Meeting Urban Water Needs: Exploring Water Governance and Development in Tagbilaran City, the Philippines

by

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Candidate's Declaration

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university. To the best of the author's knowledge, it contains no material previously published or written by another person, except where due reference is made in the text.

Karen Toni Fisher Date:

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Abstract

Water is subject to uncertainty of supply (quantity) and quality, which affects decisions determining allocation, use and management for human and environmental functions. Tensions concerning water and its allocation reflect conflicting ideologies influencing development. Focusing on water governance enables the allocation and management of environmental resources and tensions in development to be explored.

This research has as its central argument the notion that water governance is conceptualised differently at different scales and as discourses become localised, hybrid forms emerge. Place-specific hybrid governance systems which are cognisant of transformations in the local political economy and environmental characteristics can be useful in managing risks and uncertainty about water supply. This is particularly so where local knowledge about formal institutions regulating water governance and environmental conditions is low. This is because hybrid systems are more likely to be responsive to local needs than national or supra-national discourse allows. However, there are limitations with hybrid systems, particularly in terms of allocating responsibility and risk, which require effective coordination.

The aim of this research is to uncover local perspectives and knowledge about water governance and hybridity in urban environments which can be used to shape and influence urban water management. I explore the hybridisation of water governance by considering the problem of ensuring urban water supply in a developing country context. The research was undertaken as an inductive, qualitative inquiry comprising a case study in Tagbilaran City, Bohol, the Philippines. Tagbilaran is a small sized city with a population of approximately 87,000 people. The city is experiencing relatively rapid population growth along with urban development and expansion in which water demand already outstrips water supply. Ethnographic, interpretive techniques were used to distil local perspectives about water governance which are juxtaposed with official policy and discourse. Research methods included participant observation, semi-structured interviews with government employees, government officials and key informants from other organisations. Other methods included structured household surveys and the use of documentary sources.

This research reveals how formal approaches to urban water governance systems have been shaped by international development thinking and discourse. Current strategies to manage water emphasise an integrated approach which encompasses environmental, social and economic domains. At the same time neoliberal discourse exerts a powerful influence over how urban water is conceptualised and managed, and who should be responsible for its provision. The case study allows for the exploration of the ways in which development and water governance discourse have been articulated and the consideration of the local factors which have enabled the emergence of hybrid water supply services embedded in a localised hybrid governance system.

I show how water governance in Tagbilaran is hybrid because of the global-local dialectic that informs policy and practice, public-private engagement in water provision, and inter-jurisdictional water sharing. I also demonstrate how households' experiences of water supply and their physical environment influence decisions about household allocation and perceptions about human-environment interactions and water security. As a consequence, knowledge about water governance held at the household level emerges as localised and specific in which everyday experience shapes ideas around responsibility and agency such that local forms of government and engagement have more meaning for households than national and supra-national discourse. The juxtaposition of formal, bureaucratic governance institutions with household knowledge exposes multiple understandings of water governance and water supply in Tagbilaran.

The findings of this research reveal that household conceptions of water governance are divorced from formal conceptions of water governance. There is a risk, therefore, that an over-emphasis on network expansion without due consideration of water resource management may lead to greater levels of consumption. This will continue to place pressure on resources and may ultimately lead to water insecurity. This is because local knowledge of the formal political, economic, and administrative institutions is limited at the household level. Therefore, this research argues that local perspectives and knowledge need to be incorporated more into management and policy decision making. Alternatively, greater effort needs to be made to communicate formal policy to the household level.

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List of acronyms and abbreviations

AIDAB	Australian International Development Assistance Bureau (changed to AusAID)
AusAID	Australian Aid Agency for International Development (formerly AIDAB)
BOT	Build-Operate-Transfer
BW4SMP	Bohol Water Supply, Sanitation and Sewerage Sector Master Plan
BWUI	Bohol Water Utility, Inc.
CLUP	Comprehensive Land Use Plan
CPC	Certificate of Public Convenience
CPCN	Certificate of Public Convenience and Necessity
CS	Civil Society (the interview code I use to identify respondents from non-governmental organisations and civil society in Tagbilaran and Corella)
DENR	Department of Environment and Natural Resources
DILG	Department of Interior and Local Government
DPWH	Department of Public Works and Highways
EO	Executive Order
GNP	Gross National Product
GDP	Gross Domestic Product
GOLD	Governance and Local Democracy Project
GRDP	Gross Regional Domestic Product
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH (German international cooperation enterprise for sustainable development)
IBT	Increasing block tariff
IMF	International Monetary Fund
IWRM	Integrated water resource management
JICA	Japan International Cooperation Agency
JV	Joint venture

LA	Line Agencies (the interview code I use to identify respondents from national government line agencies such as the Department of Environment and Natural Resources)
LG	Local Government (the interview code I use to identify respondents from local government units in Tagbilaran and Corella)
LGC	Local Government Code
LGU	Local government unit
LWUA	Local Water Utilities Administration
MDGs	Millennium Development Goals
MOA	Memorandum of Agreement
NEDA	National Economic Development Authority
NG	National Government (the interview code I use to identify respondents from the national government)
NGO	Non-governmental organisation
NWRB	National Water Resources Board
OECD	Organisation for Economic Cooperation and Development
P	Philippine Peso
PAGASA	Philippine Atmospheric, Geophysical and Astronomical Services Administration
PD	Presidential Decree
PDC	Provincial Development Council
PES	Provincial Electric System
PG	Provincial Government (the interview code I use to identify respondents from the Provincial Government of Bohol)
PP	Presidential Proclamation
PPDO	Provincial Planning and Development Office
PPUD	Provincial Public Utilities Department
PRMDP	Philippine Regional Municipal Development Project

PWS	Provincial Waterworks System
RA	Republic Act
RDC	Regional Development Council
TACT	Tagbilaran Alliance of Concerned Taxpayers
TCWS	Tagbilaran City Waterworks System
UK	United Kingdom
UN	United Nations
UNCSD	United Nations Commission on Sustainable Development
UNDP	United Nations Development Program
US	United States
USAID	United States Agency for International Development
US$	US dollar
WCED	World Commission on Environment and Development
WD	Water districts
WW	Waterworks utility (the interview code I use to identify respondents from the waterworks utilities operating in Tagbilaran and Corella)
WWAP	World Water Assessment Programme

Glossary and Terms

Administrative Orders	Administrative orders are acts of the President, which relate to particular aspects of the government's operations in the pursuit of duties as administrative head of government (2000).
Barangay	The *barangay* is the lowest political unit of local administration commonly referred to as a village.
Barangay Captain	The *Barangay* Captain is the elected leader of the *barangay* council. The Captain is paid by the National Government. Their role is to liaise between the mayor of the municipality and the *barangay*.
Boholano	Resident of Bohol.
Brownout	A colloquial term for a temporary power failure.
Carabao	Visayan term for water buffalo.
Cebuano	Resident of the Province of Cebu and also the term used to refer to a sub-dialect of the Visayan dialect.
Chismis	Rumour or gossip.
Executive Order	An Executive Order is a presidential Act that provides rules of a general or permanent character in the implementation or execution of constitutional or statutory powers (World Bank, 2000).
Gross Domestic Product	Gross Domestic Product is the total value of income of all residents of a nation from domestic sources, including the income earned by foreign-owned factors of production (Mankiw, 1997).
Gross National Product	Gross National Product is the total value of income of all residents of a nation from domestic and foreign source, including from factors of production used abroad (Mankiw, 1997).
Groundwater	Water that fills the spaces between rocks and soil particles underground and is stored in underground reservoirs or aquifers (Christopherson, 1994; Goudie, 1994; Park, 1997).
Kagawad	Councillor elected on to the provincial, municipal or city council.

Karst	Karst is formed through the dissolution by groundwater of soluble carbonate rocks including limestone (calcium carbonate) and dolomite (magnesium calcium carbonate) to form a subsurface drainage system. Cave systems, sinkholes (see below) and low-lying topography are common characteristics in karst landscapes (Ford, 2004; Urich, 2002).
Kaingin	A Visayan term used to refer to the practice of slash and burn farming.
Presidential Decree	A Presidential Decree is a form of legislation enacted during the Martial Law Regime of President Ferdinand E. Marcos (1972-1986) (World Bank, 2000).
Presidential Proclamations	Presidential Proclamations are acts of the President that fix a date or declare a status or condition of public moment or interest, for which the operation of a specific law or regulation is dependent (World Bank, 2000).
Residence time	The residence time refers to the average amount of time that a water molecule resides in a particular reservoir before it transfers to another reservoir (see Fitts, 2002).
Republic Act	Republic acts are bills initiated by either or both of the legislative chambers of Congress (house or senate) and approved by both Chambers and by the Executive (World Bank, 2000).
Sanggunaing Bayan	The Municipal Government Council, which is comprised of elected officials.
Sangguniang Panlalawigan	The Provincial Government Council, which is comprised of elected officials.
Sangguniang Panlugsod	The City Government Council, which is comprised of elected officials.
Sari-sari store	A *sari-sari* store is a small store selling a wide range of household and other items, generally operating from private residential premises.
Sinkhole	A sinkhole is a closed depression draining underground in karst (see above), of simple but variable form; for example, a cylindrical, conical, bowl- or dish-shaped. Size varies from a

	few to many hundreds of metres in dimension. Sinkholes are also known as dolines (Urich, 2002).
Tarsier	The tarsier is a small primate that has been declared a protected faunal species of the Philippines and which is found in Corella.
Visayan	Dialect spoken in Bohol (and Cebu).
Water for Domestic Use	Water for Domestic Use is defined in Article 10 of Presidential Decree No. 1067 *The Water Code of the Philippines 1976* as: "Use of water for domestic purposes is the utilization of water for drinking, washing, bathing, cooking or other household needs, home gardens, and watering or lawns or domestic animals."
Water for Municipal Use	Water for Municipal Use is defined in Article 10 of Presidential Decree No. 1067 *The Water Code of the Philippines 1976* as: "Use of water for municipal purposes is the utilization of water for supplying the water requirements of the community."

Other Technical Notes

Units of measure

Where volume of water is measured in gallons in this thesis, I refer to US gallons. This converts to 3.78 litres.

Cubic metres is given as m^3

Cubic metres per day is given as m^3/day

Exchange rate

Unless otherwise stated, I have assumed a currency exchange rate in which $1 (Australian) is equal to P36 and $1 (United States) is equal to P50. This is an estimate based on the average rate of exchange during my fieldwork (2003 and 2004).

Unless otherwise stated, all dollar values are given in US dollars.

Philippine legislation

In this thesis, I have referred to numerous pieces of Philippine legislation. The convention I have used in the text is as follows.

Where the full title of the act is given: *Act number, title, year*. For example: *PD 1067 The Water Code of the Philippines 1976*.

Where the act is given in abbreviated form: Act number, year (reference citation). For example: *PD 1067 1976*.

The reference citation is given as the Republic of the Philippines and the year each piece of legislation was enacted. All legislation, including executive orders, is listed separately in the References section at the end of this thesis.

Chapter 1 Introduction

1.1 Problem statement

Water is essential to all life on Earth; without water, life would cease to exist. However, water is subject to uncertainty of supply (quantity) and quality, which affects decisions determining allocation, use and management for human and environmental functions. Tension over water and its allocation reflect conflicting ideologies influencing development. Focusing on water governance enables the allocation and management of environmental resources and tensions in development to be explored.

The main argument of this research is that water governance is conceptualised differently at different scales and as discourses become localised, hybrid forms emerge. That is to say, 'global', 'national' and 'local' ideas about how water should be acknowledged and taken into consideration when managing it differ. Similarly, knowledge about the institutions governing use, also differ at the varying scales. However, rather than being entirely unconnected or fragmented, or a strictly hierarchical ordering of scale which privileges 'global' over 'local' or vice versa, water governance in urban areas is contingent upon contextual factors and scale politics in locations. Therefore, as local and non-local narratives of development intersect, hybrid systems of water governance are created in order to regulate the delivery of water services. Place-specific hybrid governance systems which are cognisant of transformations in the local political economy and environmental characteristics can be useful in managing risks and uncertainty about water supply particularly where local knowledge about the formal institutions regulating governance is low and uncertainty concerning the hydrological environment exists. Hybrid systems may be more responsive to local needs than national or supra-national discourses; however, there are limitations with hybrid systems, particularly in terms of allocating responsibility and risk, which require effective coordination.

The aim of this research is to uncover local perspectives and knowledge about water governance in urban environments characterised as hybrid which can be used to shape and influence urban water management. In this thesis, I conceptualise hybrid governance as referring to the substantive changes in the technologies employed by government and non-government actors in the use of political authority and exercise of control in social and political life. The 'product' of hybridisation is the formation of a governance system in which the role of the public sector has been transformed, and the private sector and civil society have a greater role in directing social and economic development. Moreover, organisational reforms in the public sector in which models of administration take a more businesslike approach to public management based on a neoliberal, market-led agenda are also significant (Haque, 2004).

Within this conceptualisation of hybrid governance scale[1] is an important concept. The production of scale and subsequent relations between and within scales in a given locality are particularly important. In the context of the Philippine case examined by this research I distinguish multiple scales; namely 'global', 'supra-national', 'national', 'provincial', 'local', and 'household'. I seek to show how these scales have been used to legitimate decisions, to prioritise objectives, to set policy agendas, and to allocate responsibility or govern subjects in order to address problems associated with urban water supply. Rather than a strictly hierarchical ordering of scale, however, my research demonstrates scale as dialectic and relational whereby sites are constituted by those elements already present within the locality as well as cross-scale relations (Howitt, 2002).

I explore the hybridisation of water governance by considering the problem of ensuring urban water supply in a developing country context. In particular, I am concerned with exploring the challenges faced by groundwater-dependent small cities in securing municipal water for drinking and other basic needs. My decision to focus on urban water in a small city is based on the increasing significance of urbanisation in developing regions, including Southeast Asia, and the implications of rapid urbanisation on people's ability to satisfy their water needs. In addition, focusing on a groundwater-dependent city reflects the ubiquity of groundwater as a resource for urban water supply. I critically examine some of the assumptions concerning the merits of water governance and integrated water resource management, the types of institutions governing water and how they function, and the implications of private sector participation by bringing to light household experiences of water governance and urban water supply. To do this, I examine how local factors give rise to hybrid governance systems and the ways in which these systems function in Tagbilaran City, a small city of 87,000 people in the Philippines undergoing rapid population growth. I compare knowledge about water governance and water resources at the national, sub-national and local level and consider the implications of different understandings of water governance for municipal water supply. In the following section, I outline the research questions that I address in this research.

