

**DYNAMICS OF INSTITUTIONAL CHANGE: THREE
WATER POLICIES (AND TWO BRIGHT IDEAS)
EXAMINED**

LEONG CHING

(M.A., University of London)

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Declaration

I hereby declare that this thesis is my original work and it has been written by me in its entirety. I have duly acknowledged all the sources of information which have been used in the thesis.

This thesis has also not been submitted for any degree in any university previously.

Leong Ching Ching
15 August 2012

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Summary

The central problem in water institutions today is the complexity and seeming intractability of large-scale water reforms. In current literature on institutional change, three factors are identified as affecting institutional change - path dependencies, social norms and rational interests. But while they illuminate some crucial aspects of change, any explanatory force appears one-sided as they explain either change or stasis but not both. Neo-institutionalists have generally addressed this problem by providing a place for ideas, but despite the “ideational turn” some 15 years ago, a key question remains. Not *whether*, but *how*, ideas make a difference.

How do ideas cause institutional change? What is their role in the rise and fall of institutions? What is the ideational process by which institutions change? Current theorists postulate that ideas matter by reducing uncertainty and providing new guides for action. In a process of social evolution, new ideas *replace* older ones in a competitive process of elimination, hence causing or allowing institutions to change.

This thesis confounds these views by demonstrating empirically that old or existing perceptions persist even after successful institutional change, and are in fact incorporated into a meta-narrative that has elements of both the old and a new narrative. Second, the process is not an evolution but by one of hermeneutic choice between narratives which hold stronger or weaker incentives for certain courses of actions. These incentives can be economic or normative, but they obey a certain political and moral logic which forms the key narrative.

The key research question is: “What are the processes by which ideas impact institutions?” This question is located within an empirical investigation into the dynamics of institutional change in three instances - recycled drinking water in

Singapore, integrated water management in the Yellow River in China, and water privatisation in Jakarta. These variously represent the three key pathways - path dependencies, norms and rational interests - by which ideas affect change. Of the cases, the first two were successfully implemented with relatively good outcomes, while the third remains mired in problems a decade after implementation.

In terms of method, I use Saleth and Dinar's framework of subjective institutional change in the water sector, and generate data with the Q methodology. About 1,000 pieces of text and 75 survey interviews were carried out in three countries.

The key finding is that ideas cause institutional change by acting as cognitive bridges between the existing set of institutions and a new set. Institutional reforms succeed where these ideational bridges score highly along epistemic and narrative parameters of truth, richness and coherence, producing a thick narrative which allows many and sometimes contrasting perspectives. This contrasts against a thin narrative which pits pairs of antithetical propositions against each other, the old set of institutions against a new. Such a thin narrative resists institutional change.

These two theoretical modifications provide us with a better idea of how a general theory of institutional change is supposed to look, and in turn, hold practical policy impetus for large scale and difficult water reforms.

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Chapter One: Introduction

Water institutions have increased both in number and complexity over the years, and especially quickly over the past decade. This phenomenon is driven by two forces, empirical and scholarly. The first turns on an unpleasant and increasingly politically salient fact - rising demand in the face of dwindling supply. Increasing population, urbanisation and industrialisation have led to a greater demand for water, in particular urban water. At the same time, supply is dwindling because of degradation due to human activities and climate change events.

Hence while the total volume of water may remain the same, the amount that can be used is becoming ever smaller. These empirical realities present several paradoxes: water is almost completely renewable yet increasingly scarce; ubiquitous yet mostly unusable; essential to life, yet denied to more than a billion people worldwide.

Not surprisingly, these paradoxes present a rich research programme in institutions, particularly in water reform and institutional change. Over the last two decades, the hope that institutions can make a difference was a key driving force for such water research.

Today the need for water reforms remains, but there is a growing agnosticism as to the variables for policy success. With so many failed attempts at water reform, more institutional scholars are forgoing the notion of macro-models of successful institutional forms or “policy panaceas”, and calling for greater sensitivity towards institutional endowments and contexts. But this, in turn, risks an approach that is extremely granular, with success variables defined idiosyncratically.

A middle way has been advocated by theorists who look at “pockets” of effective agencies, *inter alia* Daland, 1981, Leonard, 1999, Strauss, 1998. Foremost among

these is Elinor Ostrom, with her notion of polycentric governance. Under this framework, she argues, there are many centres of legitimacy, each of which provides stability and justification for a system of governance. Her empirical demonstrations are that collective action under such polycentricity can sometimes be successful, in fact, more successful than government intervention and external sanctions. While her work is important and has routed the simplistic model of an economic actor as a rational, self-interested egoist, there is at the same time some frustration with the lack of generalisability given the complex nature of syntax and the many permutations of a polycentric framework. As she herself pointed out, when she first outlined her framework of seven types of generic rules, in addition to a list of “principles”, “several colleagues criticised me for introducing so much complexity”. (Ostrom, 2005:175) Her reply is that such detailed work allows her to understand how action situations (that is, the policy context) are constructed. It also allows her to move “beyond slogan words to describe institutions”.

Her challenge to scholars working on a general theory of institutional change is to go beyond more theorising. Instead, what is needed is meso-level empirical work to gain an understanding of “processes of change in multiple specific settings”.

This thesis is an attempt to rise to this challenge.

This thesis uses a triangulation of three case studies - two of which are intriguing success of apparently intractable water reforms - recycled drinking water in Singapore and IWRM in the Yellow River in China. These explore the issue of norms in the form of a psychological aversion to drinking sewage, and path dependencies in the 2,000-year-old history of governance of the Yellow River. In the third case, the difficulties of the privatisation of Jakarta’s water supply is explored. At the time of

implementation, it was a move which speaks to the interests of all three key stakeholder groups - the Government, the private utility and the consumers, but more than 10 years post-privatisation, all three groups appeared to have suffered for it. The analysis shows that norms, path dependencies and interests do not adequately explain the outcomes we observe. An ideational treatment however, illuminates the incentives (both economic and normative) at play, as well as the narratives that exist.

Overall, the three cases show that what differentiates the successful and unsuccessful reforms is not an absence of opposition between old and new ideas but rather, the presence a meta-narrative that allows for the two opposing discourses to be incorporated within a coherent understanding. From the discourse and discursive institutional analysis carried, we are persuaded that institutions are not just rules that guide behaviour but principles as well, which are analytically different from rules. It is this characteristic of principles - that two competing principles can be held at the same time, given different weights, rather than the all or nothing nature of rules - that allows for institutional change.

A key contribution of this thesis is to provide an empirical test of the Saleth and Dinar framework, specifically for ideational elements on institutional change, with three case studies. This framework is modified to capture discourse analysis and brings forward the project to construct a general theory of institutional change which Saleth and Dinar terms “subjective theory of institutional change”.

The significance of this project as a whole lies in the essential nature of water to life. Population growth, climate change events and increasing industrialisation are all pressure points on the diminishing supply of clean water. Understanding how ideas impact discourses and key perceptions of the policy communities will contribute to

this urgent problem by showing how large-scale and seemingly intractable water reforms can succeed.

This chapter sets out the problem on institutional change, what we know about this puzzle in general and in water sector in particular. In the literature review, I provide a synthesis of the key debates on institutional change, including the key debates on norms, path dependencies, and interests, as well as the impact of the ideational turn on these debates. In the second section, I review the theoretical progress on the role of ideas in institutional change, including a critique of current work, flaws in data, methods and conclusions of these studies, as well as gaps in current research. One of main gaps is the lack of understanding of the dynamics of interaction between ideas and institutions - *how* do ideas cause change?

The obstacles are both theoretical and methodological and the remaining sections outline the methodological premise of this thesis in overcoming these obstacles. I introduce the conceptual framework of Saleth and Dinar on institutional change, and how this can be modified to test the dynamics of ideational pathways and the interaction with institutions. The next section discusses the Q methodology which is the research tool used to capture the data on discourses and public perceptions in this study. The last section justifies the data and methodology, and sets out scope and limitations of study.

The Dynamics of Institutional Change in the Water Sector

How *do* institutions change? In fits and starts or through a glacial reshaping? Shaped by the flux of actions by self-interested individuals or by the force of history? A systematic review of the empirical research on water institutional change shows that, whether success or failure in reforms, path dependencies, norms and interests have

generally been identified as key variables in institutional change. The reforms surveyed are all empirical, data driven studies within the past 10 years, and include a variety of methods, from qualitative, discourse analysis to regressions of quantitative data.

Table 1: Review of research on path dependency

Author /year/country	Methods	Variables /unit of analysis	Findings
PATH DEPENDENCY			
Harris (2011)	Analysis of water trading and water prices in Victoria, Australia.	Victorian institutional arrangements especially elements of institutional path dependence from 1980-2010.	Each decision creates some “lock in” which explains the inefficient water trading markets as regulatory and physical constraints limit efficiency gains.
Ingram and Fraser (2006)	Case study of California.	Interest groups, policy mobilisations, decision making processes and policy design.	“Path dependence” characterise most water policy making, with punctuations (large institutional change) made possible by new ideas and new frames introduced by policy entrepreneurs.
Doukkali (2005)	Case study of Morocco.	Historical institutional evolution of water sector, water allocation patterns, water rights and prices.	Path dependence explanation for evolution, exogenous factors (droughts, economic crisis) lead to institutional change.
Blomquist and Schlager (2005)	Case study of Southern Californian San Juan Creek Watershed.	Boundaries, decisions making pathways and accountability institutions.	Creating new formal institutions such as a watershed body does not prevent the “persistence” of entrenched politics.
Fischhendler (2008) (Politics)	Case study of Israel’s drought of 1999-2002, with interviews and review of source documents.	Institutional structural change, decision making processes.	Integration at a physical level but institutions did not evolve from the old pathways and an institutional structure which ignores both the demands of rationality and democracy.

Watson, Deeming and Treffny (2009)	Case study of river basin and flood management in England in response to the EU Water Framework Directive (WFD).	Analysis on policy documents, academic public interviews, and surveys conducted between 2007 and 2009.	Institutional change is incremental and path-dependent, with the WFD “accommodated” within the existing practices.
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Path Dependence and Incremental Change

The first group of literature is probably the most instinctive - that what happens in water reform is the accumulated result of what happened in the past. This is sometimes called “path dependence” defined by Mahoney (2000: 507) as “those historical sequences in which contingent events set into motion institutional patterns or event chains that have deterministic properties”.

A typical case is that by Harris (2011) in an analysis of a water market in Victoria, Australia. She examined a water reform in which the irrigation sector attempted to move away from a government-led allocation of water, to a more market-based system, which holds the promise of greater efficiency gains. These gains, however, were not completely realised due to rigidities and lock-ins created by path dependence (PD). This is attributed to “an element of lock-in created as each decision is made so that a path’s trajectory, once established and built on by subsequent decisions, is costly to change”. (Harris, 2011)

For the PD model, change is explained by reference to exogenous forces. For example, water reform in Morocco (Doukkali, 2005), where it was found that path dependencies lead to changes that were incremental change and evolutionary. Large-scale reforms such as from centralised to decentralised governance, from subsidies to a more market-based approach, and sectoral approaches to integrated management,

cannot be explained from the “inside”. Rather, exogenous factors such as droughts, macro-economic crisis, and hitting the physical limits of water need to be brought in. Because PD typically deals with institutional change by reference to exogenous factors, it has been criticised for being better at describing change than explaining it. (Schmidt, 2008) Here, we need to make an important distinction between two versions of PD. The first is a pure statistical model, called a Polya urn model. A number of two different coloured balls were placed in a container. Every drawn ball is returned to the container and another ball of the same colour was also added to it. This very slightly increases the chances of drawing a ball of this colour in the next round. Each draw is random, but over the long run, one colour is likely to dominate due to the increased chances of balls of the over-represented colour being drawn. Only in the increasingly unlikely event of a balancing out of both colours would there be no long-term positive feedback in either direction. In this model, the notion of path dependence (PD) can be simply thought of as the path of “increasing returns” in economic terms. (David, 1985) Under this model, random, repeated events have consequences over the long term. PD is then defined as “A path-dependent sequence of economic changes is one in which important influences upon the eventual outcome can be exerted by temporarily remote events, including happenings dominated by chance elements rather than systematic forces. (David, 1985: 332)

In this non-ideational model, institutional change is a matter of repeated chance events carving the trails of history. The question “Why are there more red balls than blue ones?” is answered simply by saying that it was because in the past, there was one more red ball than blue. With more complex twists and innumerable additions and variations, this is the sort of explanation offered to the “whys” of many social processes. PD is often cited to support claims of path dependence in choices over

technologies, standards, institutional features, social behaviours, norms, laws, and city locations. (Challen, 2000; Cowen and Gunby, 1996; Crouch and Farrell, 2004; Hacker, 2002; North, 1990; Pierson, 2000, 2004) The legal principle of *stare decisis* may be thought to be a matter of path dependence. (Hathaway, 2001; Schauer, 2011) This non-teleological view is very hard to dislodge, because as we have seen above, it is a matter of mathematical truth. A preference for doing things within the “if it ain’t broke, don’t fix it” paradigm, is also reasonable because of the preference for inductive certainty.

But while we may be satisfied with this as a general description of social behaviour, in the study of the dynamics of institutional change, actors are not coloured balls. Rather than passive, random chance, the participants in the institutional urns include actors who make decisions based on values, interests, cultural biases and social norms. Although history undeniably has influence over current events, we cannot say that what happens now is merely the outcome of mechanical exogenous variables produced by some generating function; it is also a matter of endogenous choice by a strategic actor.

This objection has led to an ideational version of historical institutionalism (HI), which we can see in the second group of empirical cases, where PD is often discussed together with “politics” or “interests”, or some form of rent-seeking. For example, in Fischhendler’s study of a drought in Israel (2008), he notes how the concept of integrated water resources management (IWRM) was introduced, but merely at a physical level. This could not overcome old decision-making structures, which were neither “rational” in the sense of reaching the most efficient or effective outcomes, nor “democratic” in the sense of giving voice to the less powerful. The same applies to Blomquist and Schalger’s study of the San Juan water creek (2005) in which they

locate the difficulty of implementing IWRM in the persistence of entrenched politics. “Calls for integrated management or consensus decision-making will not prevent the emergency or persistence of politics in the watershed.” This, they argue, accounts for the polycentric arrangements found in many river basins, which although “fragmented and unscientific” (2005: 113) have some justification as a means of articulation and realisation of values and interests.

This “stickiness” is often invoked to explain away the existence of inefficient institutions. That is to say, the more history there is embedded in a particular path, the less likely the particular state of affairs or institution will change. And in the ideational form of HI, it is not merely history, but people with entrenched interests, embedded in particular decision-making structures, that make history immovable.

Levi (1997) says: “Path dependence has to mean, if it is to mean anything, that once a country has started down a certain path, the costs of reversal is very high.” We can reason this out, by some form of “sunk cost” (despite the well-known “suck cost” fallacy) and a preference for certainty over risk. People are reluctant to move out of a particular course of action because they are already “invested” in it. In institutional literature, one way of thinking of these factors is in terms of “institutional endowments” which provide the constraining factors of actions. Institutional endowments include: “Legislative and executive institutions, which include the formal mechanisms for appointing law makers and decisions and for making laws; judicial institutions; customs and norms; character of contending social interests in society including ideology; and administrative capacities.” (North, 1990)

Norms, Institutional Endowments and the Agnostic Elephant

A finer definition of paths therefore, includes such constraints as culture and social norms. In the water sector, these are often invoked to explain the lack of success in otherwise “rational” or sensible water reforms. For example, in explaining the lack of success in implementing urban storm-water management, Brown (2005) points to the “inertia” caused by technocratic norms and “institutional power and expertise” as well as values and leadership. Meinzen-Dick (2007) in her discussion on Australia’s Murray-Darling basin wrote about the impact of norms that water is a free good or “a gift from God” as inhibiting factors in the adoption of market-based policies. Conversely, a “fit” with the physical, institutional, and cultural environment was, therefore, a reason for successful institutional change. In her examination of water organisations in two states in India, Meinzen-Dick (2007) found that the social capital generated by religion seems to have a stronger influence on organisation for natural-resource management than social capital created by cooperatives, despite the fact that organising water-user associations has been largely entrusted to the cooperatives.

Table 2: Review of research on norms

NORMS/OTHERS			
Meinzen-Dick (2007)	Two-stage logistic regression, to identify variables for collective organisation and the use of such organised activity as a predictor for lobbying and maintenance.	Data on 48 water units in two Indian states, including area irrigated by outlet, distance to markets, existence of groups such as temples and cooperatives.	Norms such as the authority from religious figures, affect the success of irrigation projects in India.
Brown (2005)	Storm-water management in Sydney, Australia	Content analysis, more than 60 interviews with stakeholders	Technocratic norms and leadership values impede the implementation of new storm-water harvesting arrangements.

Miller and Buys (2008)	Case study of South East Australia's water recycling programme.	Survey of perceptions of 408 residents of the affected area, with 111 questions on a 5-point Likert scale.	Perception is that there is a serious water crisis with support for implementing water, despite existing norm of personal revulsion against drinking recycled water.
Jennifer McKay (2005)	Case studies of Australia's 1995 reform programme.		Corroborates a stage-based approach. Factors are both endogenous and exogenous to the water sector.
Claudia Pahl-Wostl (2007)	Case study: European NeWater project on water management in response to climate and global change.	Water management regimes and transition processes.	Change is due to "adaptive management" from social and collective learning. Change impeded due to a set of "interconnected" factors for the status quo.

The problem with this sort of "history matters" assertion is that it does not allow us to ask "how"; even with incorporating norms, we do not go very much beyond description. Take for example Levy and Spiller's 1994 seminal study of infrastructure, which is often taken as a starting point for exploring how public utilities succeed in implementing difficult reforms. They write: "Regulatory incentives cannot be implemented in an institutional vacuum. The country's institutional endowment, the character of distributive politics, and the nature of its regulatory governance all affect the potential for the successful design of regulatory incentives." (Levy and Spiller, 1994: 208) But there is widespread agreement that the context of a country matters, the question is *how* they, in fact, do. Levy and Spiller's own assertion that "performance can be satisfactory within a wide range of regulatory procedures as long as arbitrary administration action can be restrained" is unhelpful.

Institutional settings and their variability appear to resist typology or generalisations. As Stern and Holder (1999) said: “One feature of the Levy and Spiller paper is that the starting point for the analysis is that one should expect different regulatory mechanisms to evolve in different countries according to their institutional endowment.” This is a classic PD conclusion - that different histories lead to different outcomes.

One way is to simply shift the level of analysis - instead of looking at institutional endowments at a macro level, (using a country as the unit of analysis) we simply look at “pockets” of effective agencies. (Daland, 1981; Leonard, 1991; Strauss, 1998) Leonard (2010) attempts this in a large survey of hypotheses about effective agencies in countries with otherwise weak governance, with the aim of finding out whether such occurrences are purely random or if there is something that development administrators can do to increase the chances of their occurrence. As a sign of how many different possible correlations there are between endowments and successful outcomes, Leonard found 62 (!) (sic) separate hypothesis which have been offered to date about why some agencies are successful despite difficult circumstances. After an extensive examination of these, his conclusions continue to be of the fairly picayune variety including that “political economy shapes institutions and processes. These, in turn, influence the functions a government is performing, which joins with them in pressing for senior officials who actually care about good management”. (2010: DOI:10.1002/pad) Even then, he says there is a very long chain, and there is “a great deal of room for human agency and chance in the middle”. (2010: DOI:10.1002/pad)

In using path dependence and norms to explain the success or failure of institutional change then, the main problem appears to be an enduring agnosticism about both the

cause and the dynamics of institutional change. One way to address this has been through an interest-based approach of rational choice institutionalism.

Interests

A rational choice (RC) institutional approach sees interests as determining the way change happens. Under this model, institutions appear as a way of reducing the transaction costs of human activity whether in economics (Williamson, 1975) or in politics. (North and Thomas, 1973) It does so by assuming that an actor is rational, approaches decisions with an instrumental self-interested and strategic mindset, to maximise his own personal utility. (Hall and Taylor, 1996) Institutions, therefore, persist when the benefits they confer persist and change occurs when benefits shift, with the process explained through a calculus of interests, rather than incremental historically determined steps. Quite simply, institutions change when the cumulative forces of different interests change, and famously in the “Tragedy of Commons”, the pursuit of individual interests sometimes leads to collective disaster. (Hardin, 1968)

In water literature, this would be captured by many of the articles discussing privatisation, pitting the interests of private operators (profits) against the social and public interests of the government (equity, universal access). A third group of interests are those of consumers and water-users association, which in addition to those of access and equity, also covers such things as value for money and quality of service.

Table 3: Review of research on interests

INTERESTS			
Brown, Ashley and Farrelly (2011)	Case studies from Australia and the UK.	Data on project implementation timelines, political and bureaucratic	Political risk aversion, and professional agency fear prevent water reforms from

		incentives, 74 primary interviews, and secondary data from media.	taking place.
Castro, Kaika and Swyngedouw (2003)	Historical examination of the development of the London water supply, including move to privatisation and integrated water management.	Water supply data, organisational forms, and private sector participation from 1970 – 2010	Conflicting interests of private operators (profits) and water regulators (efficiency, equity and environmental sustainability) means changes required by regulators are unlikely to happen, in the short term. Over the mid to long-term change can happen with institutional reorganisation (and shifting interests).
Kumler and Lemos (2008)	Mixed methods investigation on Integrated River Basin Management in Paraiba do Sul River Basin in Brazil.	Data from interviews, surveys and observations on social learning capacities.	Social learning facilitates implementation of water management reform.
Huang, Rozele, Wang and Huang (2008)	Interviews and surveys of farmers, case studies of three areas in Northern China.	Irrigation water supplied, used, water prices, legal institutions and water rights.	Despite an economic incentive to save water, using prices to reduce consumption has not worked. Rather, other issues such as credible commitment to water rights are considered more important.
Lemos and Oliveira (2004)	Analysis of decentralisation of water management of the river basin, in Ceara Brazil.	Data of Users' Commission, water resources law and restructuring of water management organisations to increase participatory decision-making.	Political interests of conservative politicians prevent implementation of new regulatory framework. Ideas play a key role in influencing the choices and actions of technocrats, but failed for lack of political support.

In their analysis of two case studies in water reforms in the UK and Australia, Brown, Ashley and Farrelly (2011) write that “the notion of path dependence does not imply

that the future is closed". Rather, they attribute the lack of success in the Australia case to key actors acting in their interests, including professionals who were "fearful" to voice their true views, professional agency fears in not "protecting their employer" and "an unwillingness to go public with their concerns". In this interests-based analysis, the water reforms failed because of the "lock in" into the current paths, created by risk-averse behaviour. In this RC model, interests explain both change and stasis. But a key problem with the RC model is that although it admits some ideational elements through the notion of "interests", only cognitive elements have a place at the table. Things such as altruism, bias, greed and personal convictions, leave the RC cold. As a result, the RC effectively halves the explanatory power of the ideational turn. Cook and Levi (1990) have an extensive discussion of this in *The Limits of Rationality*, on the complexity of human motivations. In the water sector, this is most clearly and empirically demonstrated in the great collection of virtuous collective action by Ostrom (1990) which act as counterfactuals to the Hardin hypothesis of purely self-interested individuals.

Collective action of common pool resources presents a sticky problem to the RC because a purely self-interested rational being would be tempted to free ride, leading to the tragedy of the commons. Game theorists are also confounded when people appear to defy the rationalist self-interested model, playing cooperative games even when they should defect. Yet the empirical evidence is clear that benign collective action does take place, with many instances documented by Ostrom (1999, *inter alia*), from grazing pastures in Switzerland to Japanese forests, and irrigation systems in Spain and the Philippines (Ostrom, 1990). In discussing the key features of these successful collective action policies, she argued for a careful look at what works, rather than an ideological commitment to how rational people "ought to" behave. She

writes: “Most of the institutional arrangements used in success stories were rich mixtures of public and private instrumentalities. If this study does nothing more than shatter the conviction of many policy analyst that the only way to solve CPR problems is for external authorities to impose full private property rights or centralised regulation, it will have accomplished one major purpose.” (1990)

Empirically, people do cooperate, re-define their self-interests and obey the rules of the community, even if these rules appear to be detrimental to their self-interests. Further, such collective action sometimes takes place outside the regulatory form of the state or the market. The compulsion to obey these rules needs to be explained by any good account of institutional change.

Synthesis of Institutional Change: Theory and Practice

From the above review we have three key insights. First, although the empirical cases are not “pure” in the sense that any one of the three factors (norms, interests or path dependencies) were identified as being the sole source of institutional change, they remain key factors. But these variables in a “non-ideational form” run into trouble accounting for much we observe in water reforms. Given this, we need to embed a discussion of these three variables within the larger theoretical endeavour to provide for ideas within a general theory of institutional change. I will briefly outline the theoretical work so far, identify the current gaps and outline how an empirical investigation in the water sector can advance the current debate.

Broadly, there are two positions taken by change theorists – rational choice institutionalism (RC) and historical institutionalism (HI). Both form part of the neo-institutionalism school of thought, developed in the wake of the 1970s behavioural movement, and both sought to explain change. Developed in parallel, one school gave

primacy to structure, the other to agency. These two positions are succinctly captured by Blyth (2002).

In the first, the actor is primary, in the latter, the institutions. The rational choice theorist explains through the shifting interests of key players - as they perceive their benefits changing, a changing calculus ensures they strive for change to maintain or better their position. In RC theory, the individual is sovereign, and are conceived of as “budget maximisers” who act to maximise personal utility. The RC world is that envisioned by Heraclitus, the Greek philosopher who sees the world in constant flux and varied possibilities for stability. Interests and preferences shift and change, and so the world too, should shift and adapt incessantly.

The real world, of course, does not change incessantly, and institutions were at first brought into this model to explain stability. Still, even with an institutional model, an enduring puzzle remains that of collective action over the more “rational” act of free riding. Ideas were, then brought in to the RC as a source of “institutional supply” (Bates, 1988) to account for such apparently non-rational behaviour.

The HI on the other hand, is concerned with the force of contingent circumstance, with the force of history restraining choices on all sides, change can only creep along in incremental steps. (Hall, 1986; March and Olsen, 1984) The HI world is one of stability and path dependence. (Pierson, 1994) As Hall points out: “The institutions of the British state make it difficult for new administrations to even think, let alone act, all that differently from previous ones.” Since institutions are “ontologically prior” to individuals, change is thought to be exogenous. Ideas, to the HI, are a way of endogenising change.

Quite separately from the field of organisational studies, a third institutionalism dealing with norms surfaced – Sociological Institutionalism. Like HI, SI was a response to the persistence of inefficient institutions. Instead of path dependencies however, norms or culture was invoked as an explanatory variable. Institutions are like the myths and ceremonies present in societies; although not formed with some economic or rational ends in mind, they are created by similar cultural and sociological processes (Meyer and Rowan, 1977; Powell and DiMaggio, 1991). That is to say, culture itself is an institution (Hall and Taylor, 1996). Second, the SI also conceives of institutions as cognitive frames through which behaviour and action can be explained, understood and sometimes predicted. (Berger and Luckmann, 1966; Wendt, 1987) Institutions, when seen as providing meaning to social life, give us a richer understanding of how and why people actually behave in apparently “irrational” ways, because their very identity affects what a particular person in a specific situation “ought to do” in a non-moral but still normative sense. The SI views actors as behaving according to a “logic of social appropriateness” rather than the “logic of instrumentality” postulated by the RC (Campbell, 1995 as cited in Hall and Taylor, 1996).

This logic also has implications on how institutions change. SI sees change as a function of social legitimacy, of what is considered “right” by society. This is defined as a matter of cultural authority, which is then made contingent on the professional standards of certain epistemic communities. (Campbell, 1995; Meyer, 1994) There is then some sense in which SI reduces to HI. Norms, social appropriateness and culture authority all require time to evolve, in contrast to interest, which usually can change quite quickly. Like PD, the persistence of norms can also be justified on other than rational grounds, so that inefficient institutions persist because of prevailing norms. SI

can, therefore, be taken separately as a special form of HI, and in so doing, suffers from the same problem of explaining change. Under this model of institutional change, some form of learning brings about this change as actors are able to recognise that they would be better off under new institutional arrangements. (Greif, 1998; North, 1990, 1994) It is not difficult to see that SI and HI match the first group of empirical literature discussed in the previous section, and that the RC matches the discussion on interests.

Differentiating Institutionalisms I: Change Mechanisms

Change	Rational	HI	SI
Focus	Agency	Structure	Agency
Source	Exogenous	Endogenous	Both
Type	Revolutionary	Evolutionary	Both

Differentiating Institutionalisms II: Motivations

Change	Rational	HI	SI
Inputs	Interests	Paths Dependence	Norms
Outputs	Certainty	Social equilibrium	Culture
Motivations Good	Self-interest	Certainty	Collective
Case	Privatisation	IWRM	Newater

So while RCs have problems explaining stability (why do institutions persist when benefits cease?), HI theories have problems explaining change (how do actors impose themselves on institutions?). From the empirical review of institutional change in the water sector, we see that RCs face the additional problem of explaining collective

action, while HI confronts an enduring agnosticism about the variables for success or failure of water reforms. Ideas are a way out of these blind alleys.

Dynamics of Institutional Change: The Ideational Turn

Campbell (1998) was probably the first to put forward a typology of ideas for institutional analysis. His effort addresses one of the key problems at the time - what are ideas and how do they impact policy? Campbell's typology is analytically powerful and remains one of the widely-used typologies today, with more recent variants (Schmidt, 2008) making finer distinctions. Campbell sees ideas as four types - programmes and paradigms, which are ideas of a cognitive nature. Programmes are ideas that help policy elites to chart a specific course of action, while paradigms are the background assumptions informing these policies. On the normative level, there are frames and public sentiments. The first are legitimating symbols which are used to communicate with the public and the second is the background or social landscape of public assumptions which then impacts what is considered to be legitimate by a certain community.

Table 4: Types of ideas and their effects on policy-making (Campbell, 1998)

	Concepts and theories in the foreground of the policy debate	Underlying assumptions in the background of the policy debate
Cognitive level	<i>Programmes</i> Ideas as elite policy prescriptions that help policy makers to chart a clear and specific course of policy action.	<i>Paradigms</i> Ideas as elite assumptions that constrain the cognitive range of useful solutions available to policy makers.
Normative level	<i>Frames</i> Ideas as symbols and concepts that help policy makers to legitimise policy solutions to the public.	<i>Public sentiments</i> Ideas as public assumptions that constrain the normative range of legitimate solutions available to policy makers.

Table 5: Ideational Elements in Water Reforms (modified from Campbell, 1998)

	Concepts and theories in foreground	Underlying assumptions
Cognitive level	<i>Programmes</i> NEWater in Singapore, Creation of YRCC in China, Concessionaire contracts in Jakarta.	<i>Paradigms</i> Recycled drinking water, IWRM, privatisation
Normative level	<i>Frames</i> Reason versus yuck factor, integrated and participatory governance versus fragmented, regulatory state over high public subsidies.	<i>Public sentiments</i> To be investigated.

In this thesis, Campbell's typology is operationalised as in Table 2, for the empirical investigation of the dynamics of change. Having an idea of the different variables, and with a working definition of ideas, we can then assess the current efforts at working out the ideational dynamics of institutional change.

One of the foremost proponents is Blyth (1998, 2010) who explores the ideational pathways through the RC model. He argues that ideas are the causative factor behind institutional change, closely linked to but not identical to interests. First, he argues that interests are a "cluster" concept that includes beliefs and desires. "If interests are a function of beliefs and desires and if agents are confused about their desires – for example, in situations of high uncertainty - then logically, agents' interests are unstable too." Given this, holding ideas apart from interests makes little sense. For Blyth, ideas allow people to "diagnose" the situation and pick the institutional form that best reduces their uncertainty.

He sees this move as "bringing ideas back in" to the dialogue of institutionalism. He works with the broad notion that ideas are part of the RI bags of tools, arguing that "the explanatory import of ideas cannot be appreciated so long as the analyst

maintains a separation of ideas and interests. Instead, analysts should see interests as being necessarily ideationally-bound, particularly in situations of Knightian uncertainty such as periods of economic crisis". (2002: 34)

There are however, a few problems with his notion of institutional change. First ideas are not necessarily bound to interests. For example, a group of people may share the same ideas (a market-driven paradigm for example leading to the privatisation of the water utility) but quite different interests (profits for the private operator, a reduction in the need for infrastructure expenditure for the government, and better access to water for members of the public). In his defence, Blyth maintains that ideas are intimately related to interests but not reducible to them. But it is unclear how his position is different from that of the pure RC who says that ideas only become important when they move people sufficiently, that is when they see the promulgation of these ideas as being in their interest. Second, Blyth argues that it is ideas not institutions that reduce uncertainty. But how is this done? The dynamics of this ideational impact remain murky and a matter of speculation. There are at any one time, many ideas that float about in any given society, held either by groups of people that may be large or small, and may be held loosely or fervently. Do all these ideas reduce uncertainty and do they all do so to the same degree? Or is it only when they become embedded in society that they become operative?

Blyth would concur with the last point but having made ideas somehow distinct from interests, he cannot then tell us how they operate to influence change. For example, what is the life force behind these ideas? Are they held discretely - that is one idea by itself, or in a lump as in a philosophy? Discrete interests operate by providing incentives for actors to behave rationally in the realisation of these interests, but how do discrete ideas cause change? What is their persuasive power aside from that of

maximising utility? How do they reduce uncertainty? This notion of uncertainty reduction brings about its own problems. We first have to distinguish between individual and collective uncertainty. At a time preceding institutional change, or at a time of crisis, there may be great collective uncertainty, but there may not be any trouble with *individual* uncertainty. Indeed, it is likely that the two may not coincide, since it is possible that crisis or inaction in policy, is held by strongly held positions (both for and against a particular course of action), rather than sheer agnosticism about what is the right thing to do. In fact, a diversity of competing ideas may in fact *increase* uncertainty.

In short, Blyth faces two problems. First, actors aim sometimes, but not always, to reduce uncertainty. Motivations may sometimes be cognitive in which reduction of uncertainty must play a large part, but they may also be normative or aesthetic. Second, Blyth argues that ideas “solidify” into institutions, but how does he make the jump from the individual to the collective? The ideational dynamics remain uncertain, although he does seem to think it is evolutionary. In arguing for an ideational path in the realisation of interests, Blyth says that “it is only by reference to the ways that agents think about their condition within an uncertain evolutionary order that the actual path of institutional change can be fully explained”. Rather than a pendulum that goes from one extreme to another, institutional change should be conceived as a linear project that makes Man (or Institutions) ever more perfectly adapted to the environment. I shall explore this notion of evolutionary change more deeply in the discussion below on Tang’s (2010) model.

But first, however, we should note two important advances that Blyth makes in the ideational turn. First, he himself suspects that ideas are not to be taken singly but needs some sort of cognitive device to weave them together into a plan for action. He

says "...ideas do not merely reduce uncertainty for agents with pre-existing interests. Instead, they change and reconstitute those interests by providing alternative narratives through which uncertain situations can be understood". But he does not say very much about this process, aside from referring to "causal stories" that account for a certain state of affairs. Second, he makes an important point about the need for legitimacy, arguing that "following the delegitimation of existing institutions, new ideas act as institutional blue prints". (Blyth 2002: 40) This purposeful legitimation model contrasts with a parallel effort at elucidating the dynamics of institutional change. (Tang, 2010)

While Blyth worked with the RC model, Tang works within the HI tradition and postulates that institutions change by way of social evolution. An ideational HI is one in which ideas are selected and then turned into institutions, with competition of ideas and a struggle for rule-making power at the heart of this process.

Tang's model postulates that institutional change is a matter of social evolution. This, he argues is "fundamentally different" from biological evolution "because ideational forces are at play in social evolution". Institutions are "solidified ideas" (as per Boland, 1979: 964; Durkheim, 1950; Hayek, 1960) and not all ideas turn into institutions. "The process of institutional change is essential about selecting a very limited few of those numerous ideas and then turning those lucky few into institutions." He then takes ideas as genes, institutional arrangement as phenotypes and the process of institutional change as variation-selection-inheritance. In speaking of the actual processes of change, Tang thinks of the first stage as being a struggle for power to set rules, in the political mobilisation of physical resources and political support to set rules. Then, the intellectual appeal of an idea and political entrepreneurship determines whether ideas get selected. As "consistent with the

dynamics in biological selection, only some mutations survive the selection and are expressed in phenotypes”. (2010:36) After this, comes the third stage of legitimation and stability.

I agree with the notion that ideas are codified in institutions, and that the process of change is about selection of these ideas. However, his understanding of dynamics of change may pose some problems – despite his avowal to the contrary, variation-selection-inheritance is still an essentially biological process. The main problem with Tang’s model is that his notion of evolution must either be a truly biological one or merely analogous to it. If the first, then it makes the mistake of assuming that what is true of biological organisms singly must be true of a collection of organisms. The fallacy of composition counts against the assumptions of his theory, unless empirically proven; and any such test must be difficult since it purports to show that a collection of people evolves as a particular organism does.

Tang himself would opt for the second, a merely analogous account. What then is the form of such evolutions and what is the basis of selection? If indeed, ideas were means by which agents play out power games, or choose between different cognitively attractive candidates, this reduces, in a sense, to the Blythian model. Such responses surely must be particular and unique, with each new situation creating new responses. Ideas after all, are the projects of, among other things, serendipity and innovation. Why then, is there a need for an analogy with evolution? Unlike biological evolution, there is no “good” at which ideational evolution aims. Even if we accept (as I do not) the uncertainty-reduction role of ideas, is a teleological evolutionary frame for institutional change warranted by this role? The role of luck which Tang alluded to, also appears to be another recourse to the *deus ex machina* of the HI.

