infrastructures to the effectiveness and efficiency of the water sector. This special edition is an attempt to address some of these gaps in the literature.

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2. Outstanding questions

Specifically, this special edition explores the following outstanding critical questions in the literature:

(i) What do we know about the outcomes of institutional reforms in the water sector in the last three decades?
(ii) Can regulation improve the performance of government-controlled water utilities?
(iii) What are the challenges in studying water institutions?
(iv) How independent are water regulatory agencies and do they matter?
(v) What would it take to build local water institutions?
(vi) What explains the choice among governance mechanisms in the water sector?
(vii) How do political institutions affect water sector performance?
(viii) Can community driven development approaches improve access to rural water supply?
(ix) How do we construct an index of drinking water adequacy? and
(x) Can the media influence the formation of beliefs about the “yuck” factor in water reuse?

3. Empirical examples and methodology

These outstanding questions are explored using empirical examples drawn from various countries and regions, such as South Asia (India and Pakistan), East Asia/Pacific (China, Singapore, Australia), Mediterranean countries (Tunisia, Algeria, Egypt, Morocco, Jordan and Italy), as well as Latin America, the Caribbean and Brazil, among others. Contributors include economists, sociologists, political scientists, consultants, water policy professionals and staff of donor agencies.

In addition to the wide range of country examples, the papers in this special edition also employ various methodological approaches ranging from meta-analyses, comprehensive literature review, comparative analyses, content analyses, statistical and econometric analyses as well as single case studies. This special edition, therefore, adds value to the literature in terms of research questions addressed and the empirical examples and methodologies used.

4. Overview and synthesis

In the first paper, Araral (2010) provides an overview of the reform of water institutions in the last three decades, including a review of their theoretical rationale, models of reform, conditions for success as well as the implementation challenges faced by various countries. Three examples of reforms are reviewed: (1) water rights and river basin institutions; (2) decentralization in the management of water as a resource and as a service; and (3) private sector participation and regulation of water infrastructure.

The review suggests that (a) the theoretical rationale for reforms are mostly grounded on arguments for efficiency, effectiveness and fiscal sustainability with little considerations for equity; (b) pressures for reform arise from a combination of exogenous and endogenous factors; (c) models of institutional design vary from incremental to comprehensive; and (d) implementation experience across countries is mixed, driven by political economy and capacity issues. This overview of the literature provides a backdrop to the rest of the papers in this special edition.
5. Regulation

The next three papers explore various issues on the regulation of water infrastructure. Ehrhardt & Janson (2010) explores the important question of whether regulation can improve the performance of government-controlled water utilities. The conventional literature has mostly examined the question of whether private participation combined with regulation can improve the performance of government-controlled water utilities but little research has been done on whether regulation alone can improve performance. Their paper examines five water utility reform episodes in Latin America and the Caribbean. In each episode, a regulatory regime designed for private companies was applied to a government-controlled utility. Assessing performance across a number of indicators, the authors find that performance was as likely to deteriorate as to improve during periods of regulation of government-controlled utilities. This contrasts with the evidence of improvement following reforms that combined regulation with private participation.

Ehrhardt & Janson’s findings suggest that conventional regulation may be of little use in government-controlled utilities. Conventional regulation is designed to prevent a profit-maximizing utility from raising tariffs above reasonable cost-recovery levels. Government controlled utilities, however, are not commercially motivated and face systematic incentives for short-termism in tariff-setting, so limiting monopoly profits is not usually the problem that needs to be addressed. The authors conclude that conventional regulation of a government-controlled utility is not useful in isolation. They argue, however, that regulatory tools can complement governance reforms. One approach may be to adapt conventional regulatory tools so as to help citizens judge utilities’ performance, and thus be more effective in holding government to account for the performance of government-controlled utilities.

Perard (2010) illustrates one of the key questions in the debate on the regulation of water supply: how independent are water regulatory agencies and does it matter? Donors, and the literature on efficient water supply, routinely recommend the separation of regulation from production and provision. In reality, only a few developing countries are able to do this. Using case studies from southern Mediterranean countries (Tunisia, Algeria, Egypt, Morocco and Jordan), Perard finds that (a) “independent” regulatory agencies have been set up only in a few countries and that a closer look at them confirm that they are rarely independent; (b) in all cases examined, the management of water supply suffers from political interference and is overly centralized; and (c) while the corporatization of local operators has been legalized in most countries, few have implemented it.

There are two possible explanations for this, both of which need further testing: first, water supply is a politically salient good and therefore politicians are reluctant to give up effective control to an independent regulator; second, water is a mysterious good (i.e. has significant information problems in terms of water quality, information about customers and information about hidden pipe networks) all of which gives the service provider informational advantages relative to an independent regulator. Thus, when the marginal transaction costs of having an independent regulator plus the political salience of water significantly outweighs its marginal benefits, there is little incentive to establish independent water regulatory agencies. This is one possible hypothesis why independent water regulators are more the exception rather than the norm.