1.2 Research questions

I start with the assumption that multiple understandings of development and water governance are possible in a single location and that these multiple understandings are the product of both local and non-local factors. From this assumption, a number of important questions arise enabling me to explore the localisation and hybridisation of water governance

[1] Within human geography, there is general acknowledgement of scale as a social construction. Scale and scale politics have attracted much methodological and empirical attention in recent years particularly in the context of debates about globalisation (Kelly, 1997; 2000), global-local relations (Swyngedouw, 2004), urban governance (Swyngedouw, 2005b), environmental governance (Evans, 2004) and so on. For further discussions on scale and its relevance in human geography see Brenner (2001), Howitt (1998), Jonas (forthcoming), Marston, Jones and Woodward (2005), and Marston and Smith (2001).

and the significance this has on meeting urban water demand. The key questions directing this research are:

1. How are development and water governance understood and enacted across different scales?
2. Why is household knowledge of water governance important?

The significance of the first question is twofold: firstly, it signals that multiple knowledges and discourses about development and water governance exist across scales; and, secondly, it signals an awareness that practices of development and water governance (manifesting as policy, planning and everyday experiences) are performed and responded to differently at different scales. This question, therefore, reflects the epistemology underpinning this research; that is, that knowledge is plural, situated and partial (Chapter 2 and Haraway, 1988). The significance of the second question is that it recognises households as having an important role in water management and as being engaged in social, political, economic and environmental process at multiple scales beyond the household.

In answering these questions, I explore the ways in which shifting and competing discourses have influenced water policy practice in the Philippines and consider how these have contributed to the emergence of hybrid governance in Tagbilaran by mapping the formal water governance structures in place in the Philippines. I then seek to uncover how development and water governance are understood at the local and provincial government levels and how water governance is enacted by analysing development and planning policies implemented by these government bodies. Knowledge and practices at the government levels are then juxtaposed with the household level, which leads me to consider the ways in which household perspectives of water governance affect expectations and behaviour concerning urban water supply. I then demonstrate why household knowledge about water and water governance is important for ensuring secure urban water supplies and discuss the implications of knowledge gaps and deficiencies between and within the scales identified in this thesis.

In achieving the aim of this research, I distinguish multiple scales and associated ways of thinking about water governance, water resources, water policy and development more broadly. At the 'global' scale, I identify a fraternity of inter-national development agents which have influenced development thinking and practice. In addition, I identify a number of international conferences and conventions as the source of dissemination for water governance discourses, which have been significant in influencing approaches to ensuring water supply for urban areas in developing countries.

At the national and sub-national scales (the scales of implementation), I identify the state in the Philippines as being multiply scaled (Marston and Smith, 2001). As such, the government is divided into national, regional, provincial and local government units with each

level having jurisdiction over aspects of government within their territorially defined boundaries. I consider the way in which development and water governance discourses have shaped policy and practice in the Philippines and the formal governance institutions in place in the Philippines to manage water for municipal use. Finally, I identify the household scale as the level of everyday experience and as the scale most affected by problems of urban water supply. In so doing, I acknowledge the significance of social reproduction and consumption in the construction of scale, in which households are the site of micro-level social processes (Marston, 2000).

The significance of this research is that it offers a scaled analysis of water governance and allows me to bring to light the factors which enable hybrid water governance systems to emerge, as well as expose differing understandings of the environmental, social and political dimensions of water governance and institutions. In particular, by investigating households as a scale, I show how they are implicated in wider social, political and economic processes (Marston, 2000) and uncover perspectives and knowledge about water governance that may be useful in guiding development and water management policy.

In conducting this research and thereby answering these research questions, I draw on political ecology (for example, Adger, Benjaminsen, Brown and Svarstad, 2001; Blaikie and Brookfield, 1987; Bryant, 1998; Budds, 2004; Johnston, 2003), critiques of development theory (for example, Berger, 2001; Brett, 2000; Cooper, 1997; Ferguson, 1994; Finnemore, 1997; McMichael, 2000; Peet and Hartwick, 1999; Pieterse, 1996), governance and water governance literature (for example, Gupta, 2004; GWP, 2003; Rogers and Hall, 2003; UNDP, 2004; UNDP, UNEP, World Bank and World Resources Institute, 2003; WWAP, 2003), as well as literature on institutions (for example, Cleaver, 1998; Humphrey and Verdey, 2004; Mehta, Leach, Newell, Scoones, Sivaramakrishnan and Way, 1999; Ostrom, 1986) in order to provide a framework for analysing hybrid water governance, household responses and the implications of hybridity. Using this framework, I show how transformations in the Philippine political economy have created the conditions that allow hybrid systems to emerge as well as provide evidence to explain why certain approaches to development and water governance have been adopted in Tagbilaran. In the following section, I outline the context within which this research is located.

1.3 The research context: hybrid water governance and small cities

Despite the impressive efforts to improve access to water and sanitation services during the United Nations' International Decade on Drinking Water Supply and Sanitation, 1981-1991, over 1 billion people continue to live without access to safe water, with most of these people inhabiting developing countries. What is more, it is expected that challenges to provide safe drinking water will intensify in the future as a consequence of population growth, changes in

consumption patterns and increases in demand as well as increasing competition between other users of water such as agriculture, industry and the environment (UNDP, 2004).

Since the 1970s, the problem of water insecurity and access for domestic and other uses has been subject to intense scrutiny within the development arena in which concerns about how to increase supply tended to dominate. Under a supply-oriented approach, large-scale infrastructural development projects were promulgated as important for ensuring a more consistent water supply, especially during dry periods for water needs. However, there has recently been a shift in thinking away from a focus on supply as exemplified by the United Nations Development Program (UNDP) in its assertion that the problem of water insecurity has come about as a result of "… profound failures in water governance, i.e. the ways in which individuals and societies have made decisions about, and managed the water resources available to them" (UNDP, 2004:2). Moreover, in light of the Millennium Development Goals (MDGs)[2] and the target of halving the proportion of people without sustainable access to safe drinking water and adequate sanitation by 2015 (UNDP, 2004), solutions to problems of water increasingly look beyond technology and engineering and problems of supply towards water governance and institutional arrangements.

Water governance is borne out of environmental governance and a concern with governance more generally. Over the past two decades governance has become a ubiquitous buzzword used in a variety of ways to consider the changing role of the state, and adaptations made by organisations which have brought changes in management and government (Eckerberg and Joas, 2004; Jessop, 1998). Within the international development fraternity a focus on governance and where appropriate making it good is seen as inherently positive and intrinsic to promoting sustainable development. Good governance underlies contemporary development projects and programmes initiated by multilateral donors, bilateral donors, non-governmental organisations (NGO) and international financial institutions such as the World Bank (World Bank, 1992).

Similarly, (good) water governance underlies contemporary approaches to water resources and their management. The Global Water Partnership derived a definition of water governance which refers to "the range of political, social, economic and administrative systems that are in place to develop and manage water resources, and the delivery of water services, at different levels of society" (Rogers and Hall, 2003:7). Consequently, current water governance discourse

[2] The Millennium Development Goals are eight goals which provide a blueprint agreed to by all the world's countries and leading development institutions to improve the living conditions of people across the world by 2015. The goals are 1) eradicate extreme poverty and hunger; 2) achieve universal primary education; 3) promote gender equality and empower women; 4) reduce child mortality; 5) improve maternal health; 6) combat HIV/AIDS, malaria and other diseases; 7) ensure environmental sustainability; and 8) develop a global partnership for development. The target for reducing the number of those without access to safe water supplies falls under Goal 7 (UN, 2005).

posits the importance of appropriate institutions and institutional arrangements, notably property, in overcoming water insecurity (WWAP, 2003). This is particularly the case in light of the need to prioritise water allocation amongst competing users, and the nature of water resources as a common pool resource.

The management of common pool resources, that is resources used in common by different groups and individuals, is difficult. This is because common pool resources are generally characterised as having multiple uses and users, where use involves subtractability and creates rivalry amongst users. Subtractability occurs when resource use by one user subtracts from the pool thereby affecting resource availability for others, thus creating rivalry amongst users. In addition, it is often difficult to exclude individuals and groups from appropriating or using common pool resources (Edwards and Steins, 1999a; Steins and Edwards, 1999; Williams, 1997).

Common resources are seen as being particularly vulnerable to problems of over-exploitation, degradation, and production inefficiencies as a consequence of property rights failure (Heltberg, 2002). Hardin's (1968) 'Tragedy of the commons' presented a metaphor to illustrate the potential for over-grazing in non-cooperative situations in which rational, self-interested farmers are confronted with incentives that lead individuals to over-exploit a grazing common. The neo-Malthusian essence to the scenario sees the increase in population as placing further pressure on the resource to meet demand, at the same time leading to increased competition and individual exploitation to satisfy wants and needs. Hardin's thesis posits the importance of establishing property rights regimes as a means for managing resources more efficiently and effectively suggesting either state ownership or private ownership as preferable forms of ownership or regulation for common resources since such regimes would create incentives to avoid over-exploitation.

Hardin's thesis in its original form fails to recognise that common pool resources may have formal or informal rights attached to their use (Edwards and Steins, 1999b; Jensen, 2000). Beginning in the 1980s empirical evidence and research emerged that contested the tragedy thesis. In particular, scholars pointed to the importance of distinguishing between open access and common property regimes, which Hardin had failed to do. Scholars illustrated that the key distinction between common property and open access is that common property resources have attached certain rules and rights to access whereas open access does not and, therefore, tragedy of common property was not inevitable (Zwarteveen and Meinzen-Dick, 2001). To this end, notable contributions were made by Bromley and Cernea (1989), and Ostrom (1990). Scholars such as these also showed how the confusion in terminology and tendency to overemphasise the potential for the 'tragedy' is partly due to the interchangeable use of terms such as 'open access', 'common pool', 'common property' and 'the commons'. In reality, however, these terms represent important differences in the types of decision-making arrangements governing their use, access and allocation of rights (Steins and Edwards, 1999).

As a highly mobile, or fugitive, common pool resource, water may carry a diversity of rights regarding access and use.[3] Rights are socially constructed mechanisms which allow the holder to access, use or appropriate resources within a resource system and may be assigned to individuals and groups (Meinzen-Dick and Jackson, 1997; Ostrom, 1990; Sjaastad and Bromley, 2000). Rights grant privileges to holders including the exclusion of others from accessing or appropriating resources pertaining to the area covered by the right. Rights also provide the holder with the opportunity to seek redress on occasions where infringement upon their rights has occurred.

The way in which rights concerning use, access, exclusion, planning and so on are ordered and regulated is through institutions. Institutions are social constructs which regulate and order relationships between different people and people and objects. Institutions are largely conceived as being either 'formal' or 'informal': formal institutions comprise, for example, property legislation, government (local, regional, national) policy and legislation and so on. Informal institutions or, as Cleaver (2000) prefers, 'socially embedded' institutions governing a common resource emerge and evolve over time amongst users of the resource. These comprise rules, norms, and procedures "borrowing accepted patterns of interaction from sanctioned social relationships" and applying them to particular resource systems (Cleaver, 2000:381).

Following Cleaver (2000) and others, in this thesis I acknowledge the importance of both formal/bureaucratic and informal/socially embedded institutions in governing water resources, and that there is a high level of interaction between these institutions (see also Mehta, et al., 1999). Therefore, in this research I seek to uncover the myriad institutional mechanisms and arrangements that govern water for urban supply.

The nature of water as a fugitive resource, in particular the ease in which water moves from one place to another and can be impounded, complicates the institutional relationships present within a water system. Establishing secure, private property rights has been suggested as a way of avoiding a tragedy scenario (Hardin, 1968). Property is a formal institution whose meaning has changed, and continues to change over time and across locations. MacPherson (1978) and Grey (1980) describe changes in conceptualisation of property and how these are outcomes of contemporaneous social, economic and political contexts, which often served ideological functions. Grey (1980) comments that an entity can be owned by more than one person; therefore, it becomes necessary to focus on the particular limited rights each of the co-owners has with respect to the entity, hence the view towards conceiving property as a bundle of rights (Cooter and Ulen, 1996; Ostrom, 1990; Sjaastad and Bromley, 2000). In this regard,

[3] For example, rights may be granted to individuals or groups of individuals to use the resource system at a particular time and place, use particular types of equipment to appropriate resource units, or to withdraw a particular quantity of resource units from the system (Ostrom, 1990).

property can be separated from 'ownership' and 'possession' although these are related concepts as demonstrated in the quote below:

> …to have a property is to have a right in the sense of an enforceable claim to some use or benefit of something, whether it is a right to a share in some common resource or an individual right in some particular things. What distinguishes property from mere momentary possession is that property is a claim that will be enforced by society or the state, by custom or convention or law (MacPherson, 1978:3).

The argument follows that, where individuals lack secure rights and assurances that their rights will be enforced and protected, individuals lack incentives to make long term investments or to use common pool resources in a manner that is sustainable in the long run. Therefore, in an attempt to circumvent unsustainable practices, resources such as water, minerals and forestry have commonly been transferred to the state, or support has been given to developing private property rights and land markets (Hardin, 1968; Sjaastad and Bromley, 2000; Swallow, Garrity and van Noordwijk, 2001).

While rights are the means by which people are able to make claim on a resource, a regime is the rules and institutions for ensuring rights (Sjaastad and Bromley, 2000). Broadly, there are four property regime types, which have been summarised in Table 1.1 below. These are open access property, common property, private property and state (public) property (Bromley and Cernea, 1989; Cooter and Ulen, 1996; Edwards and Steins, 1999b; Ostrom, 1990). A property regime is a result of social processes in which the nature of the property regime is embedded within the broader social, political and environmental context (Edwards and Steins, 1999b; Mehta, et al., 1999).

Property type:	Description
Open access	Lack of clearly defined (physical) boundaries Lack of clearly defined rights No exclusion Use subtracts from pool affecting subsequent uses/users Rivalry between uses and users Incentive to exploit – Prisoners' Dilemma Moral Hazard – 'free rider' 'First in time, first in right'
Common Property	Some exclusion Rights to access resource granted to individuals and groups Use subtracts from pool affecting subsequent uses/users Rivalry between uses and users Institutional arrangements to allocate and manage shared resource (rules of use) Incentive to exploit/cheat still present in non-cooperative situations Moral hazard – "free rider"
State (public) Property	State owned Clearly defined boundaries Clearly defined rights Exclusion Resource use is non-rivalrous Low/no subtractability
Private Property	Clearly defined boundaries Clearly defined rights Exclusion

Table 1.1: Property types
Sources: Bromley and Cernea (1989), Cooter and Ulen (1996), Edwards and Steins (1999b) and Ostrom (1990).

Edwards and Steins (1999b) define a property regime as the institutional structure that sets the conditions of access to and control over the range of benefits arising from a collectively used resource system.

> In a property rights regime, rights are assigned to (i) an individual (private property rights); (ii) the state (public property rights); and/or a group of individuals (common property rights), excluding all unspecified others from access to the resource (Edwards and Steins, 1999b:197)

In this regard, the rights granted under a private property regime are substantively different from open access, as demonstrated by Table 1.1 above.

Water is a problematic resource over which to determine property rights and ownership given its significance as a basic need for all living things and its multifaceted characteristics as an economic, social, cultural, political and environmental resource. The fugitive characteristics of water further complicate property relations. Rose (2004) observes that large, diffuse resources such as water, air or wildlife are more difficult to turn into property than land, which "stands still, and it can bear markers like fences that can become recognizable cultural signals" (Rose, 2004:280). In addition, establishing property and access rights to water is complicated by the way in which water can be transformed from a common resource to a private good.