The above are the two key theoretical attempts to put ideas back into institutional change theories but as I have shown, the exact dynamics of the interaction between ideas and path dependencies for HI, and with interests for RCs, remain to be explored. For example, the RC (like Blyth) does not know how ideas and interests interact and fit with each other. For the HI (like Tang), there is a difficulty in outlining the impact of ideas on institutions.

In the meantime, from the empirical end of the stick, the same question has been tackled with greater success. We have noted earlier that Ostrom's study of virtuous collective actions provides a nagging counterfactual to the RC calculus model. In her research, she has found evidence that not all individuals are self-interested egoists, thus falsifying much of the behavioural realism that underlines the economics of free-rider theory. Many people do have a collective view of what is "good." For example, experimental literature on trust games shows that 30 to 40 per cent of people act in a purely self-interested way. This means, as Ostrom points out, that "60 to 70 per cent of the other individuals who tend to follow more complex strategies involving some level of trust and reciprocity".¹(ed Gintis, 2008:254) Ostrom herself has empirical demonstrations in which people re-define their self-interest in way that most benefit the community. Her important conclusion, as summarised by Rothstein (1999:12) is that the institutional form constrains human actions as "the logic of action varies, according to the *institutional forms* within which individuals must act".

That is to say, institutions cause people to re-define their self-interests, sometimes to the good of the collective, other times to its detriment. There is no logical necessity or deterministic path in this. But our suspicion is that *collective and synchronised* nature of the change requires some institutional input. How do people define their self-

¹ Moral Sentiments and Material Interests, Herbert Gintis, ed.

interest to align themselves with the collective? How do they see the “big picture” so clearly, that they obey the set of rules? The ideational turn, therefore, appears to need a methodological advance.

A recent new institutionalism, discursive institutionalism (DI) proposes to address this. Schmidt (2008) writes that DI is a collective term for all “methodological approaches that take ideas and discourse seriously, by focusing on the substantive content of ideas and/or on the interactive processes that serve to generate those ideas and communicate them to the public”. (see Schmidt 2002, Ch. 5, 2006, Ch. 5, 2008). Her work builds on past scholars who have thrown their weight behind the “ideational turn in policy”. (Campbell and Pedersen, 2001; Hay 2001, 2006)

DI is thought to be a theoretical step forward because it “explains change from the inside, by showing how real actors’ ideas in discursive interactions construct and reconstruct their choices and courses of actions”. (Schmidt, 2008) It analyses, not only cognitive and normative ideas (often in terms of explicit interests) but also internal motivations – that is why people do what they do, the discourse resulting from communicative activities. This is an “internal” point of view, as opposed to HI, which takes a disembodied view of change as a historical sweep. Another advantage is that with an internal point of view, DI no longer needs to see institutional change as being a product of exogenous events. Rather, it can account for change through ideational shifts, in collective conversations and “agents’ ideas about how they layer, reinterpret, or subvert those institutions and to the discursive interactions by which actors reach collective agreement”. (Schmidt, 2008)

DI therefore addresses the problem presented by the theoretical impasse of the HI and RC models, as well as Ostrom’s empirical puzzle on institutional diversity. Given that a diversity of institutional form is possible in any given situation, choosing from

among them will require picking the one which is best constructed to meet the needs (whether defined as interests or norms or histories) of the community. A working hypothesis incorporating the role of interests is that people voluntarily re-define their self-interest and their perception of policies because of the existence of a collection of rules that compel them to do so, a social construction of an institution that is perceived to be legitimate. This perception can be shaped by politicians, bureaucrats, the media, the people themselves. But the process itself is not entirely internal to the person. And it is neither comprised nor reducible to a mere aggregation of self-interests. The outcome of this analysis would illuminate the black box of institutional analysis - *how* do some institutions compel obedience? In Ostromian grammar, this thesis can be seen to be a study of how incentives both economic and normative are created and maintained, and how they confer legitimacy to institutions. This allows us to place ideas at the heart of the exploration of institutional change. Before we can conduct an empirical test however, there are two additional pieces to the puzzle – a concrete interpretive method, and a social constructivist definition of institutions.

Interpretation of Ideas

How do we investigate the dynamics of interaction between ideas and institutions?

I propose to use an answer located within the interpretive turn in the social sciences. I use a hermeneutic approach to argue that ideas impact the process of change in the way that they are interpreted by the policy community and embedded within existing narratives or frames. I regard this transformation of information as the production of narratives, joining effort with others who see narratives originating from policy makers who create target populations with policies, (Ingram and Schneider, 2005) from the media who present a collective social view, (Leong, 2010) or from an epistemic community. (Crawford, 2006) Along with Emery Roe (1989, 1994), I argue

for the need for stories to understand institutional change in policy issues. Roe writes: “The ability of public managers to tell a good story about a policy issue and their ability to manage the perceptions of issue uncertainty and risk are directly related.” (1989:267)

Two important characteristics of narratives are given by Fischer (1993), who locates narratives squarely in the domain of policy change with three main arguments. First, he says, narratives are qualitatively understood. He says: “It is not the knowledge in belief systems per se that holds the members of such coalitions together, but the “storylines” that symbolically condense the facts and values basic to a belief system.” Unlike beliefs, these storylines cannot be analysed quantitatively but can only be understood qualitatively.

Second, they can possess a non-logical structure “Rather than a stable core of cognitive commitments and beliefs, they share storylines that often tend to be vague on particular points, and at times, contradictory on others.” Last, they are normatively constituted. “Storylines are not just about a given reality. While they typically give coalition members a normative orientation to a particular reality, they are as much about changing reality as they are about simply understanding affirming it.” A narrative then is a reality constructed through a deliberative discourse. This last point is important; it leads us to see that reality is not a “given” but a normatively constituted one. From this then, we can see that it is a *change in narrative* that is pushing the policy change.

Having said what a narrative is, it is equally important for us to say what it is not. For one thing, it is not subjective; as Ricouer says, a narrative has an objective meaning that can be “constructed in various ways”. He noted that, in a public discourse, the problems of right understanding can no longer be solved by a simple return to the

alleged intention of the author (Ricouer, 1973), but must be construed by a process. “A text has to be construed because it is not a mere sequence of sentences, all on an equal footing, and separately understandable. A text is a whole, a totality.” Hence, while Fischer’s ideas on narratives are useful, they cannot be used in policy analysis without a more formal notion of “knowledge”. Not all stories are equally believable, and not all narratives equally persuasive.

Getting the Stories Right

From the foregoing, we see then that rules work by being interpreted by the community, and in a sense, rules succeed in guiding behaviour only insofar as people get their stories right. How then can we use the notion of narratives in empirical policy work? First, we need to see how the empirical is important in social science. Whereas the scientific mode of inquiry looks for causal mechanisms, the narrative includes not only externally observable empirical facts but also “social intentions and motivations”. Knowledge is therefore expanded “beyond the narrow confines of observational statements and logical proof to include an understanding of the ways people are embedded in the wider social contexts of situation and society”. (Fischer, 1993)

Understanding policy change, therefore, requires us to take a thick descriptive approach. Fisher writes: “The key to explaining how change comes about has to be grounded in a detailed contextual examination of the circumstances at play in specific cases. For this purpose, quantitative methods have to take a back seat to qualitative research.” This follows the broad field of “interpretative policy analysis” advocated by such thinkers as Yanow (2007). So far, we agree with Fisher’s narrative approach. Where we part company is at his “deliberative governance” model, in which the goal

of public policy is to improve the policy-making process by improving the democratic process. For Fischer then, policy making is rooted in a particular context – that of Western liberal societies, which have the wherewithal and the social inclination for widespread civic participation.

We feel that the task of understanding narratives can (and perhaps should) be taken in a politically neutral fashion, for example, as suggested by Feldman et al (2004). Second, we need a tool or some criteria for public knowledge. Kaplan (1986) has proposed a useful set of internal criteria which relate to justification, truth and community. Making the case that the construction of a public policy is like the construction of a narrative, he writes that a good narrative is “true, rich and consistent, coherent and unified”. For Kaplan, truth comes from the storyline being empirically-verified. At the same time, he observes that often conflicting accounts of a story can be empirically verified - that is to say, there is more than one “true account”.

Given this then, it falls to a richer account to hold the upper hand. This, I see as a matter of justification – an account is richer if it is able to “convey a feel for many possible true stories and performs the difficult task of selecting the most appropriate one”. It is also able to integrate all factors that need consideration. And finally, it has to be credible and believable - that it has to meet the “same consistency, congruency and unity” tests that literary theorists have applied to fictional narratives.

In this thesis, we make use of these ideas by employing two contrasting ideas of what a narrative could be - a thick and a thin version. The thin version is not a false narrative; but it is an incomplete one. In Kaplan’s account, the thin narrative is merely one of many accounts that can exist. It can, moreover, be bettered by a “richer” or thicker account, which takes more factors, views and ideas into account.

This also mirrors Yanow's account. She notes that in public policy, some goals are "verboten" - that is, "publicly unspeakable because there is no explicit public consensus underlying them". (1992:400). It is in these silent spheres that what she calls "myths" appears, performing the necessary duty of facilitating "tacit understanding" and communication about these goals. For Yanow, these myths are constructed from a particular point of view – mainly the policy makers. This is also tied up with political necessities such as maintaining "public silences about contradictions". (1992: 418) In the thin narrative, what is politically "unspeakable" lies unspoken. In the thick narrative, these silences are filled and made whole.

Framework for Analysis: A Subjective Theory of Institutional Change

From our discussion above, we have seen that institutional theories of institutional change can explain either stasis or change but not both. More recent theories have incorporated the role of ideas to resolve this dilemma but the current gap is in understanding exactly how ideas effect change. This gap can be bridged by an empirical investigation of the dynamics of institutional change, and in so doing, contribute to a general theory of institutional change. A confluence of three factors allows me to design research project that will enable this empirical investigation. First, the theoretical debate which has ripened to the stage at which discursive institutionalism can be operationalised through a discourse analysis.

I propose to do this through the already robust conceptual framework of Saleth and Dinar which has been tested on research of more than 130 water utilities across the world. This is a framework formulated to take into account "subjective factors" such as perception, mind change and political articulation.

The third piece of the puzzle comes from the data generation. This is done through the Q methodology, which allows the quantification of public perceptions, an otherwise subjective element, which can be captured, studied and analysed objectively. These latter two elements shall be discussed in this section. Given all the foregoing, this is a research project that demands a clearer understanding of the ontology of institutions.

What Are Institutions *Really*?

In our exploration of how ideas impact institutions, let us first review their ontology - are institutions ideational? That is to say, are institutions and ideas made of the same “stuff”? Most institutional theorists would say that they are. North (1990) and Arrow (1990) conceive institutions as structures that humans impose on their economic and social interactions. North (1990) says that “institutions are the humanly devised constraints that structure human interaction. They are made up of formal constraints (rules, laws, constitutions), informal constraints (norms of behaviour, conventions, and self-imposed codes of conduct), and their enforcement characteristics”. Together, he says, these institutions define the incentives in society.

In their seminal study on water institutions, Saleth and Dinar see institutions as “subjective constructs”. (Saleth and Dinar, 2004: 26) North himself suggests this when he writes of institutions as “mental constructs” or “subjective model”, (North, 1986) and he goes on to explore this part of institutions in theories of learning and cognition. With this recognition, we see that there is a gap in current literature, i.e., the role of perceptions in institutional change. As Saleth and Dinar point out, it is not information *per se*, but the *perception* of information that accounts for how institutions are constructed and changed. (Salath and Dinar, 2004: 64)

Ostrom too would say that institutions are ideational. She noted: “One of the most difficult problems in the study of institutions is how to identify and measure them. Because institutions are fundamentally shared concepts, they exist in the minds of the participants and sometimes are shared and implicit knowledge, rather than in an explicit and written form” (Ostrom, 2010).

What then does an ideational concept of institutions look like? North (1990) himself has presented a theory of institutional change in which he says that the “agent of change is the entrepreneur, the decision-maker in organisations”. He argues further that “it is usually some mixture of external change and internal learning that triggers the choices that lead to institutional change”.

Ostrom notes that according to Max Black, the word *rule* is used to denote regulations, instructions, precepts, and principles. In institutional studies, it is employed mainly in its *regulation* sense, rules refer to something "laid down by an authority (a legislature, judge, magistrate, board of directors, university president, parent) as required of certain persons (or, alternatively, forbidden or permitted)". (115) One example of this sort of rule is: "The dealer at bridge must bid first.". In most institutional analysis, rules are used as regulation, and indeed, this is the way in which Ostrom uses the term most of the time.

At the same time, there exists another more ideational conception, which for Ostrom is captured in the notion of *shared understandings* by participants about enforced prescriptions concerning what actions (or outcomes) are required, prohibited, or permitted. (Ganz, 1971; Ostrom V., 1980; Commons, 1968) She sees rules as the result of efforts to achieve “order and predictability among humans by creating classes of persons (positions) who are then required, permitted, or forbidden to take

classes of actions in relation to required, permitted, or forbidden outcomes or face the likelihood of being monitored and sanctioned in a predictable fashion”. (Ostrom V., 1991) She sometimes calls these “principles”.

North also has an ideational version of rules. Institutions, he says that they are “the rules of the game” and organisations are the players. (North, 1990) They shape the incentives in society and provide the key to understanding social change. Institutions – they provide the structure of public life by making it predictable and “include any form of constraint that human beings devise to shape human interaction”.

For him, the ideational and non-ideational forms of institutions may be thought of as formal and informal. Formal constraints are such things as rules, laws, constitutions, and informal constraints are norms of behaviour, conventions, and self-imposed codes of conduct as well as their enforcement characteristics. Together, he says, these institutions define the incentives in society. He suggests that formal and informal institutions change differently, due to different factors governing them. Formal institutions change because of a change in the process by which such institutions are formed. “As a result of legislative changes such as the passage of a new statute, of judicial changes stemming from a court decision that alters the common law, of regulatory rule changes enacted by regulatory agencies, and of constitutional rule changes that alter the rules by which other rules are made.” Informal institutions change for the same reason but “they occur gradually, and sometimes quite subconsciously as individuals evolve alternative patterns of behaviour consistent with their newly-perceived evaluation of costs and benefits”. The agent of change is the decision maker (or leader) in different organisations.

In this way, North appears to provide a role for principles in his idea of institutions - principles are a form of *informal constraint*. Elaborating on them, he says that while formal rules come from a certain regulated process, informal rules somehow emanate from a society. He sees that as (1) “extensions, elaborations, and modifications of formal rules (2) socially-sanctioned norms of behaviour and (3) internally-enforced standards of conduct”.

All these three ways are consistent with how we conceive of principles. North’s third characterisation of informal constraint as “internally enforced standards” is especially useful. Such standards, he says, can be captured by economic models because they interact with material incentives: a person is willing to give up “wealth or income or some other value in his or her utility function”. For example, people are willing to pay more for coffee that is grown by farmers who are paid a fair price, despite such coffee costing more. This is because our notions of fairness and equity trump our rational drive for the best bargain. This shows that informal constraints have an impact on the real economy and not an unimportant point.

To summarise, we see that both Ostrom and North have an ideational form of institutions which they call “principles”, whether institutions are defined as “shared understanding” or “humanly devised constraints on action”. At the same time, these principles appear to be logically distinct from rules. Hence an ideational form of institutions must comprise both rules and institutions. A socially constructed notion of institutions, therefore, will provide the view that an institution comprises not merely rules (formal or informal) but also a statement of principle that provides normative incentive for action. This is the unit of analysis which we shall be concerned with.

To summarise, *formal institutions* change because of a change in the process by which such institutions are formed. *Informal institutions* change for the same reason but “they occur gradually, and sometimes quite subconsciously as individuals evolve alternative patterns of behaviour consistent with their newly-perceived evaluation of costs and benefits”. (North, 1990) The agent of change is the decision maker (or leader) in different organisations.

North seems to think that informal institutions change relatively slowly. But, in public policy, change in political institutions, both formal and informal, has been noted to progress through “punctuated equilibrium” (PE), i.e., periods of relative stability, punctuated by crisis and change. This theory has been borne out by empirical work, for example, by True, Jones and Baumgartner (2001). They found that for American political institutions, “the result over time has been institutionally-reinforced stability interrupted by bursts of change”. The weight of evidence (data from 1947 to 1999) is impressive. Most of the time, they argue, political systems are stable and operate by means of “policy monopolies”. These monopolies do not endure forever and they “can be constructed and they can collapse”. This work has also been replicated by other theorists and it appears incontrovertible that political regimes go through “punctuated” stages of change. Time appears to be an important factor to investigate and thus forms part of our investigation in this paper.

The work of Baumgartner *et al* also speaks about the dynamics of change.

(Baumgartner and Jones 2001) They write that what accounts for policy change is the interaction of beliefs and values concerning a particular policy (“policy image”) and the prevailing set of political institutions (“policy venue”). This interaction can lead to the “rapid creation, destruction and alternation of policy subsystems”. The examination of perception in this regard is interesting because it feeds into the belief

systems. The policy image may be negative or positive – and this informs our tagging of the variables in our analysis later on.

Prima facie, therefore, this work appears to modify North's theory by asserting that crises have power to bring about large and fast changes in informal institutions. But, while this PE theory is able to give a good descriptive account of the issue from a macro-perspective, it is only able to tell us *that* change happens during a crisis, it cannot tell us *how*. A weakness of the theory is that it is almost entirely *post facto*, *i.e.*, “we can only know after the fact what successful mobilisations were”. (True, Jones and Baumgartner, 2001)

In this context, employing a different but more micro level of analysis may help. Culpepper (2008) deconstructs the process of institutional change into three stages, *i.e.*, crisis, experimentation and consolidation. In a study of union negotiations, where new ideas and new facts bring about a change in entrenched positions, such crises are seen as “common-knowledge events”, which lead to the “emergence of shared ideas in a highly contested area such as wage bargaining”. So, it is seen here that during crises, there is creation of knowledge and an accelerated rate of learning.

This knowledge creation relies on a constructivist approach² - on the fact that there are agents and actors who create such knowledge. Culpepper says this process is a “political act” which depends on the use of reasoned argument about cause and effect “in a context of shared experience”. From this approach to institutional change, we see, then, that once a crisis has been identified, the second stage is ripe for learning and the creation of new norms. “Common knowledge creation, if it happens at all,

² Finnemore (1996), Risse (2000), Schimmelfennig (2001)

takes place during the period of institutional experimentation, and the process of persuasion is central to it.”³

Under this model, therefore, the creation of new, cooperative institutions does not “require a particular history”. That is to say, as long as there is a shared sense of crisis, the creation of common knowledge can move parties from having “highly incommensurable views” to a “convergent set of views”. Culpepper’s analysis is made in the context of the economy and wage bargaining but serves equally well for the water reuse policies.

Crisis, therefore, presents an opportunity to create knowledge and change in informal institutions – it does not turn on a “particular history” or policy context, but can be applied generally. Taking this specifically to water reuse policies, we see that informal institutions such as water norms are formed by the personal beliefs and convictions of the people affected. This, in turn, is influenced by the rate of learning, which, in turn, is affected by the sense of crisis and the ability of actors or leaders to effect the change in personal beliefs and convictions of the people affected by the institutions. The foregoing points us to a realisation that there is an interpretive element that is embedded within institutions.

The Methodological Premise

From the above then, we see that we require an investigative frame that does two things: 1. Postulate that subjective ideas or ideas held are central. 2. Provide the hermeneutics of institutional change. Both are in Saleth and Dinar’s theory of inter-subjective institutional change. (2005:67) The crucial element that we are interested in is the “mind change” - working on this are objective and subjective factors - and a

³ The politics of common knowledge, p.6

third called “information and learning” is a hybrid of the two. The original framework is in Figure 1.1 below:

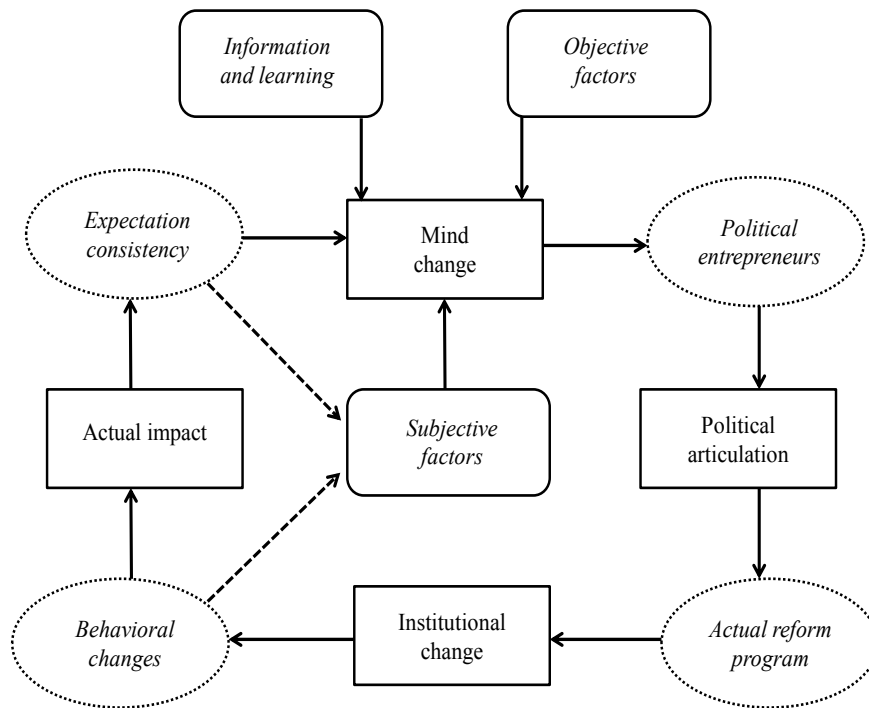


Figure 1.1: Original framework of inter-subjective institutional change (Saleth and Dinar, 2005)

As can be seen, this is a stage-based theory, where the change is initiated by the mind change, which then results in political articulation, institutional change and finally the actual impact. This is a circular rather than linear process, subject to constant subjective and objective feedback and adaptations. Subjective factors include ideology, bias as well as personal beliefs and weaknesses (“ignorance” has been pointed out) while objective factors include price, technology change and physical constraints (Saleth and Dinar, 2004:78)

Perception occupies a key role in initiating change as well as in evaluating its impact, making this an explicitly constructivist approach. As the writers list the factors affecting mind change, they introduce a subtle normative dimension: “positive roles” are assumed by learning and information, whereas “purposive and biased campaigns”

by powerful interest groups can also alter or “distort” perception. Subjective factors are at the centre of the model, since even expectation consistency and behavioural changes are a matter of perception. Given our discussion on the role of ideas and learning above, a slight modification is made in the framework shown below.

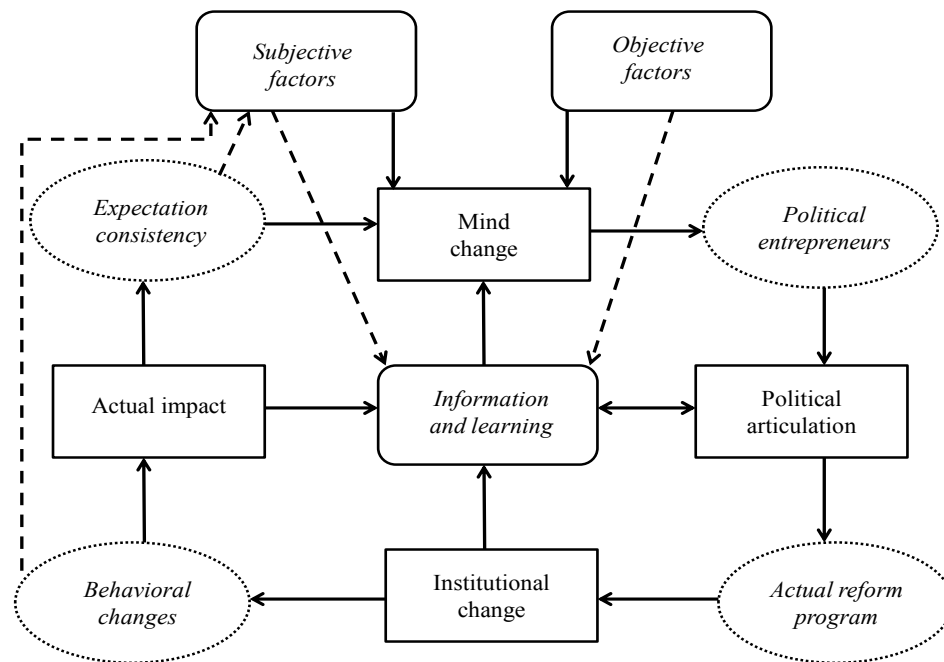


Figure 1.2: Modified framework of inter-subjective institutional change

This framework speaks to the subjective element in institutional change - but one clarification may be important - the word “subjective” here refers to the necessarily private nature of perceptive and individual mind change. It does not, however, signal that theory itself is completely non-foundational. In this way, Saleth and Dinar cannot be open to the same objections that have been levelled against, say Fisher, by Lynn (1996) that “anything goes”. For this reason, rather than “mind change”, the model is modified to give central place to learning and information, which are fed both by objective and subjective factors. This is a small but crucial change in the framework since learning is not merely something exogenous to the framework but a variable that

is influenced, shaped and constructed by these institutions, and which in turn, in another iteration of change will do the same to institutions.

This places information and learning - ideational elements - at the confluence of such change, and the communication of these ideas as the distribution channel for mind change. That is to say, ideas are placed in this model of institutional change. This modification also allows some iterations to take place between learning and each of the stages - political articulation, institutional change and the actual impact. These in turn will impact on learning and information which in turn leads to some mind change or perceptions, which leads back to the two stages involving actors - political articulation and mind change. In this model, our area of investigation focuses on the arrow pointing from the information and learning to mind change. The final piece of the puzzle shows how we generate data for this investigation.

Q methodology

The Q methodology (or Q sorting) provides the “researcher with a systematic and rigorously quantitative means for examining human subjectivity”. This method is based on two basic assumptions: first that subjective viewpoints can be communicated, and second is that such viewpoints are presented from a self-referent position. As long as these two assumptions are taken on board, and can be tolerated by the resulting analysis, there is no reason to believe that such perceptions cannot be the subject of objective, quantitative analysis. This method was picked primarily for this empirical investigation because it allows us to appreciate the particulars of the case, without losing the generalisations that policy analysis requires. As pointed out by van Eeten (2001): “Q methodology condenses the variation of views, opinions and

ideas into a set of basic positions, problem definitions or dimensions underlying the debate.”

This method has been increasingly used by policy analysts in recent years for its ability to “uncover and represent stakeholder positions and their interrelations. (Durning, 1999; Lynn, 1999; Pelletier et al, 1999) Durning (1999) argues that Q methodology is primarily employed by post positivists in their analysis, because it goes beyond the usual quantitative tool bag. In this case, Q methodology can be seen as a tool to capture qualitative responses quantitatively. The interviewees come from three main groups: political leaders, water managers, planners, consultants, and members of the public who were affected by the policies.

Second, for a Q sort, large numbers are not important. Barry and Proops (1999:339) refer to this as a “finite diversity” of a particular issue. According to Brown (1980), there is only a limited number of distinct viewpoints that can exist on different topics. If a Q sample is well-structured, it must represent all these viewpoints. This allows us a reasonable basis to examine the social construction of the water policy at hand. It also answers more general methodological questions about the reliability and generalisability of the results from a Q sort.

Given this then, I use the Q methodology to generate data allowing us to examine specific ideational elements leading to the mindset change. The data sits into the type four of Campbell’s typology which I reproduce below.

In this exploration, I shall use three key central ideas and see how they work as these four levels. From a *prima facie* fitting of these elements into Saleth and Dinar’s framework, we see that the “cognitive level” ideas seem to fit into the objective factors while the normative level ideas seem to be “subjective”. These, however, go

through some transformation before they can effect a “mind change”, and this thesis is concerned with that process.

Conclusion

In this chapter we have seen that the current empirical work on institutional change in the water sector has identified path dependencies, norms and interests as key drivers of change. This reflects the larger theoretical landscape, with three varieties of “institutionalisms”, historical, sociological and rational choice on the dynamics of change. It is then argued that non-ideational versions of these institutionalisms do not work; especially in the water sector they confront problems such as an enduring agnosticism about the process of change, or the puzzle of collective action. We then argue for a socially constructed view of institutions, and for empirical investigations of how ideas bring about institutional change by way of justifications or incentives. We show how this can be done using Saleth and Dinar’s framework of subjective institutional change. That is to say, ideas induce change by showing why a new state of affairs is better (economically or normatively) than the old.

But this “showing” is by no means a straightforward process; it is rather, one of social construction and interpretation. In this, narrative values such as truth, richness and coherence will lend some explanatory (if not predictive) power to the institutional change at hand. Applying this specifically to institutional change then, we see that institutional change will only be successful if the narrative constructed by the interpretive community is a “rich” one that provides some legitimacy for the change. There is, therefore, something in ideational elements that provide a justificatory force for a certain set of actions. Moreover, these ideas cannot be merely read off from a disinterested observer’s point of view, but must be interpreted by the community to

which they apply. The final step, therefore, is to examine how this interpretation impacts the success or failure of institutional change. The next chapters work out these propositions, in particular the link between ideas, institutional change and each of the three variables - norms, path dependencies and rational interests.

There are in short, three working hypothesis with which we approach the next three empirical chapters:

1. Ideas cause change through a process of interpretation under which a thick narrative emerges. This narrative provides a way to tolerate conflicts between existing and newly-introduced rules, principles and norms.
2. Institutional change is successful when a new narrative appears, and the selection from among the many possible sets is a matter of hermeneutic choice. Given this, and further if we see institutions as rules that guide human behaviour, then we may provide *prima facie*, for two sorts of rules: ordinary, specific rules, what North calls “formal” rules, and broader, discursively-determined propositions what I shall call principles.
3. Finally, not all ideational elements are institutions, and not all ideas are created equal. Given that there is some notion of hermeneutic choice, such narrative criteria as including truth, coherence and richness must count in these choices.

Chapter Two: Yuck and Rationality: Recycled Drinking Water in Singapore.

Introduction

There is broad agreement among water experts today that the current lack of water is less a physical limitation than the result of poor management or water governance.

This, in turn, is a function of other factors such as pricing, management, and infrastructure. Within this broad area of water governance, however, there remains a relatively unexplored issue - why do people in cities still face a water shortage when they can use recycled water for drinking?

A major United Nations report in 2012 on water states that: “While most cities would refrain from using treated waste water as a source of drinking water, this avenue is also available and has been implemented, for example, in water-scarce Singapore and the International Space Station, without ill effects.” (UNESCO, 2012) United Nations Secretary-General Ban Ki Moon said that he would recommend the strategy of recycling waste water to water-stressed countries, citing the particular case of Singapore. Mr Ban said: “The Singaporean experience and know-how should be shared by many countries which have water scarcity problems.”

But implementing recycled drinking water is a notoriously intractable problem.

Many countries have tried to implement recycled drinking water to no avail. The most commonly-cited obstacle is what has been called the “yuck” factor; in fact, this factor has been found to be the only statistically significant factor in empirical studies. (Po et al, 2005) Although this human aversion, the visceral “yuck”, is a well-recorded psychological fact, little has been written about it in connection to the use of water-reuse policies. (Po, Kaercher and Nancarrow, 2003) The case of Singapore presents a *prima facie* counterfactual to the prevailing view that the psychological barrier is an immutable one, a “social fact” with its own logic that cannot be overcome by science

and reason.

This chapter takes a cross-disciplinary approach to examining the success of Singapore in implementing its water-reuse policy. From the field of water governance, it can be seen that this “yuck” factor has been a fairly intractable problem in the implementation of water-reuse policies. From the field of institutional theory, we find that “yuck” can be usefully thought of as part of the social norms and customs - the informal institutions - surrounding water issues. From institutional analysis, and in particular that of discursive institutionalism, we construct the framework for analysis - how ideas make a difference and how do they change the norms or informal institutions.

This chapter pulls together these different approaches to give an exposition of how norms are formed in water-reuse policies, how the “yuck” factor is presented in public discourse, and finally, how these affect the implementation of such policies. Overall, the theoretical aim of this chapter is to tie the issue of water-reuse implementation to research on informal institutions and use this framework to examine how such informal norms change.

Linking this to the larger research process, this chapter is an investigation of ideas interacting with the prevailing norm of the “yuck” reaction to drinking recycled water. In particular, what ideational elements were key in the pro and anti-reuse camps, the dynamics of discourse and the key institutions that were created in the process.

Recycled Water, “Yuck” and Discourse

One often mentioned perception of reused water is the “yuck” factor. This feeling of distaste is a well-known effect in water reuse and has been variously defined as a “psychological repugnance”, “disgust”, or “profound discomfort”. (Marks et al, 2008) Paul Rozin, a professor of psychology at the University of Pennsylvania,

observes the characteristic facial expression: “There’s a grimace, the lower jaw drops, the tongue sticks out, and the nose wrinkles”. (Schmidt, 2008) Accompanying this feeling of disgust is usually a feeling of fear.

In his article on the “wow to yuck trajectory” of science, Kulinowski (2004) noted that what is astonishing and wondrous to scientists and, sometimes, to laymen, can soon degenerate into something unacceptable. For example, genetically-modified food was once hailed as the solution to world hunger but has now been vilified as a destroyer of the natural order. In the same way, nanotechnology holds much promise for many of the world’s problems. It is natural, he argues, that any technology that promises so much change is bound to generate controversy, “because with such awesome power comes the capacity to push beyond boundaries that society has deemed acceptable”. In other words, “societal and ethical concerns can rapidly turn ‘wow’ into ‘yuck’”. (Kulinowski, 2004)

This is well captured in what can be thought of as an “irrational” rejection of drinking recycled water. While technology can eradicate every microcosm of dirt and urine from sewage water, it cannot wipe out the mental association. There may be no rational basis for the “yuck” factor. But it is perhaps reasonable to expect even scientists to shudder at having to drink water recycled from a collection of toilet waste.

Another analogy is that “to some, the idea of drinking recycled sewage is akin to eating cockroach-chip ice cream - unthinkable, even if shown to be safe”. (The Australian, 2007)

It is no wonder then that the reason for implementation failure of water reuse policies has been laid at the door of the “yuck” factor. (Stenekes et al, 2006) Sensational news stories have centred on the potential health risks and scare tactics used by

politicians to score points. Researchers in Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO) (Po et al, 2005) have isolated this "yuck" as one of the few statistically significant

factors in influencing water-reuse policies. As a result of this and other empirical studies, scholars have concluded that water reuse is limited by the public's willingness to drink water that has been recycled.

The unsurprising conclusion is that "public acceptance" still has to be won in those countries or states which have faced problems in implementing water reuse. Hence in Singapore (since 2001), and California (since 1962), the public have accepted water reuse and hence, such policies can be implemented smoothly, whereas in many states in Australia, these policies have been rejected because the public cannot accept them. However, formulating the problem this way is unhelpful.

What do we mean by "public acceptance"? How do we measure it, and is a unanimous acceptance by the public a necessary condition for the success of water policies? Since there are instances of people actually accepting recycled drinking water, it clearly cannot be an immutable psychological barrier. Is it, then, a case of reason trumping instinct?

First, we see that a review of empirical studies so far (Margolis, 1996) demonstrates that there is a wide disparity in the percentage of people who support water reuse across different studies. Among those who oppose water reuse, there are those who adopt their point of view based on an inadequate (or erroneous) understanding of the science behind water recycling. Kulinowski writes of the downward trajectory of this route - scientific breakthroughs usually starting out with strong public support, with what he calls the wow factor because of the potential benefits to the economy, human health or the quality of life. But this happy stage is followed, sometimes, by "a profound discomfort with human attempts to outsmart Mother Nature". In the case of

genetically-modified food, this discomfort was confronted when the gene of a cold-water fish was spliced into that of a tomato to help the latter better withstand frost.

“In a sense, this industry (GM food) went from ‘wow’ to ‘yuck’ to nearly bankrupt”. (Kulinowski, 2004) In his discussions, Kulinowski writes of a “wow” and “yuck” index but does not ground this in any empirical data, although he did point to the media and public acceptance as playing parts in this change in perception. His advice, therefore, is for sound technical data to be made available and for “open dialogue with all stakeholders”. (Kulinowski, 2004)

Russell & Lux (2009) bring Kulinowski’s work further on from psychological analysis to locating the debate in cultural and social domains. They say that “there appears to be no compelling argument or evidence that negative reactions to recycled water cannot change with opportunities to learn about the issue”. These reactions, they point out, can shift as conditions, practices, meanings and values change. (Russell and Lux, 2009)

Given this, a question which arises is thus: can the natural visceral reaction be erased or ameliorated by science and rationality? The answer is unclear, although there is some evidence that public communications have an effect on acceptance (Dingfelder, 2004). At the same time, the issue of choice is an important one - with the sense of crises, of there being no alternative being a key motivating factor. For example, it has been reported that in Israel, there is little need to convince the population of the need to recycle since the water shortage is clearly evident. (Bruvold and Crook, 1981; Dishman, Sherrard and Rebhun, 1989) But again, we do not know what constitutes a “crisis” of water shortage, and in what sense the perception of the public is important. So, the jury is still out about the level of public acceptance needed for “successful

implementation”, and whether those people do not accept such policies say so because they are genuinely opposed or because they just do not have sufficient facts.