The third paper, by Asquer (2010), illustrates two important themes in the study of water institutions. The first theme explores the question of what explains the choice among governance mechanisms in the water sector, while the second theme explores the question of how to manage the implementation of water regulatory reforms. The main contribution of the paper is that it builds on the substantial literature...
on organizational governance and transaction cost economics, for instance Menard (2005), but applied in the case of water utilities governance. Using the case of Italy, Asquer finds that the implementation of water regulatory reforms, which lasted about 12 years, resulted in a new regulatory regime which combined selected features of public ownership, franchise allocation, and discretionary regulation. These reforms were implemented in different ways across the country, at the national and sub-national levels, resulting in different forms of organization and management of the water services at the local level. Asquer then attempts to explain why water regulatory reforms were designed as ‘hybrids’ between different regulatory ‘models’ and why, within a given regulatory institutional framework, water regulatory reforms may be implemented in different ways at the local level.

6. Decentralization

The next two papers explore several issues on the process and outcomes of decentralization in the water sector. The paper by Tankha & Fuller (2010) examines the question of what would it take to build local water institutions? The answer to this question, Tankha & Fuller argue, requires paying attention to the process of institution building. While the argument on the importance of the learning process approach to local institution building was first suggested by Korten in the 1980s (Korten, 1984), most aid agencies and academic literature still often assumes that participation will follow once the organizations and rules supporting it are in place. Comparing case studies from Brazil and India, Tankha & Fuller find that water sector reforms are creating a market of informed demand for public participation, and a supply of services to aid both the participation process and the technical work that will ensue. However, they find that this market must be created using four strands of crucial processes: (1) creation of forums for public participation; (2) capacity building for both government and non-government stakeholders; (3) creating the institutional environment for administration reform; and (4) creating demand for “good” participation from the affected communities. They argue that as each of these strands gets developed, the market for services expands and consolidates. However, they find that in both India and Brazil, capacity building and administrative reforms are lagging, thus suppressing the demand for participatory reforms, a point illustrating the difficulty of participatory approaches to institution building.

Padawangi’s (2010) paper explores a key question in the debate on decentralization and participation in rural water supply: how effective is a community driven development (CDD) approach to rural water supply? In theory, CDD has several advantages over non-CDD approaches: (1) community choices are more attuned to local needs; (2) sustainable O&M is more likely; (3) social capital is built; (4) more participation yields better oversight and less corruption; and (5) communities become active partners in development, itself a worthy objective. The key premise in CDD is that communities will act collectively to advance their interests when given control of decisions and resources. As a result, proponents suggest, outcomes are likely to be more effective, efficient, sustainable and equitable compared with centralized arrangements.

Empirically, various studies – ranging from rigorous econometric tests to single case studies – suggest the following benefits of CDD projects: (1) choices are attuned to local needs; (2) there is higher likelihood of having better and sustained O&M; (3) social capital is built; (4) better oversight and less corruption transpires; (5) communities become active partners in development; (6) they reach the poor; (7) they scale up quickly (for instance, in Indonesia, CDD is now a national program, and in Vietnam...
CDD is part of national development policy; (8) high rates of return are experienced; (9) disbursements are fast; and (10) there is low leakage or corruption.

Using both quantitative and qualitative data, Padawangi examined the case of the Punjab rural water supply in Pakistan and found that, consistent with expectations, CDD projects had done well in extending water supply, drainage, and sanitation coverage to the poor rural communities. The project was also effective in promoting local participation and ownership, particularly by women’s groups, and is therefore likely to have sustainable O&M.

7. Studying institutional performance

The last three papers illustrate the application of different methodologies in studying the performance of water institutions. Leong & Yu’s (2010) paper illustrates one of the core challenges in the study of institutions: the role of mental models or beliefs and how these can be altered by the media. Institutions or rules of the game by themselves do not alter human behavior per se but, rather, it is the belief of calculating players and how they update their belief given the flow of information. Media is widely acknowledged as playing an important role in influencing beliefs but little is understood about its role in water policy, particularly in water reuse policy. Using the case of water reuse in Singapore and using content and statistical analysis of newspapers in Singapore and Australia, Leong & Yu (1) argue that belief in the “yuck” factor commonly associated with recycled water can be influenced by the media; (2) show how learning takes place; and (3) suggest a practical communications toolkit and possibilities for theory-building. Their paper has significant policy relevance as more and more countries resort to water reuse but would have to deal first with the challenge of altering beliefs about the “yuck” factor.