In the process of providing water for urban water services, water is transformed from a 'raw' common pool resource to a privately used good which flows from people's faucets. This process precipitates transformations in the ways in which water is conceptualised, and the institutions governing water management, access and use since urban water flowing through a piped-network is substantively different to groundwater stored in an aquifer. In this thesis, I consider the implications of these transformations and how household relations to water are affected. An integral element in the transformation of water described above is the role played by waterworks utilities. Waterworks utilities are providers of municipal water services to household consumers and are themselves bulk users of water resources. That is, waterworks utilities are water producers in the sense that they transform raw water into potable water that is piped through a distribution network to household consumers for domestic consumption including drinking water: water resources are their raw material (del Castillo Laborde, 2005; Perry, Blatter and Ingram, 2001).

A valuable source of water for meeting water needs is groundwater, which has been fundamental to human settlement and social development since antiquity. Historically, groundwater resources have offered a relatively inexpensive and secure option for development in urban areas in both developing and industrialised countries. Its use remains enormously important today largely because, unlike surface water, its occurrence is highly distributed (Burke, Sauveplane and Moench, 1999). The prevalence of groundwater use is subject to some uncertainty given its ubiquity, ease of development, and the potential for small-scale use to be excluded from official statistics; however, it is estimated that more than two billion people depend directly on groundwater of which around one billion are urban dwellers living mostly in Asia (Foster, Lawrence and Morris, 1998; Morris, Lawrence, Chilton, Adams, Calow and Klinck, 2003; Tuinhof, Attia and Saaf, 2003).

Despite the significance of groundwater for urban water supply, managing groundwater is difficult and often poorly done (Burke, et al., 1999). The fact that the hydrological processes are hidden from view means that there may be a great deal of uncertainty concerning how much water has been extracted or how land use activities adversely affect water quality and so forth. The implications of industrialisation and rapid urbanisation on water resources and their management are manifold. Increased population density and changes to the physical environment as a result of urbanisation disrupt natural hydrological processes. The expansion of paved areas and soil compaction affect surface permeability, infiltration and subsurface water recharge, although this does not necessarily lead to a reduction in recharge (Foster, 2001; Niemczynowicz, 1999). This does, however, increase the risks of stormwater flooding of surface runoff water particularly in cities with inadequate stormwater drains and channels.

Deterioration of water quality through pollution from industrial sources and inadequate sanitation and waste disposal further reduces the amount of safe water available for human consumption (Abu-Zeid, 1998; Foster, 2001; Niemczynowicz, 1999). Urban areas located in

coastal areas may also be prone to salt water intrusion as a consequence of groundwater depletion, which further limits water supply. Poor sanitation and poor environmental monitoring of industrial activities also increase the chances of point source pollution thus further limiting access to safe water and increasing the risk of exposure for people to contaminated water (Bouwer, 2000).[4] In addition, security of supply can come under pressure as a result of depletion of groundwater stocks through mining, which occurs when abstraction is greater than rate of recharge and may be exacerbated by illegal abstraction and illegal connections to waterworks systems.[5]

The inability for urban environments to meet water demand is not limited to large cities and mega-cities. As a consequence of rapid urban growth and urbanisation, infrastructure and public utilities in small- and medium-sized cities are often inadequate. Public utilities in such cities are unable to cope with increasing population pressure with the effect that large numbers of inhabitants are excluded from piped water networks. As a result, some households are forced to rely on small scale private water vendors for water consumption at prices many times higher than municipal consumers with access to water networks. However, research and policy formulation concerning urban environmental management, including municipal water supply for domestic purposes, has tended to place an emphasis on mega-cities. Indeed, Cohen (2004:32) asserts that "smaller urban areas, particularly settlements under 100,000 people, tend to be significantly under-served with regard to access to piped water, waste disposal, and electricity."

Increasingly, smaller cities have been identified as other 'hot spots' warranting research attention (Drakakis-Smith, 1995; Lundqvist, Appasamy and Nelliyat, 2003), particularly in light of UN (2004b) predictions, which forecast that much of the growth will occur in small- and medium-sized cities. Smaller cities frequently serve as a stepping-stone between rural areas and larger urban areas; however, infrastructure and public utilities are often inadequate and unable to cope with increasing population pressure. In the Philippines, for example, small cities such as Tagbilaran City attract in-migration from smaller towns and rural areas within the Province and serve as feeders for larger Philippine cities (Gultiano and Urich, 2003) such as Cebu, Davao and Manila.

Despite concerted efforts towards rural development from the 1970s, the rate of urbanisation in developing regions has continued to increase. The United Nations (UN) (2004b) forecasts that urban areas will be the site of virtually all population growth during 2000-2030,

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[4] See Foster et al (1998) for a general discussion on the vulnerability of groundwater in urban areas to contamination in a variety of geological environments.

[5] It is often difficult to ascertain the extent and nature of illegal abstraction. Evidence suggests that reasons behind illegal abstraction include connections for private consumption as well as for sale by vendors to low income consumers not connected to municipal supply systems (Dinar, Rosegrant and Meinzen-Dick, 1997).

mostly in less developed regions. Rural-urban migration and transformation of rural settlements into cities are important determinants of the high population growth expected in urban areas of less developed countries and as a consequence the number of cities with populations below 500,000 will increase (UN, 2004b). Therefore, growth will be concentrated in smaller urban areas as opposed to large mega-cities and agglomerations. In Asia, approximately 38 percent of the population live in urban areas, and is estimated to increase to more than 50 percent by 2015 with the urban population doubling before 2025 (ADB, 2004). In the case of Southeast Asia, the urban population in 1990 comprised approximately 31.6 percent of the total, increasing to around 42 percent in 2000 (UN, 2004b). This represents a relatively low, yet increasing, level of urbanisation in Southeast Asia.[6]

The Philippines has one of the highest rates of urbanisation in the world and averaged a rate of five percent per year between 1960 and 1995, precipitating an increase from 8 million to 34 million urban inhabitants. In 2000, over half of the Philippines population of 78 million lived in urban areas, with an annual average growth rate exceeding three percent. It is estimated that by 2010, 60 percent of the total population will reside in urban areas rising to more than 80 percent by 2050. While urban growth has been heavily concentrated around the Metro Manila area, urban transformations are also occurring elsewhere in the country both as a consequence of natural increase in urban population and rural-urban migration (ADB, 2004; Webster, 2004).

Ensuring universal coverage for urban residents and a 24-hour supply of piped water has not yet been achieved across Southeast Asia (McIntosh, 2003) and as urban populations increase, the ability to meet urban water demand is constrained. In the Philippines, responsibility for water delivery for domestic household consumption is shared amongst three major groupings: Metro Manila,[7] provincial urban and provincial rural.[8] In this research I concentrate on provincial urban delivery in the Philippines. As of December 2000, 18.3 million people were served with safe drinking water through Level III systems,[9] representing 88.13 percent of total urban households in the country (NEDA, 2001:130). Provincial urban areas may be served by Water Districts (WD), Local Government Units (LGUs), or private operators.

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[6] It has been suggested that the actual level of urbanisation across Southeast Asia is understated because of problems associated with defining urban and rural areas and definitions of urbanisation (Rigg, 1997). Indeed, within the case study site the distinction between urban and rural is not always clear cut.

[7] Metro Manila is served mainly by Metropolitan Manila Waterworks and Sewerage System (MWSS) through its two private concessionaires: Manila Water Company Inc. and Maynilad Water Services Inc. Smaller-scale private vendors also supply water in parts of Manila (WPEP, 2002).

[8] Provincial rural areas are served with water systems by local government units, *Barangay* Waterworks and Sanitation Associations and Rural Waterworks and Sanitation Associations under the jurisdiction of the Department of Interior and Local Government (DILG), Department of Public Works and Highways (DPWH), and Local Water Utilities Administration (LWUA) (NEDA, 2001).

[9] National Economic Development Authority (2002:190) defines Level III systems as systems where there is "a source, a reservoir, a piped distribution network and household taps, generally suited for densely populated urban areas, serving 1,800 households."

Given the patterns of urban growth and urbanisation in Asia, including the Philippines, it is important for small- and medium-sized cities to be forward-thinking and innovative in terms of infrastructure and environmental management. The case study outlined in this chapter provides the opportunity for ethnographic material about water governance obtained from Tagbilaran City to be presented and analysed in light of water governance and development literature and against the backdrop of water governance institutions that exist in the Philippines.

Tagbilaran City is the Provincial capital of Bohol, which is one of the four provinces comprising Region VII, Central Visayas. Figure 1-2 shows the location of the Central Visayas Region relative to other administrative regions in the Philippines, with Bohol highlighted. Tagbilaran is located in the southwest corner of Bohol and comprises an area of 3,061 hectares (Province of Bohol, 2001). Figure 1-2 presents the municipalities of the Province of Bohol and the location of Tagbilaran. The 2000 census recorded a population of 77,700 and the number of households as 15,585. The city experienced a population growth rate of 3.26 percent per year for the period 1990 to 2000 (National Statistics Office, 2000). Much of this growth is attributable to in-migration from municipalities within the province seeking employment and educational opportunities (City of Tagbilaran, 2001; LG#1). Projections placed the 2003 population at over 87,000 (LG#1).

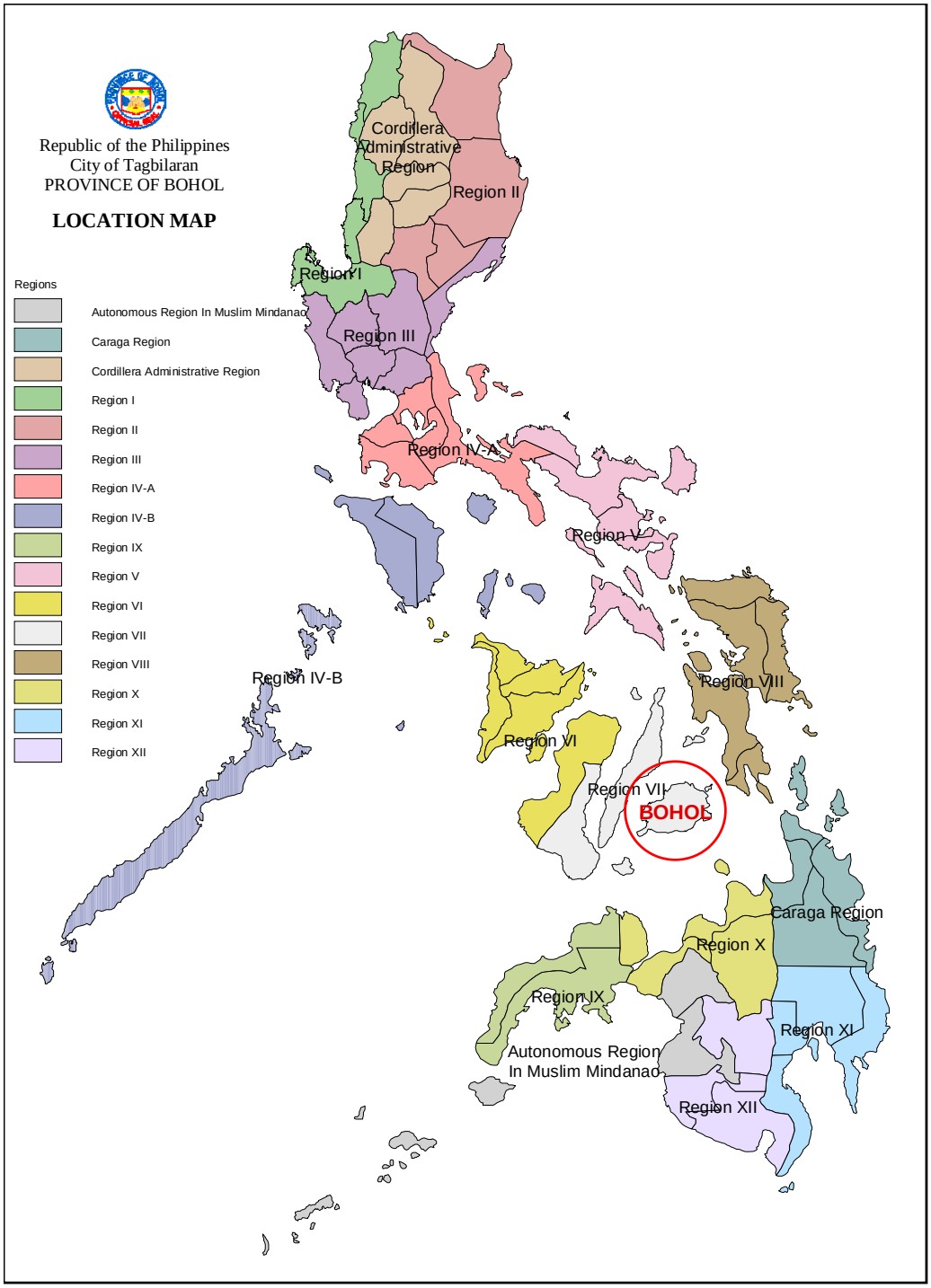

Figure 1-1: Administrative regions of the Philippines showing the location of the Province of Bohol

Source: Obtained from Provincial Planning and Development Office, 2004

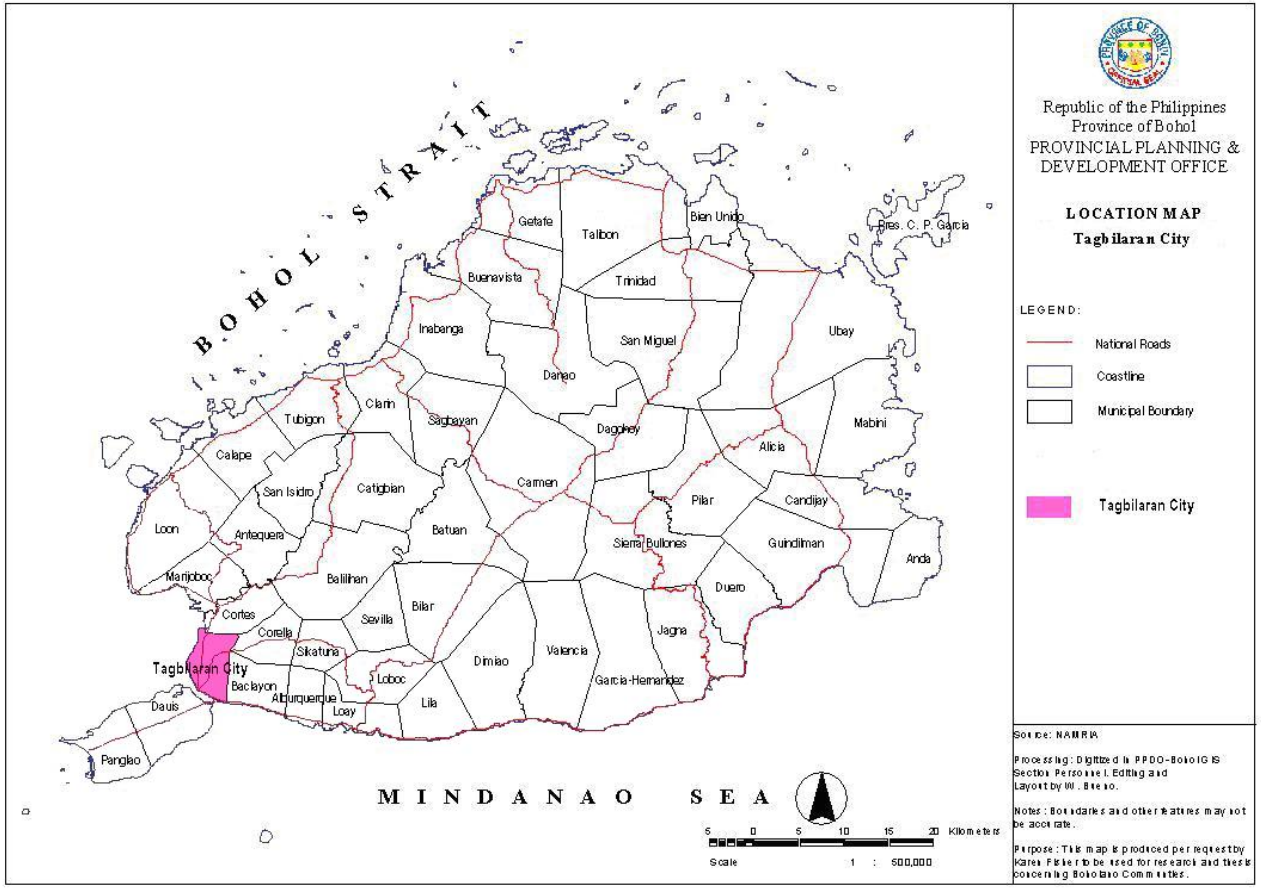

Figure 1-2: Location of Tagbilaran City, Bohol, the Philippines
Source: Obtained from PPDO, 2004.