Given all the above, for water managers to persist in testing, quantifying and measuring public acceptance for water-reuse policies, with a sort of “census approach”, is unhelpful. In short, even though we know that “yuck” is a determining factor in whether recycled drinking water policies succeed, a review of the impact of public perception and acceptance in extant literature turns up more questions than answers. As Stenekes et al (2006) put it, “there has been inadequate exploration of the reasons for the lack of success of water recycling by the water industry or what this means for water management institutions”.

This chapter is an effort in this exploration via understanding the norms, customs and beliefs of a community regarding recycled water; that is, its informal institutions. The methodological premise derives from the nature of public perception and informal institutions discussed in the first chapter. Discourse influences how people think about the issue of recycled water, and constructs these norms. To examine discourse and the resulting ideas, we undertake a discursive institutional analysis, pulling together the key elements of the idea for recycled drinking water, as well as the public perception of these ideas.

Water Reuse in Singapore

In 1997, Singapore publicly stated that it was aggressively looking at alternative sources of water. There was, in a sense, a crisis engendered by the difficulties with Malaysia over the price of raw water (an issue which remains unresolved today), with

the Malaysians threatening to increase prices by at least six times, and with no set formula to peg future increases.

At the time, the country had already been aware of its water shortages for about 30 years - since independence, the country has been importing water from Malaysia of which it had been a constituent part at the point of independence as a colony from Britain. In 1998, the Singapore Water Reclamation Study (NEWater Study) was initiated as a joint initiative between the Public Utilities Board (PUB) and the Ministry of the Environment and Water Resources (MEWR). The study made explicit that wastewater was being studied as a source of raw water. The water would go through a purification and treatment process using membrane and ultraviolet technologies. It would then be mixed and blended with reservoir water and undergo conventional water treatment to produce drinking water (a procedure known as planned indirect potable use or planned IPU).

By 2001, the PUB released NEWater for non-potable use - wafer-fabrication processes, non-potable applications in manufacturing processes as well as air-conditioning cooling towers in commercial buildings. In 2003, the PUB introduced NEWater (about one per cent of total daily water consumption) into its water reservoirs. The amount will be increased progressively to about 2.5 per cent of total daily water consumption by 2011. The journey towards the introduction of recycled water for drinking, however, was one that had started some 40 years ago.

The Place of Water in Singapore

The lack of water was a clear indicator of the precarious position that Singapore was in, at the point of independence. Singapore achieved full internal self-government (from the British) in 1959, became part of Malaysia in 1963, and gained independence

in 1965. At the time, there were about 1.6 million people⁴ living on the island, mainly crowded into the city centres. Public-health provision was poor, and waterborne disease such as cholera was common because of poor sanitation facilities. The Singapore River, which runs through the heart of the city, was an open sewer. During the wet season, many parts of the city were underwater, whereas during the dry months, water had to be rationed. This was common especially in the 1960s, with rapid urbanisation, as well as increasing demand from industry and domestic consumption. For two years in the mid-1960s, Singaporeans experienced its longest water rationing exercise - water was only supplied from 8 a.m. to 8 p.m., three times a week. This island-wide 12-hour rationing was introduced on 7 May 1963 and relaxed only in January 1964. It ended a month later, with the return of the rains.⁵ So, from the very beginning, the place of water in Singapore was a matter of high public interest, its scarcity was a fact of social life.

Water security was also a matter for diplomacy and foreign relations, given the fact that it was dependent on Malaysia for much of its water supply. In this paper, I discuss the three main factors behind the perception of water in Singapore - Singapore's relations with Malaysia, economics of water and pricing, and the "yuck" factor in drinking recycled water.

Water from Malaysia

Singapore has been importing water since 1927. During the water crisis of September 1961 to January 1962, water rationing meant some hardship for its people and ⁶ in

⁴ In 1960 as in Department of Statistics.

⁵ Clean, Green and Blue: Singapore's Journey Towards Environmental and Water Sustainability, p.125-126, Y.S. Tan, T.J. Lee, K. Tan.

⁶ Water: Precious Resource for Singapore, p. 4 - 5, Public Utilities Board Singapore, 2002.

1961, the City Council signed the 1961 Water Agreement with the State of Johor in Malaysia. Under this agreement, Singapore had the “full and exclusive right and liberty to take, impound and use all the water” within the Gunong Pulai and Pontian catchments, and Tebrau and Scudai Rivers, up till 2011. In 1962, another agreement was signed “for the supply of up to 250 million gallons of water per day (mgd) from the Johor River, until 2061”.⁷ Three years later, it became clear that the merger of Singapore with Malaysia was untenable because of deep fissions due to differences in beliefs over racial equality - Malaysia wanted a country where Malays had special rights, whereas Singapore wanted one in which all races were equal. This was captured in the trenchant choice between a “Malay Malaysia” and a “Malayan Malaysia”.

This failed merger led to difficult bilateral relations, especially over water. The first Prime Minister, Lee Kuan Yew, recounted at Singapore’s first International Water Week in 2008 how Malaysia’s first Prime Minister, Tunku Abdul Rahman has planned to hold Singapore hostage over water. The Tunku told then Britain’s High Commissioner in Kuala Lumpur that “if Singapore’s foreign policy is prejudicial to Malaysia’s interests, we could always bring pressure on them by threatening to turn off the water in Johor”.⁸ This was *realpolitick*, notwithstanding the legal standing of the 1961 and 1962 Water Agreements. This security dimension to water security had a key impact on how people felt about water in Singapore and provided a special place at the policy-making table for water issues.

In 1971, the Water Planning Unit was set up to complement the PUB’s work under the Prime Minister’s Office (PMO). The first Water Master Plan after independence

⁷ Clean, Green and Blue: Singapore’s Journey Towards Environmental and Water Sustainability, p.139-140, Y.S. Tan, T.J.Lee, K.Tan.

⁸ Dialogue with Minister Mentor Lee Kuan Yew at the Singapore International Water Week, Jun 2008.

was drawn up in 1972, and it is here that non-conventional sources either through water reclamation or desalination were first mooted. The planners recommended that Singapore be ready to deploy these sources, even though they may not be used for normal supplies. At the time, large scale desalination had already been used in the Middle East for about a decade. Other alternatives such as water reclamation through reverse osmosis were also tested in Jurong Industrial Water Works which supplied low-quality recycled water to industries. The high cost and low reliability of these methods meant that they did not gain very much support for large scale implementation.

However, demand for water grew exponentially in the 1980s and 1990s. Catchment areas and the supply from Malaysia increased, but consumption levels were so high that the Government was compelled to launch an education drive. It was at that time that institutional incentives and measures were put in place - water-saving devices such as constant-flow regulators and self-closing delayed action taps were made mandatory in all non-domestic premises. In June 1988, a Memorandum of Understanding on water and gas was signed between Prime Minister Lee Kuan Yew, and Malaysian Prime Minister Dr Mahathir Mohamad, following which two agreements were signed in 1990 to allow for the construction of the Lingui Dam. (Kog, 2001)

This was a period of calm and harmonious relations, during which Singapore was increasing water imports from Malaysia through water agreements, MOUs for constructing reservoirs and agreements to construct more dams. But it was not to last. Soon after the start of the Asian Financial Crisis in 1997-1998, relations between the two countries deteriorated. In 1999, three meetings were held between Singapore and Malaysia at the top officials' level to try and make progress on water and other

bilateral issues. In the early 2000s, Malaysia itself suffered water shortages and some quarters in Malaysia argued that water should go to Malaysians rather than being sold to Singapore. By August 2000 and early September 2001, tensions had run so high that then Senior Minister Lee Kuan Yew had to visit Kuala Lumpur. After that, both sides agreed on a revised agreement, under which Singapore would pay 45 sen per thousand gallons of raw water from Johor, from the three sen set in the 1961 and 1962 Water Agreements. The agreement also provided for a price increase to 60 sen per thousand gallons after 2061, and will be reviewed every five years.

But this legal document provided little comfort. Between September and December 2001, there was a continual stream of allegations from the Malaysia media, calling Singapore an “insincere” and “ungrateful” neighbour who has been “exploiting” Malaysia’s scarce resource. Malaysian Prime Minister Mahathir Mohamad himself led a rally in Johor where thousands of UMNO members chanted “potong, potong” (“cut, cut”), urging that Singapore’s water supply be cut.⁹

Table 6: Water Agreements between Malaysia and Singapore

<u>Year</u>	<u>Agreement Details</u>
1927	Singapore draws water from Malaysia. Johor buys back 800,000 gallons of treated water from Singapore at 25 cents per 1,000 gallons. Also permits Singapore to rent 2,100 acres of land in Gunong Pulai, where the waterworks were located. Cost of waterworks, dams, pipelines, and reservoirs to be borne and built by Singapore.
1961 (50 years)	Expired in 2011. Singapore has the “sole and absolute right to draw off

⁹ The Straits Times, 01 July 2012, “Water still not seen as a scarce resource”

and take all water available in, under or upon any part of the land”.
Singapore shall pay three sen for every 1,000 gallons of water drawn.
Malaysia to buy back 12 per cent of the total water supplied to
Singapore in treated form at 50 cents per 1,000 gallons.

1962 (99 years) Expires 2061. Singapore can draw from the Johor River, a maximum of 250 million gallons per day at three cents per 1,000 gallons. Johor can buy back two per cent of water at 50 cents per 1,000 gallons.

1990 Supplements the 1962 agreement. Singapore can construct water infrastructure such as the Lingui dam. Singapore paid the Johor Government RM 320 million as compensation for the permanent loss of the use of land referred to in the agreement, the loss of revenue from logging activities in the form of premium, royalty and cess payment and for leasing the land.

As Minister Mentor Lee Kuan Yew said in 2008: “We were under serious blackmail - I can find no better word for it...”¹⁰

It was clear that a crisis had been reached and Singapore had to move into something that it had been putting on the backburner - recycled water. Singapore had been experimenting with recycled water since 1974. Singapore’s first pilot water reclamation plant, a joint project by the PUB and ENV which cost \$1.3 million, was the Jurong Industrial Waterworks (JIWW) on Jalan Ahmad Ibrahim. The plant had

¹⁰ Dialogue with Minister Mentor Lee Kuan Yew at the Singapore International Water Week, Jun 2008.

problems such as a strong smell of ammonia. It was subsequently shut down in late 1975 after the trial.^{11 12} But by the 1990s, there were more good quality membranes and the cost had halved.¹³ In the middle of the fight with Malaysia, in 1998, government officials revisited the of recycling water,¹⁴ going to the United States, including Southern California, Orange County, Occoquan, Florida, to study recycling methods. It was at that time that they discovered that overcoming the psychological barrier would be a tough battle - water in these places was recycled and injected into the groundwater before being supplied for drinking, even though the quality of the recycled water was already good enough for direct consumption. After the visit, the Government constructed a demonstration plant to test recycled water and in May 2000, a \$6.5 million plant started operations.¹⁵

Since then, Singapore has let the 2011 Water Agreement lapse, opting instead for recycled water. Malaysian media called Singapore an “ingrate” and mocked it for drinking water from “the toilet”. Some of them spoke of “calling Singapore’s bluff”, and did not believe in this breakthrough. At the Second Ministerial-level meeting in Singapore on the package of outstanding bilateral issues in September 2002, Malaysia was uncompromising on the water issues, and insisted on a quick and steep rise in the price of raw water. In October 2002, the package negotiation was arbitrarily called

¹¹ The New Paper 06 Sep 2002 Page 8, “Nothing New About NEWater, Really”. Similar report in The Straits Times 06 Sep 2002, page H2.

¹² Channel NewsAsia documentary 28 Aug 2002 “Thirsting for New Sources”.

¹³ Today 28 Aug 2002 Page 3, “NEWater An Old Idea”. Channel NewsAsia documentary 28 Aug 2002 “Thirsting for New Sources”.

¹⁴ Background Brief on NEWater Page 1, PUB.

¹⁵ The New Paper 06 Sep 2002 Page 8, “Nothing New About NEWater, Really”. Similar report in The Straits Times dated 06 Sep 2002, page H2.

off.¹⁶ Malaysia's leaders have also been brought to see Singapore's NEWater treatment plants.

In September 2002, the name NEWater was given to recycled drinking water, an additional source of drinking water.¹⁷

Elements of Discourse: The “Yuck” Factor

Lack of public acceptance has been cited as one of the toughest obstacles to implementation of potable water recycling across the world. In Singapore, the shaping of NEWater in the minds of the public begun with reporters brought to the US (Orange County) and the UK (London) to show them how recycled water was then used for drinking. Aside from the media, the Government also embarked on a public education campaign on NEWater.¹⁸ The message they wanted to get across – drinking recycled water is not new. It has been practised in the US for more than two decades without any long-term health effects. Meantime, the quality of NEWater is comparable to or exceeds that of drinking water elsewhere in the world.

Minister for the Environment, Lim Swee Say, was a key driver in the process, speaking with 300-400 community leaders at a time, to explain to them the NEWater process.¹⁹ Bottled NEWater was produced for public sampling and distribution at key events. A centre devoted to recycled water was also set up. Meanwhile, drawing on nationalistic feelings during the celebrations of the country's independence day during

¹⁶ NEWater Case Study Page 12 - 13, 16 Jun 2003, Y.P. Chua (PUB), A.K. Nayar (MFA), A. Kam (MTI), H. Seah(PUB), C.J. Tan (Mindef), H.K. Wong (MHA).

¹⁷ Background Brief on NEWater Page 1 & Page 2, PUB.

¹⁸ Oral History Interview with Tan Gee Paw, Ref 3170, Oral History Centre, Project on The Civil Service – A Retrospection.

¹⁹ Oral History Interview with Tan Gee Paw, Ref 3170, Oral History Centre, Project on The Civil Service – A Retrospection.

the 2002 National Day Parade, some 60,000 participants toasted Singapore with NEWater, including Senior Minister, Lee Kuan Yew, and the Prime Minister, Goh Chok Tong.

An examination of the national newspapers provides a proxy of the public understanding of the time. From 1997 to 2008, there were 223 reports about recycled water in Singapore's newspapers, namely The Straits Times, The New Paper, and The Business Times. Of these, 171 carried positive tones or opinions about recycled water, which the Government eventually named "NEWater". The positive reports centred on how Singapore need not depend on Malaysia for a long-term water supply, and how safe it was to drink water that was recycled. By the time NEWater began flowing into reservoirs in February 2003, the focus of subsequent media reports was on newer water recycling technologies that could produce more NEWater and at a cheaper price. These technologies later made Singapore attractive to firms looking to do research and development in water recycling.

During the same period, there were nine reports that had negative tones or opinions about recycled water. Many of the reports were related to how NEWater would affect bilateral relations with Malaysia. Politicians in Malaysia took potshots at NEWater, warning their people that the water in Singapore could be unclean and even suggesting that Malaysia should sell sewage and not water to Singapore. There was one report in The New Paper that said more had to be done to promote NEWater as there was not much awareness about it in the heartlands.

Of the reports, 40 contained the "yuck" factor, with 29 positive stories, or stories that were supportive of the recycled drinking water project. Positive stories included stories about the Government assuring Singaporeans that the water was safe to drink, public acceptance, and about how foreigners were giving the thumbs-up to recycled water after tasting it. Negative stories included those about Malaysian politicians and

media suggesting that NEWater was not clean and was unsafe to drink. The majority of the stories were supportive of water-reuse policies, using rational grounds for justification.

First, and importantly, it is noted that public acceptance played very little part in the discussion. In this sense, this finding squares with the current literature that rhetoric about acceptance is counter-productive. In a comparative study between Singapore and Australia, where there was an unsuccessful attempt to introduce recycled drinking water in the latter, it is important to note that the key difference does not lie in the acceptance of one side, and the rejection of the other. On both sides it can be seen that media reports of public attitudes are conspicuously absent. (Leong, 2010)

The chief difference lay in the framing. In Singapore, the most common adjectives are “cheap” (or variations such as “cost less”), “purified”, and “tried and tested” (for variations such as “not new”, “track record”, “used in other countries”). This contrasts with adjectives used in other countries such as “treated effluent”, “toilet to tap”, and “shit water”. Language used for recycled water has an impact for willingness to accept it, as studies have shown. Menegaki *et al* (2008), for example, have shown that framing treated “wastewater” as “recycled water” increased the willingness to use by both farmers and consumers.

In understanding the opposition to recycled drinking water, some appreciation of the polarised pairs arising from this initial discourse analysis may be helpful. Barthes wrote, “Every joining of two antithetical terms, every mixture, every conciliation - in short, every passage through the wall of the Antithesis - thus constitutes a transgression.” (Barthes, 1974). In the case of recycled drinking water - introducing a psychological distasteful element into something that needs to be pristine and clean, something that is essential to life is naturally controversial.

The various antithetical pairs are presented below.

Table 7: Polar Pairs in Text

Antithetical Pairs	Contrast
toilet / tap	purity versus danger
secrecy / information	transparency versus closed
visceral reaction/ science	experts versus ordinary

Language, therefore, is not unimportant to water reuse. Singapore's discourse in the news media has consistent key messages. First, water reuse has a good track record and has been used in many other developed countries. Second, political leaders drank reused water openly and frequently. Third, identical words are used by all political leaders. This has the overall effect of reducing uncertainty in the public. In short, the elements of the discourse are outlined below:

Key elements of “thin” discourse has the key narrative that drinking recycled water is an activity supported by science but rejected by the public because of the “yuck” factor.

1. People don’t accept recycled drinking water because of the “yuck” factor.
2. They don’t understand the science.
3. They need more information.
4. The problem can be treated as a matter of science and technology.
5. The problem can be solved by more explanation, communication and better public relations or education.

Discursive Institutional Analysis: Q Methodology

These statements were then subjected to a Q sort with 25 participants whose responses were inputted into the PQMethod software. The results generated are summarised below, with eight key factors identified as forming the key parts of the dialogue. The shaded statements are those which are least correlated with the factors at hand.

Table 8: The opinion continuum for the Q sort

<i>Number of statements</i>	5	10	20	10	5
<i>Statement Scores</i>	-2	-1	0	1	2
	SD	D	N	A	SA

<u>Factor 1: Technology can overcome water shortages</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
There is a need for better technology and engineering solutions as the demand for a secure water supply rises with	2	2	0	0	1	0	2	2

a growing global population. (17)								
It is a responsibility for all Singaporeans to keep water not only clean but also not to waste it. (39)	2	1	0	0	1	2	1	1
Water shortage was once a headache for Singapore but NEWater has increasingly allowed Singapore to be less reliant on Malaysia. (26)	2	-1	1	-1	-1	0	0	-1
NEWater is a key part of self-reliance. (37)	2	0	0	1	-1	0	0	1
Water conservation projects, such as installing water-saving thimbles on taps to reduce water consumption, are not enough to meet Singapore's increasing water needs. (2)	2	2	1	0	-2	-1	0	0
New methods of producing water like NEWater may lead to higher water tariffs. (27)	-2	0	0	-1	0	-2	-2	-1
Today we are taking Singapore's own sources of water for granted. (38)	-2	1	-2	-2	1	0	1	-2
It is a challenge to secure public acceptance and encourage industry use of NEWater. (24)	-2	1	0	0	0	-2	-2	-1
Factor 2: Water security remains a real problem	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
Water conservation projects, such as installing water-saving thimbles on taps to reduce water consumption, are not enough to meet Singapore's increasing water needs. (2)	2	2	1	0	-2	-1	0	0
Water security is a real problem that should not be glossed over as an unnecessary worry. (35)	1	2	1	0	1	1	1	1
There is a need for better technology and engineering solutions as the demand for a secure water supply rises with a growing global population. (17)	2	2	0	0	1	0	2	2
Even with the increased supply of water from NEWater, it is important to treat water as a security issue. (19)	1	2	1	0	1	0	1	2
The flow of clean, plentiful water is essential to our economy and society so it should not be taken for granted. (23)	1	1	0	0	2	1	2	0
Government support is needed to help companies in research and development as well as exporting their products. (43)	0	1	0	-1	0	0	0	0
Singapore has the opportunity to provide the water sector leadership by offering the most conducive environment for	-1	-2	-1	1	0	0	0	-1

innovation and devising best management and operational practices for water and sanitation service delivery. (47)								
The private sector in Singapore has shown willingness and ability to partner with the public sector to improve access and delivery of water and sanitation services; and water problems confronting the world today has shown that government efforts alone are not enough so the private sector must step in as well. (48)	0	-2	-2	-1	-1	-1	0	0
Water is a precious commodity and should be priced as such to ensure no one wastes it without feeling the pinch. (4)	0	-2	2	0	2	-2	0	0
The price of water has to take into account its scarcity as well as the cost of supplying and cleaning it. (29)	-1	-2	2	1	1	0	0	1
<u>Factor 3: Water should be priced to reflect the cost of supply</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
Water is a precious commodity and should be priced as such to ensure no one wastes it without feeling the pinch. (4)	0	-2	2	0	2	-2	0	0
The price of water has to take into account its scarcity as well as the cost of supplying and cleaning it. (29)	-1	-2	2	1	1	0	0	1
NEWater is reclaimed water that has undergone purification and treatment processes. (11)	-1	0	2	-1	0	1	-1	1
NEWater helps to ensure Singapore's water supply is not affected during dry months, which we may see more of as climate change causes rainfall to become unpredictable. (1)	-1	0	2	2	0	1	0	2
NEWater is part of Singapore's efforts to manage the entire water loop of water usage, collection and production. (6)	0	1	1	1	0	1	-1	0
NEWater is one of Singapore's four "taps" and an important part of its water supply. (12)	1	0	1	-2	-2	1	1	2
Today we are taking Singapore's own sources of water for granted. (38)	-2	1	-2	-2	1	0	1	-2
Continual research into all aspects of water production can lead to lower water prices for Singaporeans. (46)	-1	-1	-2	-1	1	0	-1	-2
Singapore-based companies have burnished the country's reputation in the water industry by winning large projects overseas in Vietnam, China and Australia. (42)	0	0	-2	1	0	0	-1	0

<u>Factor 4: Innovations in water management ensure a good supply of water</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
NEWater helps to ensure Singapore's water supply is not affected during dry months, which we may see more of as climate change causes rainfall to become unpredictable. (1)	-1	0	2	2	0	1	0	2
Singapore applies the same pricing to industry as well as domestic users up to a certain level of consumption of water because both sectors have an equal responsibility to conserve water. (31)	-1	-2	-1	2	0	-1	0	0
Singapore is now recognised as a global hydro hub for its innovative water management. (25)	0	-1	-1	2	-1	0	-1	0
The drive to be self-reliant has given Singapore the room to be totally self-sufficient if there is no new water agreement with Malaysia in 2061 when the second water agreement expires. (28)	0	0	0	2	0	2	2	0
NEWater shows that environmental sustainability is not incompatible with economic development. (16)	-1	1	-1	2	-2	0	1	1
The price of water has to take into account its scarcity as well as the cost of supplying and cleaning it. (29)	-1	-2	2	1	1	0	0	1
NEWater is a strain to Singapore's energy network as it requires more energy to process than reservoir or imported water. (7)	-1	-1	0	-2	2	-1	0	0
Today we are taking Singapore's own sources of water for granted. (38)	-2	1	-2	-2	1	0	1	-2
NEWater is more energy-efficient than desalination. (13)	-1	0	1	-2	0	1	1	0
Energy consumption in desalination and reclamation technologies has to be reduced. (8)	0	-1	0	-2	2	-2	1	-1
<u>Factor 5: Spore needs to choose the most cost-efficient way to produce water</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
Singapore is simply too small to collect enough water for its domestic and industrial needs. (3)	0	1	-1	1	2	-1	1	0
Water is a precious commodity and should be priced as such to ensure no one wastes it without feeling the pinch. (4)	0	-2	2	0	2	-2	0	0
NEWater is a strain to Singapore's energy network as it requires more energy to process than reservoir or imported	-1	-1	0	-2	2	-1	0	0

water. (7)

Energy consumption in desalination and reclamation technologies has to be reduced. (8)

	0	-1	0	-2	2	-2	1	-1
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The flow of clean, plentiful water is essential to our economy and society so it should not be taken for granted. (23)

	1	1	0	0	2	1	2	0
--	---	---	---	---	---	---	---	---

Water reclamation is a long-term investment entailing huge costs in the short term but yielding benefit in the long term. (14)

	1	0	0	0	-2	2	-1	1
--	---	---	---	---	----	---	----	---

Water conservation projects, such as installing water-saving thimbles on taps to reduce water consumption, are not enough to meet Singapore's increasing water needs. (2)

	2	2	1	0	-2	-1	0	0
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NEWater benefits science in Singapore as it is a boost to the reputation of the scientific community and helps to attract more funding for water-reclamation research. (5)

	0	-1	0	0	-2	-1	0	0
--	---	----	---	---	----	----	---	---

NEWater is one of Singapore's four "taps" and an important part of its water supply. (12)

	1	0	1	-2	-2	1	1	2
--	---	---	---	----	----	---	---	---

NEWater shows that environmental sustainability is not incompatible with economic development. (16)

	-1	1	-1	2	-2	0	1	1
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Factor 6: Recycling water ensures independence and growth 1 2 3 4 5 6 7 8

The drive to be self-reliant has given Singapore the room to be totally self-sufficient if there is no new water agreement with Malaysia in 2061 when the second water agreement expires. (28)

	0	0	0	2	0	2	2	0
--	---	---	---	---	---	---	---	---

Water-related issues can harm business – everything from drought to pollution to increased water tariffs. (49)

	0	0	-1	-1	0	2	-2	0
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Business opportunities in water management are abundant as developing countries such as China, India and the Philippines have huge potential for water technology investment. (20)

	1	-1	-2	0	1	2	0	1
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It is a responsibility for all Singaporeans to keep water not only clean but also not to waste it. (39)

	2	1	0	0	1	2	1	1
--	---	---	---	---	---	---	---	---

Water reclamation is a long-term investment entailing huge costs in the short term but yielding benefit in the long term. (14)

	1	0	0	0	-2	2	-1	1
--	---	---	---	---	----	---	----	---

NEWater is more energy-efficient than desalination. (13)	-1	0	1	-2	0	1	1	0
Disagreements over the water agreements between Singapore and Malaysia were a matter of life and death and could have led to war. (44)	-2	-2	0	-1	-1	-2	-1	1
It is a challenge to secure public acceptance and encourage industry use of NEWater. (24)	-2	1	0	0	0	-2	-2	-1
New methods of producing water like NEWater may lead to higher water tariffs. (27)	-2	0	0	-1	0	-2	-2	-1
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>

Factor 7: The “Yuck” factor still exists and the science of recycling needs to be better known

The science of NEWater needs to be made better known to the general public. (9)	1	-1	0	0	0	0	2	-1
There is a need for better technology and engineering solutions as the demand for a secure water supply rises with a growing global population. (17)	2	2	0	0	1	0	2	2
The flow of clean, plentiful water is essential to our economy and society so it should not be taken for granted. (23)	1	1	0	0	2	1	2	0
The drive to be self-reliant has given Singapore the room to be totally self-sufficient if there is no new water agreement with Malaysia in 2061 when the second water agreement expires. (28)	0	0	0	2	0	2	2	0
There is still an element of instinctive repulsiveness in drinking recycled sewage water. (40)	-2	1	0	-1	-1	-1	2	-2

New methods of producing water like NEWater may lead to higher water tariffs. (27)	-2	0	0	-1	0	-2	-2	-1
NEWater helps in making Singapore a sustainable city by providing more potable water. (10)	1	0	1	0	0	0	-2	1
It is a challenge to secure public acceptance and encourage industry use of NEWater. (24)	-2	1	0	0	0	-2	-2	-1
Water-related issues can harm business – everything from drought to pollution to increased water tariffs. (49)	0	0	-1	-1	0	2	-2	0
Developing NEWater is strategic asset management at a time when global water scarcity is undermining economic progress. (18)	0	0	0	0	0	0	-2	2

<u>Factor 8: Because of climate change, recycled water is the way to go</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
NEWater helps to ensure Singapore's water supply is not affected during dry months, which we may see more of as climate change causes rainfall to become unpredictable. (1)	-1	0	2	2	0	1	0	2
NEWater is one of Singapore's four "taps" and an important part of its water supply. (12)	1	0	1	-2	-2	1	1	2
There is a need for better technology and engineering solutions as the demand for a secure water supply rises with a growing global population. (17)	2	2	0	0	1	0	2	2
Developing NEWater is strategic asset management at a time when global water scarcity is undermining economic progress. (18)	0	0	0	0	0	0	-2	2
Even with the increased supply of water from NEWater, it is important to treat water as a security issue. (19)	1	2	1	0	1	0	1	2
Continual research into all aspects of water production can lead to lower water prices for Singaporeans. (46)	-1	-1	-2	-1	1	0	-1	-2
There is still an element of instinctive repulsiveness in drinking recycled sewage water. (40)	-2	1	0	-1	-1	-1	2	-2
Today we are taking Singapore's own sources of water for granted. (38)	-2	1	-2	-2	1	0	1	-2
NEWater's origin as sewage has slowly ceased to be the centre of jokes. (30)	0	-1	-1	0	0	0	-1	-2
The most important thing may not be the water itself but effective water policy. (50)	-2	1	0	0	-1	0	1	-2

Ideational elements:

Factor 1	Technology can overcome water shortages
Factor 2	Water security remains a real problem for Singapore
Factor 3	Water should be priced to reflect cost of supplying it
Factor 4	Innovations in water management, such as pricing and recycling, help ensure good supply of water
Factor 5	Singapore has severe physical and energy constraints and needs to choose the most cost-efficient way of producing water
Factor 6	Recycling water is a way of preserving independence and continued growth
Factor 7	The science of recycling still needs to be better known and there is still an instinctive rejection of drinking sewage water (“yuck” factor).
Factor 8	As climate change and global water scarcity take root, recycled drinking water is the way to ensure water supply.

Table: Ideas about NEWater

Institutional Change: “Yuck” to NEWater

In Singapore’s case, three key discourses can be seen in the public perception to recycled drinking water. These three discourses are derived from the eight factors identified by the Q as follows.

Discourse 1: Technology can change current paradigms.

1. Technology can overcome water shortages
2. Innovations in water management, such as pricing and recycling, help ensure good supply of water

The introduction of a new source of water supply was unprecedented for Singapore, which has all along relied on two traditional sources of water - from local catchments

and imported water - since its independence 40 years ago. Within the discourse, the use of technology was firmly established, and contributed towards the level of trust that the population had in PUB water to NEWater.

In this, the discourse showed that a deliberate attempt was made to shift the attention away from the source by focusing on the treatment process, which involves using advanced, state-of-the-art membrane technology. The discourse was also partly shaped by the terms that the water utility chose for these new water products. They did not use internationally-recognised terms such as “wastewater” or “sewage” because these had a negative connotation. Instead, they called it “reclaimed” or recycled water.

This is a discourse which highlights the role of technology and reason; rather than pitching “yuck” against science it allows for the role of technology to be pitted against water scarcity. Water reuse is not new and has been used quite extensively and successfully in other countries, including the US. By explaining how other countries overcame similar problems when pumping treated sewerage back into the groundwater, rivers or other water supply systems, as well as detailing the science behind Singapore’s NEWater, there is a greater understanding and acceptance of NEWater.

The discourse also included international comparisons such as Orange County in California and Scottsdale in Arizona, showing that water recycling is not a new phenomenon, and that it has actually been a way of life for many years. At the same time, the policy makers took steps to meet the psychological reluctance to drink recycled water, for example, a significant part of the discourse was about how NEWater was never going to go straight from the plant to the tap. It was used by industry first, and then it was pumped into the reservoirs in a small but slowly growing proportion. All these measures again helped users understand that NEWater

was being monitored and tested closely to make sure the quality of drinking water was safe.

In short, instead of downplaying the “yuck” issue, the discourse was about how different countries dealt with their water problems differently and the results of these policies.

Scientific tests and technology were a key part of the policy change. The Government conducted a comprehensive study to ensure that NEWater was within the World Health Organization Drinking Water Guidelines and USEPA Drinking Water Standards. An independent expert panel comprising both local and foreign experts was set up. More than 20,000 tests were carried out and some 150 water quality parameters were tested. The expert panel also verified and confirmed that NEWater is suitable as raw reservoir water for Indirect Potable Use (IPU) in accordance with international practice.

The PUB was also transparent about the quality of NEWater, releasing technical data which compared well with international quality parameters.

The public was also kept informed of highly technical details such as the process by which Singapore reclaims its water.²⁰ First, used water is treated through conventional processes to globally recognised standards. Then it goes through three stages. First, microfiltration (MF) or Ultrafiltration (UF) where treated used water is passed through membranes to filter out suspended solids, colloidal particles, disease-causing bacteria, some viruses and protozoan cysts. The resulting water contains only dissolved salts and organic molecules. Second, reverse osmosis (RO), through a semi-permeable membrane which has small pores allowing only small molecules such as

²⁰ Background Brief on NEWater Page 1 & Page 2, PUB.

water molecules to pass through. Bacteria, viruses, heavy metals, and chemicals such as disinfection by-products and hydrocarbons cannot pass through. Finally, ultraviolet disinfection is used to kill all organisms and some alkaline chemicals are added to restore the pH balance.

All this information was not only made transparent, it was actively promoted and transmitted through the media as well as the visitor centre. For the more general public, who would not take in the technical details, the water authority also bottled NEWater in attractive plastic bottles. These were not sold but distributed free at community and national events.

Discourse 2: Water security is a problem with an economic cost

1. Water security remains a real problem for Singapore
2. Water should be priced to reflect cost of supplying it
3. Singapore has severe physical and energy constraints and needs to choose the most cost-efficient way of producing water

As has been pointed out by North (1990) and Culpepper (2001), a coherent communications message is needed to formulate “agreed ideas” and create genuine knowledge. Discourse 2 shows both the existence of a crisis at the time, and the need to address this crisis in the most cost-efficient way. In 1997, when the idea of recycled water was first mooted, it was at the time of the Asian Financial Crisis, as well as rising tensions with Malaysia. Rather than the highly politicised “there is no alternative” scenario, Singapore’s discourse is a rather more cold-blooded one, of opting for recycled drinking water because it was the most cost-efficient option. The discourse shows an open comparison between desalination and recycling water.

The pricing of NEWater was a subject that was openly discussed, together with the price of alternatives such as desalination. Before NEWater, Singapore had already established the principle of price recovery for its water tariffs. The same principle was applied to NEWater with a resulting tariff of \$1.30/m³.²¹ Deputy Prime Minister, Lee Hsien Loong, in explaining the price of NEWater said that “that when NEWater was mixed into the potable water supply system, all end users should pay NEWater cost as the marginal cost of water”.²²

NEWater was considered to be economically more attractive than desalination. In 1995, a team of government officials had visited the Middle East, and Malta to see desalination in practice. Then the average cost of desalinated water was \$1.60-\$1.80/m³. The team also studied the various resources required such as land, construction period, and building costs. Cost in Singapore was found to be high \$3.20/m³, as land costs in the countries studied were excluded because the land was provided by the government. Although the technology was not implemented then because of the relatively high cost, the Singapore Government kept experimenting.²³ In 2003, the Government awarded a contract for a desalination plant to supply desalinated water for 20 years from 2005.²⁴ Two years later, Prime Minister Lee Hsien Loong officially turned on the supply from desalinated water. The same testing since April 2005 and audited by the PUB’s external audit panel was carried out.²⁵ Salt extracted from the water was put back into the treated used water before discharging it

²¹ Water & Used Water Pricing (2009), Y.H.Wah, W.Yang

²² Note to Pre-Cab Ministers on Pricing of NEWater, 28 Aug 2001, DPM Lee Hsien Loong.

²³ Report on Desalination Study Visit to Saudi Arabia, Abu Dhabi & Malta (27 Jul to 8 Aug 95), Y.K. Chan, Director Water Department, 21 Dec 95.

²⁴ PUB Press Release “PUB Desalination project - Award of Tender” 19 Jan 2003.

²⁵ PUB Press Release “Fourth National Tap Flows” 13 Sep 2005.

back to the sea, so as to not interfere with the balance of the biodiversity.²⁶ In June 2010, the water authority PUB announced plans to build another desalination plant.²⁷

This economic comparison with desalinated water allowed recycled water to be framed as merely one option, weighed against others in terms of economic cost.

NEWater was not so much an ultimatum, it was a policy choice that was taken because it was the most cost-efficient at the time. The building of large and expensive desalinated plants showed that there were other options that could join the water supply puzzle when they became viable. While it was true that water was essential to life, and held a strong security and strategic dimension, the economic dimension was also strongly ingrained in the Singapore discourse.

This is not to say that the political confrontations with Malaysia did not feature. In fact, as can be seen in the statement “Water security remains a real problem for Singapore”, the public perception is still that Singapore remains vulnerable to Malaysia because of its reliance on Johor water.

Discourse 3: Environmental and global realities make it imperative to recycle water

1. Recycling water is a way of preserving independence and continued growth
2. As climate change and global water scarcity take root, recycled drinking water is the way to ensure water supply
3. The science of recycling still needs to be better known and there is still an instinctive rejection of drinking sewage water

Discourse 2 had created a sense of vulnerability to reduced water supply from the strained bilateral relations with Malaysia. There is, however, a more general threat

²⁶ Oral History Interview with Tan Gee Paw, Ref 3170, Oral History Centre, Project on The Civil Service – A Retrospection.