Kallidaikurichi & Rao’s (2010) paper illustrates the importance as well as the challenges of measuring the performance of water institutions, specifically in constructing an index of drinking water adequacy (IDWA). They note that indices are useful for several reasons: they focus attention, have considerable political appeal and are eye-catching. They suggest that the key components of an IDWA should reflect five parameters: resources, access, capacity, use and quality. The rationale for these is as follows: first, ensuring adequate drinking water is facilitated if the nation has its own resources. Second, one or other type of access mechanism will help in ensuring supply. Third, adequacy is best assured by a relatively higher than lower income level, that is, the capacity to purchase water. Fourth, despite having resources, access mechanisms and capacity, actual use of water may be adequate or less than adequate. The IDWA methodology – a work in progress – was applied to 23 countries in Asia and the trends, implications and data limitations were discussed. This approach offers a promising alternative to the current simplistic indicators of access to water supply currently used to track progress on the Millennium Development Goal on water and sanitation (MDG-7), i.e. the extent of access denoted by the proportion (percentage) of total populations with access to safe drinking water.

The final paper, by Whitford et al. (2010), explores the question: what are the macro institutional causes of disparities in access to clean water and sanitation? Using econometric analyses on a cross-country data set, the paper specifically assesses the impact of a number of political, economic, and social mechanisms on disparities in access to clean water and adequate sanitation. They offer a series of vignettes using cross-national data from 2002 and 2004 to assess the effects of key institutional variables on the improvement of access to safe water and sanitation. Two key variables of specific interest are a
country’s commitment to “quality regulation” and the country’s long-term development path. They find that the evidence for those factors on expanding or contracting access to water and sanitation is mixed.

8. Commonalities and points of distinction

The study of water institutions as a discipline is still in its early stages. In general, there are several challenges to scholars undertaking institutional analysis (Ostrom, 1999). These challenges are evident, in differing degrees, among the papers in this edition. First, the term institution refers to many different types of entities, including both organizations and rules used to structure patterns of interaction within and across organizations. Second, institutions are invisible to the extent that they are formal or informal shared patterns of understanding. Third, to develop a coherent approach to studying diverse types of institutional arrangements, such as markets, hierarchies, firms, families, voluntary associations, national governments and international regimes, one needs multiple inputs from diverse disciplines.

Fourth, given the multiple languages used across disciplines, a coherent institutional framework is needed to allow for expression and comparison of diverse theories, and models of theories, applied to particular puzzles and problem settings. Fifth, decisions made about rules at any one level are usually made within a structure of rules at a different level. Institutional analysis therefore needs to encompass multiple levels of analysis. Finally, at any one level of analysis, combinations of rules, attributes of the physical world and the characteristic communities of individuals involved are combined in a configural rather than an additive manner.

In the case of water institutions, Saleth & Dinar (2005) note several dark and grey spots in the literature, some of which are addressed by the papers in this special edition: (i) the failure of studies to reckon the role of perception, and (ii) the underestimation of the role of individuals (Leong & Yu’s paper attempts to address both of these concerns); (iii) the absence of an ex-ante approach in institutional analysis (a point Padawangi tries to address); (iv) the inadequate treatment of institutional linkages (a concern partially addressed by Ehrhardt & Janson); (v) the need for institutional decomposition (which is a point addressed by Kallidaikurichi & Rao’s paper); and (vi) research-based knowledge for institutional change (a point addressed by Tankha & Fuller, as well as by Asquer).

More particularly, in the case of research on urban water institutions, Shirley (2006) notes that the number of comparative studies on water and sanitation are few and the findings are ambiguous. She notes that most studies fail to control adequately for the many local factors that affect water. Some comparative assessments of public and private management of water systems also fail to control for endogeneity, even though there are reasons to suspect that governments are more likely to privatize badly performing water systems. Shirley argues that this gap in knowledge is significant given the ill-informed and emotional nature of much of the public debate over private participation in water.

9. Implications for research and policy

Much work remains to be done to provide satisfactory answers to the important questions to broaden and deepen our understanding of the causes and consequences of water institutions. The papers in this special edition have attempted to provide partial answers to these outstanding questions in the literature.
However, much remains to be known about the outcomes of institutional reforms in the water sector in different countries, in varying stages of development. The role of political institutions on water sector performance remains ambiguous and more empirical work needs to be done. There are still numerous methodological challenges in studying water institutions including their configural relationships.

The effectiveness of independent water regulatory agencies remains a question, as well as whether or not regulation can improve the performance of government-controlled water utilities. Also, much needs to be understood about what it would take to build local water institutions beyond the panacea of community-driven development approaches to rural water supply. Finally, explaining the choices among governance mechanisms in the water sector is not yet clearly understood and much work needs to be done to improve the measurement of drinking water adequacy.

The collection of papers in this special edition have attempted to shed some light on these questions but there is still a long way to go to advance our understanding of the causes and consequences of institutions in the water sector.

References


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