Approximately 50 percent of Bohol—the southern part of the province—is karst limestone while the geology in the northern part of the province is largely volcanic. The karst is characterised by cave systems and channel ways through which water passes, sinkholes and depressions. Tagbilaran is located within this landscape and is completely reliant on groundwater. The implications of a karst environment for underground water processes are significant since karst waterways are unpredictable and present difficulties in trying to ascertain flow velocities and directions particularly when underground streams are also a feature (Urich, Day and Lynagh, 2001).

In Tagbilaran, demand for water is forecast to increase while supplies are already threatened due to over-extraction and potential for contamination. Government functions and responsibilities have been devolved to local and sub-national government bodies as a consequence of decentralisation. These bodies are responsible for the formulation and implementation of policies in keeping with national policy objectives while seeking to facilitate economic and social development. The case also presents an opportunity for considering the role of the private sector in the provision of municipal water that can be contrasted with a public utility. The city's water supply is shared by public and private utilities; that is, water services are provided by Tagbilaran City Waterworks (TCWS), a publicly owned and operated water utility, and Bohol Water Utility Inc., (BWUI), a joint venture company formed as a result of a partial divestiture of the former publicly-owned Provincial Waterworks System (PWS).

The findings from this research have implications that reach beyond the case study explored in this thesis in drawing attention to the difficulties faced by local government authorities in implementing integrated water resource management in an environment dominated by groundwater processes. In addition, this research highlights the complex institutional arrangements that exist to manage and regulate groundwater. Furthermore, the findings from this research challenge assumptions concerning the implications for households of private sector participation in urban water supply which provide useful insights for other contexts. The contributions made by this research to broader development and water governance scholarship are discussed in the following section.

1.4 Research contribution

In this thesis, I offer a theoretical conceptualisation of hybrid water governance and employ empirical material to demonstrate what hybridity is and how it functions. This research makes several important contributions to development and water governance scholarship. These are in regard to the difficulties in implementing integrated water resource management, the role of institutions in regulating urban water resources, and the implications for households of private sector participation in urban water supply.

The case presented in this thesis and findings concerning the difficulties in governing groundwater have implications for other cities. Numerous cities in the Philippines and

elsewhere rely on groundwater for urban water needs and are confronted with rapid population growth. For instance, Foster et al (1998) identified more than 40 cities globally that utilise groundwater for urban consumers and for which water quality and quantity concerns have arisen. This research acknowledges, along with Foster et al (1998), Burke et al (1999), and Morris et al (2003) the significance of groundwater in urban development and, following Lundqvist et al (2003) and Foster et al (1998), the importance of considering groundwater in smaller urban centres and the implications of urbanisation. Following Burke et al (1999), this research seeks to make visible the difficulties associated with implementing integrated water resource management in taking into account groundwater resources. In so doing, this research endorses the proposition put forward Rahaman and Varis (2005) of the need to reduce the gap between universal, theoretical agreed policies about integrated water resource management and contextual implementation lest integrated water resource management becomes meaningless jargon.

This thesis also seeks to extend scholarship concerning the role of institutions in regulating water resources by focusing on urban water resources. There has been a tendency to focus on formal institutions or those informal institutions which have emerged to regulate collective management over water resources (see, for example, Araral, 2005; Fujiie, Hayami and Kikuchi, 2005; Meinzen-Dick, 1997), with little attention given to the institutions present in urban areas. Where research has looked at urban institutional arrangements, the emphasis has been on collective water groups, mega-cities, or informal settlements. However, in this research I set out to challenge a collective action approach to water since a collective may be absent and also because such an approach does not adequately address issues of social differentiation and power or acknowledge the diversity and heterogeneity of interests within collective groups. In this regard, this research resonates with the work of Mehta (2003), Mehta et al (1999) and Cleaver (1998; 2001; 2000; 2002) in acknowledging the importance of informal institutions and conceptions (in this case, property) and the significance of context.

This thesis extends the scholarship on private sector participation in urban water provision in three important ways: firstly, by presenting findings of a private sector undertaking as the result of a partial divestiture; secondly, by refuting the assumption that private sector participation is confined only to large multinationals; and, thirdly, by critically examining the implications for household consumers of private sector participation. In particular, this thesis echoes the stance of Budds and McGranahan (2003a; 2003b), who claim that the polemical debate over privatisation is a ‘red herring’ since many of the arguments mobilised to support/refute the benefits and/or ills of public and/or private sector provision are based on misconceptions and assumptions. Moreover, as this research will demonstrate, water is a highly politicised resource even when provided by a public utility. The contestability of water as a multifaceted entity is intensified by debates over its properties as a public good and a commodity which arises because of the privatisation of water utilities and the perception of

privatised (public) water. However, following Mehta (2003), I suggest that water is an impure public good based on the definition of a public good given in Chapter 3. Additionally, I challenge overly simple conceptualisations of commodification as offered by authors such as Barlow and Clarke (2002) or Shiva (2002), for example. Instead, I extend work of Castree (2003; 2004) and Bakker (2005) among others by resisting the temptation to conflate commodification with privatisation, or to position household consumers as helpless in the face of the private sector.

In this research I identify the importance of providing access to safe drinking water in urban areas and move beyond the polemical debate in order to explore whether private sector participation can assist in achieving this. I do not seek to advocate private sector participation over the public sector or vice versa since there is evidence to suggest that both public and private waterworks utilities can provide good and bad services. Rather, I argue it is important to carefully consider the ways in which water service provision can be made better so as to ensure access to all, particularly the poor. Therefore, this research aligns with the work of authors arguing for effective, independent regulatory bodies to protect the interests of water consumers, especially the poor, as well as ensuring the sustainable use of water resources (see, for example, Bayliss, 2002; Budds and McGranahan, 2003b; ECLAC, 1996; Foster, et al., 1998; Johnstone, Wood and Hearne, 1999; Lee and Floris, 2003; Loftus and McDonald, 2001; Nickson and Vargas, 2002; Rees, 1998).

1.5 Thesis structure and chapter outlines

This thesis is structured so as to allow for differing conceptualisations of water governance to be exposed and analysed. The structure and outline in this thesis is summarised in Table 1.2. The thesis comprises four parts. Part One comprises an introductory chapter and a chapter outlining the methodological approach and methods used in conducting this research. In Part Two, I consider the shifts in development and water governance discourse in order to determine how water governance and an integrated approach to water resources have come to the fore in overcoming water deficiencies for urban residents. In Part Three, I begin to theorise how hybrid governance systems emerge and what constitutes hybridity. This theoretical analysis is carried out in the context of the Tagbilaran City and focuses on the implementation of policy as well as the delivery of water by waterworks utilities. In Part Four, I juxtapose household perceptions of urban water governance and related concepts derived from ethnographic material obtained in Tagbilaran with official discourse and practice to further ground the theoretical analysis. Finally, the findings are synthesised and the contributions made by this research are discussed. I then identify lessons for other cities facing the challenge of ensuring secure water supplies under increasing demand.

Chapter	
Part One: Introduction and methodology	
1 Introduction	Introduction to research topic and questions that the research seeks to address.
2 Methodology and Methods	Explanation of the methodological approach used in the research and the qualitative methods used.
Part Two: Shifts in development and water governance discourse	
3 Water Governance and Development for Urban Areas	Urban water governance in developing countries has been influenced by international development discourse. Current strategies to manage water emphasise an integrated approach encompassing environmental, social and economic domains. At the same time, neoliberal discourse exerts a powerful influence over how urban water is conceptualised and managed and who should be responsible for its provision. *Hence:*
4 The Hydrological and Physical Environment of Tagbilaran	In overcoming urban water problems, it is important to determine the contextual environmental and hydrological characteristics along with management approaches adopted. *Moreover*:
5 The Process and Consequences of Urban Growth in Tagbilaran	The socio-economic characteristics of the urban areas are also important since water consumption patterns and water availability are affected by economic development, notably urbanisation. *Which leads me to argue:*
Part Three: Theorising hybridity	
6 Hybridity and Water Governance in a Development Context	Water governance is conceptualised differently at different scales and as discourses become localised, hybrid forms emerge. Mapping development strategies and water governance structures in the Philippines exposes the ways in which discourses are articulated. *Furthermore:*
7 Municipal Water Supply in Tagbilaran	As local and non-local narratives of development intersect, hybrid systems of water governance evolve in order to regulate the delivery of water services comprising public-private, global-local and other 'mixed' institutions. Improving the efficacy of urban water governance requires acknowledging this emerging hybrid system. *For this reason:*
Part Four: Implications and conclusion	
8 Local Perspectives about Hybrid Water Supply, Access and Security	Ethnographic material from Tagbilaran is brought to light to enable local conceptualisations of urban water governance and development to be considered against formal policy. *Which in turn enables:*
9 Perspectives on Hybrid Urban Water Governance Institutions	The exposure of the multiple conceptualisations and understandings of water governance that are present in urban areas, but which are not adequately accounted for in prescriptive policy statements. *In conclusion:*
10 Lessons from Tagbilaran on Hybridity and Water Governance	The juxtaposition of local perceptions and knowledge concerning water governance with formal bureaucratic institutions highlight how knowledge deficiencies and uncertainties undermine attempts to meet urban water needs.

Table 1.2: Thesis structure and chapter outline

In Chapter 1, I have stated my main argument and aims in conducting this research. I have also stated my research questions, and introduced key concepts underpinning my research; in particular, water governance, scale and institutions. I have provided the context for this

research, namely, hybrid water governance in small cities in developing countries, and provided a preliminary introduction to the case study.

In Chapter 2, I outline the methodological approach taken and methods used to complete this research. In this chapter, I discuss my role as researcher by considering my positionality and subjectivity in conducting this research, as well as practical matters such as language and research assistance, and ethical considerations guiding my approach to the research and the production of this thesis. I also provide an account of how households were sampled and methods of analysis used for empirical material obtained from households in Tagbilaran and Corella.

In Chapter 3, I review development and water governance literature in order to examine the shifts in discourses and the implications this has had on approaches to water resources allocated and management. I focus on neoliberal discourse in development and water governance discourses emanating from supra-national governance institutions and highlight the implications for urban water services by concentrating on integrated water resource management as the predominant approach to managing and governing water resources, and the changing role of the state and private sector in the provision of urban water services.

In Chapter 4, I outline the contextual factors in the case study location which serve to mediate development and water governance discourses. I begin this chapter by focusing on the hydrological and physical environment in Tagbilaran City, the Philippines. In so doing, I discuss the significance of the karst environment within which Tagbilaran is located and identify some of the factors affecting groundwater in Tagbilaran including threats to water quality and quantity such as saltwater intrusion, contamination because of improper solid waste disposal and inadequate sewerage and sanitation, and urban expansion into recharge areas. I also consider the extent to which integrated water resources management has been implemented in Tagbilaran specifically and the Philippines more generally.

In Chapter 5, I continue to outline the contextual factors in Tagbilaran by considering the process of urban growth and the implications this has for water. I identify the key drivers of urban growth in Tagbilaran and connect these back to regional and national processes. I briefly describe the socio-economic environment of the city in order to show how urban growth and human activity implicate water resources. In particular, I focus on the externalities of urban growth and urbanisation and discuss further the threats to groundwater identified in Chapter 4; namely, saltwater intrusion, contamination because of improper solid waste disposal and inadequate sewerage and sanitation, and urban expansion into recharge areas.

In Chapter 6, I theorise hybridity and present a conceptualisation of hybrid governance for Tagbilaran. To do this, I map the ways in which global discourses have been mediated and articulated in policy and practice at the national, provincial and city levels. I then map the formal water governance institutions in the Philippines, in particular legislation and policy,

existing to regulate water resources and urban water services. By contextualising these elements in Tagbilaran and taking into account the specificities of place as well as local narratives of development, I offer a conceptual model for thinking about hybrid water governance which has arisen as a consequence of global-local influences, public-private participation in water services, and inter-jurisdictional water sharing. In this chapter I introduce information about the neighbouring municipality of Corella and establish the ways in which Corella is implicated in urban growth in Tagbilaran.

In Chapter 7, I continue the exploration into hybridity by providing a detailed account of the waterworks network present in Tagbilaran and, by implication, Corella. I demonstrate how the waterworks network is itself a hybrid network, which is embedded in a hybrid system of governance. I describe the events which have led to the operation of two waterworks utilities in the city, the inter-jurisdictional water sharing arrangement, and private sector participation. The waterworks network is shown to be highly complex and to present challenges to development planners and decision-makers in terms of ensuring equitable access, and to be controversial and contested by interest groups present in the city.

In Chapter 8, I present ethnographic material from households in Tagbilaran and Corella in order to uncover household perspectives and knowledge concerning urban water supply and services which is later juxtaposed with formal notions of urban water governance. This first involves establishing household water consumption patterns and the factors influencing household consumption behaviour. I bring to light household perceptions concerning changes in waterworks services in Tagbilaran and implications for households before showcasing household knowledge concerning threats to water access and supply and strategies to ensure water security.