²⁷ PUB Press Release “PUB calls tender to build second and largest desalination plant in Singapore”, 30 Jun 2010.

from climate change and weather events, rather than the need to overcome water shortages which is demonstrated in Discourse 3. The statement “NEWater helps to ensure Singapore’s water supply is not affected during dry months, which we may see more of as climate change causes rainfall to become unpredictable” shows that recycled drinking water is not merely for drinking but part of a larger climate change resilience or business continuity plan. This links back to the economic incentives presented in Discourse 2. Indeed, we see that that all three discourses have many linkages to enable them to hang together in a coherent whole, although within themselves, there may be conflicting principles or ideas. For example, the “yuck” factor has not been eliminated by the scientific and technological elements in Discourse 1 and has surfaced in Discourse 3. There is here an explicit recognition that there remains an “instinctive rejection” but clearly, instinct is something that can be overcome. It is weighed against the larger need to cope with global environmental challenges as well as imperatives stemming from nationalistic sentiments. Rather than one side of the issue invalidating another, there is a weighing of different sides, with a resulting narrative that acknowledges the existence of both, but giving more weight to one.

Discourse 3 is significant because it has a wider relevance for other cities which face water shortages from change in climate patterns. If the need for recycled water is tied to a crisis stemming from personal survival (drinking water) or purely economic incentives such as use for industry, there is a danger for support falling when the sense of crisis is weakened. For example, if the crisis is caused say, by a drought or some short-term event, such incentives for accepting recycled drinking water may disappear when the rains appear as was the case in the Australian city of Toowoomba.

(REF) But with the sense of imperative emanating from a long-term event such as climate change, the need to recycle water becomes more sustained.

As Discourses 1 to 3 have shown, the basic narrative in recycled drinking water has, therefore, been transformed from a norms-based approach, focusing on the prevailing psychology reaction to drinking recycled water, to a more complex one, incorporating economic interests as well as national security. The narrative was no longer an either/or dichotomous discourse that pits the pro against the anti-water reuse camp (a thin narrative), but one that is thicker, making room for both camps, but allowing a principled stance for the acceptance of recycled water.

In short, the transformation was from:

Thin: Recycled water is supported by science but rejected by the public because of the “yuck” factor

1. People don't accept recycled drinking water because of the “yuck” factor
2. They don't understand the science
3. They need more information
4. The problem can be treated as a matter of science and technology, with no reference to historical/political context
5. The problem can be solved by more explanation, communication and better PR

To:

Thick: There are good reasons to accept recycled water despite the “yuck” factor

1. People have different reasons for accepting drinking water
2. The debate is not one of science over emotions

3. More information need not help; what is needed may be interpretative frames for the information
4. Science itself is not deterministic - it is finally agnostic about the issue
5. History and context matters - subtexts such as the struggle with Malaysia, which affect the issue

Conclusion

This chapter has analysed the attitudes and perception of the “yuck” factor as part of the social norms and customs - the informal institutions surrounding water issues.

Through a discursive institutional analysis, it illustrates how the construction of water reuse has had implications for its ability to move beyond the “experimentation” crisis phase of institutional change. The paper also outlined how the discourse of water-reuse policies can be located within a wider literature of informal institutions, and suggests some preliminary institutional changes that will help the implementation of water-reuse policies.

It can be seen that the discourse was not one that eschewed the “yuck” idea completely, or overturned it. Rather, the new narrative allowed the “yuck” element to exist, but provided a larger pro-reuse policy that was coherent with this element. In this, the various organisational and formal institutional forms were key partners in shaping public perception, public learning and, hence, institutional change in water norms.

Contrary to common perception, public acceptance in the form of a scientific survey or poll does not appear to be a necessary condition for successful implementation of water-reuse policies. That is, public acceptance as an implicit or tacit agreement

appears to work as well. The experiences of Singapore indicate that, relating to water institutions, at least the process of change in informal institutions can be fairly quick, even in cases when such changes is counter-intuitive.

These two findings add a richer dimension to the common explanatory variable of the “yuck” factor as a physiological norm against the implementation of recycled drinking water. Viewing “yuck” as a norm does not explain why this was able to change, the speed of this change, or the necessary conditions for it. Implanting an ideational element to it gives us greater explanatory power.

In addition, it also points us towards some ways in which current thinking on institutional change can be modified. One rich area of research is to explore the work now being done to study the effect of crisis on change. What is the role of crisis in informal institutional change? Is there something intrinsic in water that engenders a “crisis mentality”, thus making informal change faster than it usually is for other issues? While this chapter has been limited to the exploration of the mutability of a psychological reaction or norms, there is some *prima facie* support for theories that postulate a higher tendency for social learning during or after crisis events.

Culpepper’s for example, has a stage-based framework that sees institutional change as moving from crisis to experimentation and then consolidation. Culpepper says that during normal times, entrenched institutions are not easily displaced. During crises, however, a large number of players or actors upset the “cognitive bases” for such institutions. The search, then, begins for a new equilibrium, what he calls “institutional experimentation”. Such experimentation is characterised by “deep uncertainty” which places a premium on persuasive argument to create new

knowledge. This process of creation also turns on a constructivist approach.

(Finnemore, 1996; Risse, 2000; Schimmelfennig, 2001)

So, contrary to North's idea that informal institutions change relatively slowly, the speed of change can vary, depending on perception convergence. This exception to the rule has already been postulated by Saleth (2004: 96) and this study provides empirical support. In addition, it has been found that factors such as a positive representation of "yuck" as well as the social momentum, can make a difference to the speed at which social norms are formed.

Again referring to Culpepper's framework where crises are seen as "common knowledge events", leading to the "emergence of shared ideas in a highly contested area such as wage bargaining". So, it is seen here that during crises, there is creation of knowledge and an accelerated rate of learning.

Overall, this chapter is a fairly simple demonstration that ideas impact norms by eroding the relative attractiveness of different courses of action. For example, the "logic of social appropriateness" is not quite cast in stone, nor is it immune to other logics, for example, science and economics. The role of technology, the incentives presented by the prices, as well as less rational factors such as national pride, all played a part in justifying the switch to the new narrative.

At the same time, this simple test brings forward two other questions:

First, what is the status of these ideas that can overcome the logic of norms? From our discourse analysis, we have shown which ideas ultimately find their footing with the new narrative. But is there something special about the ones who made it, compared to the ones which did not? Second, if ideas cause institutional change by eroding the power of norms, are the same dynamics at play in the next closest thing to norms -

historical paths? The first question can only be answered at the end of this three-case investigation, but the second shall be answered in the next chapter, on the implementation of an integrated water resource management system in the Yellow River in China.

Chapter Three: Integrated Water Resources Management in the Yellow River

Introduction:

The Yellow River has presented a near-impossible policy challenge for officials in China. For more than 30 years, it has been running dry before it reaches the sea. Even as demand for water rises, both from households and industry, supply is shrinking due to heavy sedimentation and overuse. Things came to a head in the early 1990s, as a hit dry spell meant that water trucks had to be sent out to many villages to provide drinking water. The river stopped some 200km inland, with economic losses amounting to the millions of dollars and many hundreds of species of birds and plant life becoming extinct.

The crisis prompted some 160 scholars and scientists to lobby the government into taking some action, with a resulting series of sweeping institutional and regulatory reforms. One of the most significant is the appointment of the Yellow River Conservancy Commission (YRCC) as an umbrella body to govern the river. Ten years on from the reform, the river has run to the sea every year. However, constant tussles for water between industry and farmers remain. Pollution of the river continues to be severe.

This chapter traces the complex and contentious institutional change from a system of disparate and localised river management to a more integrated one over the past decade, from a fragmented and disparate structure into a more centralised and integrated one. At first glance, the policy success can be broadly thought of as an instance of integrated water resources management (IWRM), a governance tool for managing river basins. A commonly accepted definition is that by Global Water Partnership (2000), as “a process which promotes the coordinated development and

management of water, land and related resources, in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems”.

Although *prima facie* attractive, as a holistic and participative form of governance, it has been difficult to implement in practice. One reason often cited is the deep path dependencies and entrenched institutions that make it difficult to move to a more integrated mode of governance. A natural assumption for the success of IWRM in the Yellow River, therefore, would be that the centralised power structure of China, and the high tolerance for top-down decision-making led to the success of this regulatory form.

My examination of the transformation however, confounds this view. Rather than more centralised and top-down decision-making, it was found that local control and increased use of negotiation among the different parties remained and, indeed, may have increased under the reform and contributed to policy success. In the discourse analysis, the language of local benefits, joint decision-making and community ownership of water featured strongly as key themes. The use of technology, not merely to accrue gains but to distribute them, was also seen as important in ensuring a fair outcome.

Path Dependencies in the Yellow River

China had an extremely complex bureaucratic system in water resource management, which is made worse by the natural challenges presented by the Yellow River. The Yellow River is the second longest river in China, with a stream length of 5,464 km. It passes through nine provinces (Qinghai, Sichuan, Gansu, Ningxia, Inner Mongolia,

Shaanxi, Shanxi, Henan and Shandong), and provides water to a population of more than 140 million and 160,000 sq km farmlands in the Yellow River basin².

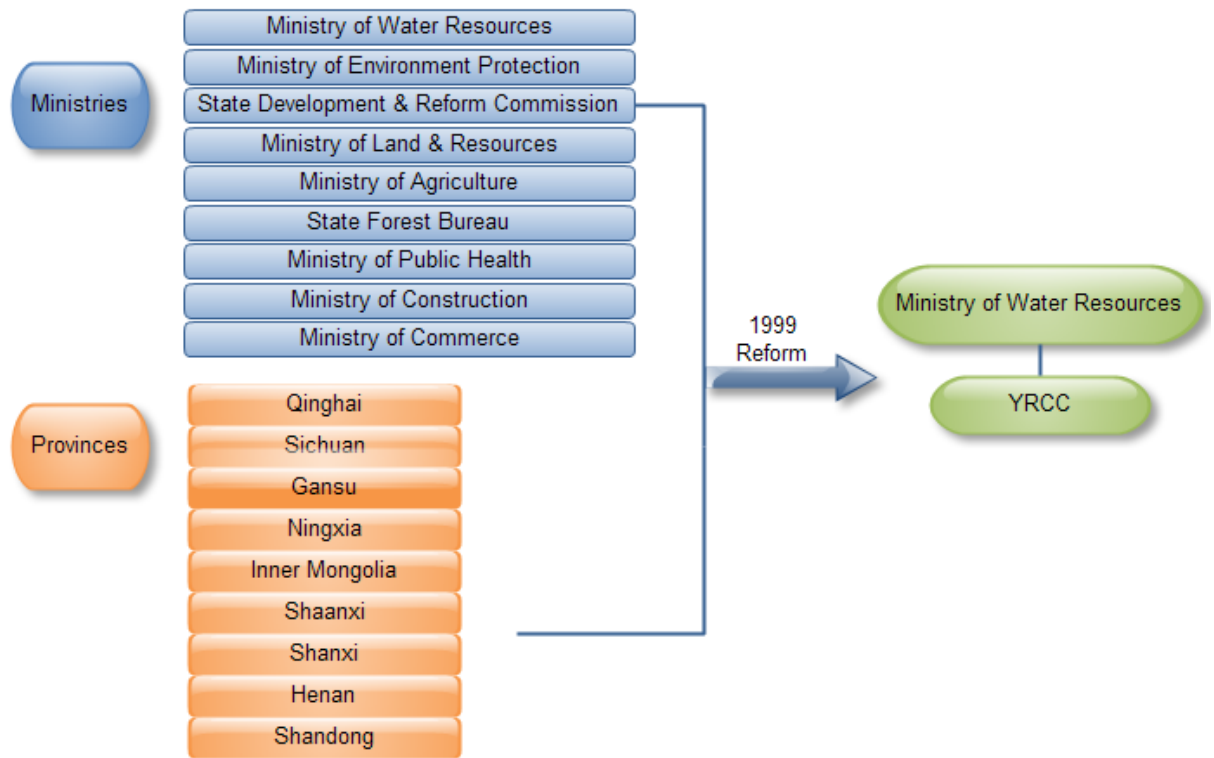
This river is first an ecological, physical challenge. During floods, it damages vast extents of croplands and deposits sedimentation as high as roof tops. During the dry season, there is not even a trickle - long stretches of drought along some of the most densely populated and farmed regions of China. The problem of the Yellow River's caprice is 2,500 years old, with a constant battle among the different provinces.

In modern times, however, the cost is accounted more severely, due to the extensive economic activities along the river since the 1950s. For example, during the dry season, the Yellow River's acute water shortage leads to fights among local governments for water. The local governments in the upper and middle reaches exploit their geographical advantage by closing sluices and gates to trap as much water as they can. While the annual underground water exploitation in the 1980s amounted to 9.3 billion m³, the number increased to 12 billion m³ in the late 1990s. More than 90 per cent exploitable underground water was consumed by 1999. As a result, the lower Yellow River suffered from severe water shortage and zero flow.

To tackle the increasing stress on the river, administration of the river had grown into a grinding bureaucracy of "a multitude of dragons managing the waters (多龙管水)" by the time of the crisis in the 1990s. Nine ministries were regulating the river, with a complex interplay of local and economic interests. (Zhao et al, 2002) These included institutions overseeing water resource, electric power, environmental protection, and agriculture, which shared power and held different (sometimes competing) interests. Overlaying these divisions were the physical sectors, as the three reaches of the

Yellow River were separately administrated by the nine provincial governments located in the river basin (see Figure 1).

Figure 1: Yellow River basin management before and after the 1999 reform



Before the regulatory reforms, the YRCC’s authority was limited to the northern streams and lower reaches, but it was not clearly assigned the power to supervise the regulation enforcement in the upper or middle reaches. (Wang et al, 2001) In other words, the YRCC did not have any authority in mediating trans-provincial water disputes, let alone the disputes among ministries. Even today, this authority is unclear and mediation is often a matter of political cut and thrust.

It is clear that the demand for water overall is increasing, although the China government is trying to manage demand. It has a national target that by 2030, an enhanced water-saving mechanism will be adopted, with the reuse rate for industrial water reaching 80 per cent, and to reduce non-revenue water for irrigation to less than

41 per cent. Based on this, it is estimated that the multi-year average total water demand out of the Yellow River watercourse will increase from the current 58.7 billion m³ to 65.1 billion m³ in 2030, which is a 6.4 billion m³ increase.

The absence of an effective water management system worsened the zero flow situation of the Yellow River. The first time the river ran dry was in 1972, and this zero flow was to increase in frequency over the years until it became a near annual event in the 1990s (see Figure 3). While zero flow usually happened in May and June in the 1970s and 1980s, it also struck in February and March in the 1990s. In 1997, the length of dry land stretched to 704 km, double the length of the 1970s. This is a long historical trend, and the creeping nature of this trend created a high degree of inertia and made it difficult to implement any change to the complex array of institutions and practices in place.

Table 10: Yellow River zero flow since the 1970s

Period	1970s	1980s	1990s	2000s
First time of zero flow in a year	23 April	4 April	1 January	N.a.
No. of years with zero flow	6	7	9	0
No. of zero flow days	86	105	901	0
Average days of zero flow in a year	14	15	100	0
Severest zero flow (days in a year)	21 (in 1979)	36 (in 1981)	295 (in 1997)	N.a.
Average length of zero flow segment per year (km)	242	256	418	0
Longest zero flow segment (km in a year)	316 (in 1974)	662 (in 1981)	704 (in 1997)	N.a.

This zero flow has a disastrous impact - hundreds of bird and fish species became extinct. The economic loss of agriculture and industry in the lower Yellow River amounted to CNY 2.22 billion in 1970s and CNY 21.64 billion during 1990-1996. (Liu et al, 2007)

Things came to a head in 1995, the 10th year that the river had broken its flow. In an unusual move of high-level public lobbying, 163 scholars from the Chinese Academy of Sciences and the Academy of Engineering submitted a petition to the central government, calling for a concerted effort to solve the problem. This galvanised official action.

In April 1997, the Ministry of Water Resources, the State Planning Commission, and the National Science and Technology Commission held a seminar on the Yellow River. After a series of group discussions, the consensus was for a system of “unified water management”. This set off one of the most thorough and far reaching regulatory reforms in China. Water resource minister at the time Wang Shucheng introduced a new paradigm for thinking about water. Rather than using the traditional task oriented approach of water engineering, he used a socio-ecological metaphor. Wang argued for the idea of water resource sustainability and a “harmony between man and ecosystem”. Translated into policy, this meant a move from a fragmented, decentralised governance structure into one that is more integrated and planned. In terms of structure, the move meant that water resource management now integrates water resource exploration, utilisation, administration, allocation, conservation, and protection. In 1998, the State Council called this a “unified management of water resources”, which entailed a central regulatory structure under the Ministry of Water Resources. In March 1999, on behalf of the Ministry of Water Resources, the YRCC was officially empowered by the State Council to manage water allocation from the Yellow River basin. This marked the beginning of the end of the time of “multitude of dragons managing water”.

Path Dependencies: Integrated Water Resources Management

As described above, the reform in the Yellow River fits naturally into the lens of a global dialogue on IWRM. First, as its name suggests, IWRM involves physical, sectoral, and organisational integration. (Kidd and Shaw, 2007) This requires “hard” infrastructural integration such as at the basin level or catchment scale of a water

body, as well as “soft” integration in management and governance such as integration of institutions including laws, or management agreements are formal decision-making structures in water allocation and management. (Bressers and Kuks, 2004) IWRM thus has practical as well as normative dimensions, and is a variety of water reform that requires substantial financial resources for coordination.

Because of its broad definition, IWRM is sometimes considered to be a concept that is more than a hundred years old. (REF) The United Nations first made mention of it only in 1957 (REF) and the definition most commonly accepted today is that by the Global Water Partnership, as “a process which promotes the coordinated development and management of water, land and related resources, in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems”. The key concept then is the bringing together of fragmented water institutions and disparate actors into an integrated structure.

It is a broad normative appeal that allowed IWRM to gain traction in recent years, and was especially vigorously promoted in the 1990s as the “holy grail” of management. (Biswas, 2004) It is seen as an efficient and democratic approach, (Ohlson, 1999; Newson, 2000; Matondo, 2002) with social and economic benefits. (Global Water Partnership, 2007; UNEP, 2006) From a management perspective, IWRM is expected to provide better adaptability against unforeseen conditions such as droughts or floods. (e.g. Pahl-Wostl, 2007; UNEP, 2006; UN Water, 2007; Watson, 2007; Mitchell, 2007) As a decision-making matrix, it has also been lauded for devolving authority from national or federal governments to local governments, river basin organisations, and local water users. (Kemper et al, 2007) The process allows for

multi-stakeholder participation and an incorporation of knowledge and interests from different groups. (Brunner and Steelman, 2005) As a result, IWRM has been widely endorsed by many international organisations concerned with development issues.

(Asian Development Bank, 2006; Dublin Statement, 1992) In terms of practical implementation, elements of IWRM have been widely adopted in countries as diverse as the United States of America, Israel and Chile. (Watson, 2007)

At the same time, IWRM has its share of detractors who criticise both its theoretical foundations and practical outcomes. (Biswas, 2004; Blomquist and Schlager, 2005)

As Biswas points out, IWRM may be attractive as a concept, but has little value as a real guide to implementation. He argues that unless the concept can actually be applied in the real world to improve the existing water management practices, “its current popularity and extensive endorsements by international institutions become irrelevant”.

Indeed, many attempts to implement IWRM have failed. (Jonker, 2002; Geary and Jeffery, 2006; Pahl-Wostl and Jeffrey, 2007) In those cases where IWRM has been successfully implemented, the outcomes have fallen short of what its advocates have anticipated. (Medema and Jeffrey, 2005; Shah and van Koppen, 2006)

Empirically, while there is still no conclusive evidence on what variables lead to reform success in IWRM, current research points to two factors as being critical. First, as integration needs to take place across existing organisations and sections where there are already many entrenched groups and interests at play. Getting these people to agree on joint new policies and institutional structures is often a problem, given that large number of people and diverse interests at play. (Blomquist and Schlager, 2005) This “transaction cost” of institutional change has been pointed out by institutional scholars since the 1980s, (Williamson, 1981; North, 1990; Ostrom, 1990;

Taylor and Singleton, 1993) and remains an issue today. This is a particularly sticky issue in IWRM since the parties involved are not merely from the water sector, but also from agricultural, environmental, industrial, and energy sectors. As a result, agreement becomes difficult to achieve because of “extensive turf wars, bureaucratic infighting, and legal regimes”. (Biswas, 2004:254)

A second potential challenge presented by IWRM stems from the physical integration of an IWRM system. As others have noted, the scale and dimensionality of a physical landscape can have important implications for adaptive capacity’ (van Cleve et al, 2006) Expansive scales and multiple physical dimensions can make it difficult for stakeholders to agree on what to adapt and how, or create high “sunk costs”, i.e., costs that cannot be recovered, that may impede their willingness to alter these systems. (Ingram and Fraser, 2006) Even if institutional changes could be achieved without major infrastructure alterations, many water supply systems and allocation regimes have been developed to ensure high reliability of resource flows, which can also impede the likelihood that resource users will be open to change. (Roe and van Eeten, 2002) As institutional theorists widely recognise, the relative benefits of such institutional arrangements can, therefore, tend to increase over time, which in turn increases the costs of institutional change. (Levy 1997; Pierson, 2000)

So both in terms of structure and actors, there is a strong tendency to stick with the status quo. One factor which the literature on IWRM has cited as being able to overcome such inertia is a strong coordinating centre to enforce this approach, which necessarily has to overcome and override existing institutions and rules to put an integrated approach into place.

Challenges can be understood in terms of the path dependencies. As has been outlined in the literature review chapter, water reforms have sometimes been attributed to inability to overcome long standing path dependencies. This is especially relevant in the case of IWRM in the Yellow River, given the long-standing institutional structure as well as problem-resolution mechanisms that have been at play.

IWRM in China

The implementation of IWRM took place with several formal institutional changes, the foremost of which is the Yellow River water-allocation regulations issued by the State Council. These provided the broad principles rules for the YRCC in its key task of allocating water to the nine provinces. The water quota was set annually and at the beginning, was a hugely contentious issue, with each side demanding more.

Negotiations thus were a key part of the implementation process since the document only provided for principles of allocation, balancing the interests of all the three reaches, nine provinces, and industrial and agricultural sectors in the Yellow River basin.

Aside from conducting such negotiations, the YRCC also put in place institutions for IWRM at the local level. First, specialised water dispatching bodies were established in each province to coordinate the water allocation, with executive responsibility given to leaders at different bureaucratic levels (from provinces to villages).

Meanwhile, there was a great deal of supervision and inspection to ensure that the local managers kept to the agreed targets. For instance, the YRCC inspection team took site supervision, tours inspection, spot checks, and other inspection mechanisms to ensure effective policy implementation of the water allocation quota.

The system was also given some policy teeth, by formal water supply agreements, orders, and the “water fetching” permit system. Second, the YRCC also applied economic instruments for the integrated management of the Yellow River. Water pricing was categorised and standardised, based on different water usage from domestic, industrial, and agricultural consumption. The exceeded water usage was designed to be highly charged for the sake of water conservation.

Third, in the aspect of legislation and regulation, the YRCC promoted the *Yellow River Water Allocation Bill* which got final approval from the State Council in 2006. The bill ensured the YRCC’s role in Yellow River’s unified management and became the legal protection for the integrated water resource management. Last, the YRCC used scientific and engineering techniques, for example, in remote sensing and automation. These were used to collect real-time river system information and coordinate the operation of the reservoirs.

In terms of outcomes, the change in management models appeared to have worked. Since 2000 there has been no flow cut-off of the Yellow River. Basic industry, agricultural and household demands have been met. The river basin’s ecology has improved following the YRCC’s guidelines for the conservation of the rivers, estuary, and coastlines within the basin. A 2004 survey shows that the number of bird species in the Yellow River Delta National Nature Reserve increased from 187 to 283 within five years after the YRCC reform. (Ang, 2007)

Table 11: The opinion continuum for the Q-sort

<i>Number of statements</i>	13	12	19	12	13
<i>Statement Scores</i>	-2	-1	0	1	2
	D	SWD	N	SWA	A
Factor 1	Environmental protection has a legitimate claim as a policy goal				
Factor 2	Competition for water is not just a matter of quantity but differences in use				
Factor 3 A	Technology creates gains but negotiation is needed to distribute these gains fairly				
Factor 3B	The gains from technology should be used to benefit the river as a whole				
Factor 4A	A piecemeal and local approach needs to be part of the governance puzzle				
Factor 4B	Local interests need to be addressed through an integrated approach that may be challenging and needs continuous high level attention				
Factor 5	Water governance is a matter of personal responsibility				
Factor 6	Keeping the Yellow River flowing is a matter of national				

Summary

The 51 responses to the 69 statements were correlated in a 51 by 51 matrix. The matrix was factor analysed using the PQMETHOD software. The initial factor loadings were determined automatically by PQMETHOD, which extracted eight principal component factors. Varimax rotation was used and resulted in eight identifiable factors. Of the 51 respondents, 3 clustered on factor 1, 3 on factor 2, 3 on factor 3, 6 on factor 4, 3 on factor 5, 1 on factor 5, 5 on factor 7, and 3 on factor 8. Factor loadings with eigenvalues greater than 1.00 were considered significant. (McKeown and Thomas, 1988) Analysis of three randomly generated Q-datasets of the same dimensions as the Chattooga data showed that factors explaining less than 3-4 per cent of the variation should be ignored. A total of eight factors had eigenvalues greater than 1.00 (15.4895, 2.9698, 2.4840, 2.2849, 2.0821, 1.9857, 1.8013 and 1.6450).

Factor 1	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
The Yellow River basin management organisations should pay more attention to the ecological protection and maintenance of healthy life of the river when handling the relationship between economic development and environmental protection. (13)	2	2	2	1	1	1	0	1
Preservation of the ecological system is important for long-term stability. (14)	2	1	0	0	0	2	2	0
The primary goal of a healthy Yellow River is to ease the conflicts between water supply and demand. To reach that goal, an optimal mechanism of water resources allocation should be developed. (20)	2	0	2	0	-1	1	0	2
The local governments have the responsibility to protect the ecological environment along with economic development in the Yellow River basin. (24)	2	1	2	0	1	-2	1	2
The government has the responsibility to provide timely forecasting particularly during the flood seasons to give people peace of mind. (33)	2	1	0	0	2	1	2	2

The Yellow River has the problem of water pollution. (46)	2	-1	0	1	1	1	0	1
The Yellow River has life, and intrinsic value, and should be respected for that. (51)	2	1	0	2	1	0	2	0
We should use science to accelerate the modernisation of the Yellow River management, while keeping a balance between water use for homes, industry and the environment. (11)	2	1	2	2	-1	0	0	0
The water shortage of the Yellow River will inevitably slow down the process of industrial modernisation in the region and will also cause deterioration of the ecological environment of the river. (12)	2	1	-1	-1	0	-1	-2	-2
I know that the Yellow River used to run dry. (52)	2	-2	-1	2	2	2	2	0
Industries pollute the river by discharging waste into it. (15)	2	0	0	-1	1	-2	1	0
The Yellow River is a river seeped in Chinese history and culture and it would be a tragedy if the river flow disappeared. (40)	2	-2	-1	2	2	0	2	1
Flood control is the first task of Yellow River governance. (44)	2	-2	-1	1	0	1	0	2
Irrigation using the Yellow River has increased crop production, but the wasteful use of water in irrigation causes the river drying up in the long term. (7)	-2	2	0	-2	2	0	-1	-2
Climate change puts further stress on the balance between water supply and demand in the Yellow River basin. (41)	-2	-2	1	-1	2	-1	-1	0
Hydropower stations stop working because of drying up of the Yellow River and electric power shortages will cause inconvenience. (35)	-2	0	-2	0	-2	1	-2	-1
Less water in the Yellow River means wells running dry and ordinary people will have problems finding drinking water. (34)	-2	1	0	1	2	0	0	2
Particularly in dry seasons, the local governments of the Yellow River basin should follow the state's coordination and give priority to key economic zones. (21)	-2	-1	0	-2	-1	-2	-1	-2
The "Yellow River Water Dispatch Regulation" (the laws governing water allocation) is fundamental in ensuring that there is a constant flow of the Yellow River. Meanwhile, water rights should be developed to transfer water between different regions. (26)	-2	1	0	0	0	0	-1	0
Ecological destruction of the Yellow River source has severe consequences for the livelihood of animal herders. (2)	-2	-2	-1	2	2	1	0	2
When there is a conflict between provinces, the provinces should settle it between themselves. (65)	-2	-1	-2	0	-1	2	-2	-2
The Yellow River has enough water resources to ensure economic development and protect incomes of farmers along the river. (1)	-2	1	-2	1	-2	-1	-2	-1
For the usage of the Yellow River water, the upstream areas should have the priority rights. (55)	-2	0	-1	-2	-1	0	-2	-1
The Yellow River floods are not something to be afraid of as the government has taken decisive action to avoid floods and drownings. (30)	-2	-2	-2	-1	-2	2	-2	0
I think the local water authorities have done a good job. (68)	-2	-1	-2	-2	-2	-2	-2	-1
Ecological protection of the Upper Yellow River has seen benefits go mainly to the lower reaches so the central	-2	1	1	1	2	1	0	0

government should establish a special fund for ecological compensation for the Upper Yellow River. (5)								
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Factor 2	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
The lack of water along the Yellow River has led to lower crop yields and lower agricultural income for farmers. (3)	1	2	0	-1	0	-2	0	1
The Yellow River basin management organisations should pay more attention to the ecological protection and maintenance of healthy life of the river when handling the relationship between economic development and environmental protection. (13)	2	2	2	1	1	1	0	1
The Yellow River basin management agency should look at regulation and supervision, strengthening groundwater resources management. (29)	0	2	0	0	0	0	0	2
Water supply is the first task of Yellow River governance. (45)	-1	2	-1	-1	0	2	0	2
The work of the water utilities should be given higher priority. (69)	0	2	1	1	-1	2	2	0
A constant river flow maintains the healthy life of the Yellow River and ensures drinking water safety in urban and rural areas along the river. (6)	0	2	0	2	-2	-1	0	-1
Irrigation using the Yellow River has increased crop production, but the wasteful use of water in irrigation causes the river drying up in the long term. (7)	-2	2	0	-2	2	0	-1	-2
The Yellow River water resources build a national agricultural base, since it provides sufficient water irrigation to the farmlands along the river. (9)	-1	2	0	0	-1	2	1	-2
When the interests of the river and the needs of the province conflict, the needs of the river should take priority. (57)	0	2	2	-1	1	0	-1	1
Protection of the river is the responsibility of all, with special onus on those living near the river. (64)	0	2	-1	0	1	0	-1	1
National considerations should take priority over local ones in the management of the Yellow River basin. (28)	1	2	2	-2	1	2	1	1
The Yellow River flood control ensures people's safety, and overall national stability and development. (37)	0	2	0	0	0	-1	2	0
It is better to sacrifice the economic development of the river banks than to allow the water to run dry. (53)	1	2	-1	-2	2	1	2	1
Ecological destruction of the Yellow River source has severe consequences for the livelihood of animal herders. (2)	-2	-2	-1	2	2	1	0	2
Flood control is the first task of Yellow River governance. (44)	2	-2	-1	1	0	1	0	2
I know that the Yellow River used to run dry. (52)	2	-2	-1	2	2	2	2	0
Water is critical for the daily operations of the energy bases like Shengli Oil Field as frequent drying up causes significant decline in crude oil production and losses to the state. (4)	-1	-2	-2	0	-2	0	-1	-1
The Yellow River is a river seeped in Chinese history and culture and it would be a tragedy if the river flow disappeared. (40)	2	-2	-1	2	2	0	2	1
My home is located near the Yellow River basin. (42)	1	-2	0	2	0	1	0	2

I know about the Yellow River Conservation Commission (YRCC). (58)	1	-2	-2	-1	2	0	1	0
I am willing to tolerate some discomfort for the sake of restoring the health of the Yellow River. (49)	0	-2	2	0	-1	-1	1	0
Climate change puts further stress on the balance between water supply and demand in the Yellow River basin. (41)	-2	-2	1	-1	2	-1	-1	0
I pay plenty of attention to the governance of the Yellow River. (43)	1	-2	-1	-1	-1	-2	0	1
As long as I have access to water from the Yellow River, I have the right to use it. (50)	-1	-2	-2	-2	-2	-2	-2	-2
I am confident that the problems of the Yellow River can be resolved. (48)	1	-2	1	0	-1	2	-2	-1
The Yellow River floods are not something to be afraid of as the government has taken decisive action to avoid floods and drownings. (30)	-2	-2	-2	-1	-2	2	-2	0

Factor 3	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
We should use science to accelerate the modernisation of the Yellow River management, while keeping a balance between water use for homes, industry and the environment. (11)	2	1	2	2	-1	0	0	0
The primary goal of a healthy Yellow River is to ease the conflicts between water supply and demand. To reach that goal, an optimal mechanism of water resources allocation should be developed. (20)	2	0	2	0	-1	1	0	2
If we do not effectively manage the Yellow River, the "hanging river" in the upper reaches is bound to lead to frequent drying up in lower reaches, threatening people's lives, property and the economic development of the basin. (38)	-1	0	2	2	0	0	0	0
When the interests of the river and the needs of the province conflict, the needs of the river should take priority. (57)	0	2	2	-1	1	0	-1	1
Integrated water management of the Yellow River strengthens sustainable water use for the sake of sustainable economic and social development; meanwhile, it should strengthen ecological protection, pollution prevention and soil erosion control. (10)	-1	0	2	2	0	-1	1	1
The Yellow River basin management organisations should pay more attention to the ecological protection and maintenance of healthy life of the river when handling the relationship between economic development and environmental protection. (13)	2	2	2	1	1	1	0	1
The local governments have the responsibility to protect the ecological environment along with economic development in the Yellow River basin. (24)	2	1	2	0	1	-2	1	2
The Yellow River management should be governed by an integrated, scientific approach, and local governments should not be allowed to develop projects at will. (27)	0	0	2	2	0	-2	1	2
National considerations should take priority over local ones in the management of the Yellow River basin. (28)	1	2	2	-2	1	2	1	1
All the relevant Yellow River management agencies should cooperate on regulating water conservation in industry, agriculture, and household use. (17)	1	0	2	1	0	0	2	0
The Yellow River is the mother river of China and its management should be in a comprehensive and integrated manner to better benefit the whole nation. (22)	-1	0	2	2	0	0	2	2
I am willing to tolerate some discomfort for the sake of restoring the health of the Yellow River. (49)	0	-2	2	0	-1	-1	1	0
For the usage of the Yellow River water, all the riparian areas have equal rights. (56)	0	0	2	1	-1	0	1	-1
Ecological protection of the Upper Yellow River has seen benefits go mainly to the lower reaches so the central government should establish a special fund for ecological compensation for the Upper Yellow River. (5)	-2	1	1	1	2	1	0	0
Climate change puts further stress on the balance between water supply and demand in the Yellow River basin. (41)	-2	-2	1	-1	2	-1	-1	0
The state has been paying attention to this problem and has contributed highly to the governance of this river. (62)	0	-1	-2	-1	-2	-2	-1	-2
Water is critical for the daily operations of the energy bases like Shengli Oil Field as frequent drying up causes significant decline in crude oil production and losses to the	-1	-2	-2	0	-2	0	-1	-1

state. (4)								
The main responsibility for protecting the river lies with the governments. (63)	-1	0	-2	0	1	2	-2	-2
I think the local water authorities have done a good job. (68)	-2	-1	-2	-2	-2	-2	-2	-1
I know about the Yellow River Conservation Commission (YRCC). (58)	1	-2	-2	-1	2	0	1	0
The local governments should ensure that water allocated to each province should also be used to contribute to improving the ecological environment. (8)	1	1	-2	1	2	-2	2	0
The Yellow River floods are not something to be afraid of as the government has taken decisive action to avoid floods and drownings. (30)	-2	-2	-2	-1	-2	2	-2	0
When there is a conflict between provinces, the provinces should settle it between themselves. (65)	-2	-1	-2	0	-1	2	-2	-2
Hydropower stations stop working because of drying up of the Yellow River and electric power shortages will cause inconvenience. (35)	-2	0	-2	0	-2	1	-2	-1
The Yellow River has enough water resources to ensure economic development and protect incomes of farmers along the river. (1)	-2	1	-2	1	-2	-1	-2	-1
In general, I am satisfied with the governance of the Yellow River. (67)	-1	-1	-2	-2	-2	-2	-2	-2
The Yellow River drying up leads to uncertainty and anxiety in the lives of ordinary people. (32)	1	0	-2	0	1	-1	-1	2
As long as I have access to water from the Yellow River, I have the right to use it. (50)	-1	-2	-2	-2	-2	-2	-2	-2