In Chapter 9, I continue to explore household knowledge and perceptions about water governance by considering the institutional mechanisms present in Tagbilaran regulating water governance. I present household conceptualisations of and knowledge about property, rights and ownership related to water and show how these are grounded in everyday practice and experience. I discuss the significance of household perspectives and discuss the implications of knowledge gaps and deficiencies for formulating and implementing effective water policy.

Finally, in Chapter 10, I synthesise the findings presented throughout this thesis and evaluate these in light of the research questions stated in Chapter 1 and the literature used to construct a framework for analysis. I consider the significance of the methodological approach taken in this study and address each of the research questions before suggesting possible areas of future research.

Chapter 2 Methodology and Methods

2.1 Introduction

The purpose of this chapter is to explain the research design, including the epistemological influences on design, and techniques employed for collecting and understanding information presented in this thesis. Since the research is interested in exploring the gaps in understanding and perceptions concerning development and water governance at different scales, the research was designed as an inductive, qualitative enquiry. Ethnographic material is used to examine the concept of property and scrutinise understandings of water governance in the Philippines (Humphrey and Verdey, 2004); therefore, in order to distil micro-level perceptions of municipal water supply, an important method employed was the case study located in Tagbilaran City, Bohol as briefly introduced in Chapter 1. This involved conducting fieldwork in order to obtain empirical material, which incorporated ethnographic, interpretive techniques, documentary sources and interviews with a variety of informants.

2.2 Qualitative strategies for research enquiry

Qualitative methodologies in human geography enable research strategies that recognise the diversity and complexity of human experience in social settings through the use of multiple methods to gain insight and understanding into particular situations. The influence of ontological and epistemological reflections in social sciences is evidenced in the evolution of research methodologies. These range from positivistic and naturalistic, to methodologies that acknowledge knowledge as partial, socially situated and socially mediated in which the positionality of the researcher has significance in research design and implementation, from identification of 'the project' through to presentation or 'writing-up' (Murray and Overton, 2003; Scheyvens and Storey, 2003; Smith, 2001).[10]

Ontological considerations about what can be known and the nature of reality have influenced the subject of enquiry. Epistemological reflections about the relationship between observer and the reality observed and the conceptualisation of what constitutes 'valid' knowledge, or a particular kind of knowledge, has led to recognition of plurality in viewing events and has emphasised capturing alternate, subordinated, subaltern, marginalised and concealed knowledges (Corbetta, 2003; Denzin and Lincoln, 2003; Robinson, 1998).

The epistemological influences shaping the methodological approach undertaken in this research are largely critical and feminist methodologies. In particular, recognition of knowledge that is situated and partial (Haraway, 1988) is fundamental to this research; therefore a universal truth was not sought. Rather, the research sought to uncover perceptions and

[10] See Denzin and Lincoln (2003) for a review of the evolution of qualitative enquiry with respect to methodology and methods since the 1900s.

opinions from multiple sources to provide one of many possible accounts concerning municipal water use. This is not to say that the research findings are not generalisable in other contexts since findings related to processes and practices, for example, are not necessarily location-specific.

The act of interpretive enquiry within qualitative research and the practice of research have promulgated metaphors of the qualitative researcher as *bricoleur*, as boat builder, as quiltmaker, among others (Denzin and Lincoln, 2003; Flannery, 2001; Hammersley, 1999; Kincheloe, 2001). These metaphors connote researchers as drawing together material from many elements in different forms and by using different methods in an iterative and interpretive process to construct a representation of a complex social situation. The *bricoleur* as jack of all trades, drawing on the work of Lévi-Strauss (1966) casts the researcher as able to think on their feet and to employ a range of strategies, techniques and methods in order to obtain empirical material (Denzin and Lincoln, 2003).

The metaphor of the *bricoleur* can be usefully applied to development fieldwork such as was undertaken for this research. Oftentimes, on-the-ground realities stymie a well-planned methodology and research design because issues are not as clear-cut as originally imagined or other issues emerge that warrant a shift in the original research focus. Accessing information may be difficult because of gatekeepers (Leslie and Storey, 2003b; Scheyvens, Nowak and Scheyvens, 2003; Twyman, Morrison and Sporton, 1999) or because of misunderstandings associated with working across different cultures whereby the *way* you ask for information is also important.[11] In addition, information concerning particular subjects may not exist in written form. Finding ways of overcoming these difficulties requires resourcefulness and adaptability from the researcher, as well as establishing good relationships and building networks with people who can assist in identifying contact people/organisations or even to bring a different perspective to viewing a situation. Scheyvens and Nowak (2003) identify a number of personality traits that aid researchers in doing fieldwork in developing countries: tolerance, empathy, sympathy, courtesy, patience, tact, open-mindedness, willingness to learn, and being receptive to new information. They also point out the need to be prepared for rejection from prospective participants and resistance or lack of interest in your research. While such traits and experiences are not unique to development fieldwork, difficulties associated with living and working cross-culturally (standing out in a crowd, culture shock, feelings of isolation and loneliness) compound problems that may be encountered during the research process and present additional challenges that need to be overcome in order to continue.

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[11] For example, in my experience I found I needed to be very specific about the kinds of documentary information I required from government and other offices in order to obtain material relevant to my research.

In order to help me overcome some of the difficulties associated with conducting fieldwork in the Philippines, I kept a fieldwork journal as a place in which I was able to reflect upon the research process, upon information received and reviewed, and my experiences in doing the fieldwork (Leslie and Storey, 2003a; Scheyvens and Nowak, 2003). Through this reflection and conversation with Filipino friends, assistants and others I was able to make sense of my surroundings and overcome some of the personal difficulties of conducting fieldwork. In addition, I was able to trial different techniques, to develop lines of enquiry, identify people or organisations to approach, and refine the research questions for conducting the fieldwork and gathering information.

In addition, the research was designed to be flexible and employed multiple methods to assemble empirical material – semi-structured- unstructured- and structured-interviews, participant observation, conversations, and documentary analysis. A variety of sources – newspapers, documents, government agencies, NGOs, private sector, conversations, and observations – were also drawn upon. This reflexivity and collaboration with participants, assistants and others enabled an inductive approach whereby themes and patterns were allowed to emerge from the data and guide the research (Janesick, 2003).

The research is informed by grounded theory in the manner in which the empirical material gathered in Tagbilaran was used to elaborate on existing theory concerning institutional arrangements such as property that affect water for municipal use (Strauss and Corbin, 1998). The research process was non-linear (Murray and Overton, 2003) and 'stages' blurred (Maxey, 1999) such that empirical material was able to be collected before, during and after fieldwork in the Philippines, and writing and preliminary analysis of findings was begun whilst I was still in the field. The fieldwork was conducted in two phases: an initial phase of six months and a return visit of six months, with four months spent outside the Philippines in between. I found that leaving 'the field' and having the opportunity to reflect upon the research and empirical material provided me with the space and opportunity to re-draw the links between the case-based material and broader theory related to development and water in urban environments. Following Cupples and Kindon (2003) I find it useful to expand the notion of the field as a geographical location to a space "which is actively constituted through the social and spatial practices of the researcher and his/her relationships with participants" (Cupples and Kindon, 2003:217). In this regard, the field influenced and shaped my writing; I commenced writing my thesis while in the Philippines; I maintain contact with Filipino and non-Filipino friends in the Philippines; I maintain contact with other researchers engaged in fieldwork/research in Bohol. In the following section I discuss my positionality in the field and beyond.

2.3 Positionality: "Dili ko Americana. Taga New Zealand ko"[12]

Work of feminist and critical geographers note the importance of researchers acknowledging their positionality ('race' nationality, gender, age, social and economic status, sexuality among other things) in terms of the research project and in relation to those that are being researched since this may have bearing upon collection/exclusion of data and representation of subjects (Butler, 2001; Ley and Mountz, 2001; Maxey, 1999; Mohammad, 2001; Rose, 1997; Scheyvens and Storey, 2003; Skelton, 2001). My interest in conducting research into matters of natural resource management within the context of a developing country is borne primarily from my university studies in geography and work experience in a local government authority in New Zealand and research groups within an academic institution in Australia. My particular interest in water, development and the Philippines builds upon previous research undertaken in Bohol for my Masters degree (Fisher, 1998).

I am a New Zealander studying in Australia, of mixed ethnicity (New Zealand Mäori/New Zealand Pakeha), from a 'working class' background. However, when I was in Tagbilaran/Bohol I was generally perceived as a 'big, rich, white Americana'.[13] Even when I had the opportunity to correct people about not being 'Americana', many did not know where New Zealand or Australia was (in fact, some people thought these countries were states in the United States). In New Zealand and Australia, I am not considered 'white'; my mixed ethnicity is recognised. The first time I was referred to as white in the Philippines was very unsettling (Fisher, 1998). An alternative descriptor that I encountered is *mestizo* (denoting mixed ethnicity), which I found preferable to white but carries what I perceive to be negative connotations and is problematic as a descriptor because it is a Spanish-colonial discursive construction indicating a racialised social hierarchy.[14] I also preferred 'foreigner' when talking about myself and/or other non-Filipinos although by doing so I potentially reinforced the insider/outsider dichotomy. However, following Nast (1994), it is useful to think of 'insiderness' and 'outsiderness' as fluid and capable of change over time and in various contexts rather than as a simple binary.

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[12] This translates to "I am not American. I am from New Zealand" and is a phrase that I repeated often.

[13] Use of the term "Americana" is undoubtedly linked to the period of American colonialism, 1898-1946, and the close relationship post-independence between the United States (US) and the Philippines. Kelly (2000) suggests that Filipinos were subtly inculcated into seeing things and people that are foreign as superior. In my experience I encountered both a sense of self-effacement from Filipinos with respect to Americans/the United States as well as hostility and Filipino self-pride. I cannot speculate as to what emotion was being directed at me when people referred to me as Americana; however, I do speculate that such labelling contributed to my outsiderness.

[14] For further information see Kelly (2000), who describes the racialisation of social hierarchy in which European-born Spaniards were considered the top of the hierarchy, then Philippine-born Spaniards, Spanish-Filipino *mestizos*, Chinese-Filipino *mestizos*, Chinese, and native Filipino.

In this way, I speculate that I was both insider and outsider. Previous research fieldwork in the Philippines and the evidence of a relationship with Bohol spanning seven years endeared me to those with whom I had the opportunity to share such information. Likewise, shared experiences, an understanding of social and cultural practices, living with a local family for more than six months, and attempts at speaking the local language increased my acceptance. Having already conducted research in Bohol, I had a small network of contacts in government and NGOs that circumvented problems I might otherwise have encountered as a complete outsider. Additionally, my association with an already established and respected researcher who has worked in Bohol for nearly 20-years was advantageous in terms of accessing participants and information.

On several occasions, individuals related the story of a public rally that had taken place in 1997 to protest a proposed 'Build-Operate-Transfer'[15] water project. They were proud of the action that had taken place, and surprised and pleased when I informed them that I had been present at the rally and my Masters research had focused on that project (Fisher, 1998; Fisher and Urich, 1999; Fisher and Urich, 2001). Likewise, respondents to Household Surveys were bemused when I reacted to their answers given in Visayan and would invariably seek to find out more autobiographical information and how I came to be researching in their 'place'. Living with a family and experiencing the same problems as the respondents – paying the bill, loss of water during brownouts, and low water pressure at peak times – also helped in building rapport with participants and to dismantle the insider/outsider divide somewhat.

I conjecture that the use of the term 'white' in Tagbilaran/Bohol is used synecdochically for 'Western'; therefore, I was constructed as white. Mohammad (2001) speaks of interpellation as the process by which we are constituted as subjects through language: "Interpellation is therefore the positioning of an individual into a particular role in a given narrative…the individual can slip into the role created by the discourse or resist it" (Mohammad, 2001:114). I resisted interpellation as 'white' and 'Americana' and sought to present myself as a New Zealand student studying in Australia of mixed ethnicity wherever appropriate and possible; however, I assume for many inhabitants of Tagbilaran and Bohol, I remained as a 'big, rich, white, Americana' (see also Twyman, et al., 1999). Therefore, for many, particularly those with whom I did not interact directly, I likely remained an outsider. A reflexive approach to research ensured that I was able to negotiate the fluidity of my position as insider and allowed me to adapt my practise in a manner fitting the context.

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[15] Build-Operate-Transfer refers to a form of project financing in which the public sector grants a franchise to a private entity to finance, design, construct, and operate a facility for a specified period, after which ownership is transferred back to the public sector. In the Philippines, this is normally 25 years.

2.4 Research methods

Method refers to the process or technical means of collecting data. For this research, the methods include a case study, interviews, documentary material and ethnographic techniques such as participant observation and the use of a fieldwork journal. The use of multiple methods allowed for triangulation of information to clarify meaning and verify information thereby giving the research greater robustness.

Case studies are commonly used in human geography to explore processes and structures in social situations more closely. Case studies may be quantitative or qualitative or a mixture of both. Cases can be simple or complex but all are bounded such that the case demonstrates features or patterns, or acts as an example, to distinguish the case from the larger picture (Bradshaw and Stratford, 2000; Stake, 2003).

The case for this research is predominantly sited in the City of Tagbilaran, Bohol, with supplemental research also conducted in the Municipality of Corella, Bohol Philippines. Figure 2-1 shows the location of Tagbilaran and Corella. Following Stake's (2003) classification of case studies, the case is an instrumental case study since it provides a means to understand the links between development and water provision in a developing city context. Twelve months of the research process was spent living in the Philippines over two periods: June to December 2003 and April to October 2004. The six months from June to December 2003 was the primary period for the collection of empirical material. The second visit – April to October 2004 – provided an opportunity for augmenting empirical material gathered in 2003 including conducting follow-up interviews with informants to clarify and expand on points.

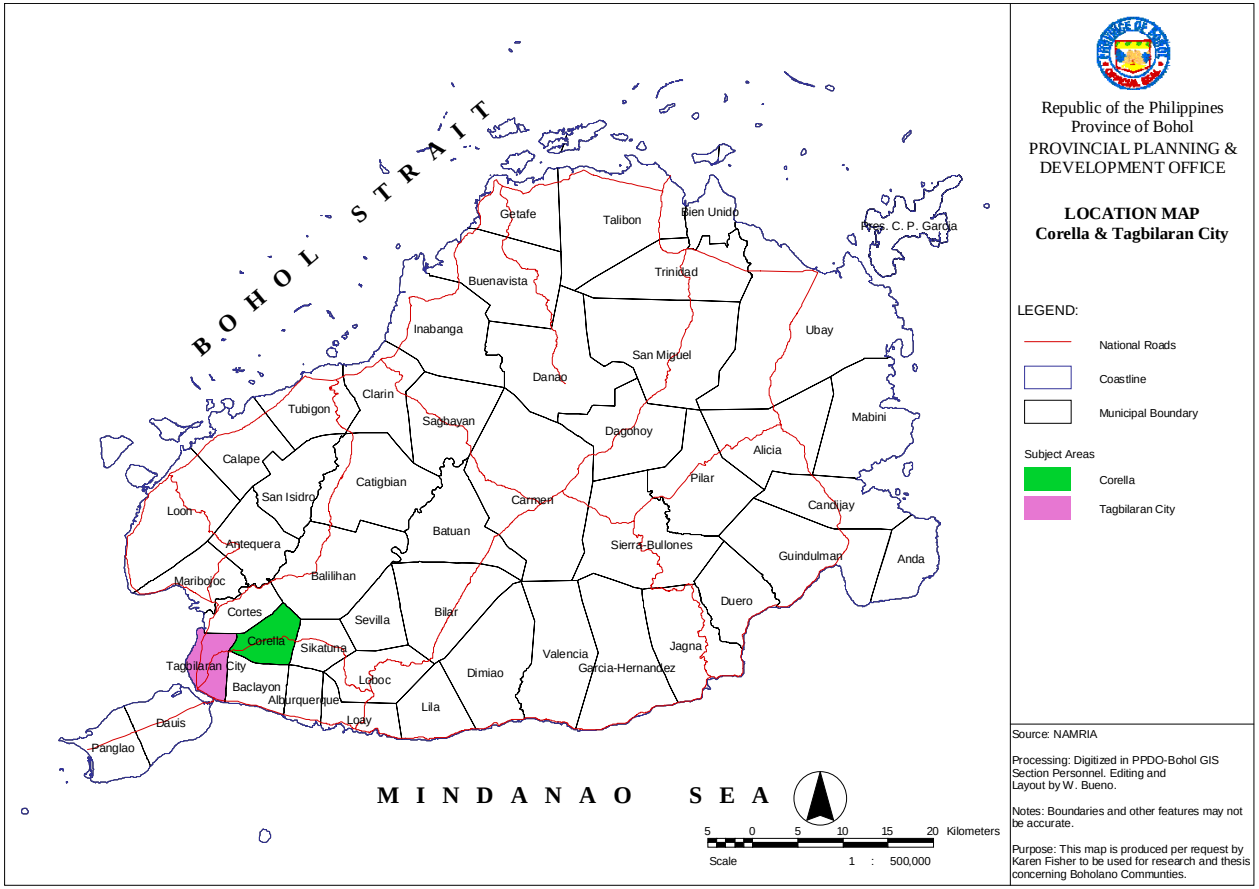

Figure 2-1: Map of Bohol showing location of Tagbilaran City and the Municipality of Corella
Source:Obtained from PPDO, 2004

Interviews were employed to obtain empirical data. Interviews have become a customary technique used in qualitative research that allow for gaps in knowledge to be filled and a diverse collection of opinions and experiences to be aired (Dunn, 2000; Holstein and Gubrium, 2004). Dunn (2000) notes that it is important for geographers to recognise that interviews provide a means to gain insight into different opinions and perceptions about events or issues; they do not, however, provide the (singular) truth or the (singular) public opinion on a matter. In keeping with feminist methodology, however, discovery of singular, universal truths was not intended.

There are three major types of interviews: structured, semi-structured and unstructured (Denzin and Lincoln, 2003; Dunn, 2000; Robinson, 1998). Structured and semi-structured interviews were the primary interview types employed in this research. Where the opportunity arose, structured surveys gave way to conversational/unstructured questioning to ascertain deeper understanding of particular ideas or perceptions held by the respondents.

Structured interviews are interviews that use an interview schedule with a list of carefully worded and ordered questions (Dunn, 2000). The structure is such that the questions are repeated for each person with whom the interviews are conducted in order to allow a degree of comparability and replication (Dunn, 2000; Robinson, 1998). Structured interviews in this research took the form of Household Surveys and Privatisation Surveys. Household Surveys were undertaken in Tagbilaran and Corella to illustrate the complex nature of water supply and management in Tagbilaran. The surveys sought to uncover people's impressions, perceptions and opinions concerning waterworks services, government, understandings of environmental and development issues, ownership and rights of water resources, water sharing as well as ascertaining what is important to the people in terms of meeting their water needs. It was my intention that the surveys were able to be answered easily and quickly by respondents. On occasion respondents discussed the questions with others present during the interview. The ordering and wording of questions in the interview schedule were carefully considered, tested, and adjusted as deemed necessary (Dunn, 2000). On occasion additional questions beyond those listed on the interview schedule were also asked and interviewing came to resemble semi-structured interviews.

Semi-structured interviews are interviews in which an interview guide is used to prompt the interviewer on particular areas that the interviewer wants to explore. This approach is more flexible than structured interviews and as such, the order of questioning is not as important. Semi-structured interviews were conducted with key informants representing government agencies, the NGO community and the private sector. All semi-structured interviews were undertaken in English without an interpreter and were not tape-recorded. Dunn (2000) identifies some of the disadvantages and advantages of recording interview sessions. Advantages include enabling a more natural conversation style in which the interviewer is not so pre-occupied with taking down all information thereby also allowing the interviewer to read

the interviewee's expressions and gestures, as well as capturing verbatim responses. Disadvantages include creating a sense of formality that may inhibit the responsiveness of participants or stultify spontaneity. In considering the advantages and disadvantages of whether to record interview sessions, I decided that I wanted participants to feel as comfortable as possible in conversing with me, hence my decision not to record sessions.

I met with each key informant more than once and was able to clarify ideas and meanings. Because I commenced writing up my findings while still in the Philippines, I was also able to provide drafts of work pertinent to material obtained from participants for clarification and further information. By providing drafts to participants, I was able to illustrate the way in which their contribution would be presented and participants were invited to make amendments[16] to the drafts as they saw fit.

Unstructured interviews are concerned with personal perceptions and personal histories and as such are guided by the informant. Questions are guided by the informant's responses and are more conversational than structured or semi-structured interviews (Dunn, 2000). In this research, unstructured interviews and conversations with a range of different people provided important contextual information about the subject under research as well as broader social, cultural and political facets of the community in which the case study was located. Such interviews tended to be opportunistic and spontaneous. Table 2.1 below presents an overview of the types of interviews conducted for each sector and organisation/location.

Sector	Organisation/Location	Interview type
Government officials	National Government	Unstructured
	Provincial Government	Semi-structured Unstructured
	Tagbilaran City Government	Semi-structured Unstructured
	Corella Municipal Government	Semi-structured Unstructured
NGOs	Tagbilaran	Semi-structured Unstructured
	Cebu	Semi-structured Unstructured
Private sector	Tagbilaran	Semi-structured
Households	Tagbilaran	Unstructured Structured (N=241)
	Corella	Unstructured Structured (N=25)

Table 2.1: Interviews conducted and type

In addition to interviews, I employed participant observation as a research method in order to obtain empirical information as well as to improve my understanding of the context and location within which my research was sited. Participant observation is an ethnographic technique which allows the researcher to observe and interact with people in their natural

[16] This included removing information if they desired.

setting. Participant observation enabled me to be involved in the everyday lives of the research participants while at the same time observing, reflecting on and recording my experiences in more generally in Tagbilaran/Bohol/the Philippines (Patton, 1990). I participated in everyday life in ways similar to those living in Tagbilaran. In so doing, I was also able to observe and record experiences and information obtained through informal discussions and anecdotal information. Beyond personal/informal spaces such as my home and homes of friends, public places including public transport, public transport terminals, market places and shops, churches, public meetings and hearings, public streets, and work places such as offices provided opportunities for me to enrich my empirical material as well as my understanding of my research project and case study.

Where I wanted to validate 'facts' or formal material obtained from formal, informal and anecdotal sources, data was triangulated with documentary sources. These included plans and reports prepared for and by various government departments and agencies at the city/municipal, provincial, regional and national scales. Local newspapers were also employed as a source of information concerning water supply in Tagbilaran City. There are three newspapers in circulation in Tagbilaran: the *Bohol Chronicle*, the *Bohol Times*, and the *Bohol Sunday Post*. The *Bohol Chronicle* was used as the primary newspaper source and editions from the mid-1990s until the present were canvassed in order to find articles relating to municipal water in Tagbilaran City. This proved to be a very time consuming exercise hence the decision to focus mostly on the *Bohol Chronicle* and not the other newspapers.

An additional method employed in this research to enrich the material obtained in Tagbilaran was photography. Photographs were used as a visual method in order to convey information about the land uses, population densities and character of locations in the field study areas. Photographs were also used to provide snapshots of people's experiences of water and municipal supply.

In utilising these methods in Tagbilaran, language emerged as a challenge to obtaining empirical material. The means by which I addressed difficulties with language are discussed in the following section.

2.5 Language

English is an official language in the Philippines and is taught throughout school. Government documents are largely printed in English; many newspapers – national and local - are also printed English. Key informant interviews with government officials, government workers, NGO workers and representatives, and others representing interest groups/organisation were conducted in English, the respondents generally being college educated, semi-

professional/professional.[17] Considering the level of English language proficiency and the fact that official documents and media material are reproduced in English, I felt comfortable with providing draft material to participants for review written in English (c.f. Twyman, et al., 1999).

During the early stages of fieldwork in 2003, I completed a short language training course to learn Boholano, the vernacular language spoken in Tagbilaran.[18] Lessons were conducted by a private tutor using a Peace Corps language training package for teaching Cebuano that I obtained from a foreign development volunteer. Boholano is a written language; however, there is no official grammar or rules that structure the language. On the other hand, grammar, rules and a standardised glossary of Cebuano terms has been developed. While there are some differences between Cebuano and Boholano, these are not substantial. This provided me with a basic understanding of the language in order that I could conduct simple conversations.

While I acknowledge the advantages of being fluent in the language of the area within which the research is conducted, achieving such language fluency is considerably more difficult in practice, particularly in terms of understanding subtle nuances or multiple meanings, given the time constraints associated with fieldwork (Gade, 2001). This point is also made by Watson (2004), although in her example, her attempts at learning the local language were made difficult by the lack of study aids and resources and the language was not written. The continued presence of development volunteers in the province, for example Peace Corps (United States), Australian Youth Ambassadors for Development (AYAD) (Australia), and Volunteer Services Overseas (VSO) (United Kingdom), meant that some resources were available to aid in language learning. An additional factor that I consider to be quite advantageous in conducting my research, and perhaps almost as beneficial as language fluency, was the cultural learning associated with living with a Filipino family as mentioned in Section 2.2.

2.6 Research assistance

Research assistants were employed to undertake the Household Surveys and Privatisation Surveys. Twyman et al. (1999) discusses the importance of considering the positionality of research assistants assisting with interviews in the field along with the positionality of the researcher. The assistants were three female college graduates in their early- to mid-20s. Each had had experience in research and conducting surveys through work with other doctoral students, local NGOs and a research centre at a local university. Two of the assistants had a particular interest in environmental issues while the third had been involved in research concerning economic and social development. The assistants were native Visayan speakers with excellent English skills. Questions were asked in Visayan and then translated into English.

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[17] I also encountered many everyday, that is, non-professional people in Tagbilaran who had very good English language skills and with whom I was able to converse effectively.
[18] Boholano is a variant of Visayan. Visayan is the most widely spoken dialect in the Philippines.

All of the surveys undertaken in Corella were in Visayan and translated into English. Most of the surveys in Tagbilaran were also undertaken in Visayan although some were conducted in English. Language training meant that although I was not able to conduct the interviews myself in Visayan, I was able to understand a good deal of what was being discussed, which allowed for active, collaborative interviews (Holstein and Gubrium, 2004). This ameliorated some of the distance between what respondents actually said and the translated transcriptions that were produced between me and my assistants (Twyman, et al., 1999; Watson, 2004). I sought to involve my assistants in the question design process particularly with respect to the wording of questions and identifying themes to explore (Twyman, et al., 1999).

Household Surveys were undertaken in batches. Surveys in Corella to households served by Corella Waterworks System (CWS) were conducted in October 2003; surveys to households in Tagbilaran served by Bohol Water Utility Inc., (BWUI) were conducted in October 2003 and July 2004; and, surveys to households in Tagbilaran served by Tagbilaran City Waterworks System (TCWS) were conducted in July 2004. The Privatisation Surveys were conducted in May to July 2004. Most of the surveys were conducted in respondent's homes although some surveys were also conducted at *barangay*[19] halls, market places and on public transport. Many of the interviews were undertaken solely by one of the research assistants. It was pointed out to me that in some instances my presence could be off-putting for people, especially those in remote, rural areas, since they feel "ashamed" about talking to a foreigner. There were instances where I encountered reluctance from some respondents who thought that the surveys, and my research, were politically motivated, particularly as the pre-test for the Privatisation Surveys commenced shortly after the May 2004 government elections and the privatisation 'issue' had been raised again in the months leading up to the election. On such occasions having assistants that were not affiliated with government organisations but rather educational institutions, proved advantageous. My assistants and/or I would stress that I had no affiliation with any government (Philippine or Australian) and would reiterate my position as a student. Respondents were free to refuse to participate in the surveys (Twyman, et al., 1999).

For surveys undertaken when I was present, I would compare notes with my assistant after each completed survey and then discuss the surveys undertaken – what worked, what didn't, interesting comments – at the end of each day. For the surveys undertaken when I was not present, I would discuss the comments and responses with my assistant and ask for her perceptions and impressions of the process. By providing outlines of my research to my assistants as well as preliminary findings, I hoped to engage my assistants' interest in my topic and also to engender a sense of cooperation between them and myself.

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[19] A b*arangay* is a political unit of local administration representing a village, district or ward. A *barangay* hall is a public building in which *barangay* meetings and other activities are held.

2.7 Ethical considerations

In conducting this research, a number of important ethical considerations were identified and taken into account. These included obtaining consent from research participants, confidentiality and anonymity. The means by which consent to conduct interviews was sought depended on the type of interview and with whom they were conducted. In the case of semi-structured interviews with key informants such as representatives of NGOs or government, a letter of introduction including an outline of my research was forwarded to each potential interviewee.[20] This was followed by a phone call to discuss whether they were willing to participate and, if they were, to arrange a meeting time. Upon meeting the interviewee, I once again explained who I was, where I was from, my research objectives, and why their participation was being sought. Their verbal consent was sought to participate in the interview and written consent sought to publish their name in my thesis.[21] The participants were made aware that they had the right to refuse consent and withdraw from the research at any time.

Because households were selected at random for the Household and Privatisation Surveys, I was not able to provide respondents with information prior to conducting the surveys. Once houses were selected, my research assistant would introduce us to the occupants and explain how I was conducting research on water in Tagbilaran and requested their participation. During this introduction, respondents were free to ask questions concerning my affiliation, research objectives and so forth, and also to refuse to participate without providing an explanation. Confidentiality and anonymity were assured and no personal or identifying information was collected.