Factor 4	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
We should use science to accelerate the modernisation of the Yellow River management, while keeping a balance between water use for homes, industry and the environment. (11)	2	1	2	2	-1	0	0	0
I know that the Yellow River used to run dry. (52)	2	-2	-1	2	2	2	2	0
The Yellow River has life, and intrinsic value, and should be respected for that. (51)	2	1	0	2	1	0	2	0
My home is located near the Yellow River basin. (42)	1	-2	0	2	0	1	0	2
A constant river flow maintains the healthy life of the Yellow River and ensures drinking water safety in urban and rural areas along the river. (6)	0	2	0	2	-2	-1	0	-1
Everyone has the responsibility to keep the Yellow River healthy since it would be shameful for the entire nation if it were to run dry. (36)	1	0	0	2	1	0	2	2
The Yellow River is a river seeped in Chinese history and culture and it would be a tragedy if the river flow disappeared. (40)	2	-2	-1	2	2	0	2	1
The Yellow River management should be governed by an integrated, scientific approach, and local governments should not be allowed to develop projects at will. (27)	0	0	2	2	0	-2	1	2
If we do not effectively manage the Yellow River, the "hanging river" in the upper reaches is bound to lead to frequent drying up in lower reaches, threatening people's lives, property and the economic development of the basin. (38)	-1	0	2	2	0	0	0	0
Integrated water management of the Yellow River strengthens sustainable water use for the sake of sustainable economic and social development; meanwhile, it should strengthen ecological protection, pollution prevention and soil erosion control. (10)	-1	0	2	2	0	-1	1	1
The integrated approach maintains a constant flow in the Yellow River and brings about economic, social, ecological gains. (19)	0	0	1	2	0	0	1	0
Ecological destruction of the Yellow River source has severe consequences for the livelihood of animal herders. (2)	-2	-2	-1	2	2	1	0	2
The Yellow River is the mother river of China and its management should be in a comprehensive and integrated manner to better benefit the whole nation. (22)	-1	0	2	2	0	0	2	2
The work of the water utilities should be given higher priority. (69)	0	2	1	1	-1	2	2	0
For the usage of the Yellow River water, all the riparian areas have equal rights. (56)	0	0	2	1	-1	0	1	-1
The Yellow River floods are not something to be afraid of as the government has taken decisive action to avoid floods and drownings. (30)	-2	-2	-2	-1	-2	2	-2	0
China has the capacity to coordinate all the relevant departments to ensure that the Yellow River will run to the sea consistently and that the Yellow River will not be landlocked. (25)	-1	-1	0	-2	-2	-1	0	1
When we use water for economic development, priority should be given to those whose use is most efficient, even if the water goes to another province. (54)	0	-1	0	-2	-2	-1	-2	-2

YRCC represents and speaks for the Yellow River. (59)	0	-1	-1	-2	-2	-1	-1	-2
Particularly in dry seasons, the local governments of the Yellow River basin should follow the state's coordination and give priority to key economic zones. (21)	-2	-1	0	-2	-1	-2	-1	-2
It is better to sacrifice the economic development of the river banks than to allow the water to run dry. (53)	1	2	-1	-2	2	1	2	1
Irrigation using the yellow river has increased crop production, but the wasteful use of water in irrigation causes the river drying up in the long term. (7)	-2	2	0	-2	2	0	-1	-2
National considerations should take priority over local ones in the management of the Yellow River basin. (28)	1	2	2	-2	1	2	1	1
I think the local water authorities have done a good job. (68)	-2	-1	-2	-2	-2	-2	-2	-1
The integrated approach has reduced the income of the Yellow River gate management officers, who also have to cope with the unhappiness of end-users when they do not get enough water. (18)	-1	0	-1	-2	0	2	0	-2
In general, I am satisfied with the governance of the Yellow River. (67)	-1	-1	-2	-2	-2	-2	-2	-2
For the usage of the Yellow River water, the upstream areas should have the priority rights. (55)	-2	0	-1	-2	-1	0	-2	-1
As long as I have access to water from the Yellow River, I have the right to use it. (50)	-1	-2	-2	-2	-2	-2	-2	-2

Factor 5	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
Ecological protection of the Upper Yellow River has seen benefits go mainly to the lower reaches so the central government should establish a special fund for ecological compensation for the Upper Yellow River. (5)	-2	1	1	1	2	1	0	0
The Yellow River is a river seeped in Chinese history and culture and it would be a tragedy if the river flow disappeared. (40)	2	-2	-1	2	2	0	2	1
Irrigation using the yellow river has increased crop production, but the wasteful use of water in irrigation causes the river drying up in the long term. (7)	-2	2	0	-2	2	0	-1	-2
Ecological destruction of the Yellow River source has severe consequences for the livelihood of animal herders. (2)	-2	-2	-1	2	2	1	0	2
It is better to sacrifice the economic development of the river banks than to allow the water to run dry. (53)	1	2	-1	-2	2	1	2	1
The Yellow River basin is facing severe water scarcity. (47)	0	-1	1	-1	2	-2	-1	-1
Less water in the Yellow River means wells running dry and ordinary people will have problems finding drinking water. (34)	-2	1	0	1	2	0	0	2
Climate change puts further stress on the balance between water supply and demand in the Yellow River basin. (41)	-2	-2	1	-1	2	-1	-1	0
The government has the responsibility to provide timely forecasting particularly during the flood seasons to give people peace of mind. (33)	2	1	0	0	2	1	2	2
I know about the Yellow River Conservation Commission (YRCC). (58)	1	-2	-2	-1	2	0	1	0
The local governments should ensure that water allocated to each province should also be used to contribute to improving the ecological environment. (8)	1	1	-2	1	2	-2	2	0
When we use water for economic development, priority should be given to those whose use is most efficient, even if the water goes to another province. (54)	0	-1	0	-2	-2	-1	-2	-2
A constant river flow maintains the healthy life of the Yellow River and ensures drinking water safety in urban and rural areas along the river. (6)	0	2	0	2	-2	-1	0	-1
The YRCC should be better authorised to strengthen its governance of the Yellow River. (61)	-1	-1	1	-2	-2	1	2	0
The state has been paying attention to this problem and has contributed highly to the governance of this river. (62)	0	-1	-2	-1	-2	-2	-1	-2
In general, I am satisfied with the governance of the Yellow River. (67)	-1	-1	-2	-2	-2	-2	-2	-2
YRCC represents and speaks for the Yellow River. (59)	0	-1	-1	-2	-2	-1	-1	-2
The Yellow River has enough water resources to ensure economic development and protect incomes of farmers along the river. (1)	-2	1	-2	1	-2	-1	-2	-1
China has the capacity to coordinate all the relevant departments to ensure that the Yellow River will run to the sea consistently and that the Yellow River will not be landlocked. (25)	-1	-1	0	-2	-2	-1	0	1
Water is critical for the daily operations of the energy bases like Shengli Oil Field as frequent drying up causes significant decline in crude oil production and losses to the	-1	-2	-2	0	-2	0	-1	-1

state. (4)								
Hydropower stations stop working because of drying up of the Yellow River and electric power shortages will cause inconvenience. (35)	-2	0	-2	0	-2	1	-2	-1
As long as I have access to water from the Yellow River, I have the right to use it. (50)	-1	-2	-2	-2	-2	-2	-2	-2
I think the local water authorities have done a good job. (68)	-2	-1	-2	-2	-2	-2	-2	-1
The Yellow River floods are not something to be afraid of as the government has taken decisive action to avoid floods and drownings. (30)	-2	-2	-2	-1	-2	2	-2	0

<u>Factor 6</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
The Yellow River water resources build a national agricultural base, since it provides sufficient water irrigation to the farmlands along the river. (9)	-1	2	0	0	-1	2	1	-2
Preservation of the ecological system is important for long-term stability. (14)	2	1	0	0	0	2	2	0
The integrated approach has reduced the income of the Yellow River gate management officers, who also have to cope with the unhappiness of end-users when they do not get enough water. (18)	-1	0	-1	-2	0	2	0	-2
The work of flood control and drought management is a huge challenge and the officers at all levels should work together under the supervision by a coordinating agency. (23)	0	1	1	-1	0	2	1	1
National considerations should take priority over local ones in the management of the Yellow River basin. (28)	1	2	2	-2	1	2	1	1
The Yellow River floods are not something to be afraid of as the government has taken decisive action to avoid floods and drownings. (30)	-2	-2	-2	-1	-2	2	-2	0
Water supply is the first task of Yellow River governance. (45)	-1	2	-1	-1	0	2	0	2
I am confident that the problems of the Yellow River can be resolved. (48)	1	-2	1	0	-1	2	-2	-1
I know that the Yellow River used to run dry. (52)	2	-2	-1	2	2	2	2	0
The main responsibility for protecting the river lies with the governments. (63)	-1	0	-2	0	1	2	-2	-2
When there is a conflict between provinces, the provinces should settle it between themselves. (65)	-2	-1	-2	0	-1	2	-2	-2
When there is a conflict between provinces, the state should mediate. (66)	0	0	-1	0	1	2	-2	-2
The work of the water utilities should be given higher priority. (69)	0	2	1	1	-1	2	2	0
Particularly in dry seasons, the local governments of the Yellow River basin should follow the state's coordination and give priority to key economic zones. (21)	-2	-1	0	-2	-1	-2	-1	-2
The Yellow River basin is facing severe water scarcity. (47)	0	-1	1	-1	2	-2	-1	-1
The local governments should ensure that water allocated to each province should also be used to contribute to improving the ecological environment. (8)	1	1	-2	1	2	-2	2	0
The Yellow River management should be governed by an integrated, scientific approach, and local governments should not be allowed to develop projects at will. (27)	0	0	2	2	0	-2	1	2
The local governments have the responsibility to protect the ecological environment along with economic development in the Yellow River basin. (24)	2	1	2	0	1	-2	1	2
The state has been paying attention to this problem and has contributed highly to the governance of this river. (62)	0	-1	-2	-1	-2	-2	-1	-2
The lack of water along the Yellow River has led to lower crop yields and lower agricultural income for farmers. (3)	1	2	0	-1	0	-2	0	1
I pay plenty of attention to the governance of the Yellow River. (43)	1	-2	-1	-1	-1	-2	0	1

Industries pollute the river by discharging waste into it. (15)	2	0	0	-1	1	-2	1	0
Effective governance of the Yellow River allows the lives of residents along the river to flourish. (31)	0	0	0	1	0	-2	0	0
In general, I am satisfied with the governance of the Yellow River. (67)	-1	-1	-2	-2	-2	-2	-2	-2
I think the local water authorities have done a good job. (68)	-2	-1	-2	-2	-2	-2	-2	-1
As long as I have access to water from the Yellow River, I have the right to use it. (50)	-1	-2	-2	-2	-2	-2	-2	-2

Factor 7	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
The work of the water utilities should be given higher priority. (69)	0	2	1	1	-1	2	2	0
I know that the Yellow River used to run dry. (52)	2	-2	-1	2	2	2	2	0
It is better to sacrifice the economic development of the river banks than to allow the water to run dry. (53)	1	2	-1	-2	2	1	2	1
The Yellow River flood control ensures people's safety, and overall national stability and development. (37)	0	2	0	0	0	-1	2	0
Preservation of the ecological system is important for long-term stability. (14)	2	1	0	0	0	2	2	0
Everyone has the responsibility to keep the Yellow River healthy since it would be shameful for the entire nation if it were to run dry. (36)	1	0	0	2	1	0	2	2
The Yellow River has life, and intrinsic value, and should be respected for that. (51)	2	1	0	2	1	0	2	0
The Yellow River is the mother river of China and its management should be in a comprehensive and integrated manner to better benefit the whole nation. (22)	-1	0	2	2	0	0	2	2
The government has the responsibility to provide timely forecasting particularly during the flood seasons to give people peace of mind. (33)	2	1	0	0	2	1	2	2
The local governments should ensure that water allocated to each province should also be used to contribute to improving the ecological environment. (8)	1	1	-2	1	2	-2	2	0
The Yellow River is a river steeped in Chinese history and culture and it would be a tragedy if the river flow disappeared. (40)	2	-2	-1	2	2	0	2	1
The Yellow River has enough water resources to ensure economic development and protect incomes of farmers along the river. (1)	-2	1	-2	1	-2	-1	-2	-1
As long as I have access to water from the Yellow River, I have the right to use it. (50)	-1	-2	-2	-2	-2	-2	-2	-2
When there is a conflict between provinces, the state should mediate. (66)	0	0	-1	0	1	2	-2	-2
I am confident that the problems of the Yellow River can be resolved. (48)	1	-2	1	0	-1	2	-2	-1
I think the local water authorities have done a good job. (68)	-2	-1	-2	-2	-2	-2	-2	-1
The water shortage of the Yellow River will inevitably slow down the process of industrial modernisation in the region and will also cause deterioration of the ecological	2	1	-1	-1	0	-1	-2	-2

environment of the river. (12)								
When we use water for economic development, priority should be given to those whose use is most efficient, even if the water goes to another province. (54)	0	-1	0	-2	-2	-1	-2	-2
Hydropower stations stop working because of drying up of the Yellow River and electric power shortages will cause inconvenience. (35)	-2	0	-2	0	-2	1	-2	-1
In general, I am satisfied with the governance of Yellow River. (67)	-1	-1	-2	-2	-2	-2	-2	-2
When there is a conflict between provinces, the provinces should settle it between themselves. (65)	-2	-1	-2	0	-1	2	-2	-2
The Yellow River floods are not something to be afraid of as the government has taken decisive action to avoid floods and drownings. (30)	-2	-2	-2	-1	-2	2	-2	0
For the usage of the Yellow River water, the upstream areas should have the priority rights. (55)	-2	0	-1	-2	-1	0	-2	-1

<u>Factor 8</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
Everyone has the responsibility to keep the Yellow River healthy since it would be shameful for the entire nation if it were to run dry. (36)	1	0	0	2	1	0	2	2
My home is located near the Yellow River basin. (42)	1	-2	0	2	0	1	0	2
The Yellow River is the mother river of China and its management should be in a comprehensive and integrated manner to better benefit the whole nation. (22)	-1	0	2	2	0	0	2	2
Less water in the Yellow River means wells running dry and ordinary people will have problems finding drinking water. (34)	-2	1	0	1	2	0	0	2
Ecological destruction of the Yellow River source has severe consequences for the livelihood of animal herders. (2)	-2	-2	-1	2	2	1	0	2
The local governments have the responsibility to protect the ecological environment along with economic development in the Yellow River basin. (24)	2	1	2	0	1	-2	1	2
Water supply is the first task of Yellow River governance. (45)	-1	2	-1	-1	0	2	0	2
The Yellow River drying up leads to uncertainty and anxiety in the lives of ordinary people. (32)	1	0	-2	0	1	-1	-1	2
Flood control is the first task of Yellow River governance. (44)	2	-2	-1	1	0	1	0	2
The Yellow River management should be governed by an integrated, scientific approach, and local governments should not be allowed to develop projects at will. (27)	0	0	2	2	0	-2	1	2
The primary goal of a healthy Yellow River is to ease the conflicts between water supply and demand. To reach that goal, an optimal mechanism of water resources allocation should be developed. (20)	2	0	2	0	-1	1	0	2
The Yellow River basin management agency should look at regulation and supervision, strengthening groundwater	0	2	0	0	0	0	0	2

resources management. (29)								
The government has the responsibility to provide timely forecasting particularly during the flood seasons to give people peace of mind. (33)	2	1	0	0	2	1	2	2
The Yellow River is a river steeped in Chinese history and culture and it would be a tragedy if the river flow disappeared. (40)	2	-2	-1	2	2	0	2	1
For the allocation and usage of the Yellow River water, provinces should comply with requests from the YRCC in terms of coordinating efforts. (60)	0	0	1	0	-1	1	-1	-2
The main responsibility for protecting the river lies with the governments. (63)	-1	0	-2	0	1	2	-2	-2
The water shortage of the Yellow River will inevitably slow down the process of industrial modernisation in the region and will also cause deterioration of the ecological environment of the river. (12)	2	1	-1	-1	0	-1	-2	-2
When there is a conflict between provinces, the state should mediate. (66)	0	0	-1	0	1	2	-2	-2
When we use water for economic development, priority should be given to those whose use is most efficient, even if the water goes to another province. (54)	0	-1	0	-2	-2	-1	-2	-2
The state has been paying attention to this problem and has contributed highly to the governance of this river. (62)	0	-1	-2	-1	-2	-2	-1	-2
Irrigation using the Yellow River has increased crop production, but the wasteful use of water in irrigation causes the river drying up in the long term. (7)	-2	2	0	-2	2	0	-1	-2
Particularly in dry seasons, the local governments of the Yellow River basin should follow the state's coordination and give priority to key economic zones. (21)	-2	-1	0	-2	-1	-2	-1	-2
In general, I am satisfied with the governance of the Yellow River. (67)	-1	-1	-2	-2	-2	-2	-2	-2
YRCC represents and speaks for the Yellow River. (59)	0	-1	-1	-2	-2	-1	-1	-2
The integrated approach has reduced the income of the Yellow River gate management officers, who also have to cope with the unhappiness of end-users when they do not get enough water. (18)	-1	0	-1	-2	0	2	0	-2
As long as I have access to water from the Yellow River, I have the right to use it. (50)	-1	-2	-2	-2	-2	-2	-2	-2

Because of the complexity and high variance in local conditions, I will illustrate the key elements of these factors with the case of Inner Mongolia.

Discourse in Inner Mongolia

In winters past, Farmer Liu Gao Qi, 61, would have stayed at home in his farm in the heart of Inner Mongolia, smoked, played a game of luck or two, and waited for spring so he could work his land. This winter, he watched the plants grow in temperature-controlled tents, and ate fresh tomatoes harvested from his farms.

The difference, he says, comes from the fact that there is enough investment in the new high-technology farms, which use drip irrigation and controlled temperatures to make sure that farms continued to be productive, even in the winters of Erdos, where temperatures can plunge to -32 degrees Celsius.

“We would never have been able to afford this sort of equipment on our own, it’s thanks to this exchange we have with industry,” he said.

Meanwhile, as the winds howled around the Dalate Power Plant, Deputy Director Liang Xi, is watching every drop of the water he has, because he is on a strict quota. Each year, the Yellow River Conservancy Commission (YRCC) set a quota of 44 million cubic metres and each year, the power plant comes close to busting it.

“In 2005 we have a traditional water-cooling system in operation which consumed more than 40 million cubic metres of water. In recent years, air-cooling systems have taken the place of traditional systems, and consumed no more than 40 million cubic metres of water.”

This water is precious because it is transferred from farms, and paid for by the plant - not just in water tariffs but also in money to build waterproof canals and to import technology and know-how such as the tents that Farmer Liu oversees.

The Economics of Water Use

Factors:

- 1. Environmental protection has a legitimate claim as a policy goal.**
- 2. Competition for water is not just a matter of quantity but difference in use.**

There are such innovative exchanges which 14 thirsty industrial projects in Erdos have taken part in. The net gain from this exchange is estimated to be CNY 26.6 billion - after squaring off all the investments that they needed to make to ensure that farms have enough water to transfer to them.

Part of the Inner Mongolia Autonomous Regions, Erdos (“many palaces” in Mongolian) lies in the southwest, marked out by the Great Wall to the west, and the Yellow River in the north and east. It is a resource-rich area, with coal, natural gas as well as animal products - with the world’s largest cashmere product-processing base located in Erdos.

Of special relevance to the issue of water transfer is the fact that there are several large open-cut coal mines such as the Dong Sheng coalfield and the Zhungeer coalfield. They set the scene for many power plants to harness this energy. These plants, such as the Dalate plant, are guzzlers for water, which is needed to cool the machines.

It is a win-win situation because the farmers gain in terms of increased harvests and improved technology, industry gains because, without water, economic activities would be severely curtailed.

First, big money can come from the private sector, as long as they see returns. From 1999 to 2005, the central government invested CNY 32.83 million in water

infrastructure in Erdos. Over the next three years, the local government invested CNY 701.84 million in the two large irrigation areas. On average, the central government invested CNY 5.4 million each year – this means that local annual investment is nearly 40 times that of the central government.

The local government is able to do this because it levies a charge on industries that want to use water. The money is then transferred to the water infrastructure project. Officially it is called “water rights transfer” but in reality, it is an economic price, borne by the private sector as a cost of doing business. So if more money is needed, the government need not be the only one forking it out.

Second, money does not tell the whole story. To make investments count, public support is vital. The government can raise money to build a large infrastructure, and may indeed hit all its short-term investment targets. But water conservancy requires constant vigilance, and infrastructure requires careful husbandry, and both require public support.

In other words, there is a clear element in the discourse about technology gains as well as distributions of such gains:

The Impact of Technology

Factors:

3A: Technology creates gains but negotiation is needed to distribute these gains fairly.

3B: The gains from technology should be used to benefit the river as a whole.

In Inner Mongolia, this ideational element plays out in a triangulation of factors: low supply of water, healthy industry, wasteful agricultural sector.

Low water supply

In the “Communiqué of the Yellow River Water Resource” from 1988 to 2005, Inner Mongolia Autonomous Region and Shandong Province repeatedly exceeded the annual quota set by the “1981 Water Quota Scheme” of the state council. Overall, there were five provinces that exceeded the annual water quota from the Yellow River - Qinghai, Gansu, Ningxia, Inner Mongolia and Shandong. Among which Ningxia and Inner Mongolia exceeded the quota by the amount of 729 million m³ and 1,386 million m³, respectively. Clearly, there is a great demand for water.

At the same time, there is no increase in supply. Provinces such as Ningxia, Inner Mongolia and Shandong have reached their quota limit. At the same time, the water licence is non-transferable and the illegal transfer of licensed water will be penalised (“Implementation Scheme of Water Fetching Licence”, State Council, 1993). In addition, there is a tight hold on the inflow of water, with the YRCC stating that regions which have exceeded their water quota will not see new water-intensive projects approved.

Healthy industry

Geographically, the Yellow River Valley is rich in energy resources such as coal, power, petro and natural gas. The coal reserve is 449.2 billion tons, which is 46.5 per cent of the total coal reserve in China, and the estimated total reserve of coal is around 1.5 trillion tons. The energy bases that need to be supported by the water from the Yellow River include: Ningxia Ningdong Energy Base, the “Golden Triangle” of

Hohhot, Baotou and Erdos in Inner Mongolia, Wuhai City and Wusitai Industrial Energy Base, Shanxi Shanbei Yulin Energy and Heavy Chemical Industry Base and Shanxi Liliu Coal Power Plant Base.

Meanwhile, there are oil fields such as Changqing, Zhongyuan and Shengli that are located in the mid and low reaches of the Yellow River valley. Due to the development of the industry and energy base in the Yellow River water served regions, the increase in demand for industrial water reached 4 per cent per annum since 1980. By 2030, the industrial water demand in the valley will reach 12.7 billion m³, double that of 2000 (“Comprehensive Planning Report on Water Resource in the Yellow River Valley”).

Given the strong demand for water, the ability of industry to pay, and the unproductive use of water by farmers, a clear trade appears to be possible. The institutional arrangement chosen for this transfer of water from farmers to industry, and the return in the form of investments for water infrastructure is that of the “water rights market”. Together with the Ministry of Water Resource, since 2003, the local government has collaborated with the water authority of Ningxia and Inner Mongolia autonomous region, in a pilot project.

Ningxia and Inner Mongolia both have an abundant coal reserve. In the Ningxia Ningdong region, the reserve is 31 billion tons, the 6th largest in China. In Erdos, Inner Mongolia, there are 149.6 billion tons which account for half of all coal in Inner Mongolia and one-sixth of China. These two autonomous regions have an industrial structure that is aimed at building up the energy and heavy chemical-industry base in west China.

This natural endowment was the basis of a master plan which included a series of power and coal-chemical projects, making Ningdong and Erdos important energy hubs in the national “west-east electricity transmission project”. The construction of these bases is strategically important to the national energy security. The programme of the Ningdong Energy and Heavy Chemical Industry Base is to establish nine power stations by 2020 with a total installed capacity of 15 million KW.

The plan also included a large-scale coal mine with an annual output of 74.6 million tons of raw coal, a heavy chemical industry base with an annual chemical output of 6.9 million tons of dimethyl ether and methyl alcohol refined from coal. The programme of Erdos Energy Base is to build 14 pithead power stations by 2020 with a total installed capacity of 4.212 million KW; and to build 12 coal-chemical projects and to form a heavy chemical industry base with annual output of 4 million tons of methyl alcohol, caustic soda and dimethyl ether, respectively. These plans require a lot of water. The construction of the energy base in Ningxia and Inner Mongolia alone required 641 million m³ in 2010; while the long-term demand in 2020 will reach 1.092 billion m³.

These are ambitious plans. But because of regulatory restrictions and the physical lack of water, many proposed new industrial projects in Ningxia and Inner Mongolia were stymied.

High non-revenue water by industry

The first solution in response to the dwindling supply is to increase water conservation efforts. The agricultural water in Inner Mongolia and Ningxia accounts for 90 per cent of the total water consumption. However, much of the water is non-revenue water. For example, in the Hetao irrigation regions in Inner Mongolia only 42 per cent of water is accounted for. In the southern bank this is 34.8 per cent, and in Qingtongxia it is around 38 per cent to 53 per cent.

So, agricultural water use is very wasteful. A straightforward economic approach requires that the most efficient user of the resources be allocated to its use. But at the same time, the farmers also have an institutional right to the water. What can be done to break this deadlock?

Water Rights Transfer

The solution was a policy innovation by the YRCC and implemented in pilot schemes in Ningxia and Inner Mongolia - the notion of water rights transfer. Mr Li Guo Ying, the Commissioner of the YRCC, admits that the mix of high demand and dwindling supply was a “very worrying thing”. He explained how the notion of water trading was based on the fact that benefits from saving water were not sufficient to motivate change.

“If the water right is not tradable, the benefits from saving water will only be shown in the water bill. But water, especially for irrigation, is very cheap. Due to the special position of agriculture in the national economy it is impossible to significantly raise the price of the water,” he said. This accounts for the slow pace in adopting water-saving measures for the farmers.

The water-trading system however, allows some flexibility in pricing. Under this system, the YRCC sets a different price for “traded water” compared to “allocated water”. There are three main implementation tools for water trading: a simple transparent framework, strong technical support and data monitoring.

This exchange of water between inefficient farmers and water hungry industries was facilitated by the “Implementation Scheme of Water Fetching Licence”. In 2004, it was decided that “water fetching rights” can be transferred from farmers to industry. This is limited only to instances where there is extra water or there is water saved by water-saving measures.²⁸

It is also defined that the “water right transfer” is the transfer of water from agriculture to industry. It was launched on a trial basis with the provision for expansion in future. Since April 2003, five industrial projects such as Inner Mongolia Dadian Stage 4, Ningxia Daba Power Plant Stage 3 were selected as the trial programmes for water right transfer, and the water saving in irrigation regions involves the southern bank irrigation regions and the Ningxia Qingtongxia irrigation region.

²⁸ On 15 April, 2006, the State Council promulgated the “Regulations on Water Fetching Licence and Water Resource Fee Levy” and according to that, the institutions and individuals that obtained the water fetching right legally are allowed to transfer their saved water resource for profit under the approval of primary government agencies within the period of validity of water fetching licence and quota. The “Administrative Regulations on Water Fetching Licence” promulgated by the Ministry of Water Resource in April 2008 also defined the related water right transfer requirements. The new regulations will further promote the implementation of the Yellow River water right transfer.

Remains of a Local Fragmented Approach

Factors

4A Piecemeal and local approach needs to be part of the governance puzzle.

4B Local interests need to be addressed through an integrated approach that may be challenging and needs continuous high-level attention.

Regulatory and institutional design

On 18 May, 2004, the Ministry of Water Resource issued the “Guiding Opinions on the Trial Water Right Transfer Work in the Mainstream Areas of the Yellow River in Inner Mongolia and Ningxia Autonomous Region”. Following that, the Yellow River Committee issued the “Implementation Measures on the Yellow River Water Right Transfer Management (Pilot)”, “Examination and Verification Measures on Water-Saving Projects in the Yellow River Water Right Transfer (Pilot)” in succession, which gave specifications on the principles of water right transfer, the limit of authority and procedure, the requirements on the formation of technical documents, period of validity and cost, implementation, supervision and penalty, and the examination and verification of water-saving projects in the transfer.

These new pieces of regulation identified the responsibilities of the water management authorities at local and provincial level. After the water right transfer application has been approved, the provincial authorities would arrange for the signing of the transfer contract between the two parties of transfer, and implement the transfer itself. Its other responsibilities include the examination and verification of the design of the water saving projects in the transfer; the arrangement or supervision of the bidding and

construction of water-saving transformation projects; the funds available for the transfer and the supervision on the use of the funds.

Two other pieces of regulations guide the transfer: “Administrative Regulation on Water Fetching Permission and Water Resource Levy” and the “Regulations on the Yellow River Water Quota”.

Aside from rules and regulations, the YRCC also put detailed and objective data monitoring benchmarks. These include:

- i. Clear evaluation criteria: This includes the verification of master plans, a demonstration report of the construction projects, a feasibility report and initial design of the water transfer and water-saving projects. Also required is the quantity of water that the party who is transferring the water (usually the farmer) is required to save; the project scale of the water-saving programme and whether it can meet the demand for saved water.
- ii. Provinces and regions are required to send their master plan and reports to the Yellow River Committee.
- iii. Evaluation of actual water saved. The transferring party is required to carry out continuous monitoring, analysis and evaluation on the water saving performance of the projects, and submit their water-saving performance monitoring report to the Yellow River Committee and the water authority of the provincial municipal government within one year when the programme is approved (“Examination and Verification Measures on Water Saving Projects of the Yellow River Water Right Transfer (pilot)”).

The regulations also identify the procedure and contents of the quality verification of the water-saving projects. For example, whether the location of the water-saving

project, scale and content are in accordance with the official requirements; whether the structure and quality of the projects in the sampling inspections meet the designing requirements; whether the water-measuring facilities are installed and if they meet the national regulations and standards; whether the underwater level monitoring facilities are deployed in the water-saving affected areas; and whether the maintenance measures and funds in the operation of the water-saving projects are practical or feasible.

Outcomes

Since April 2003, there have been five trial projects, including Extension Projects of Dalate Power Plant Stage 4 in Inner Mongolia, etc.. The total installed capacity of the five trial projects is 7,320 MW, and the quantity of transferred water is 83.83 million m³.

The corresponding irrigation districts from which the water has been transferred include the southern bank irrigation district in Inner Mongolia and the Qingtongxia irrigation district in Ningxia, with a total amount of 98.33 million m³ of water, and the total investment for the water saving projects is at CNY 326 million. Currently, all the five trial transfer projects have been verified and approved by the Development and Reform Committee. Among the projects, three have been completed and two are being constructed. One has been approved and given the water fetching licence.

With a strong economy, the scale of water transfer has increased steadily. The YRCC approved nine other water transfer projects and conducted technological examination for 12 transfer projects.

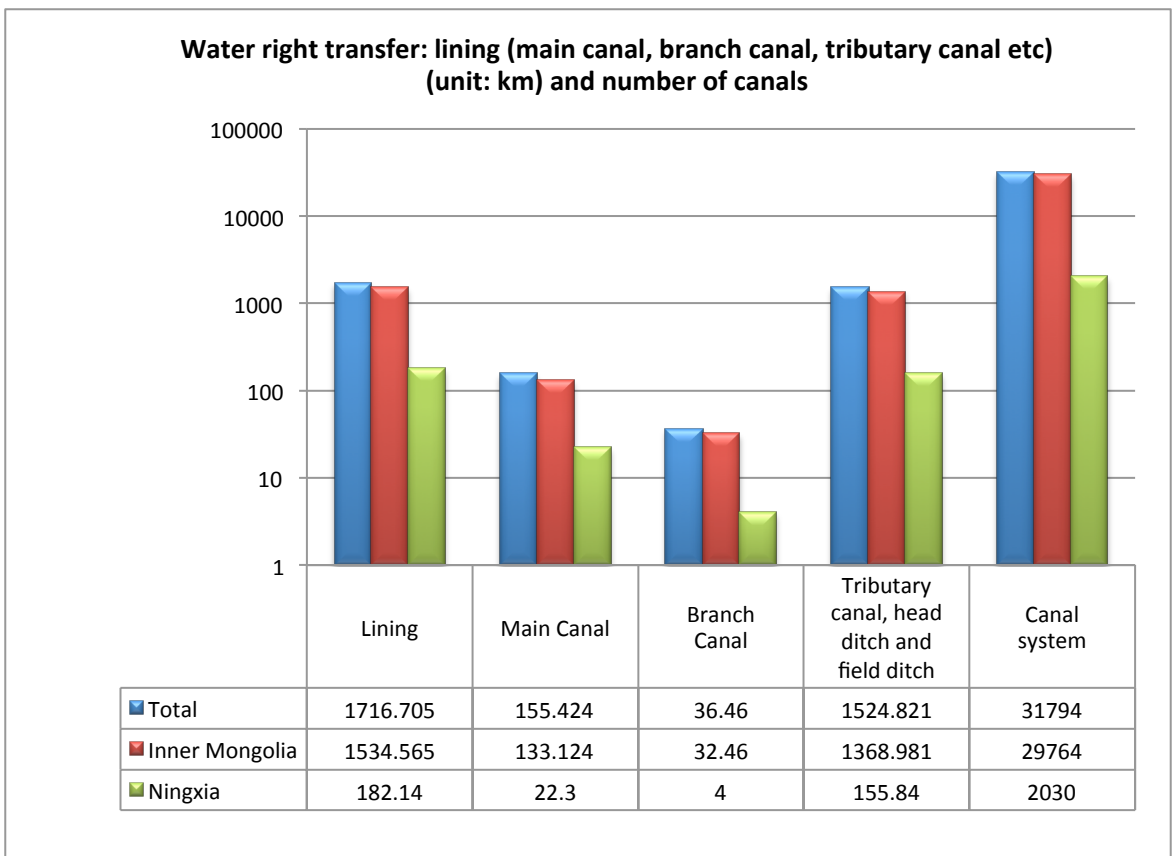
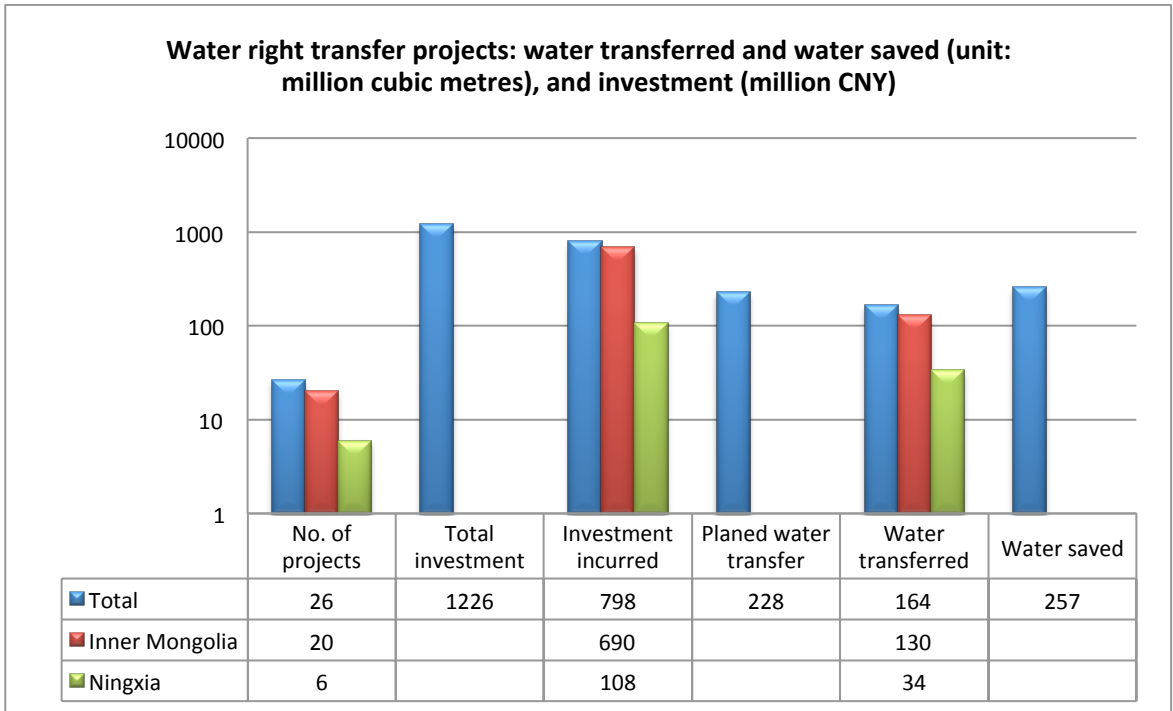


Figure 3.3: Water rights transfer projects

The water rights transfer is a policy innovation that has met the interests of the various stakeholders. Overall, there are two important outcomes for the farmers - first, their

legal rights to use water remain protected, and second, the cost of agriculture is reduced.

First, the water that is transferred to the industrial projects is gleaned from the amount saved during the transport cycle. Therefore, the actual water allocated for irrigation is not reduced, and the farmers' legal rights to use water are effectively protected.

Second, after the upgrading of the canals and other water infrastructure, water loss in distribution is reduced, resulting in an actual reduction in the farmers' water costs.

According to a comparison analysis of the farmers' water costs conducted by the Southern Irrigation District Authority of Inner Mongolia, the per mu water costs is reduced by CNY 10.69 in 2006 compared to the previous year.

For the local government, the most important outcome is the new source of private funds for national water infrastructure. By means of water right transfer, the recipient of the water is obliged to invest in the water-saving projects in the irrigation districts.

According to the water right transfer master plan of Ningxia and Inner Mongolia, by 2010, CNY 3.6 billion of funds can be raised in the water-saving renovation in the irrigation districts of Ningxia and Inner Mongolia, of which CNY 1.4 billion are from Ningxia and CNY 2.2 billion from Inner Mongolia. By the end of 2007, the actual fund-raising in the irrigation-renovation projects in the southern bank in Erdos has reached CNY 690 million, which is about 28 times the total amount invested in this district by the country since China was founded. This is an astonishingly high amount, and demonstrates both the low prices of irrigation water, as well as the desperate need for water by industry.