Confidentiality was ensured by coding interview transcripts and prohibiting access to this information by others. All quotes presented in this thesis are from individuals who have given their written permission for me to quote them and to use their names. To ensure anonymity of informants, I have used codes for interview respondents in the body of the thesis rather than identifying them by name despite having permission to identify them because of my concerns that some of the material provided may be viewed as inflammatory by others. For consistency, this convention has been applied for all interview responses even those which are innocuous in content. Codes have been determined based on the organisational affiliation of informants. Each code is a unique identifier and comprises initials to represent the organisation/group they were representing at the time of the interview, and a number. Interviews were conducted with informants representing national government agencies (NG), provincial government agencies (PG), local government agencies (LG), waterworks utilities (WW), national government line agencies (LA), and representatives of non-governmental organisations, citizen groups and other

[20] See Appendix A for an example of letter and outline.
[21] See Appendix B for example of consent form.

members of civil society (CS). Coding for interview respondents and the identifiers which appear in this thesis are summarised in Table 2.2 below.[22]

Code	Description	Identification in thesis
NG	National government agencies such as the National Water Resources Board	NG#1 – NG#2
PG	Representatives from the provincial government such as the Provincial Planning and Development Office	PG#1 – PG#5
LG	Representatives from the Municipality of Corella and the City Government of Tagbilaran	LG#1 – LG#6
WW	Tagbilaran City Waterworks System, Bohol Water Utilities Inc., and Corella Waterworks System	WW#1 – WW#5
LA	National government line agencies such as DENR representatives in the region/province	LA#1 – LA#2
CS	Representatives from NGOs, citizen's groups, and other civil society groups	CS#1 – CS#4

Table 2.2 Interview codes

Codes have also been used to identify quotes made by survey respondents. Each survey code is unique and allows for responses to be matched to location (Tagbilaran or Corella) and waterworks utility (see Table 2.3 below). Where quotes are used additional information, such as *barangay* or household income class,[23] is also noted where relevant in parentheses.

Survey Code	Survey Type	Waterworks Utility Consumers
COR001 to COR 025	Corella Household Surveys	CWS consumers
TAG001 to TAG098	Tagbilaran Household Surveys	BWUI consumers
TAG099 to TAG141	Tagbilaran Household Surveys	TCWS consumers
PRIV001 to PRIV100	Tagbilaran Privatisation Surveys	BWUI consumers

Table 2.3: Survey codes

In keeping with the ethical requirements of my university, I discussed the ethical considerations of my research with each of my research assistants before commencing data collection. As an additional measure, I asked each of my research assistants to sign an ethical research agreement form.[24] As noted above, each assistant had previous experience in research and conducting surveys and was, therefore, aware of matters such as obtaining consent, the need for confidentiality and anonymity.

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[22] For a general description of interview respondents and the dates interviews were conducted see Appendix C.

[23] Household income information was obtained and has been grouped into classes corresponding to the Provincial and Tagbilaran City Government's classification system as per the Provincial *Medium Term Development Plan* (1997) *Socio-economic Profile for Tagbilaran City* (2002) and the *Comprehensive Land Use Plan: Tagbilaran City* (2001). The classes range from Class 1 (P1,000 per month) to Class 10 (greater than P10,000 per month). See Appendix D for further information.

[24] Permission to conduct fieldwork was granted by the Australian National University Human Research Ethics Committee in May 2003. See Appendix E for an example of the ethical research agreement form.

2.8 Sampling selection and analysis for structured household interviews

Household Surveys were administered according to waterworks utility coverage area; therefore, three forms were designed for BWUI, TCWS and CWS household consumers. Some of the questions were specific to each sub-set whereas others were more general and asked of all respondents.[25] The selection of *barangays* in which to undertake the households was purposefully sampled; households within *barangays* were sampled at random. Interviews were mostly conducted during the day during weekdays and weekends. Transport and accessibility influenced the location of houses chosen. When private transport[26] was available I sought to select houses to represent geographical and spatial differences; for example, low-lying and elevated areas, remote and highly populated locations. When private transport was not available, public transport was taken to the local market place and/or the *barangay* hall and houses were chosen within walking distance.

One hundred and forty one Household Surveys were conducted across the fifteen *barangays* within Tagbilaran. BWUI surveys were conducted in the *barangays* of Bool, Booy, Cogon, Dampas, Dao, Mansasa, Poblacion I, Poblacion II, and Poblacion III, which represents the coverage area for BWUI. TCWS surveys were conducted in Cabawan, Dao, Manga, San Isidro, Taloto, Tiptip and Ubujan representing the coverage area of TCWS (see Table 2.4 below). Figure 2-2 shows the coverage areas for waterworks utilities in Tagbilaran.

[25] See Appendix D for a description of the survey themes for the Household Surveys and copies of the survey forms.
[26] Private transportation was used for all of the surveys in Corella.

Barangay	BWUI	TCWS	Total
Bool	16		16
Booy	7		7
Cabawan		6	6
Cogon	14		14
Dao	8	4	12
Dampas	8		8
Manga		8	8
Mansasa	8		8
Poblacion I	10		10
Poblacion II	10		10
Poblacion III	10		10
San Isidro	7	3	10
Taloto		5	5
Tiptip		9	9
Ubujan		8	8
Totals	**98**	**43**	**141**

Table 2.4: Household Surveys samples, BWUI and TCWS

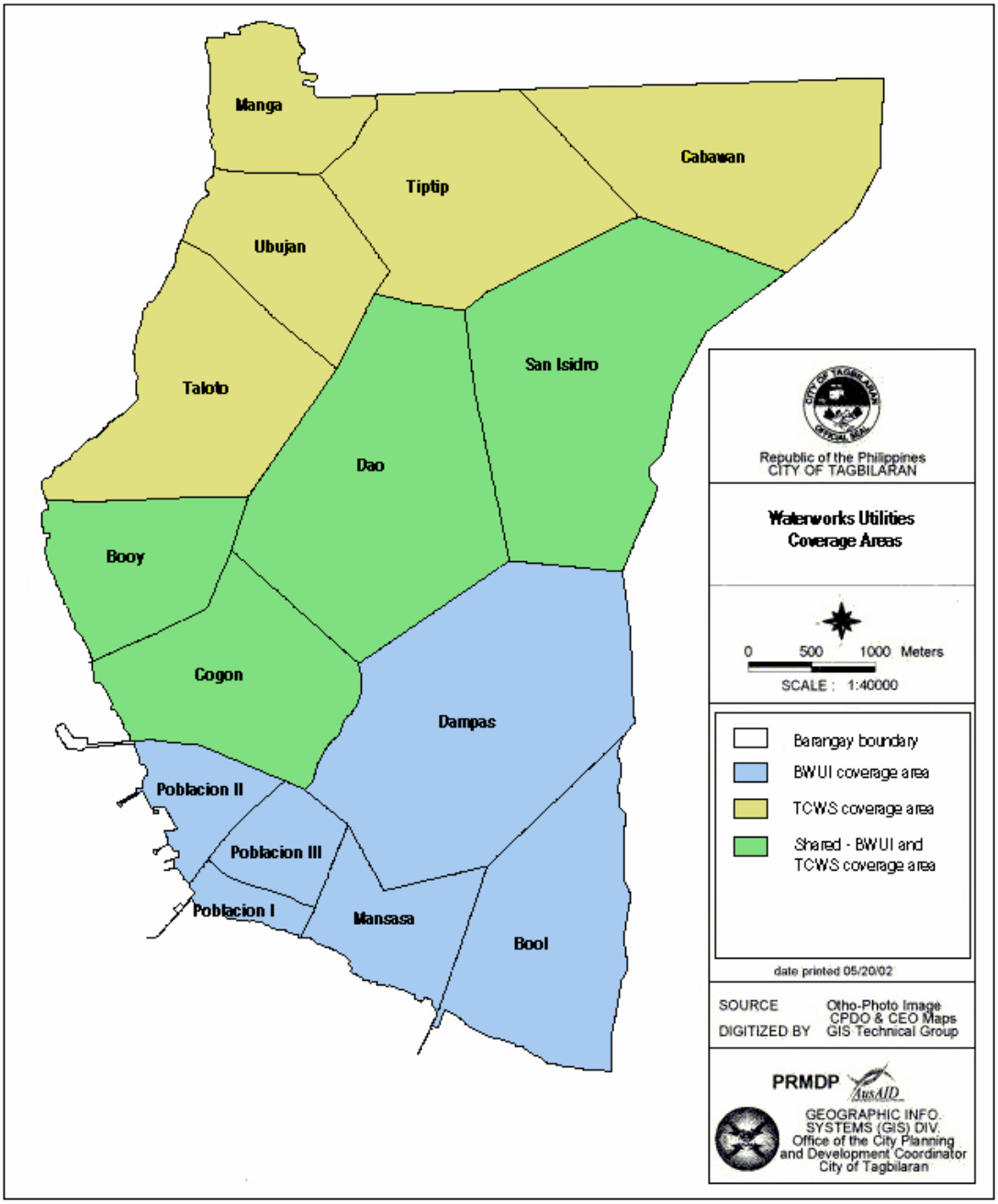

Figure 2-2: Waterworks Utilities Coverage Areas, Tagbilaran

Twenty-five Household Surveys were conducted in four *barangays* within Corella, namely Cancatac, Poblacion, Sambog and Tanday. Poblacion, Sambog and Tanday were chosen because pumping stations for Tagbilaran are located there. Cancatac was chosen because they experienced some difficulty in service due to elevation and distance and so I was interested to see whether this influenced their perceptions of water governance and management. Table 2.5

shows the sample distribution for Corella. Figure 2-3 shows the Municipality of Corella and indicates the *barangays* in which the surveys were conducted.[27]

Barangay	
Cancatac	7
Poblacion	5
Sambog	7
Tanday	6
Total	**25**

Table 2.5: Household Surveys sample, Corella

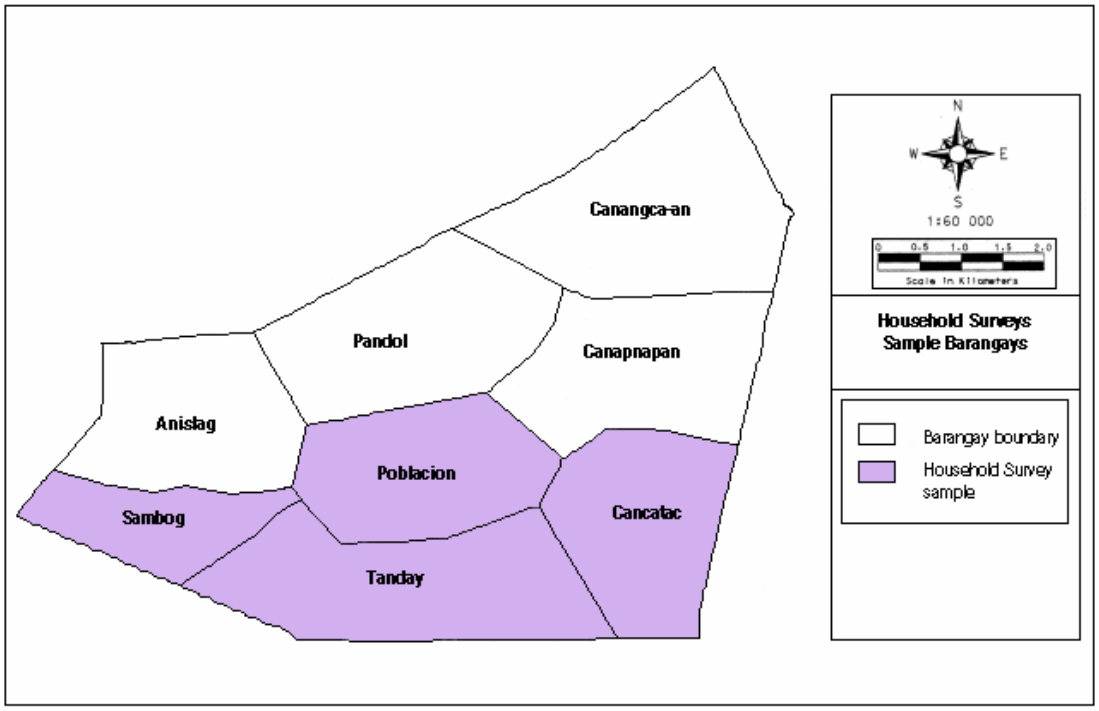

Figure 2-3: Corella *barangays* and sample area

Privatisation Surveys[28] were conducted across Tagbilaran in May to July 2004 to elicit perceptions and opinions about the privatisation of the water utility and the proposal of Governor Aumentado to buy back the water utility. These surveys were sampled at random within BWUI coverage area; all respondents were BWUI consumers. All surveys were conducted in Visayan generally at the home of the respondent. Socio-economic and demographic information was not sought. The means by which the material obtained by these surveys was analysed are discussed in the following section.

[27] All *barangays* in Corella are served by CWS.
[28] See Appendix F for a description of the survey themes for the Privatisation Surveys and copies of the survey form.

2.9 Methods of analysis

A total of 141 Household Surveys and 100 Privatisation Surveys were conducted for this research. The data obtained from surveys was entered into a Microsoft Access database which I created while in the Philippines. This enabled me to design queries in order to interrogate the data to find trends and patterns concerning household consumption and knowledge, and was useful because it provided a means by which I was able to organise large quantities of data and reflect on the findings while I was still in the field. Queries were exported into Microsoft Excel where I utilised PivotTables, arithmetic and statistical functions in order to produce numerous tables and charts, which were used as the basis for analysis.

Analyses were performed based on location, waterworks utility and *barangay* classification.[29] Analysis based on waterworks utility was conducted for information relating to consumption and costs since each utility has different tariff rates for water consumption. Likewise, findings concerning affordability, satisfaction, water quality, improvements and service were also analysed according to waterworks utility. In the case of water sharing, findings from CWS were contrasted with those provided by BWUI consumers to determine if there were differences in perception associated with respective locations; that is, as the site for supply (Corella) and the site for demand (Tagbilaran).

Analysis based on *barangay* classification was conducted in order to determine how other factors unrelated to waterworks utility influenced the findings. Households in Tagbilaran and Corella are heterogeneous and diverse in composition, sources of income and occupation, levels of income, geographical attributes and engagement with extra-local social, economic and political processes. The Household Surveys were conducted in varying socio-economic contexts across Tagbilaran and Corella. In Tagbilaran, waterworks services are broadly divided such that BWUI is the service provider to urbanised *barangays* while TCWS is the service provider to rural *barangays*. Differences in perceptions about the links between human activity and environment emerged that were unrelated to waterworks provider and were instead influenced by land use activities and population densities. For this reason, I have also chosen to group households according to land use, population density and landscape for the purposes of contrasting and comparing opinions and perceptions regarding environmental issues. The categories are rural/low (population) density, urban/high (population) density and urban/low (population) density.

Table 2.6 shows the number of surveys conducted per *barangay* for rural/low density *barangays*. Figure 2-4 illustrates those *barangays* that were surveyed within Corella and have been categorised as rural/low density.

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[29] Socioeconomic information derived from the Household Surveys and which is supplemental to analysing the empirical material is provided in Appendix G.