This is a policy innovation and, perhaps, the two most important factors in the discourse are the key ones providing the normative incentives for such innovations:

1. Water governance is a matter of personal responsibility
2. Keeping the Yellow River flowing is a matter of national pride

In summary then, the impact of ideas on the path dependencies in the YRCC has been to transform the narrative from a thin to the thick one as illustrated below:

China

Idea: Integrated water management is a highly complex system that requires a centralised planning system and large coordination efforts to succeed.

Table 12: Polar Pairs in Text

Antithetical Pairs	Contrast
individual / group	self versus collective
farmers / industry	wealth versus need
nature / science	unpredictability versus control

Thin:

1. Water use is a zero-sum game, and where more for one user means less for others.
2. Engineering and technical improvements have made a big difference.
3. Objective quota and targets enable a smooth implementation of water allocation.
4. Integrated water management needs a centralised, detailed system.
5. China's top-down approach makes it easy to implement an integrated system.

Thick

1. Water can be measured by use, as well as by quantity.
2. Softer aspects such as negotiations and personal ties, can make a difference.
3. Targets obtained by consensus require negotiation and other soft skills.
4. A piecemeal approach, using pilot project and local and bilateral cooperation, has made the difference.
5. Rural administration and implementation is not easy for a centralised system.

Conclusion

How then do the ideas make a difference in removing path dependencies in institutional change? The short answer is that they do not. Rather, they overlay the old paths with new ones - provide new logics to old ways of doing this, such that it becomes possible and reasonable to pursue new paths while leaving the old open.

It is important to appreciate that this is not merely analogy but real decisions and real paths. As the above case as shown, there are clear policy gains in the ideational switch,

and perhaps it is these gains, as well as the normative attractions that provide the impetus for continuing with this integrated water management.

But our analysis has also shown that the policy cannot continue in its present form.

First, there are gaps in actual implementation. For example, a safeguard mechanism for the operation and maintenance funds has not yet been established. “The Administrative Measures of the Yellow River Water Right Transfer (trial)” clearly states that the overall expense of water right transfer should include the operation and maintenance costs for water-saving projects and water-measuring facilities. These costs should be borne by the private companies. During the transfer period 2 per cent of the project construction expense should be paid annually. But collecting this money has been a problem. Only the Erong Silicon Electric Power project has paid this fee. (B:17).

Another example is the still incomplete monitoring system. The monitoring system is an important means in the administration of water transfer, and the foundation for the research and promotion of the water transfer in the next stage. Ningxia and Inner Mongolia have conducted monitoring on a certain scale within certain regions, on the topic of effectiveness of the transfer projects and the influence of transfer projects on underground water. However, problems such as the incomplete monitoring system, limited monitoring scope and scale, lack of standardisation of the monitoring contents and evaluation mechanism, still exist in practice.

Second, the plans for implementation remain murky. For example, the sequence of the construction of water right transfer projects is not always clear. Each industrial project is matched by a water-saving renovation project of a similar scale. Each transfer project examined by the YRCC should also be submitted to the State Development and Reform Committee for approval and verification. However, because of the difference

in time taken for approval and verification, by the time permission is granted, there is already a change in the amount of water available. More importantly, from the point of view of private companies, there is also a possibility that a project approved by one authority is not approved by another. Therefore, the sequence of planning of the water transfer and water-saving projects is not easy to predict and causes difficulties in the planning and administration.

The same lack of planning is reflected in the schedules of water-saving and water-using projects. These two sets of projects are supposed to run in parallel but often do not. For example, the Baotou Hexi Power Plant in Inner Mongolia, Dazhong Mineral Industry and Maliantai Power Plant (Stage One Project) have been examined and approved by national and local authorities, while some have even started production. However, their water-saving projects have either not started or have yet to be completed. On the other hand, the water-saving projects of Weijiamao Power Plant, State Power Changtan Power Plant and Jiutai Energy programme have been completed, but the industrial projects have not yet been examined or approved by the national and local authorities. Last, and perhaps most urgently, the reforms, although increasing the productive use of water and allowing more growth of industry, have also reduced water revenues in the local government. For example, the income of the Water Authority of Huangjinqi in the south bank had CNY 1.1 million less income in 2006 compared to the previous year because less water was used by the farmers. And this trend will continue as more water projects are transferred. These revenues fund the administrative institutions of the irrigation districts, which are responsible for the project operation, maintenance and irrigation water dispatch. If there are no effective measures, the operations of these organisations will be affected.

Much of the work, therefore, appears to lie in ironing out the implementation details. Although regulations such as the “Guiding Opinions on Trial Water Right Transfer in the Mainstream Areas of the Yellow River Valley in Inner Mongolia and Ningxia Autonomous Region” by the Ministry of Water Resource; “The Implementation Methods of the Administration on the Yellow River Water Right Transfer (trial)” and “Project Examination and Verification Mechanism on Water Right Transfer of the Yellow River” exist, the schedule for examination, approval and construction of water right transfer projects is not determined.

Overall then, this case continues to reinforce the empirical finding that IWRM as a concept is not sufficient to produce implementation guidance. Rather, each policy must find its own footing, requiring narrative coherence and richness across the disparate segments.

Timeliness, continuous field-water intake, real time monitoring and analysis, are neither technologically demanding nor difficult, but given the scale of the Yellow River, it is difficult to ensure high compliance. But the YRCC not only has to ensure this, but also move on to the more difficult and expensive ways of tackling water challenges. At present, the main method of saving water is through lining in the canal system. But since thousands of miles have already been lined, authorities need to explore technologies such as spray irrigation and trickle irrigation which can improve the water utilisation rate up to more than 80 per cent. Given the current problems with the comparatively simple implementation of canal lining, these new technologies are likely to be severely challenging.

On a larger scale, the water right transfer concept is, so far, only successfully implemented in Ningxia and Inner Mongolia. Currently, the Yellow River water right

transfer work is conducted only within the same region or city - there is no tested mechanism that transfers across regions or districts. But, in theory, water transfer is merely constructing a quasi-market under the control and supervision of the government. Given the policy gains from this transfer, there is a *prima facie* reason to promote this on a national level.

Chapter Four: Privatisation and Competing Interests: Jakarta's Water Supply

The urban-water supply in Jakarta was privatised in the late 1990s, carried along by the wave of decentralisation sweeping Indonesia. The privatisation itself started out with much optimism and fanfare - the hope of efficient, cost-effective services, water for all, and a sorely needed injection of investment for the capital city's ageing water infrastructure. With an ensured 22 per cent profit margin for the private operator, it was meant to be a gain-gain gamble.

Now, more than 10 years later, the customers have no better service than before; operators have fallen short of their profits targets, and the Government is in debt to the tune of Rp 580 billion (US\$65.54 million) to Palyja. By 2022, the debt could possibly swell to Rp 18.2 trillion. At the same time, the price of water in Jakarta is among the highest in Asia, after Singapore and Hongkong. (Bey and Trapp, 2009)

At the time of writing, the water services in Jakarta remain poor. Only about 43 per cent of Jakarta has water connections, and those that do have connections, only have water two-thirds of the time. Non-revenue water is at 50 per cent and whatever water that reaches the tap must be boiled before it can be drunk. In North Jakarta, where some of the poorest city-dwellers live, there are reports of public health problems, such as cholera.

This chapter examines the privatisation of Jakarta's water supply in two main portions, the first outlines the key ideas behind the privatisation of the Jakarta water supply, setting it in the global contexts of neo-liberalism and the local move towards decentralisation. It sets out the normative attractions of such a move, as well as the economic analysis of greater efficiency. It also gives a broad narrative of the events over the past decade, leading up to the current financial and operational crisis facing

the current Jakarta administration. The second portion is the Q sort, conducted on 24 people who live in Jakarta, 12 from each of the operators.

The privatisation of Jakarta bears close examination for several reasons, the foremost of which is the extent to which it can inform the larger, international debate on privatisation and the form of private sector participation. Second, Indonesia itself appears to be on the cusp of a wave of privatisation of its water utilities, despite the less than positive reviews from the Jakarta experience. The country has more than 300 PDAMs and at least 250 have been earmarked to be privatised because they are classified as being “sick” or performing poorly. (Ardhianie, 2006)

The Privatisation Debate: The Attractions of the Regulatory State

The privatisation of Jakarta’s water supply needs to be examined in the larger context of privatisation of water utilities in developing countries, which is sometimes seen as a matter of economic fiat. Estimates from the World Bank early in the new century indicate that developing countries would need \$60 billion for the water sector over the next 10 years (Haarmeyer and Coy, 2002) while more recent studies puts the figure closer to \$200 billion. (World Business Council for Sustainable Development, 2005) Given these figures, it is unlikely that governments in the global south would be able to finance this on their own. In fact, it is expected that 23 per cent of the world’s population would be served to some extent by private sector by 2015, comparing to only 7 per cent today. (Marin, 2009)

The participation of the private sector is not mere economic necessity, but in some ways, a normative one as well. Because water is essential to life, the mobilisation of FDI in this sector is seen not just as fiscally prudent but a matter of political obligation. Bremer writes: “If water access is a right, as recently confirmed by the

United Nations, then it is governments' responsibility to make water available as efficiently as possible . . . If mobilisation of private investment is the only way that water systems can be put in place to meet community needs, then governments have a duty to do precisely that. The question is not whether this option makes sense - it is the only option.” (Bremer, 2003: 11)

Because of these economic and normative pushes, the harnessing of the private sector into water provision has become a policy imperative. Among the many options in water privatisation such as management contracts, leases, divesture, and Greenfield projects, the “French model” of water management, under which private water utilities provide water supply and sanitation services under long-term concession contracts, has emerged as the primary choice for private sector participation in the water sector. According to the World Bank, (World Bank, 2005) concession contracts accounted for nearly 80 per cent of all private sector participation (PSP) projects in urban water utilities from 1990 through 2005.

This push is also supported by a pro-market governance approach, which can be broadly ascribed to a rise in neoliberal thinking. (Berger and Dore, 1996; Boyer and Drache, 1996; Crouch and Streek, 1997) Broadly, this has meant three things: market deregulation, state decentralisation, and a reduction in the role of the state in economic affairs. (Albert, 1993; Lash and Urry, 1987; Przeworski, 1995)

In this, it finds traction within a larger dialogue of modernisation theories, including Keynesian theories and the Washington consensus of the 1980s and 1990s, with the process of development surmised to be technical and largely apolitical. In the 1990s, with the rise of interest in governance, the regulatory nature of state authority became a focal point, in particular the ability of the state to shape and facilitate the operations

of markets. (Hout and Robison, eds, 2009) Markets could deliver public utilities, if only the state learnt how to govern them properly.

Empirically, we find more non-state actors, including private sector groups, taking part in public life. (Lynn and Ingraham, 2004; March and Olsen, 1995; Peters, 1996; Rhodes, 1997; Rosenau and Czempiel, 1992) Kettl describes the forces transforming governance as “the diffusion of administrative action, the multiplication of administrative partners, and the proliferation of political influence outside government’s circles”. (2002: 159). Dunleavy and Hood (1994) observe this new paradigm along two lines - first, the public sector is “less distinctive as a unit from the private sector” and second, public officials work through a less dense grid of rules and regulations and have more discretionary use of their powers.

This, in turn, gives rise to flexible arrangements, and differing forms of authority structures, including new legitimisation processes. (Garvey, 1997; Kettl, 2000)

Broadly speaking, therefore, there have been an increasing use of third parties, (Salamon, 2002) accompanied in some cases by the decline of hierarchy within the government. (Frederickson and Smith, 2003)

This new paradigm is not just an argument about the scope and scale of the government, but also its basic forms. (Jessop, 1997; Pierre, 2000) With reference to the provisions of public utilities, in the US (Bardach and Kagan, 1982) and in Europe, (Majone, 1994, 1997; Moran, 2003; Vogel, 2003) this conversation has taken place within the discourse of the “rise of the regulatory state”.

Types of Interests

In the regulatory state, the concerns are mainly with the role of competition, markets, and the wave of privatisation. (Jordana and Levi-Faur, 2004; Vogel, 1996)

Regulation, as commonly understood today is a set of rules, administered by some regulatory agency, which governs public behaviour. Regulation is used to denote some form of governance, as efforts by the government to steer the economy, as well as in the wider sense, off all forms of social control. ((Baldwin, Scott, and Hood, 1998; Braithwaite, Coglianese and Levi-Faur, 2007)

Whichever definition is used, however, we see that the promise of privatisation under a regulatory state is to capture market sector efficiencies, effectiveness and a “service” culture, under which political ties are replaced by straightforward contracts between a consumer and service provider.

Writing specifically on market-building efforts in the water sector, Mary Shirley, in a case study of six urban water systems says that contracting out water services to private operation may be most useful to countries with *weak* institutions. “The concern of global operators with their worldwide reputations, local relationship and their responsiveness to the incentives under contract can propel improvements that would not have occurred under a public operator not subject to these motivations. Governments’ concerns about its international reputation function more strongly when there is an international operator present...”. (2002: 37)

There is, to put it crudely, a match of interests - on the side of the operators, there is an interest to obtain the incentives under contract, whether in terms of pricing, or preferential investment terms. In addition, there is a need also to preserve reputations - both in terms of the private operators and the governments. So, the first legitimisation device of the regulatory state is a straightforward one of capturing private-sector efficiencies.

The second leads off from the first into an argument from fiscal prudence - that whoever serves community interest more effectively should take over the provision of such services. If commercial firms can serve this interest, there is no reason for the state to perform the same function. At the same time, there is an argument from bounded rationality - politicians do not have the time, expertise or capacity to design and administer complex policies. Special agencies, with highly trained and expert staff should be allowed to carry the burden. (Majone, 1999) Salamon (2002) argues: “Problems have become too complex for government to handle on its own, because disagreements exist about the proper ends of public action, and because government increasingly lacks the authority to enforce its will on other crucial actors without giving them a meaningful seat at the table.”

For a government with little financial resources, and a mounting crisis in public utilities, as was the case in Jakarta in the late 1990s, the argument from fiscal prudence was a clear justification for privatisation. (World Bank, 1997:1) The World Bank supported both the push towards privatisation, and subsequent legislation.

The third element comes from the need to provide credible commitment. Scholars locate this need in the alleged decline in public trust in major political and social institutions. As Moran (2000) said: “We audit and we regulate, when we cease to trust.” Majone (1999) argues that this is the main reason for delegating policy powers to what he calls “non-majoritarian institutions”. He observes: “Under the expectation of alternation, democratic politicians have few incentives to develop policies whose success, if at all, will come after the next election. Moreover, because a legislature or a majority coalition cannot bind a subsequent legislature or another coalition, public policies are always vulnerable to renegeing and hence lack credibility.”

He noted that whole such “short-termism” has long been recognised as intrinsic problems of democratic governance, the need to achieve credible commitment has taken on a new and greater urgency due to the growing interdependence among nations, the increasing complexity of public policy, and, the greater role assigned to regulation.

In short, credible commitment is especially needed in the regulatory state, where much depends on the private investors’ perception of the credibility of the government. Unlike the governance model, which appears to be premised on the fact that smaller government is always better, the regulatory model sees regulation is merely a better way of achieving the same goal as the state.

In summary then, the key interests and ideational elements at play are:

Table 13: Ideational elements and interests

Ideational elements	Interests
Private sector efficiency	Improved service (people) reputational risk (private operator, government), promise of profits (private sector)
Fiscal prudence	Reduced expenditure for expensive infrastructure (public sector) reduced taxes (people)
Credible commitment	Reduced investment risk (Private sector), greater assurance of access to water (people)

The case of Jakarta can be viewed as an attempt to realise these three key ideational elements of the regulatory state. In a practical sense, private contracts were extremely attractive since it promises an injection of private capital in instances where the government coffers are very low. At the time, there was also a wave of optimism about privatisation, with the consensus that private capital from multinational companies generates considerable benefits for host economies. (Ehrhardt, 2000) FDI was thought to be superior to other realistic alternatives.

Jakarta: The Market Turn

Jakarta is the capital city of Indonesia, with an area of 662 sq km and a population of 9.9 million. Since 1922, Perusahaan Daerah Air Minum DKI Jakarta or PAM Jaya, the Government's water company, has operated the water-supply system. (Lanti, 2006) The outflow, or the resulting wastewater and sanitation is under the purview of PAL JAYA.

The strain on its water-supply system has suffered from poor service and high losses from the early days of urbanisation. By the late 1980s, these losses reached breaking point - service coverage ratio was 23 per cent and non-revenue water rate was 51 per cent. (JBIC, 2001) By the 1990s, Jakarta was a mega-city, with a population close to 10 million - but less than half received water from the public supply. Clearly, significant capital expenditure was needed to remedy the situation, but it was money which the Government did not have. (Tutuko, 2001)

In 1995, President Suharto ordered his public works minister, Radinal Mochtar, to privatise Jakarta's water. In this exercise, the city was divided in half, and by 1998, the Government had contracted Jakarta's water services to Suez (from France) and

RWE Thames (from the UK). Both were multinational companies, taking the Western and Eastern Sectors respectively, with 25-year concession contracts.

The privatisation of Jakarta bears close examination for several reasons, the foremost of which is the extent to which it can inform the larger, international debate on privatisation and the form of private sector participation. It will also be helpful for the country itself, since Indonesia appears to be on the cusp of a wave of privatisation of its water utilities, despite the less than positive reviews from the Jakarta experience. The country has more than 300 PDAMs and at least 250 have been earmarked to be privatised because they are classified as being “sick” or performing poorly.

(Ardhianie, 2006)

The tender process and “birth defects” in contracts

One of the most distinctive parts of this privatisation deal was the fact that the contracts were awarded on a negotiation rather than an open competitive tender. What makes it even less palatable was the fact that the contracts were eventually awarded to companies with close ties to the President.

One of the companies which won the contract was London-based Thames Water Overseas Ltd, which had formed an alliance with Harjojudanto, the eldest son of the President, who held one fifth of the company. Thames explained its decision in strategic terms. “At the time, any company dealing with Indonesia would have to deal with almost some element of the Suharto family because of the way the Government was set up,” said Peter Spillett, head of environment, quality and sustainability for Thames. (Harsono, 2005)

The second company, Suez, selected the Salim Group, then the largest conglomerate in Indonesia whose founder, Sudono Salim, was a close ally of Suharto’s. “Access to

politics is essential. The water business is always political,” said Bernard Lafrogne, a Suez representative in Jakarta. (Harsono, 2005) On 1 February 1998, the assets of PAM Jaya, including the network and treatment plants and equipment, were transferred to the private operators on the understanding that they will be returned to PAM Jaya at the end of the concession period on 1 February 2023. (PAM Jaya and PALYJA, 2005)

Andrew McLernon, an urban development consultant for the World Bank, had said that the project suffered from “birth defects” - a lack of transparency, the failure to raise rates prior to the privatisation, and the lack, initially, of an independent regulator. The privatisation effort was initially supported by the World Bank, but when it realised that the contracts were to be awarded on a non-competitive basis, it dropped the case. (World Bank, 1997: 177)

The negotiations for privatisation went on for two years from 1995-97, until Garuda, the local partner of Thames, brought the case directly to the Governor of Jakarta. It argued that “technically speaking, there were no fundamental problems to be solved by the negotiating team and the private party”, (Letter to the Governor, 14 April 1997, cited in Boombaard, ed. 2007:303) and urged the Governor to intervene and speed up the process. On the other hand, the Government’s team still faced what they saw as thorny issues - including, significantly, projection of expenditure such as manpower, where the wage bills and overseas training for staff came under fire.

The issue was then brought up to the attention of the President himself. Subsequently, the Minister took over the negotiations himself, travelling to London to discuss the issue with Thames Water. He also formed a negotiation team with the two companies, the Jakarta administration, as well as PAM Jaya. PAM Jaya representatives remained

reluctant but despite their reservations, the contract was signed on 7 June 1997.

A priori, several weaknesses can already be seen in the contract.

First, the contract provides for a “water charge” to be paid to the water companies by PAM Jaya. This water charge is calculated based on the projections done by the private companies of an Internal Rate of Return (IRR) of 22 per cent for the duration of the contract. In effect, it provides a guarantee by the Government of an IRR of 22 per cent, and protects the businesses against the difficulties and uncertainties of raising water tariffs. The terms of payment also included a “management know-how” fee to the parent companies.

PAM Jaya, in turn, was supposed to have paid for this water charge from the water tariff which is paid by the consumer. These tariffs are collected by the private companies and deposited into an escrow account. In theory, the monies would be sufficient to pay for the water charge, as well as pre-existing debts and payments to the city government. In practice, PAM Jaya was to find that the tariffs collected was not even sufficient to pay the water charge, partly because of the difficulties of raising tariff rates. As will be seen in the discussion on the rate rebasing exercises, it is no easy matter to decide on the quantum as well as the timing of tariff increases. As a result, the Government got deeper and deeper in debt.

Second, the currency hedge, or compensation for exchange rate fluctuations and interest rate variations protects the companies from any risk from foreign exchange or interest rate movements. Such risk was borne by the Government; that is to say, all external shocks were compensated for by the Government. This was to be a high

pressure point for the contract during the Asian financial crisis which shall be discussed later.

From these two conditions, we see that most economic benefits were to be reaped by the private operators, while the risks were borne by the Government. A third contractual provision made the contract even less tenable. The contracts made several assumptions that were incommensurate with the empirical reality on the ground. The regulatory model adopted was the French one in which the contract itself is assumed to be sufficient to guide the conduct of business - and that the government and the private operators could rely on the legal form to adjudicate in the instance of disagreements. With such a lopsided contract, implementation would surely be rocky. There was no independent regulator that would be able to address and balance between interests, including that of public consumers.

We see then, that the contract itself, the main instrument by which the process of privatisation was to be institutionalised, was arrived at by a flawed process, which in turn produced an outcome that was severely lopsided. With an assured level of profits, an off loading of business risks to the public, and no regulatory authority to answer to, the private sector appeared to have emerged with a winning deal for itself. It was also a failure in a more general sense - for example, there was also a great deal of uncertainty which the contracts failed to address - including the employment, security and reimbursements of the staff of PAM Jaya to the private operators. These staff formed 90 per cent of the total workforce and yet were not certain who they actually worked for, and the terms of employment.

All these vulnerabilities were exposed in the tumultuous first three years.

A month after the contracts were signed, the Asian monetary crisis began to unravel the Southeast Asian economies, starting from Thailand's baht followed shortly by the Indonesian rupiah. Food prices shot up. The rupiah to U.S. dollar exchange rate went from 2,300 in July 1997 to more than 14,000 in February 1998. As a result, while the water charge levied by the private operators (in US dollars) increased dramatically, the revenue to the Government (in rupiah) fell correspondingly. (Bakker, 2006)

There was widespread unhappiness with President Suharto, as well as the disproportionately wealthy Chinese minority. In May 1998, rioters burned many Chinese-owned buildings and killed more than 2,500 people in Jakarta. With riots spreading across the country, President Suharto, in the seat of power since 1965, was finally forced to step down.

In the aftermath, a popular backlash erupted against the water privatisation projects. During the unrest, foreign operators fled Jakarta, leaving the water utilities unattended and PAM Jaya to fill the void. (Bakker, 2006) At the time, operations were disrupted by strikes and violence by the employees. Given the political salience of water prices during this time, the Government instructed PAM Jaya to hold tariff steady for the first three years of the PSP. In the meantime, inflation had spiralled to 120 per cent. As a result, PAM Jaya was squeezed on both sides - unable to increase tariffs on the one hand, while having to make grossly increased payments to the private operators on the other. Finally, it broke with government policy and increased tariffs three times, that is, 1 April 2001 by 35 per cent, 1 April 2003 another 40 per cent and 1 January 2004 by 30 per cent. News reports at the time showed the public unrest and fears over the drinking water supply. PAM Jaya officials feared that the Jakarta water network might be poisoned. Others even predicted a cholera outbreak. (Harsono, 2005)

As the crisis subsided, the foreign operators returned. By that time, the contracts had been cancelled by the locals; in return, the operators called on their respective governments to put pressure on the federal government. Under the threat of lawsuits from the large MNCs, the contracts were duly revived, despite high anti-privatisation public feelings. The Suharto-linked Indonesian partners, however, were bought out and the names of the companies changed from KTA to PT Thames PAM Jaya (TPJ), and from GDS to PT PAM Lyonnaise Jaya (PALYJA).

Under the new contract, targets for coverage and leakage reduction were relaxed to levels so low they were even below those achieved by the local water utility pre-privatisation. Meanwhile, three years into the contract, the price of water in Jakarta more than doubled. These are further discussed in the section below. On 22 October 2001, a new contract was signed between PAM Jaya and the private operators. Both Thames and Suez established new companies: PT Thames PAM Jaya and PT PAM Lyonnaise Jaya, 95 per cent owned by their parent companies in London and Paris, with the shares held by the subcontractors of these international companies. Under the new contract, the multinational companies agreed to give PAM Jaya joint control of the bank accounts. At the same time, the five service standards and five technical targets monitored by the contract were reset.

The new contract also provided for a regulatory body, the Jakarta Water Supply Regulator Body (JWSRB), which was designed after a study funded by NERA of Australia in June 1999. Its terms of reference were “to protect the interest of the consumers and also the interest of the Parties in the RCA between PAM Jaya and the two concessionaires”. (PAM Jaya and PALYJA, 2001:1; PAM Jaya and TPJ, 2001:1)

In real terms, the main roles of JWSRB are to review tariffs and make proposals to the Governor, to monitor the performance of the companies and to mediate disputes

between the contractual parties and customers. After the first three-year term, the Government strengthened the independence of the regulatory body by specifying that the chairman and members of the Board be independent from the Government, and publicly recruited.

An important duty of the JWSRB, as in most regulatory bodies, is to resolve conflicts and balance the interests of three main groups of stakeholders. This mediation is required in the regular rate-rebasing exercise, needed to keep up with inflation, and appears to be *prima facie* straightforward since such increases are regular, automatic and set out both in the original contract and the RCA. But the first rate-rebasing exercise in November 2003, demonstrates how intractable the problem can become, and how little real power the regulatory body held.

In preparation for the exercise, ministry officials set up an Independent Combined Expert (ICE) team, including the JWSRB. In mid-February 2004, the ICE presented its results, setting out the increases expected. Under its terms of reference, the JWSRB can recommend a certain level of tariff, but has no power to enforce it - the Governor still needs to approve this increase. (Iwanami and Nickson, 2008) Not surprisingly, the Jakarta Governor declined to implement the increases. The Jakarta Government then consulted with the Ministry of Public Works, and a joint team was formed to try and forge an agreement for new water charges. Again, this attempt ended in failure. Finally, both parties came to JWSRB and requested mediation. In December 2004, PAM JAYA and PALYJA reached an agreement for a new rebased water charge. TPJ however, refused to sign on. There was no agreement until end of November 2005, more than three years after the 2002 deadline.

It took a High Executive Meeting of the Jakarta Provincial Government chaired by the

Governor, before the first implementation of a supposedly *automatic* tariff adjustment. In January 2005, both parties finally accepted the opinion of JWSRB on the rate rebasing.

Elements of discourse

Jakarta

Idea: Privatisation provides investments for large infrastructures but is a politically-sensitive issue that pits the social needs of people against the profit motive of private companies.

Table 14: Polar Pairs in Primary Text

Antithetical Pairs	Contrast
private /public	Profits versus social need
foreign/local	MNCs versus local interest groups
efficiency/ corruption	rational knowledge versus political interests

Thin:

1. Private investors are good sources of the large amounts of capital needed for water infrastructure.
2. Private firms are out to raise tariffs and make the most of their monopolistic powers in their term of contract.
3. This profit motive should be curbed by the government with regulators and oversight.
4. The people should expect better quality for the same price.
5. Privatisation introduces efficiencies and operational improvements.

Q Sort

Table 15: The opinion continuum for the Q sort

<i>Number of statements</i>	6	10	18	10	6
<i>Statement Scores</i>	-2	-1	0	1	2
	SD+D	SWD	N	SWA	A+SA
Factor 1	Privatisation of its water supply has failed for Jakarta.				
Factor 2	The Government is partly responsible this failure.				
Factor 3	Rules and institutions are poorly designed.				
Factor 4	The private companies are concerned about profits rather than the demands of residents.				
Factor 5	The Government does not have the capacity to provide good water service to all residents.				
Factor 6	Residents have to find ways to cope with the water crisis on their own.				
Factor 7	Money or higher tariffs has not solved the problem.				

Summary

The 50 responses to the 50 statements were correlated in a 50 by 50 matrix. The matrix was factor analysed using the PQMETHOD software. The initial factor loadings were determined automatically by PQMETHOD, which extracted eight principal component factors. Varimax rotation was used and resulted in seven identifiable factors. Of the 50 respondents, 14 clustered on factor A, 5 on factor B, 5 on factor C, 3 on factor D1, 3 on factor 5, 2 on factor E1, and 4 on factor E2. Factor loadings with eigenvalues greater than 1.00 were considered significant. Analysis of three randomly generated Q-datasets of the same dimensions as the Chattooga data showed that factors explaining less than 3-4 per cent of the variation should be ignored. A total of eight factors had eigenvalues greater than 1.00 (21.3806, 4.7781, 3.9960, 3.4338, 1.1989, 2.3122, 1.7617 and 1.4887).

<u>Policy Argument 1</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>
Jakarta is a water-impooverished city. (16)	2	0	0	1	-1	-1	1
Rather than complaining about there being not enough water, residents who do not have water from the pipes should start stocking up as much as possible so that it is enough for one day. (30)	2	-2	1	-1	1	2	2
The water distribution contract between two foreign companies is responsible for the bad quality of Jakarta's water. (17)	2	0	0	0	0	0	1
The public is bearing the burden of PAM Jaya's debt to the private companies. (42)	2	1	0	-2	1	2	1
Privatisation of water in Jakarta for the past 13 years has ignored the public's right to water in Jakarta. (41)	2	-1	0	1	1	2	1
Both private companies have not kept their promises to improve performance. (29)	2	0	0	1	-1	1	1
The (PPP) agreements resulted in 150,000 Jakarta residents paying monthly bills without getting any clean water. (47)	1	0	2	0	2	1	0

The quality of water service provided by the private operators is worse than PAM Jaya's back then. (4)	1	0	1	0	2	-1	2
The subsidy for water is an excuse for the Government to privatise water resources. (11)	-2	-1	0	2	0	0	0
The private sector is a useful partner because the Government has limited money for investments, the private sector is more efficient and can bring in new technology. (18)	-2	-2	-1	2	0	0	-1
The blame does not lie with the operators alone but with the corruption within the management. (39)	-2	2	1	1	0	0	0
Public-Private Cooperation projects support the principle of pay as you use, i.e. a person only pays what he uses. (20)	-2	0	-2	-2	-1	-2	-2
With the private sector in particular, clean-water distribution can be more spread out, leakage minimised, and all bill readings and collection more organised. (21)	-2	0	-2	-2	-1	-2	-2
The Jakarta Government and clean water operators should change the pricing structure so that they can reduce the tariff of this essential commodity. (28)	-2	2	-2	-1	-2	-2	-2

<u>Policy Argument 2</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>D1</u>	<u>5?</u>	<u>E1</u>	<u>E2</u>
If the water service does not improve, there will be a big demonstration by the residents. (33)	0	2	1	0	0	0	0
The Government should take back the management of water from the private operators. (38)	1	2	1	-1	0	2	0
The blame does not lie with the operators alone but with the corruption within the management. (39)	-2	2	1	1	0	0	0
The Jakarta Government and clean water operators should change the pricing structure so that they can reduce the tariff of this essential commodity. (28)	-2	2	-2	-1	-2	-2	-2
Private operators are diligent when it comes to asking to pay the bill even though the water does not come out of the pipes. (8)	0	2	-1	0	-1	-1	1
Private operators have more technical and financial capabilities compared to PAM Jaya to make the water service as good as the level of service in developed countries. (6)	-1	2	-2	1	0	-2	-2
Private operators prioritise care more for business and the rich	0	-2	-1	0	1	-1	1

when it comes to providing new clean water networks. (10)							
With Public-Private Cooperation, sustainable financing can be achieved. (19)	0	-2	0	0	-1	-2	0
Water companies are profit-oriented and only financially-abled citizens are able to access clean water. (13)	0	-2	0	2	0	-1	0
The Government needs to give incentives for the private sector to participate in PPP projects for developing access to water for the people. (27)	0	-2	0	-1	0	1	0
There need to be steps for PDAM (the water-utility companies) to improve their services, either through new loans, private sector, or own capital. (15)	-1	-2	0	-2	0	-2	-1

<u>Policy Argument 3</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>D1</u>	<u>5?</u>	<u>E1</u>	<u>E2</u>
There is no one to complain to about poor water service because operators and PAM Jaya are blaming each other. (45)	0	0	2	0	0	2	0
The (PPP) agreements resulted in 150,000 Jakarta residents paying monthly bills without getting any clean water. (47)	1	0	2	0	2	1	0
Because of poor regulations and patronage between the investors and the Government, the consumers must bear the cost of the poor performance. (48)	0	1	2	0	2	-1	-2
PPP in Jakarta is a failure. (49)	1	1	2	1	1	1	-1
The Government and the operators should cooperate to improve the situation. (46)	0	-2	2	1	-1	1	-1
The contract gives excessive protection to the two private companies while consumers' interests are ignored. (50)	1	-2	2	-1	1	1	-1
The blame does not lie with the operators alone but with the corruption within the management. (39)	-2	2	1	1	0	0	0
The conflict between PAM Jaya and the two private operators is becoming more confusing to customers. (40)	-1	-2	1	0	0	0	0
An exploitation scheme that only benefits the interests of foreign companies. (25)	1	-1	-1	0	1	-1	0
Private operators cannot fulfil the water demands of Jakarta citizens. (3)	0	1	-1	2	2	1	2

The Jakarta Government could have been more stern with the operators given their bad performance. (34)	0	1	-2	-1	-2	0	-1
The contract should be re-negotiated. (26)	0	0	-2	-1	0	0	0
Private operators have more technical and financial capabilities compared to PAM Jaya to make the water service as good as the level of service in developed countries. (6)	-1	2	-2	1	0	-2	-2
The Jakarta Government and clean water operators should change the pricing structure so that they can reduce the tariff of this essential commodity. (28)	-2	2	-2	-1	-2	-2	-2
With the private sector in particular, clean water distribution can be more spread out, leakage minimised, and all bill readings and collection more organised. (21)	-2	0	-2	-2	-1	-2	-2
Public-Private Cooperation projects support the principle of pay as you use, i.e. a person only pays what he uses. (20)	-2	0	-2	-2	-1	-2	-2

<u>Policy Argument 4</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>D1</u>	<u>5?</u>	<u>E1</u>	<u>E2</u>
Private operators always ask for increases in water tariff. (2)	1	1	0	2	0	1	1
Private operators cannot fulfil the water demands of Jakarta citizens. (3)	0	1	-1	2	2	1	2
Government does not want to be responsible for providing water to its citizens. (9)	-1	-1	0	2	2	-1	-2
The subsidy for water is an excuse for the Government to privatise water resources. (11)	-2	-1	0	2	0	0	0
Water companies are profit-oriented and only financially-abled citizens are able to access clean water. (13)	0	-2	0	2	0	-1	0
The private sector is a useful partner because the Government has limited money for investments, the private sector is more efficient and can bring in new technology. (18)	-2	-2	-1	2	0	0	-1
Water-privatisation policy is not a popular policy currently, mainly because of the rise of the price required by the private operators. (43)	0	0	1	-1	0	0	0
The public is bearing the burden of PAM Jaya's debt to the private companies. (42)	2	1	0	-2	1	2	1
The Government continuously asks for cooperation with many parties in order to achieve the clean water and sanitation targets.	-1	-2	0	-2	-1	0	0

(14)							
There need to be steps for PDAM (the water-utility companies) to improve their services, either through new loans, private sector, or own capital. (15)	-1	-2	0	-2	0	-2	-1
Public-Private Cooperation projects support the principle of pay as you use, i.e. a person only pays what he uses. (20)	-2	0	-2	-2	-1	-2	-2
With the private sector in particular, clean water distribution can be more spread out, leakage minimised, and all bill readings and collection more organised. (21)	-2	0	-2	-2	-1	-2	-2
It is better to drill my own well than going to the water utilities. (37)	-1	1	0	-2	-2	1	0

<u>Policy Argument 5</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>D1</u>	<u>5?</u>	<u>E1</u>	<u>E2</u>
Private operators cannot fulfil the water demands of Jakarta citizens. (3)	0	1	-1	2	2	1	2
Government does not want to be responsible for providing water to its citizens. (9)	-1	-1	0	2	2	-1	-2
The (PPP) agreements resulted in 150,000 Jakarta residents paying monthly bills without getting any clean water. (47)	1	0	2	0	2	1	0
Because of poor regulations and patronage between the investors and the Government, the consumers must bear the cost of the poor performance. (48)	0	1	2	0	2	-1	-2
The private operators' performance is disappointing. (5)	1	0	0	0	2	1	2
The quality of water service provided by the private operators is worse than PAM Jaya's back then. (4)	1	0	1	0	2	-1	2
Rather than complaining about there being not enough water, residents who do not have water from the pipes should start stocking up as much as possible so that it is enough for one day. (30)	2	-2	1	-1	1	2	2
Cooperation with private operators have caused PAM Jaya (the public-water utility) to lose money. (1)	0	0	-1	0	1	2	2
With the private sector in particular, clean water distribution can be more spread out, leakage minimised, and all bill readings and collection more organised. (21)	-2	0	-2	-2	-1	-2	-2

Public-Private Cooperation projects support the principle of pay as you use, i.e. a person only pays what he uses. (20)	-2	0	-2	-2	-1	-2	-2
The son of then President Suharto pushed to include the private sector in providing water for Jakarta. (23)	-1	1	0	1	-2	0	-1
The Jakarta Government could have been more stern with the operators given their bad performance. (34)	0	1	-2	-1	-2	0	-1
The Jakarta Government and clean water operators should change the pricing structure so that they can reduce the tariff of this essential commodity. (28)	-2	2	-2	-1	-2	-2	-2
Residents are relieved because they no longer have to buy water from the water vendors, as houses are now installed with water pipes connecting to the master meter, the main hydrant supplied by PT PAM Lyonnaise Jaya (Palyja). (36)	-1	0	-1	-1	-2	0	-1
Prices are up, but the service is still poor, the water died without any notification, and the flow is very weak. (31)	0	0	0	0	-2	-1	1
It is better to drill my own well than going to the water utilities. (37)	-1	1	0	-2	-2	1	0

<u>Policy Argument 6</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>D1</u>	<u>5?</u>	<u>E1</u>	<u>E2</u>
Cooperation with private operators have caused PAM Jaya (the public water utility) to lose money. (1)	0	0	-1	0	1	2	2
Rather than complaining about there being not enough water, residents who do not have water from the pipes should start stocking up as much as possible so that it is enough for one day. (30)	2	-2	1	-1	1	2	2
The Government should take back the management of water from the private operators. (38)	1	2	1	-1	0	2	0
Privatisation of water in Jakarta for the past 13 years has ignored the public's right to water in Jakarta. (41)	2	-1	0	1	1	2	1
The public is bearing the burden of PAM Jaya's debt to the private companies. (42)	2	1	0	-2	1	2	1
There is no one to complain to about poor water service because operators and PAM Jaya are blaming each other. (45)	0	0	2	0	0	2	0
Private operators have more technical and financial capabilities compared to PAM Jaya to make the water service as good as the level of service in developed countries. (6)	-1	2	-2	1	0	-2	-2

With the private sector in particular, clean water distribution can be more spread out, leakage minimised, and all bill readings and collection more organised. (21)	-2	0	-2	-2	-1	-2	-2
The Jakarta Government and clean water operators should change the pricing structure so that they can reduce the tariff of this essential commodity. (28)	-2	2	-2	-1	-2	-2	-2
With Public-Private Cooperation, sustainable financing can be achieved. (19)	0	-2	0	0	-1	-2	0
Public-Private Cooperation projects support the principle of pay as you use, i.e. a person only pays what he uses. (20)	-2	0	-2	-2	-1	-2	-2
There need to be steps for PDAM (the water-utility companies) to improve their services, either through new loans, private sector, or own capital. (15)	-1	-2	0	-2	0	-2	-1

<u>Policy Argument 7</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>D1</u>	<u>5?</u>	<u>E1</u>	<u>E2</u>
The quality of water service provided by the private operators is worse than PAM Jaya's back then. (4)	1	0	1	0	2	-1	2
Rather than complaining about there being not enough water, residents who do not have water from the pipes should start stocking up as much as possible so that it is enough for one day. (30)	2	-2	1	-1	1	2	2
The private operators' performance is disappointing. (5)	1	0	0	0	2	1	2
Cooperation with private operators has caused PAM Jaya (the public water utility) to lose money. (1)	0	0	-1	0	1	2	2
There is a water crisis in Jakarta. (35)	1	-2	1	0	-1	0	2
Private operators cannot fulfil the water demands of Jakarta citizens. (3)	0	1	-1	2	2	1	2
The water distribution contract between two foreign companies is responsible for the bad quality of Jakarta's water. (17)	2	0	0	0	0	0	1
The process of privatisation should be more transparent. (44)	-1	0	1	0	0	0	-1
PPP in Jakarta is a failure. (49)	1	1	2	1	1	1	-1
With the private sector in particular, clean water distribution can be more spread out, leakage minimised, and all bill readings and collection more organised. (21)	-2	0	-2	-2	-1	-2	-2

Government does not want to be responsible for providing water to its citizens. (9)	-1	-1	0	2	2	-1	-2
The Jakarta Government and clean water operators should change the pricing structure so that they can reduce the tariff of this essential commodity. (28)	-2	2	-2	-1	-2	-2	-2
Because of poor regulations and patronage between the investors and the Government, the consumers must bear the cost of the poor performance. (48)	0	1	2	0	2	-1	-2
Public-Private Cooperation projects support the principle of pay as you use, i.e. a person only pays what he uses. (20)	-2	0	-2	-2	-1	-2	-2
Private operators have more technical and financial capabilities compared to PAM Jaya to make the water service as good as the level of service in developed countries. (6)	-1	2	-2	1	0	-2	-2

Analysis of Key Factors: The Rhetoric and Reality of Implementation

The section above shows that the concession contract was the main instrument of the market-building efforts. With its accountability and key performance indicators, it was thought to be the key in improving governance of the water sector, from one based on patronage, personal relations, to one based on business and contractual relationships. That is to say, the contract was the main instrument through which different interests would manifest, be balanced and resolved. With this in mind, it is worth looking at the form of the contract in some detail.

Jakarta originally adopted a model of regulation by contract where there was no regulator. Public contracts are enforced in the same way as private ones - by force of law and legal structures. (Groom et al, 2006) It later moved to a model of discretionary regulation, where the regulator has a role in curbing private sector opportunism and representing consumer's interest. This hybrid form of concession contracts used rules and regulations to balance between the use of discretion and the

inclination towards self-serving opportunism. (Bryner, 1987; Handler, 1986; Hawkins, 1992)

Bearing in mind the tension between the need for flexibility and dangers of discretion inherent in concession contracts, we can now turn to examining challenges of realising the three different normative elements of the regulatory state. Specifically, I will show how the factors present in current discourse and public perceptions undermine the manifestation of all three key legitimating arguments.

1. Capturing private sector efficiencies

Factors: Privatisation of its water supply has failed for Jakarta.

Rules are poorly designed.

The contracts were to capture these efficiencies in two key ways - price and competition. The first was to have been captured through the process of selection of the operator, and through the use of key performance indicators and benchmarking to a competition. It is not difficult to see that Jakarta has failed to demonstrate such efficiencies. However, we see the point that this failure *by itself* is not unusual. Cost reduction, the main legitimate device for privatisation, has been unevenly obtained, across countries. In a review of all published econometric studies of water and waste production since 1970, (Bel and Warner, 2008) found that there is little support for the idea that privatisation leads to cost savings.

What is notable in the case of Jakarta is the way in which such efficiencies were jettisoned. This is where the factor of “Rules are poorly designed” comes into play.

First, the selection process, one of negotiation rather than open tender, was a key factor in eroding some of the potential gains. The “birth defects” showed that even as

privatisation sought to dispel personal ties and political influence in public service provision, these very elements became embedded in the market-building processes. Going forward, institutional design, therefore, needs to be free of such political pressures to capture efficiency gains.

The same argument applies to failure of competition. Both operators have failed to live up to the performance indicators agreed upon at the start of contract - with relative impunity. Because of the lopsided nature of the contracts, the Government does not appear to have leverage against these operators. While calls for the contracts termination have emerged almost since their inception, the Government has deemed the political cost too high. With the high debt now mounting, there is also little incentive for the Government itself to terminate the contracts since it has no way of repaying these debts. At the same time, there appears to be little benchmark competition between the two operators.

2. Fiscal prudence

The private companies are more concerned about profits rather than the demands of residents.

Money or higher tariffs has not solved the problem.

Residents have to find ways to cope with the water crisis on their own.

The argument from fiscal prudence stems from the possibility that a private operator would allow the Government to shift the burden of both investments and operational attention. In the case of Jakarta, both were manifestly still borne by the Government. Moreover, in the case of Jakarta, it is becoming increasingly clear that a pure market-approach is not satisfactory in getting water to the poor.

This conclusion is not new, because market-building efforts in the water sector are

notoriously politically difficult. (Finger and Allouche, 2002; Johnstone and Wood, 2001; Laurie and Marvin, 1999; Swyngedouw, 2005) But this argument becomes even harder to sustain in the face of a private sector operator that has not demonstrated its ability to reduce tariffs or achieve significant improvements in customer service. This lends support to the perception that the “Private companies are more concerned about profits than the demands of residents”. This is not an unreasonable conclusion, given the empirical reality pointed out above - tariffs have gone up, while service levels are still below what was contractually agreed upon. Residents, especially the urban poor, have had to find their own solutions, including digging wells and contriving illegal connections.

3. Credible commitment

The Government is partly responsible this failure.

The Government does not have the capacity to provide good water service to all residents.

The notion of credible commitment assumes that a private operator, who takes out a contract with the civil service, would be able to provide a long-term commitment divorced from political considerations.

In regulation by contract, the pre-RCA (renegotiated contracts) model, we see that the main mechanism for ensuring security and protection of interests was by contractual law and the courts - interestingly, there was no attempt by either side to use the courts in the enforcement, or the mediation, of the contractual terms. The concessionaires were taken to court on charges of corruption but not over disputes in implementation. Instead, the process of contract enforcement, rocky from the start, proceeded in fits

and starts through negotiation and political bargaining. The notion of “credible commitment”, therefore, is hard to realise. Even under the RCA, we cannot see that there is increased credibility in terms of isolating the provision of water from political processes.

Given the failure of the effort, what then can we say of the ideational impact of the market turn?

First, there is the fairly obvious we need to note that there is no thick narrative appearing from the Jakarta case. At the moment, 2 - 4 are strongly supported by the interviews and 5 strongly disagreed.

At the same time, we see that the present set of circumstances creates some pressure for change and re-regulation in some ways, which then allows us to see what a possible construction of a thick narrative could be. In other words, the ideational elements have had some impact and are predicted to lead to some institutional change in the future.

Conclusion

In recent years, there have always been increasingly widespread complaints about the quality, quantity and regularity of water supply in Jakarta. (Platts' Global Water Report, 2002) In 2003, opposition to water privatisation was intensified with the introduction of a bill that critics argued would enable privatisation throughout Indonesia.

Empirically, it is clear that private companies have not been able to turn the water provision situation around. The companies have achieved a 31 per cent increase in water connections, and over 33,000 additional connections in the “very modest” areas,

in a city of 10 million around half of which are slum dwellers. The majority of the poor in Jakarta continue to buy drinking water from street vendors, and about 70 per cent still lack running water.

Clearly privatisation of its water utility has not brought Jakarta any closer to the promises of higher efficiency, increased investments and better services.

In our analysis, we have seen that the current narrative remains a thin one. However, our narrative analysis has suggested that there are ways out of the current thin narrative, bearing in mind the various legitimation pathways. One possible thick narrative is presented below:

1. The government, the people and the firm are all responsible for paying for water.
2. Policy goals cannot be clearly be divided into public or private goals.
3. The people sector has its own coping mechanisms, and these costs are not fully captured.
4. The costs of failure are borne by the private, public and the people sector.
5. Privatisation introduces new costs and coordination problems.

These address the three key concerns now about the costs of privatisation, divergent interests and the institutional incentives presented by the current regulatory design.

Costs of privatisation

The costs of failure are borne by the private, public and the people sector.

Privatisation introduces new costs and coordination problems.

The first pressure for change comes, paradoxically, from the private sector. The experience of water privatisation in Britain provides an interesting alternative

perspective to the Jakarta case on how profits in the private sector can matter. One crucial fact in this analysis is that, to recall that regulation not only builds a market but also distributes the gains. (Bakker, 2003, p. 372) In the case of Britain, when regulations in the monopolistic market created supernormal profits, it was these profits that created the pressure points; in the case of Jakarta, it could very well be the huge losses.

Bakker points to the high amount of profits that water companies made in the initial years under a light-handed regulatory regime in Britain. While the expected rate of return was seven per cent, the water industry's actual rates of return had not dropped below 10 per cent since privatisation. (Miller-Bakewell, 1998: 2) At the same time, water prices had been increasing since privatisation. Hence there was pressure for the dismantling of such regulation in favour of "deregulation and re-regulation".

Bakker locates the failure of the regulatory model in Britain to "contain the contradictions between stable returns and the efficiency imperative, on the one hand, and politically acceptable rates of return and the equity imperative, on the other". (2003, p. 359) To resolve the tensions between goals of equity and justice and such market-oriented goals as profits and efficiency, the regulatory framework evolved stricter standards, more demanding information requirements, and imposed increasingly stringent "price caps" on water companies' regulated activities. Along this increase in regulation to hold commercial interests to account, there is a new transformation called the "mutual state", where there is collective ownership of national assets. Some have called such models "associative self-governance". (Mayo and Moore, 2001)²⁹

The same pressure political points can be said to exist in Jakarta. On the one hand, we can say that the contract is lopsided in favour of the private operators. Today, the Jakarta Government already owes Rp 580 billion (US\$65.54 million) to Palyja. By 2022, the debt could possibly swell to Rp 18.2 trillion. The money is owed to the private operators, but given the unsustainable nature of this debt, and the increasingly unlikely prospect of recovering such debts, the private sector itself may see the need to change. As Hutchcroft points out, there is an increasing lack of tolerance for uncertainty among private operators. He writes: “Private sector interest nurtured within them are more likely to tire of the uncertainties of rents and see their interests increasingly in markets defined by general systems of rules and regulation”. (Hout and Robison ed., 2009: 48)

Joint and Mutual Interests

Policy goals cannot be clearly divided into public or private goals.

The second pressure point comes from the regulatory body. We have observed that the regulatory form is a hybrid one; for such a model to work, a strong and independent (that is non-opportunistic) public sector was needed. In a developing country context such as Jakarta, there is often insufficient policy capacity for adaptive changes to be made. (Bloomfield, 2006; Gomez-Ibanez, 2003; Johnston and Gudergan, 2007) The contract also requires a formal hierarchical order of command and control, (Dryzek, 2000) as well as clear and stable goals. It is widely recognised that the regulatory body did not have much power. For example, the JWSRB/ The World Bank had pointed out the isolation of technocrat reformers and their powerlessness to prosecute the incentive reform programme in the face of vested interest. “With the help of an entrenched and corrupt judiciary and an intransigent

bureaucracy, technically bankrupted business groups held onto their key assets, effectively socialising the costs of their losses.” (2000: 43)

The effects of these limitations have been thrown up by the difficulty in reaching an agreement in the rate rebasing exercise. At the same time, however, it does show that the regulatory body does have an important mediation role, including bridging the interests of both sides. For example, the approving body for tariff increases is the Jakarta Governor, but he has very little incentive to agree to increase tariffs because of the political cost. But if some incentive (in the form of a promised investment in infrastructure, with resulting improvements in service) could be given, the Governor could agree to these increases.

At the same time, such an agreement would also remedy a shortcoming in the current contract - at the moment, such investments targets are not spelt out in the contract as being legally binding. Rather, they were set as targets - for example, the firms were expected to invest more than US\$100 million each in the first five years of the contract - but only half this amount was invested by 2004. Many other targets such as coverage, potability of water, and reduction of non-revenue water were all not met.

The regulatory body could negotiate some investment commitment from the operators, while at the same time, requesting a quid pro quo on the part of the Governor on the approval of tariff increases. The regulatory body, therefore, can pursue commitment not just of the pure contractual sort, but of economic or political incentives.

Aligning Interests and Institutions

The Government, the people and the firm are all responsible for paying for water.

The people sector has its own coping mechanisms, and these costs are not fully captured.

The win-win-win economic logic of the original privatisation was premised on the fact that tariffs could increase along with improvements in service. The difficulty of reaching agreements on tariff increases demonstrates the still existing contractual weakness even under the new and renegotiated contracts - there is no alignment between incentives and the power to increase tariffs; yet the tariff increases are the lifeblood of the whole set-up.

The Governor of Jakarta, the person who actually has the authority to implement tariff increases, has little incentive to increase tariffs since it would mean a political cost, with no resulting benefit - at least not in the near term, and even in the longer term, it is a calculated risk that the private operator would invest in improving services. PAM Jaya too has no power to implement the increase. While it is true that it is PAM Jaya getting deeper into debt as a result of low tariffs, it has no political power to force the issue. And since it was opposed to the privatisation at the start, there is no incentive for it to make the current arrangements work - indeed, one particular reading would see PAM Jaya forcing a breaking point, and termination of contact. As for the private operators, the existing terms were so favourable that they would have no incentive to accept any change in the status quo. The contract itself does not stipulate a time frame for agreement to be reached.

Given that the three main parties held such divergent interests, and given that none of them had a clear incentive to agree on a new set of tariffs, it is no wonder that the contracts continued to be dysfunctional and agreement on new rates was delayed. In fact, it was only near breaking point - when the private operators realised the

unsustainable extent to which PAM Jaya was in debt (to the tune of some US\$100 million), that they began to press in earnest for tariff increases.

The thick narrative, therefore, does not break with the existing narrative completely, nor does it oppose the current feelings. Rather, it seeks to break the private/public dichotomy by showing how it is possible to share the costs of privatisation; the foreign/local divide by mutual interests and the false choice between efficiency/corruption by showing how institutional forms can present incentives that can restrain corruption while allowing the private sector a role in water reforms.

Chapter Five: The Political and Moral Logic of Institutional Change

Recapitulations

This research was conceived as a response to two problems, one empirical, the other theoretical. The first is a dilemma faced by the water sector today - an urgent need for water reforms, coupled with a growing agnosticism as to the variables for policy success. With so many failed attempts at water reform, more institutional scholars are foregoing the notion of models of “best practices” and arguing for a greater appreciation for contexts and historical particulars. It was part of a search for a middle way between general principles that do not speak to concrete cases, and the extremely granular approach that regards policy success (or failure) as idiosyncrasy. Particular ideas and reforms, therefore, came to be the subjects of such meso-level approaches.

The second, more theoretical, puzzle comes from three dominant strands of public policy literature at the moment: the first from the literature of institutional change, which recognises the key role of ideas in effecting change. This ideational turn, although promising, has become stuck in a few areas - including the process by which ideas interact with institutions, how ideas eventually become rules that guide actions, and how this selection is made - that is, the processes by which ideas consolidate or transform into institutions.

In confronting these two problems, a third one - in methods - appeared. Ideas, like rules and principles, are invisible. How then can they be quantified and studied? It was thus that the Q methodology was found, to measure and analyse the perceptions and key factors of a particular policy community. This research was an attempt to make a place for subjective variables such as perceptions, ideas and informal

institutions at the quantitative table. Importantly, this also means that an “inter-subjective” framework such as Saleth and Dinar’s can be properly investigated, not just in terms of its formal rules and observable outcomes, but also in the perceptions of the policy community such as the population of a particular water policy.

In short, it was a propitious confluence of the above three puzzles that allows us to design a research programme that addresses the broad puzzle with which we started – namely, that while ideas impact institutional change, it is unclear *how* they do so. This question is investigated by three empirical investigations of the dynamics of institutional change. We have found that ideas induce change by showing why a new state of affairs is better (economically or normatively) than the old. Moreover, we have seen that this “showing” is by no means a straightforward process; rather, ideas work their way into the change process by means of social construction and interpretation. In this, narrative values such as truth, richness and coherence will count in the legitimation effect of the policy, and lends some explanatory (if not predictive) power to the institutional change at hand.

This concluding chapter has three main parts - the first showing a synthesis of our findings and how they confound current understanding of institutional change. Here, I present the argument that institutional change is a process by which one set of rules or principles governing a particular sphere of activity transforms into another. The process does not take place in an all-or-nothing fashion, nor are we presented with a false choice of HI or SC, between punctuated equilibrium or incremental change, between rational agents or a historically-determined path. Instead, the dichotomy of HI and RC models can be bridged with a general theory of institutional change. This bridging is not made on the back of a deterministic evolutionary mechanism or a rational move to reduce uncertainty, as postulated by current

theorists, but is form of hermeneutic choice - where the existing narrative takes in ideational elements of a new narrative, with a gradual discarding of elements of the old. There are still elements of the old in the new, and the narrative moves towards a new or remains with the old insofar as these elements persist or are discarded.

This leads us onto the second section - a discussion of the limitations of our findings, including two important critiques, one phenomenological and the other hermeneutic. In replying to the critics, I elaborate on the interpretive method employed in this thesis and show how this narrative conception of institutional change fits into Saleth and Dinar's inter-subjective theory. I find that the pathways by which change takes place are the familiar variables already identified in existing theory - norms, historical paths and rationally-held interests. Ideas impact change by showing how certain ideational elements fit better with existing narrative than others and in so doing, make political and moral claims about the state of affairs in a policy community. These claims then give, or deny, legitimacy to particular directions of institutional change. In this, the notion of legitimacy means that institutional change is not just about the logic of interests or social appropriateness ("instrumentality" versus "social appropriateness", (Campbell, 1995 as cited in Hall and Taylor, 1996) but also a political and moral logic.

In the last section, I show how this conception of institutional change has elements of a general theory - it holds true for formal and informal institutions, for change as well as stasis. Hence, even as I started with the quest for an answer on *how* institutions change, I may end also with a glimpse of an answer about *why* they do so.

Synthesis of Findings

The three cases of investigation were in water recycling (Singapore), integrated water management (China) and water privatisation (Jakarta). These were chosen because they spoke to a particular set of variables: norms (psychological “yuck” to drinking recycled water), path dependencies (historical local management of water resources) and interests (private versus public). These were the main variables of the three dominant forms of institutionalisms. The dynamics of institutional change, and the ideas embedded with the reform were tracked, both from documents and from survey and discourse analysis.

In all three, I examined about 1,500 pieces of data (including newspaper and magazine articles), to construct a thin narrative of the main ideas informing a particular water debate. I contrasted this with the thick narrative, which I obtained with about 75 interviews in total, with a Q sort that allows me to create key themes from public perception using the Q methodology. Using such an approach, I investigated how rules and principles in the form of new ideas impact an interpretive community, resulting in a social construction of a water policy. These constructions can be thick or thin interpretations, with a thick construction or interpretation resulting in a social construction of a policy that is perceived to be legitimate. A thick construction is defined according to narrative or hermeneutic merits such as truth, richness, cohesiveness and justification. The main finding is that while the thin narrative is in the form of three or four dichotomous pairs, where the truth of one proposition entails the falsity of the other, or at least erodes at its credibility, the thick narrative allows for a greater coherence even among competing propositions. Rather than being an either/or choice between propositions, the thicker narrative allows for different weights to be assigned to propositions for or against a certain idea. In this way, a successful policy is likely to obtain in a policy setting that allows for greater

truth, richness and coherence among the different policy propositions, the key criteria for evaluating narratives.

The contrast between the thick and thin narratives is shown below:

Singapore

Thin: Recycled water is supported by science but rejected by the public because of the “yuck” factor.

6. People don't accept recycled drinking water because of the “yuck” factor.
7. They don't understand the science.
8. They need more information.
9. The problem can be treated as a matter of science and technology.
10. The problem can be solved by more explanation, communication and better PR.

Thick: People have different reasons for accepting recycled drinking water.

6. Science is not pitted directly against emotions.
7. Science itself is finally agnostic about the issue.
8. Water is embedded with larger interests, economic and political.
9. Historical events, such as the struggle with Malaysia, matter.

China

Thin: IWRM is a superior way of managing water because it is a scientific way of bringing together fragmented sectors and divergent interests.

6. Water use is a zero sum game, and where more for one user means less for others.
7. Engineering and technical improvements have made a big difference.

8. Objective quota and targets enable a smooth implementation of water allocation.
9. Integrated water management needs a centralised, detailed system.
10. China's top-down approach makes it easy to implement an integrated system.

Thick: IWRM requires soft skills and a piecemeal approach to succeed.

6. Water can be measured by use, as well as by quantity.
7. Softer aspects such as community leadership and personal ties can make a difference.
8. Targets obtained by consensus require negotiation and other soft skills.
9. A piecemeal approach, using pilot project and local and bilateral cooperation, has made the difference.
10. Rural administration and implementation is not easy for a centralised system.

Jakarta

Thin: Private operators will improve water utilities because they bring market efficiencies, capital and best practices into the water sector.

6. Private investors are good sources of the large amounts of capital needed for water infrastructure.
7. Private firms have a profit incentive to raise tariffs.
8. This profit motive should be curbed by the Government with regulators and oversight.
9. The people should expect better quality for the same price.
10. Privatisation introduces efficiencies and operational improvements.

Thick: There is no thick narrative appearing from the Jakarta case.

At the moment, statements 2 - 4 are strongly supported by the interviews and 5 strongly disagreed. Clearly the outcomes from the 10year long privatisation exercise have fallen far below expectations. The below are possible ways out of moving from the current anti-privatisation narrative.

6. The Government, the people and the firm are all responsible for paying for water.
7. Policy goals cannot be clearly be divided into public or private goals.
8. The people sector has its own coping mechanisms, and these costs are not fully captured.
9. The costs of failure in public utility provision is borne by the public sector.
10. Privatisation introduces new costs and coordination problems.

Analysis

From a review of the three cases, we can make a few comparative observations between the thick and thin narratives, as well as between the three countries. First, we see that the thin narrative pits one idea against another - to summarise, in Singapore for example, the thin narrative as a clear divide between the pro- and anti-reuse camps, whereas the thick narrative allows for the factors that inform both camps, and offers a meta-narrative that includes the principles held by both sides. The same bridge appears in IWRM, which pits those who prefer local over centralised authority. The thin narratives offers an either/or choice whereas the thicker one recognises the complementary nature of both, at different levels of governance. In Jakarta, the thin narrative pits the social and public interests of the citizens and government for good services and accountability on one side, against the profit motive of the private operator. The Jakarta thin narrative continues to pit pairs of antithetical propositions against each other, the old set of institutions against a new. This thin narrative prevents successful institutional change since there is no ideational path for people to change their perceptions from an anti- to a pro-privatisation one. Our analysis of the Jakarta case shows the possible institutional as well as narrative solutions to this problem.

Second, we find that success in institutional change is accompanied by thick narratives. In the case of China and Singapore, we see that the policies that have thick narratives have been successfully introduced with good outcomes. In Jakarta, we see that privatisation has generally failed, and that a thick narrative does not exist. In some ways although there were rules for privatisation in terms of regulative policies, these rules did not compel obedience. The failure of the Jakarta case to yield a thick narrative also leads us to suspect that there is a critical distinction between rules and

principles with institutional forms. This distinction shall be explored further in a later section on the difference between these two ideational elements of institutions, one cognitive, the other normative. In general, we have found that that the ideational foundations of institutional change lie in the cognitive bridges between the existing set of institutions and a new set. Successful institutional reforms succeed where these ideational bridges score highly on truth, richness and coherence, producing a thick narrative which allows many and sometimes contrasting perspectives.

Third, we find this cognitive/normative distinction in ideational forms to be mirrored in the thick and thin narrative. While the thin narrative has claims that appear to be cognitive, the thick claims are primarily political or moral in nature. These include claims such as:

“I can/am willing to tolerate some discomfort for the sake of restoring the health of the Yellow River” (49); “When the interests of the river and the needs of the province conflict, the needs of the river should take priority” (57); “The drive to be self-reliant has given Singapore the room to be totally self-sufficient if there is no new water agreement with Malaysia in 2061 when the second water agreement expires” (28) and “NEWater is part of the Singapore story of realising an impossible dream of a strong state out of an island with no natural resources (34)”.

These apparently non-rational issues were very much at play in the formation of perceptions. This finding squares with what has been observed in recent behavioural studies, providing counterfactuals to the rationalistic notion of individuals as self-interested egoists, and that the behavioural assumptions underlining much of the economics of free-rider theory is empirically false.

Prima facie, therefore, these findings provide some support for the three working hypothesis with which we approach this investigation, viz.

4. Ideas cause change through a process of interpretation under which a “thick” narrative emerges. This narrative provides a way to tolerate conflicts between existing and newly-introduced rules, principles and norms.
5. Institutional change is successful when a new and narrative appears, and the selection from among the many possible sets is a matter of hermeneutic choice.
6. In hermeneutic choice, criteria as including truth, coherence and richness must count.

These elements are located within the inter-subjective theory of institutional change that we discussed in the first chapter, as below:

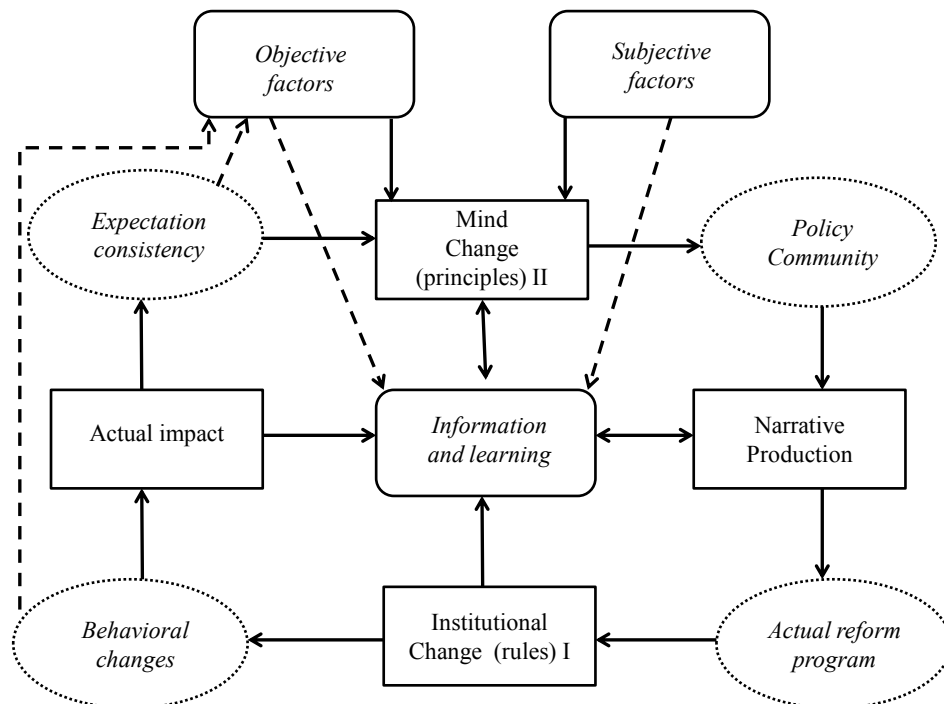


Figure 1.2: Modified framework of inter-subjective institutional change

The inter-subjective theory of institutional change has correctly identified perceptions as being central to institutional change, in particular, identifying subjective and

objective factors, as well as information and learning as being crucial to initiating change. We have included the key elements on our analysis including the production of the thick narrative, the differentiation between rules and principles, and the presence of a policy community. These elements are taken in turn below. But first, I would like to discuss a few limitations.

Limitations

Any narrative analysis is open to the accusation that it is mere “spin”; stories can say what we mean them to say, and any challenge, whether to its descriptive, explanatory power can be resolved by reference to ever finer interpretations and taking in nuances from “contexts” and histories. Hence, even as we make the case in each of the case chapters that the thick narrative succeeds because it is as truthful and, in addition, is richer and provide better coherence among the different ideational elements, the challenge can be made that such criteria is subjective and open to interpretation depending on one’s internal make-up.

It is, in a sense, a critique of the openly phenomenological approach that this thesis has taken. As Dryzek rightly points out, such an approach relies upon an understanding of the “logic of the situation” in which individuals find themselves. “Individuals are capable of action based on an understanding of their circumstances, in a way that the objects of natural science are not.” This is why he is driven to say that “generalisation in social science is a chimera as all situations are different”. (1982:301) Theorists like Dryzek may not mind this critique and may indeed concede to it, since they do not aim for general understandings, but rather a deep and particular understanding about specific incidents. However, such criticisms can be resisted in our current investigations in two ways.

First, our claim is limited. It would indeed be too quick to infer from our observed correlation between thick narratives and successful institutional change (and moreover only from a sample size of three) that a thick narrative *causes* successful institutional change, or even that the two are necessarily correlated. Instead what we present is the limited possibility that the presence of thick narrative accompanies successful change, and in some way describes and explains how such change can be successful. Such a limited conclusion however, is already a step forward, given that it is empirically underwritten and explains some of the difference between a failed and successful change.

Second, our model is quantitative, which allows a differentiation from more purely narrative approaches that do not allow for comparisons of data. With the Q methodology, identical tests can be performed and repeated both across time and space. Any explanatory claim will, therefore, be verifiable, resisting that claim that “anything goes” in narrative analysis. For example, if we have the case that a thin narrative accompanies a successful institutional change, we see that that this counterfactual is sufficient to render the entire thesis false. Until we find such a case, however, our working hypothesis stands.

Yet this is not a raw empiricism of the sort seen in current research work in the water sector such as those cited in the first chapter. It relies on an interpretative method, a particular hermeneutic. This invites another criticism - why or how does the superior narrative lead to change? What are the rules for interpretation and how do they lead to a more defensible path of change than others? More devastatingly, we can see that a narrative model is certainly not internal to the actors. That is to say - none of the factors in the Q sort are narrative in nature. It could, of course, be a fallacy of division to say that what is true of the whole must be true of its component parts, but

we need to see what logics operate at the level where the individual ideational element is at play. This is a deeper criticism and requires us to develop this interpretive model further. If it is true, and it does appear *prima facie* to be so, that narratives no matter how thick do not justify themselves, we need to see what they stand upon.

The Political and Moral Logic of Thick Narratives

The factors themselves give us an idea of the possible model of justification. An examination of the narrative factors shows that they are primarily *political* or *moral* in nature. For example, in the issue of changing norms as in the case of recycled drinking water in Singapore, the notion of a psychological revulsion in the thin narrative was one which pits science against reason. In the thick narrative however, we see that “water is embedded with larger interests, economic and political”. The factors also resonate with historical events, such as the struggle with Malaysia, an explicitly political struggle. In overcoming the determinism of historical paths in the Yellow River meanwhile, the moral rhetoric of a right to water, where the farms’ right to water is weighed against industry, is a key feature. In addition, it is clear that political aspects of water management such as the need for community leadership and bilateral cooperation are also an important feature for the resulting perceptions.

These point towards the fact that there are standards which the community accepts (or rejects) insofar as policy actions are concerned. Saleth and Dinar’s framework seems to suggest that they rely on the legitimacy of a certain political and moral logic peculiar to the policy community, which they call the institutional “ecosystem”. They locate the impetus of institutional change within the mindset change of actors, who internalise the exogenous factors from their surroundings,

leading to a change in perception and subsequent to changed action. Their framework is applied to our findings and modified into a more deeply hermeneutical model and one that brings the discussion further along the political economy of the water sector.

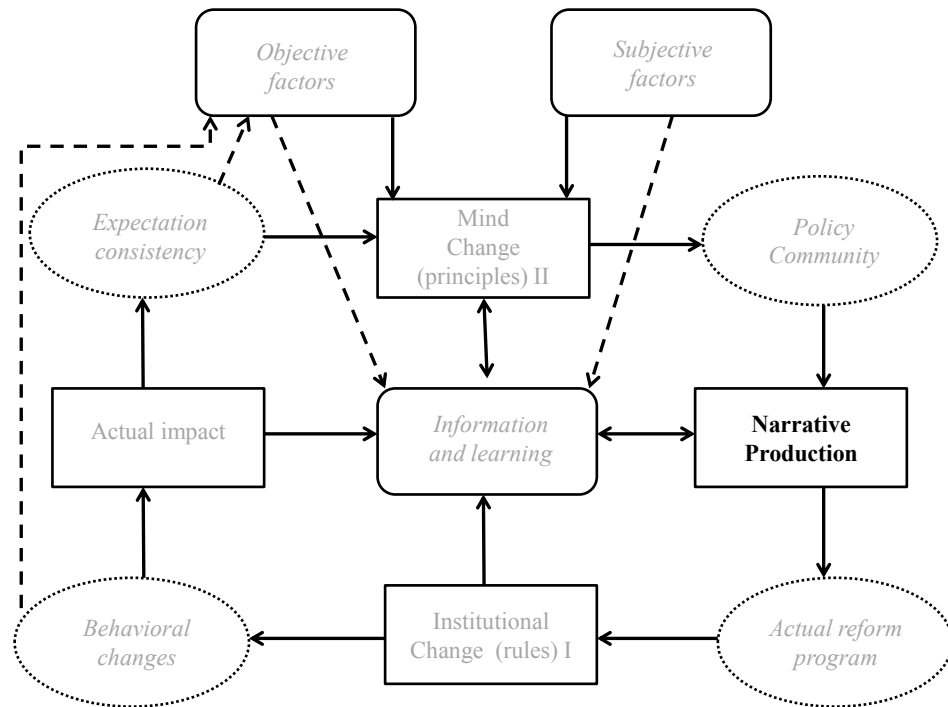


Figure 5.1: Final modified framework of inter-subjective institutional change

However it does not tell us how perceptions are filtered, constructed and linked to institutions. Although there is some provision for learning and information, it does not, in fact, tell us how learning differs from merely perceiving. We have some intuition that ideas (rather than biases and personal preference) count in learning, but what is the precise role of ideas this frame? So far, the explanatory force given to ideas is merely in hermeneutic or narrative terms. From the synthesis above, it can be seen that the thick narrative scores higher on coherence, richness than the thin ones, although all show elements of truth. While this is sufficient to show why one is superior to another in narrative terms, we need to go further if we are to explain this as a matter of policy choice - why is a thick version more powerful or compelling than a thin one? Aesthetic or narrative values cannot be self-justifying. We need to go

further, and see this in a more political light by framing the success or failure of change in terms of legitimacy. That illegitimate water institutions are likely to fail is unsurprising; (Hanberger, 2003) what is unexpected is the finding that these fail, not because they do not possess good rules, (Gearey and Jeffery, 2006) but because these rules and norms are somehow, in conflict with other kinds of rules and standards which are principles.

This was illustrated with the case of Jakarta. While there is a good case to be made for private sector participation, with its need for fair returns, there was an opposing case to be made for the right to water, even for those who cannot afford it. The bridging narrative, which allows the accommodation of both these principles, was not found. Given this, even though the formal nature of the contract - a concessionaire - was found to work in many other countries, it was not underwritten by principles that cohere with the surroundings, and hence did not succeed.

Saleth and Dinar recognises this question when they noted that one gap in our current understanding of water governance relates “to the overestimation of the role of information and underestimation of the role of software that people sue for interpreting information”. Hence they argue for a “mental model” which they employ in their research of performance of institutions, by conducting large scale surveys of the perception of water leaders. This mental model approach yields insights. First, they observe that many of the features which characterise institutions - inter-linkages, malleability or the ability to change, and their embedded nature - make them an ecosystem. As such they can be meaningfully understood as being part of an ecosystem together with their environment defined by “social, cultural, political, economic and resource conditions”. (2004:72) Writing of this as the “institutional ecology principle” they say that institutional structures evolve with this environment

as part of the ecosystem, with intimate and complex linkages. In their empirical study, they provide corroborating evidence for this, showing that the general political, legal and socio-economic environment has a “significant positive effect” on the performance of institutions and institutional reform. (2004:316) Given that the data points are perceptions and mental modes, their framework also provides for the role of learning and information.

The subjective theory looks far beyond the role of individuals and their subjective perceptions. In this, they avoid the charge of being entirely self-referential (in the form subjective perceptions) while providing for linkages with the external environment. This is an important step forward but still does not allow us to explore the justification of change - why does change take place in one direction rather than another? Or within this framework - why do the actors change their minds in one direction rather than another? How are mind-changes justified? This limit is recognised by Saleth and Dinar themselves when they say that it “uses individuals and their perceptions *not as an end in themselves*, but only as a means of endogenising the participatory process through which perceptual convergence and consensus formation emerge among key players including stakeholders and decision-makers”.

Perceptions are indeed not ends in themselves, but then to what ends then do they contrive? What then determines the choice of ideational elements from the environment? Why do people decide to pick thick narratives over thin ones? This question is a vital one since it accounts for the convergence of perceptions that the framework turns on.

The narrative explorations we undertook in the previous chapters point towards the answer and in this concluding chapter we draw out its mature form.

1. An institutional change occurs when supported by a thick narrative of ideational elements that bridges between existing and new set of institutions.
 2. Institutions are themselves ideational, comprising both rules and principles.
 3. Principles provide *normative incentives* for thick narratives and certain courses of action.
-

In this, we see that mere rules are not institutions - they need principles to give institutional legitimacy. To have a clearer idea of this notion of a political and moral logic of an ecosystem, therefore, we need to have a better understanding of the “principles” components of institutions and how they differ from rules.

Rules and Principles

This leads us to a question on the ontology of an institution itself. From the recognition that institutions are constructed and that perceptions play a large part in institutional change, a more nuanced concept of institutions may be needed. From North and Ostrom’s work, we had earlier taken a working definition that institutions comprise not just rules but also principles. Added to this is the “interpretive turn” in public policy-making, when narratives and hermeneutics were naturally added to the theoretical toolbox. We come now to the suggestion that ideas, if they are to become successful in influencing institutional change, need to be embedded into the narrative of the moment, in the form of normative principles. This argument is obtained using the same logic as Dworkin’s (1978) theory of law which he applied to rules and principles of law.

He argues that *contra* positivists, legal principles as well as legal rules, are part of law; while the latter is usually referred to in easy cases of law, principles help

the judge to decide hard cases. This analysis has since been applied to rules and principles in business by Braithwaite (2002). Here, we bring the application a step further to the policy sciences, in arguing that water institutions comprise principles as well as rules.

Why is it important to have principles in our ontology?

Hodgson (2006) points to the justificatory force of principles when he says that that “formal institutions always depend on non-legal rules and inexplicit norms in order to operate. If laws or declarations are neither customary nor embodied in individual dispositions, then - “formal” or not - they have insignificant effects. They are mere declarations or proclamations, rather than effective social rules”. (2006: 18) This we do not have problems accepting as true, but there is a suspicion that institutions of the sort that we investigate must operate according to something more than “social rules” or norms.

These principles are justification for actions, and indeed are a critical factor for successful institutional change. Dworkin puts it this way, speaking about the law: The difference between principles and legal rules is a logical one. Both point to particular decisions about obligations, but they are different because of the way they point. “Rules are application in an all-or-nothing fashion. If the facts a rule stipulates are given, then either the rule is valid, in which case the answer it supplies must be accepted, or it is not, in which case it contributes nothing to the decision.” (1967:25) He cites an example as: “A will is invalid unless signed by three witnesses.” Therefore, if a will has only two witnesses, it is not valid. There may be exceptions to the rule, but these could, in theory at least, all be listed. Principles on the other hand, do not “purport to set out conditions that make their own application necessary.

Rather, it states a reason that argues in one direction, but does not necessitate a particular decision”.

The justification, Dworkin says, comes in the additional dimension of “weight” which principles possess and rules do not. Rules are flat in the sense that they apply in an all or nothing fashion; contending principles on the other hand, can co-exist. Given that principles have weight, they justify themselves; rules do not. For Dworkin, the notion of justification is tied to the fact that “principles seem more energetically at work, carrying most weight, in difficult lawsuits”. (1967:29) After such cases are decided, he says, it may be said that the case stood for a particular rule (for example, as in *Riggs*, that one who murders a person is not entitled to benefit under the will of the victim) but this rule did not exist before the case is decided. “The court cites principles as its justification for adopted and applying a new rule.”

In routine policy-making, the visible rules are sufficient to compel obedience and make things work. In intractable or difficult policies, as in cases of large-scale water reforms, reference to the invisible principles need to be made. If these principles are found to be lacking, then no acceptable course of action on difficult cases can be taken, and the policy is likely to fail. This explains the relative success of collective action arenas where principles are likely to be rich and well-accepted by the community, and rule-making and resolutions of difficult problems more likely.

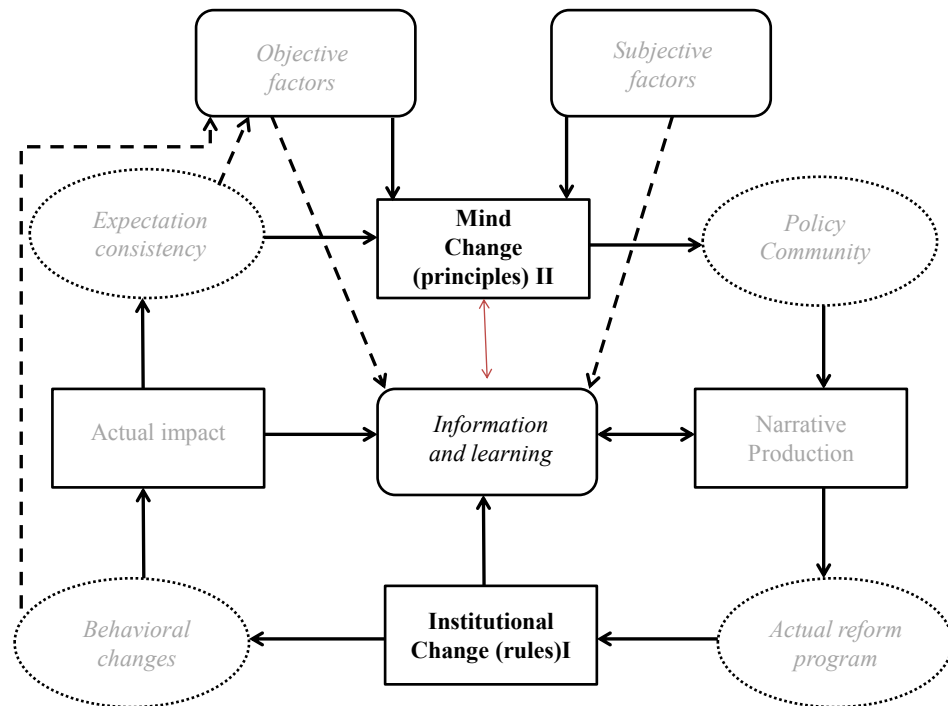


Figure 5.1: Final modified framework of inter-subjective institutional change

Recalling Ostrom’s observation on the dual nature of human beings, that people *can* act in the collective interest, we can usefully ask - what ensures that they *do*? That is to say, demonstrating the existence of two possibilities does not appear to answer the collective and synchronised nature of the change. How do people define their self-interest to align themselves with the collective? How do they see the “big picture” so clearly, that they obey the set of rules? Our answer lies in the principles that are present in the policy community.

The existence of these principles have already been shown in behavioural experiments, for example the well-established “reactance” effect to regulatory control shows that normative rewards such as praise are rather more useful than punishments or material rewards in securing compliance. (Braithwaite, 2002) Rothstein’s work shows that trust is another key variable - if people trust one another, they are more likely to believe that each will act in their collective interest, and hence are more

inclined to behave in a similar manner. There is in short, some measure of trust and reciprocity which accounts for institutional legitimacy in collective actions. Both these variables are invisible; both account for the ability of groups and individuals to make credible commitments. Moral incentives can be present in different forms - physiological reaction (a “warm glow”, (Andreoni, 1989; Ledyard, 1995) encouragement, (Coleman 1988) enhanced reputation, (Coleman, 1988) deontological imperatives (honor, (Ullmann-Margalit, 1977), duty (Knack, 1992), internalised norms, (Coleman, 1987) public spiritedness, (Mansbridge, 1994) and moral duty. (Etzioni, 1988) More easily, measures are external imperatives (social sanctions), (Knack, 1992) third-party sanctions, (Bendor and Mookherjee, 1990) and externally sanctioned norms. (Coleman, 1987)

In short, once we see that institutions comprise both rules and principles, we see how the “mindset change” happens. Rules conjoin with principles in an institution and indeed principles are a necessary part of an institution because they provide the foundations, both normative and hermeneutic for these rules. All these then have implications for how institutions change. This difference has sometimes been explored in the different ways in which informal and formal institutions change, and I make a brief exegesis of work in this field to show how principles fit into this conception.

Here we rely once again on the distinction between formal and informal institutions which we made in chapter one. First, *formal institutions* change because of a change in the process by which such institutions are formed. *Informal institutions* change for the same reason but they occur gradually, and sometimes quite subconsciously. The agent of change is the decision maker (or leader) in different organisations.

We have come to a realisation that there is an interpretive element that is embedded within institutions. The next step then lies in teasing how learning and information leads to the mindset change, and the iterative influences in the other direction. In short, the legitimation processes at play.

Justification and Legitimacy

Political scientist David Beetham writes: “Rules cannot justify themselves simply by being rules, but require justification by reference to considerations that lie beyond them...For power to be full legitimate, then three conditions are required: its conformity to established rules; the justifiability of the rules by reference to shared beliefs...; the expressed consent of the subordinate, or the most significant among them, to the particular relations of power.” (Beetham, 1991: 19) Another popular concept of legitimacy used in empirical research derives from the research of Scharpf (1998:2), who writes that legitimacy in practice is “to justify the exercise of governing authority - of the authority to adopt collectively binding decisions to implement these with resources taken from the members of the collectivity, and ultimately by resort to the state’s monopoly of legitimate coercion”.

These arguments, he says must be arguments that are able to establish a *moral duty* to obey. He points to two analytically distinct concepts - in the “input” dimension, “government by the people”, which implies that “collectively binding decisions should originate from the authentic expression of the preferences of the constituency in question”. Gearey and Jeffery (2006) put it more simply by noting that: “Theories of good governance suggest criteria for evaluating legitimacy. Many such theories distinguish between the level of “input legitimacy” (the issue of how decisions are taken) and “output legitimacy” (whether a goal has been successfully

achieved).” Input legitimation, therefore, is the idea that democratic decision-making is legitimised with reference to the procedural guarantees of equally political rights to provide “inputs” to political decision making processes”. (Heinelt, ed., 2006) In empirical investigations, such input legitimacy was found to exist when there is a consensual or majority decision. (Lijphart, 1984, 1991) In the output dimension “government for the people” implies that the collectively binding decisions should serve the common interest of the constituency.

Overall, then, there appears to be three broad paths to answer the question: “*What makes rules legitimate?*” First, we may refer to some general concept of fairness, reason or justice. Second, we may refer at the process by which these rules are created - if the rules are created according to a due process, then the rule is legitimate. Third, is the notion of acceptance, if a rule is widely accepted, it is legitimate? This is a constructive process recognisably Weber’s, in which legitimacy forms the basis for human action - it provides a reason for man to behave in a certain manner even if such behaviour appears to be against his self-interest. (Scharpf, 2009; Stryker, 1994; Walker et al, 1991) At the same time, Weber locates legitimacy in “the eyes of the beholder” as it were. (Jentoft, 2000) In this latter approach, emphasis is placed on how legitimacy is created and maintained.

The interpretive model allows us to understand institutional change in a way that captures all three understandings of institutional legitimacy. In method, it also slips between the raw empiricism of current water research and the oversimplification of general large-n studies. As Yanow (2007) points out, 40 years of positivist analytic tools have promised much but delivered little - “complex problems require analytic tools that do not oversimplify social realities in order to force feed them into restricted, and restrictive, models”. The promise of interpretive analysis, she

argues “to return persons, their meanings, and their very human agency to the centre of analytic focus”. (2006:117) This call for a more hermeneutic approach towards public policy is not new - it was first made by Dryzek in his seminal “Policy Analysis as a Hermeneutic Activity” where he argued persuasively that such an approach is the most appropriate model when “transformation and utilisation of information” (1982:311) is needed. What is new is that over the past 20 years, two new developments have occurred which now makes operationalising such research feasible. The first is our understanding of the dynamics of institutional change, which has ripened in the foregoing chapters to an understanding of the ontology and the place of ideas in institutional theory. In this, we can now fit an interpretive scheme. Second is method - we now have better and more rigorous statistical models such as the Q methodology. This enables us to make scientific, replicable experiments with public perceptions and handle them legitimately as data points.

	Rational	Socio/His	Discursive
Basis	Fiscal	Credible commitment	Group interest
Nature	Instrumental	Instrumental	Intrinsic
Inputs	Expert advice	Market forces	Ideas

Outputs	Small public sector	Profits, lower costs	Meeting collective needs
Motivations	Self-interest	Material incentives	Group/Moral

Figure 5.2: Models of Legitimacy: Institutionalisms and Motivations

This concept of institutional legitimacy, therefore, depends on a policy ecosystem which derives justification from a political and moral logic. We now need a clearer notion of this community or ecosystem. The segment we are considering now, therefore, is the place where principles feed into the particular policy community.

Policy (Interpretive) Community

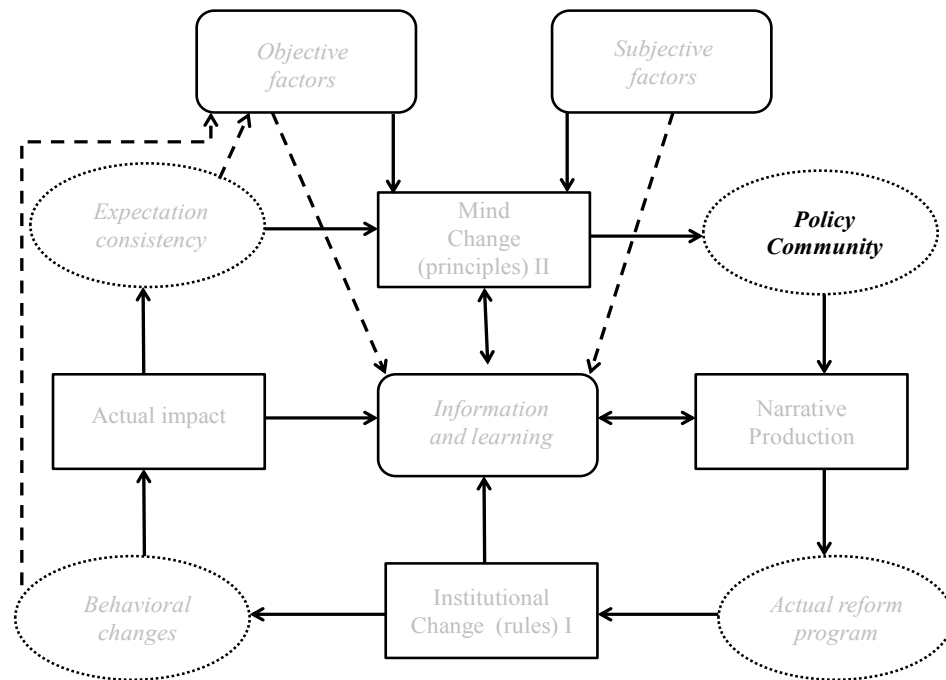


Figure 5.1: Final modified framework of inter-subjective institutional change

We have shown that institutions comprise principles as well as rules. Both Ostrom and North have already outlined how simple rules work, and their models are not disputed here - in routine policy-making, these rules which are simple and admit of straightforward interpretation, are sufficient to compel obedience and make things work. It is less clear, however, how principles guide action. Two ways are possible - deontological and interpretive. The deontological force of principles can be said to compel obedience in the same form as simple rules - that is to say, clear-cut instructions for a specific course of action. For example, “Thou shall not kill.” But while this serves well enough as a model for understanding personal action and decisions, but does not move up to the higher level of analysis needed to explain institutional change in a community.

We, therefore, need a more complex interpretive model. We had earlier discussed this model in relation to the workings of principles and legitimacy; we come now to locating this political and moral logic within a community. A community model of legitimacy, where policy institutions possess normative incentives that compel obedience allows us to place our findings into legal or political theories. Two models are useful candidates. The first is Rothstein, who argues that political and moral logics are “intimately connected to each other and so must be treated in a single context”. The empirical tests show that in the three cases, political and moral logic underpins institutional change. Rothstein characterises the dialectic of public life in this manner “the willingness of citizens to assist in realising the objectives of a universal welfare policy depends on their regarding both the substance and the process of the policy as correct. This depends in turn on how the political institutions, charged with the making and implementation of collective decisions, are designed”.

Second, Dworkin’s notion of a “moral community”. His conception of political communities is normative in that they must meet certain conditions before they can impose obligations upon members. The most important of these conditions is that the practices of the association must show equal concern for all its members. Dworkin says that “they accept that they are governed by common principles”.

In the water sector, we see this in the use of regulation such as that used for the privatisation of Jakarta, or for the institutional reform for IWRM in China. Regulation, as Black points out, is essentially an enterprise to bring about a mass and uniform set of behavioural changes, a “process involving the sustained and focused attempt to alter the behaviour of others, according to identified purposes with the intention of producing a broadly identified outcome or outcomes, which may

involve...behaviour modification”. (2002:170) A regulatory conversation, she argues, takes place between the regulators, regulated and others involved in the regulatory process, a process sometimes called “deliberative”. (Braithwaite and Drahos, 2000) From this, it follows that regulatory conversations are a significant feature of regulation when there is a large room for discretion, a high degree of uncertainty and where processes are in place to encourage deliberation. The context in which the conversation occurs is also important.

Given that regulations are a class of institutions, we can widen this analysis to include general institutional change - the dynamics of institutional change is that change happens through a conversation, where each one in the policy community interprets the contexts, ideas and history, in light of his personal histories, and makes decisions about how to redefine his own interests.

In the YRCC, the conversation revolved around the rights of people to water, right to participate in decision-making to set annual quotas, as well as the payment of new water infrastructure. Such conversations were facilitated by the policy contexts such as community leaders and the openness of the central government to bilateral negotiations. In Jakarta, the conversations were also about the right to water, but this was pitted against the right to fair returns on investments as well as the appropriate compensation for business risk. The conversation in Jakarta, therefore, appears to be very different from that in China.

From Dworkin and Black’s accounts, three key hermeneutic foundations appear to be required:

1. A broad shared platform of meanings and interpretive principles.

2. Less “positivist” concepts such as values and interests are an essential part of the conversation.
3. Interpretations may be contested and discursive in nature but they can be evaluated - thick/thin (Habermas, 1996) or as good or bad narratives. (Kaplan, 1990)

Conclusion

This thesis is an attempt to show how ideas work in policies, and the processes by which they bring about institutional change by way of justifications or incentives.

That is to say, ideas induce change by showing why a new state of affairs is better than the old. Such incentives can only be manifest if the narrative constructed by the interpretive community is one that provides some legitimacy for the change.

Our empirical investigations have shown how a “thick” narrative emerges, whose justification rests on its ability to provide coherence between existing and newly-introduced rules, principles and norms. In this way, institutional change is successful when this new narrative appears from among the many possible sets. We have shown that this is a matter of hermeneutic, as well as moral and economic, choice. We have also seen that institutions are not comprised merely of ordinary, specific rules, what North calls “formal” rules, and broader, discursively-determined propositions which are termed principles in my analysis.

In the matter of hermeneutic choice, the variables are not merely rational ones such as self-interest, or normative ones such as duty or morality, rather, embedded in the notion of hermeneutic choice are such narrative criteria as truth, coherence and richness which form a concept of institutional legitimacy.

Overall, institutional change is located with a concept of an institution as comprising of rules and principles; it is the latter which provides the justificatory force for a certain set of actions. This justificatory force is constructed with ideational elements that cannot merely “read off” from a disinterested observer’s point of view, but must be interpreted by the community to which they apply. The final step shows how interpretation impacts the success or failure of institutional change, through the political and moral logic of the community which the policy affects and whose perceptions determine their actions. Future work remains to be done to show the deeper links between hermeneutics and legitimacy.

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Appendix 1: Q-SAMPLE AND FACTOR SCORES

<u>All Statements</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
NEWater helps to ensure Singapore's water supply is not affected during dry months, which we may see more of as climate change causes rainfall to become unpredictable. (1)	-1	0	2	2	0	1	0	2
Water conservation projects, such as installing water-saving thimbles on taps to reduce water consumption, are not enough to meet Singapore's increasing water needs. (2)	2	2	1	0	-2	-1	0	0
Singapore is simply too small to collect enough water for its domestic and industrial needs. (3)	0	1	-1	1	2	-1	1	0
Water is a precious commodity and should be priced as such to ensure no one wastes it without feeling the pinch. (4)	0	-2	2	0	2	-2	0	0
NEWater benefits science in Singapore as it is a boost to the reputation of the scientific community and helps to attract more funding for water reclamation research. (5)	0	-1	0	0	-2	-1	0	0
NEWater is part of Singapore's efforts to manage the entire water loop of water usage, collection and production. (6)	0	1	1	1	0	1	-1	0
NEWater is a strain to Singapore's energy network as it requires more energy to process than reservoir or imported water. (7)	-1	-1	0	-2	2	-1	0	0
Energy consumption in desalination and reclamation technologies has to be reduced. (8)	0	-1	0	-2	2	-2	1	-1
The science of NEWater needs to be made better known to the general public. (9)	1	-1	0	0	0	0	2	-1
NEWater helps in making Singapore a sustainable city by providing more potable water. (10)	1	0	1	0	0	0	-2	1
NEWater is reclaimed water that has undergone purification and treatment processes. (11)	-1	0	2	-1	0	1	-1	1
NEWater is one of Singapore's four "taps" and an important part of its water supply. (12)	1	0	1	-2	-2	1	1	2
NEWater is more energy-efficient than desalination. (13)	-1	0	1	-2	0	1	1	0
Water reclamation is a long-term investment entailing huge costs in the short term but yielding benefit in the long term. (14)	1	0	0	0	-2	2	-1	1

Singapore's robust regulatory and legislative framework, transparent selection process, and the assurance of payments as these are made by a credit-worthy government are some reasons why the private sector is ready to be involved in water reclamation. (15)	0	0	0	1	0	0	0	0
NEWater shows that environmental sustainability is not incompatible with economic development. (16)	-1	1	-1	2	-2	0	1	1
There is a need for better technology and engineering solutions as the demand for a secure water supply rises with a growing global population. (17)	2	2	0	0	1	0	2	2
Developing NEWater is strategic asset management at a time when global water scarcity is undermining economic progress. (18)	0	0	0	0	0	0	-2	2
Even with the increased supply of water from NEWater, it is important to treat water as a security issue. (19)	1	2	1	0	1	0	1	2
Business opportunities in water management are abundant as developing countries such as China, India and the Philippines have huge potential for water technology investment. (20)	1	-1	-2	0	1	2	0	1
NEWater is safe to drink as it exceeds standards for drinking water around the world. (21)	0	0	-1	0	1	1	-1	0
There is a rising acceptance worldwide of the use of reclaimed water as countries grapple with issues such as water scarcity and pollution. (22)	0	0	0	1	1	0	0	-1
The flow of clean, plentiful water is as essential to our economy and society so it should not be taken for granted. (23)	1	1	0	0	2	1	2	0
It is a challenge to secure public acceptance and encourage industry use of NEWater. (24)	-2	1	0	0	0	-2	-2	-1
Singapore is now recognised as a global hydro hub for its innovative water management. (25)	0	-1	-1	2	-1	0	-1	0
Water shortage was once a headache for Singapore but NEWater has increasingly allowed Singapore to be less reliant on Malaysia. (26)	2	-1	1	-1	-1	0	0	-1
New methods of producing water like NEWater may lead to higher water tariffs. (27)	-2	0	0	-1	0	-2	-2	-1
The drive to be self-reliant has given Singapore the room to be totally self-sufficient if there is no new water agreement with Malaysia in 2061 when the second water agreement	0	0	0	2	0	2	2	0

expires. (28)								
The price of water has to take into account its scarcity as well as the cost of supplying and cleaning it. (29)	-1	-2	2	1	1	0	0	1
NEWater's origin as sewage has slowly ceased to be the centre of jokes. (30)	0	-1	-1	0	0	0	-1	-2
Singapore applies the same pricing to industry as well as domestic users up to a certain level of consumption of water because both sectors have an equal responsibility to conserve water. (31)	-1	-2	-1	2	0	-1	0	0
NEWater has helped Singapore build up a symbol of creativity on top of its usual reputation of efficiency. (32)	1	-1	-1	-1	0	-1	0	0
NEWater is a better alternative than desalinated water because when salt and minerals are removed from water, they have to go somewhere and this has an impact on the environment. (33)	0	-1	0	0	-1	-1	-1	-1
NEWater is part of the Singapore story of realising an impossible dream of a strong state out of an island with no natural resources. (34)	1	-1	0	0	-1	0	0	0
Water security is a real problem that should not be glossed over as an unnecessary worry. (35)	1	2	1	0	1	1	1	1
Installation of NEWater infrastructure benefits home-grown companies as some of the contracts go to Singapore firms and they are able to expand overseas. (36)	0	0	0	0	0	0	0	-1
NEWater is a key part of self-reliance. (37)	2	0	0	1	-1	0	0	1
Today we are taking Singapore's own sources of water for granted. (38)	-2	1	-2	-2	1	0	1	-2
It is a responsibility for all Singaporeans to keep water not only clean but also not to waste it. (39)	2	1	0	0	1	2	1	1
There is still an element of instinctive repulsiveness in drinking recycled sewage water. (40)	-2	1	0	-1	-1	-1	2	-2
Over the last five years, the water industry has become increasingly important to Singapore's economy by doubling its share of GDP. (41)	0	-1	-2	1	0	-1	0	-1
Singapore-based companies have burnished the country's reputation in the water industry by winning large projects overseas in Vietnam, China and Australia. (42)	0	0	-2	1	0	0	-1	0

Government support is needed to help companies in research and development as well as exporting their products. (43)	0	1	0	-1	0	0	0	0
Disagreements over the water agreements between Singapore and Malaysia were a matter of life and death and could have led to war. (44)	-2	-2	0	-1	-1	-2	-1	1
Singaporeans should take pride that we used this major problem as an opportunity to create a real and important asset for Singapore. (45)	0	-1	0	-1	-1	1	0	0
Continual research into all aspects of water production can lead to lower water prices for Singaporeans. (46)	-1	-1	-2	-1	1	0	-1	-2
Singapore has the opportunity to provide the water sector leadership by offering the most conducive environment for innovation and devising best management and operational practices for water and sanitation service delivery. (47)	-1	-2	-1	1	0	0	0	-1
The private sector in Singapore has shown willingness and ability to partner with the public sector to improve access and delivery of water and sanitation services, and water problems confronting the world today have shown that government efforts alone are not enough so the private sector must step in as well. (48)	0	-2	-2	-1	-1	-1	0	0
Water-related issues can harm business – everything from drought to pollution to increased water tariffs. (49)	0	0	-1	-1	0	2	-2	0
The most important thing may not be the water itself but an effective water policy. (50)	-2	1	0	0	-1	0	1	-2

Appendix 2: List of Interviewees

No.	Name	Designation
1	Song Chun 宋春	Vice Director, Office of the Municipal Bureau of Water Resources 市水利局办公室副主任
2	Liu Bin 刘斌	Department of Water Administration and Water Resources, Municipal Bureau of Water Resources 市水利局水政水资源科
	Zhang Yingchun 张迎春	Department of Water Projects, Ordos City Bureau of Water Resources 鄂尔多斯市水利局水利科
	Duan Meisi 段美思	
	Jiang Yuan 江原	Department of Water Resources, Ordos City Bureau of Water Resources 鄂尔多斯市水利局水资源科
	Sun Shousong 孙寿松	Deputy Director, Division of Water Administration, YRCC 黄委会水政局副局长
	Li Feng 李锋	Captain of the Water Policy Motoring Team, Bureau of Water Resources, Daqi 达旗水利局 水政监察大队大队长
	Su Zhong 苏忠	Vice Captain of the Water Administration Team, Daqi 达旗水政副队长
	Xu Lianzhen 徐连镇	Vice Captain of the Operation Department 运行部 副部长
	Liang Xi 梁喜	Deputy Director of the Water Field, Dalate Power Plant 达拉特发电厂 水场副主任
	Liu Gaoqi 刘高奇, 61	Secretary, Ulan Zhang village 乌兰漳尔村支书
	Wang Ruijun 王瑞军	Technician, Facilities Administration of Agricultural Areas, Dugui Tara Town 独贵塔拉镇 设施农业区技术员
	Li Gaolun 李高仑	Head and Senior Technician, Division of Water Resource Management and Relocation 山东黄河河务局水资源管理与调度处 水资源科科长 高级工程师
	Wang Zongbo 王宗波	Vice Director, YRCC Shandong Bureau 山东黄河河务局 副处长 教高

	Meng Xiangwen 孟祥文	Head, YRCC Shandong Bureau 山东黄河河务局 科长 教高
	Liu Guangsheng 刘广生	Deputy Director, Jinan Municipal Branch, YRCC Shandong Bureau 山东济南黄河河务局 副局长
	Zhu Xingming 朱兴明	Vice Director, Jinan Municipal Branch, YRCC Shandong Bureau 山东济南黄河河务局 副处长
	Zhang Jianchun 张建春	Head, Jinan Municipal Branch, YRCC Shandong Bureau 山东济南黄河河务局 科长
	He 贺... ..	Head, Sluice Gate Management and Monitoring Station 闸管所所长
	Zhang Jihong 张继红	Water Monitoring staff member 站所测流人员

Appendix 3: Q-SAMPLE AND FACTOR SCORES

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>
<u>All Statements</u>							
Cooperation with private operators have caused PAM Jaya (the public water utility) to lose money. (1)	0	0	-1	0	1	2	2
Private operators always ask for increases in water tariff. (2)	1	1	0	2	0	1	1
Private operators cannot fulfil the water demands of Jakarta citizens. (3)	0	1	-1	2	2	1	2
The quality of water service provided by the private operators is worse than PAM Jaya's back then. (4)	1	0	1	0	2	-1	2
The private operators' performance is disappointing. (5)	1	0	0	0	2	1	2
Private operators have more technical and financial capabilities compared to PAM Jaya to make the water service as good as the level of service in developed countries. (6)	-1	2	-2	1	0	-2	-2
Private operators only care about company profit but not adequate service. (7)	0	0	-1	1	1	-1	1
Private operators are diligent when it comes to asking to pay the bill even though the water does not come out of the pipes. (8)	0	2	-1	0	-1	-1	1
Government does not want to be responsible for providing water to its citizens. (9)	-1	-1	0	2	2	-1	-2
Private operators prioritise care more for business and the rich when it comes to providing new clean water networks. (10)	0	-2	-1	0	1	-1	1
The subsidy for water is an excuse for the Government to privatise water resources. (11)	-2	-1	0	2	0	0	0
The Government should see to providing water as a main priority and not get the private sector to intervene. (12)	0	0	-1	1	0	0	0
Water companies are profit-oriented and only financially-abled citizens are able to access clean water. (13)	0	-2	0	2	0	-1	0
The Government continuously asks for cooperation with many parties in order to achieve the clean water and sanitation targets. (14)	-1	-2	0	-2	-1	0	0
There need to be steps for PDAM (the water utility companies) to improve their services, either through new loans, private sectors, or own capital. (15)	-1	-2	0	-2	0	-2	-1

Jakarta is a water-impooverished city. (16)	2	0	0	1	-1	-1	1
The water distribution contract between two foreign companies is responsible for the bad quality of Jakarta's water. (17)	2	0	0	0	0	0	1
The private sector is a useful partner because the Government has limited money for investments; the private sector is more efficient and can bring in new technology. (18)	-2	-2	-1	2	0	0	-1
With Public-Private Cooperation, sustainable financing can be achieved. (19)	0	-2	0	0	-1	-2	0
Public-Private Cooperation projects support the principle of pay as you use, i.e. a person only pays what he uses. (20)	-2	0	-2	-2	-1	-2	-2
With the private sector in particular, clean water distribution can be more spread out, leakage minimised, and all bill readings and collection more organised (21)	-2	0	-2	-2	-1	-2	-2
PPP in provision of clean water is very promising, but financial support from the Government is needed so the private sector can recover their costs and gain profit. (22)	0	0	1	0	0	0	0
The son of then President Suharto pushed to include the private sector in providing water for Jakarta. (23)	-1	1	0	1	-2	0	-1
Water management by the private sector is based on unfair contract, that leads PAM Jaya to be in debt despite the profits of the private companies. (24)	1	1	-1	0	1	0	0
An exploitation scheme that only benefits the interests of foreign companies (25)	1	-1	-1	0	1	-1	0
The contract should be re-negotiated. (26)	0	0	-2	-1	0	0	0
The Government needs to give incentives for the private sector to participate in PPP projects for developing access to water for the people.(27)	0	-2	0	-1	0	1	0
The Jakarta Government and clean water operators should change the pricing structure so that they can reduce the tariff of this essential commodity. (28)	-2	2	-2	-1	-2	-2	-2
Both private companies have not kept their promises to improve the performance. (29)	2	0	0	1	-1	1	1
Rather than complaining about there being not enough water, residents who do not have water from the pipes should start stocking up as much as possible so that it is enough for one day. (30)	2	-2	1	-1	1	2	2

Prices are up, but the service is still poor, the water died without any notification, and the flow is very weak (31)	0	0	0	0	-2	-1	1
The water tariff cannot be raised any more because the water tariff in Jakarta is already high compared to other cities in Indonesia. (32)	-1	1	0	-1	-1	0	-1
If the water service does not improve, there will be a big demonstration by the residents. (33)	0	2	1	0	0	0	0
The Jakarta Government could have been more stern with the operators given their bad performance. (34)	0	1	-2	-1	-2	0	-1
There is a water crisis in Jakarta. (35)	1	-2	1	0	-1	0	2
Residents are relieved because they no longer have to buy water from the water vendors, as houses are now installed with water pipes connecting to the master meter, the main hydrant supplied by PT PAM Lyonnaise Jaya (Palyja). (36)	-1	0	-1	-1	-2	0	-1
It is better to drill my own well than going to the water utilities. (37)	-1	1	0	-2	-2	1	0
The Government should take back the management of water from the private operators. (38)	1	2	1	-1	0	2	0
The blame does not lie with the operators alone but with the corruption within the management. (39)	-2	2	1	1	0	0	0
The conflict between PAM Jaya and the two private operators is becoming more confusing to customers. (40)	-1	-2	1	0	0	0	0
Privatisation of water in Jakarta for the past 13 years has ignored the public's right to water in Jakarta. (41)	2	-1	0	1	1	2	1
The public is bearing the burden of PAM Jaya's debt to the private companies. (42)	2	1	0	-2	1	2	1
Water privatisation policy is not a popular policy currently, mainly because of the rise of the price required by the private operators. (43)	0	0	1	-1	0	0	0
The process of privatisation should be more transparent. (44)	-1	0	1	0	0	0	-1
There is no one to complain to about poor water service because the operators and PAM Jaya are blaming each other. (45)	0	0	2	0	0	2	0
The Government and the operators should cooperate to improve the situation. (46)	0	-2	2	1	-1	1	-1

The (PPP) agreements resulted in 150,000 Jakarta residents paying monthly bills without getting any clean water. (47)	1	0	2	0	2	1	0
Because of poor regulations and patronage between the investors and the Government, the consumers must bear the cost of poor the performance. (48)	0	1	2	0	2	-1	-2
PPP in Jakarta is a failure. (49)	1	1	2	1	1	1	-1
The contract gives excessive protection to the two private companies while consumers' interests are ignored. (50)	1	-2	2	-1	1	1	-1