Barangay	Total
Cancatac	7
Poblacion	5
Sambog	7
Tanday	6
Total rural/low density	**25**

Table 2.6: Rural/low population density *barangays*

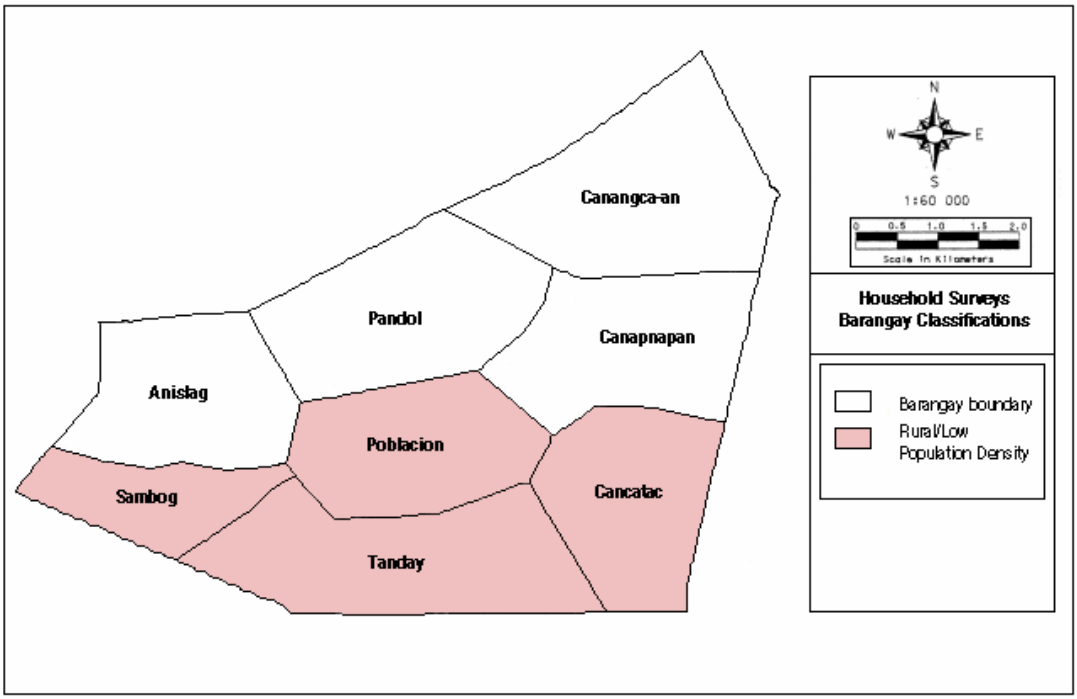

Figure 2-4: Household Surveys *barangay* classifications, Corella

Table 2.7 and Table 2.8 give the number of surveys undertaken per *barangay* for urban/low population density and urban/high population density respectively. Figure 2-5 illustrates these categories within Tagbilaran. Descriptions for all categories follow below.

Barangay	Total
Bool	16
Booy	7
Cabawan	6
Dao	12
Dampas	8
Manga	8
Mansasa	8
San Isidro	10
Taloto	5
Tiptip	9
Ubujan	8
Total Urban/low density	**97**

Table 2.7: Urban/low population density *barangays*

Barangay	Total
Cogon	14
Poblacion I	10
Poblacion II	10
Poblacion III	10
Total urban/high density	**44**

Table 2.8: Urban/high population density *barangays*

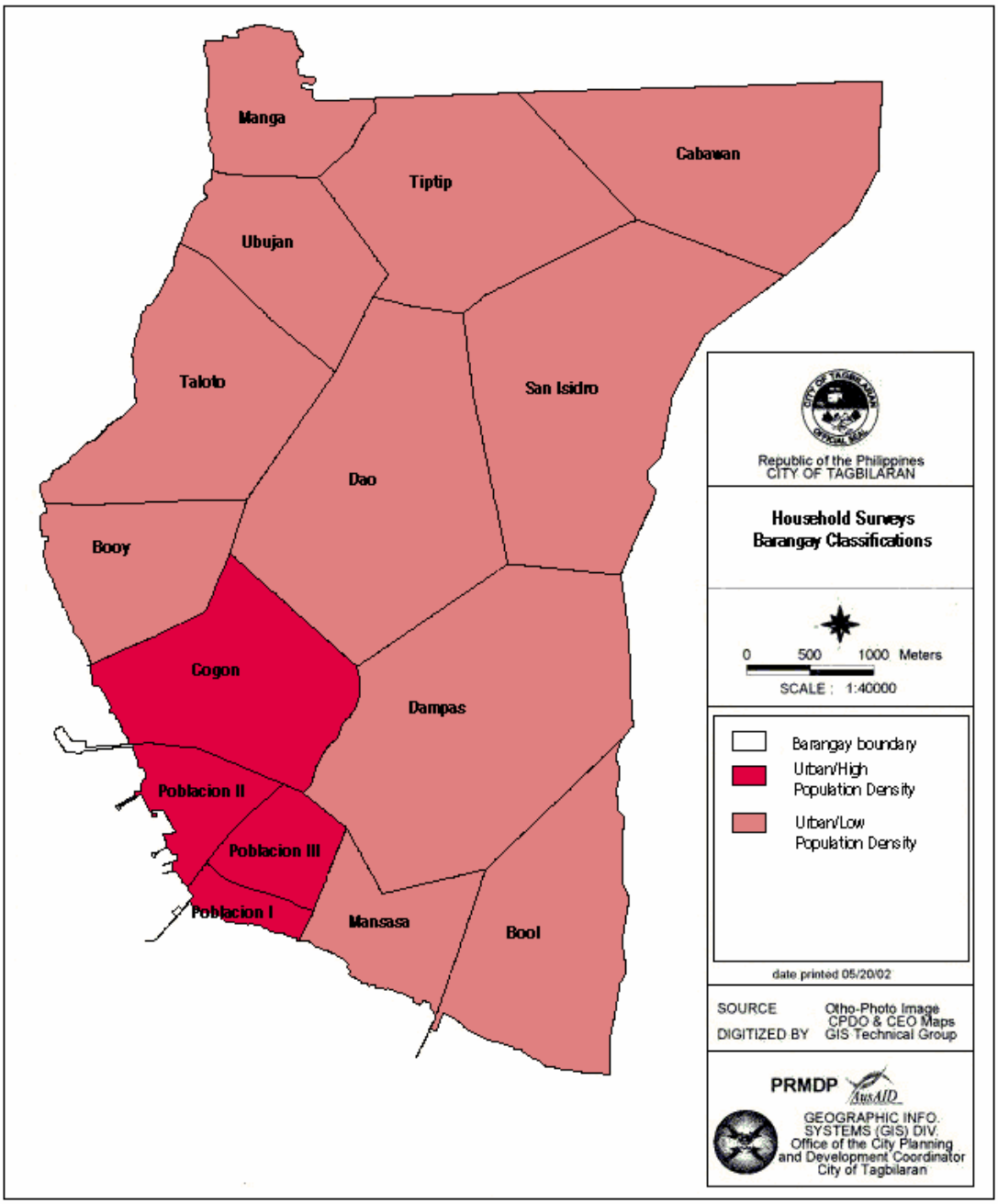

Figure 2-5: Household Surveys *barangay* classifications, Tagbilaran

Households in Corella have been characterised as rural/low density. Population densities are low ranging from less than one person per hectare to four persons per hectare (see Table 6.6). Agricultural landholdings accounted for 72 percent of properties surveyed, with residential properties 16 percent and commercial properties 12 percent. The average land holding was slightly larger than 5000 m^2. The municipal market, municipal hall and church are located in Poblacion. Plate 2-1 and Plate 2-2 illustrate some of the land uses, population density and building intensity within this category.

Photo by Fisher, 2004.

Plate 2-1: Poblacion, Corella (market place on left).
The main road through Poblacion, Corella, is generally quiet, with relatively little traffic.

Photo by Fisher, 2004.

Plate 2-2 Houses in a residential compound, Tanday, Corella
Houses located off *barangay* roads away from *barangay* halls or the markets are likely to occupy large, spacious residential compounds.

Households characterised as urban/high density are located within *barangays* identified by the City of Tagbilaran as "urban" or "highly urbanized" *barangays* (City of Tagbilaran, 2001; 2002). These *barangays* are Cogon, Poblacion I, Poblacion II, and Poblacion III. Population densities range from 79 persons per hectare (Cogon) to 123 persons per hectare (Poblacion I) (see Table 5.3). These *barangays* are heavily built-up and comprise residential and commercial landholdings. The central business district is located in Poblacion II. Livelihoods and occupations are diverse but exclude *in situ* agriculture. Plate 2-3, Plate 2-4 and Plate 2-4 illustrate some of the land uses, population density and building intensity within this category. Plate 2-3 shows Carlos P Garcia (CPG) Avenue in Poblacion II, which is the main street through Tagbilaran and the commercial centre for the City. Plate 2-4 was taken in Poblacion III near the Provincial Capitol site and shows commercial and residential buildings. Plate 2-5 shows a residential area within Poblacion III.

Photo by Fisher, 2004

Plate 2-3: Carlos P Garcia (CPG) Avenue, Poblacion II, Tagbilaran.
CPG Avenue is the main road through Tagbilaran City, and is a busy thoroughfare for motorists and pedestrians.

Photo by Fisher, 2004.

Plate 2-4: JA Clarin Street, Poblacion III, Tagbilaran.
High population density and expansion of paved areas coupled with poor drainage affect recharge patterns and stormwater runoff. Flooding can be problematic in parts of the city.

Photo by Fisher 2004.

Plate 2-5: Poblacion III, Tagbilaran City
Houses in densely settled *barangays* occupy small lots. Roads are often poorly sealed with no drainage, increasing the risk of polluted stormwater runoff infiltrating underground.

Households characterised as urban/low density are located within *barangays* identified by the City of Tagbilaran as "rural" *barangays* (City of Tagbilaran, 2001; 2002). These *barangays* are Bool, Booy, Cabawan, Dampas, Dao, Manga, Mansasa, San Isidro, Taloto, Tiptip and Ubujan. Population densities range from 3 persons per hectare (Cabawan) to 56 persons per hectare (Mansasa) (see Table 5.3). Built-up areas tend to be concentrated in areas close to the local market and/or *barangay* hall; buildings then become more diffuse and the landscape has more green space or vacant areas, or may take on a more 'rural' aspect. Livelihoods and occupations are diverse and include some *in situ* agricultural activities including rice fields, banana and coconut trees and livestock (including *carabao*). Roosters are common within the city and in many instances are raised for cock fighting, which is a popular activity for many men in Tagbilaran and the Philippines in general. The breeding and sale of fighting roosters may also serve as an additional income source.

Plate 2-6: Cabawan, Tagbilaran.
Cabawan has the lowest population and population density in Tagbilaran. Many *barangay* roads are unsealed and the landscape is very rural. *Carabao*, as above, are used by farmers for working their fields in the *barangay*. Photo by Fisher, 2004.

Plate 2-7: Mansasa, Tagbilaran.
Large house lots are more widespread in urban/low density *barangays* than urban/high density *barangays*. This household in Mansasa has ample room for raising roosters for cock-fighting and was also home to several dogs. Photo by Fisher, 2004.

Photo by Fisher, 2004.

Plate 2-8: Mansasa, Tagbilaran.
Residential streets in urban/low density *barangays* are more likely to have large trees, shrubs and gardens as buffers between houses and road frontage, with more unpaved area around the house.

2.10 Summary

This research was designed as a qualitative inductive inquiry which employed a variety of social science research methods most notably a case study in Bohol, the Philippines. Interviews and surveys were used to obtain empirical data within the case study location, along with documentary and other sources which were collected during periods of extended fieldwork. Since this research is a qualitative cross-cultural study in a developing country, my subjectivity and positionality influenced all aspects of the research design and its conduct, particularly in the Philippines. As a social science thesis dealing with 'real people' and their 'real lives', ethical considerations such as anonymity and confidentiality have been central to how I have presented empirical material in my thesis,

In Part Two, I locate my research within the larger body of knowledge concerned with development and water governance. I begin in the following chapter to chart the shifts in development and water governance discourse more broadly, and show how these have influenced approaches to meeting urban water needs.

Chapter 3 Water Governance and Development for Urban Areas

3.1 Introduction

In developing countries, international development thinking and discourse have been influential in shaping urban water governance systems, which are in turn mediated by local narratives and experiences of development. Current strategies to meet urban water needs emphasise an integrated approach which encompasses environmental, social and economic domains, while at the same time neoliberal economic discourse exerts a powerful influence over how urban water supply is conceptualised and governed and who should be responsible for its provision.

In this chapter, I demonstrate how major shifts in development discourse have influenced the ways in which the problems of urban water supply and meeting urban water needs in developing countries have been conceptualised. I emphasise how, since the 1950s, modernisation discourse and neoliberalism have each been important in shaping approaches to development and the provision of water for urban areas. Particularly significant in light of these shifts in discourse is the changing role of the government in implementing development strategies and planning for water resources, and the technologies employed by the government and other development agents in meeting urban water needs.

I show how there has been a paradigm shift in urban water provision from a solely technocentric approach focused on supply (or a 'hardware' approach), to acknowledging the significance of governance and institutions (or a 'software' approach)[30] largely due to local water security issues being problematised at the global level by global institutions and the development fraternity. As a consequence, there has been a shift towards a more holistic approach to water resource management encompassing environmental, social and political domains advocated at the supra-national level. This shift has been influential in local contexts and precipitated changes in how concepts of governance are deployed within development and water discourses. Notably, the increasing role played by the private sector in the provision of urban water supply has been accompanied by concerns that the private sector is anti-poor and has the potential to exacerbate inequities. For the most part, however, the polemical debate for and against privatisation obscures the complexity of water services provision since both public

[30] The term 'software' in this context refers to approaches to water resource management which emphasise focusing on governance and institutions and which also incorporate demand management. This term was used by Hirsch et al (2005) in a report on water governance in development assistance prepared for AusAID. In July 2005 I attended a workshop at AusAID which focused on the contents and findings of this report. This is where I first became familiar with the use of 'software' to refer to institutions in water management.

and private utilities can be effective or perform badly, as will be shown in the latter part of this chapter.

3.2 Modernisation, neoliberalism and discourses of development

Enhancing and harnessing water resources have long been recognised as important facets of development particularly under conditions of scarcity. As a basic human need, ensuring stable supplies of safe water is fundamental to development. In terms of economic growth and development, water is identified as a key input for agriculture, industrial uses, and commercial activity. As such, water has been targeted within development programs as a resource to be 'developed' with a variety of different sectors as the target. The form of improvements undertaken reflects trends in development discourse as well as discourses related to water, where 'discourse' is interpreted as being representations of ideas over phenomenon, which in turn influences practice and performance in relation to that phenomena. Discourse, then, can be regarded as "a shared meaning of a phenomenon" (Adger, et al., 2001:35) that is socially constructed by actors, in which meanings are produced, reproduced through written and oral statements. Therefore, discourses are expressions of knowledge and power in which certain interpretations and meanings are privileged over others (Adger, et al., 2001; Danaher, Schirato and Webb, 2000).

The notion of sustainability has become a central part of contemporary development discourse, particularly as concerns debates over the environment and development (Sneddon, 2000). The World Commission on Environment and Development (WCED) defined sustainable development as "development that meets the needs of the present without compromising the means of future generations to meet their own needs" (WCED, 1987: 43). Although a contested term, sustainable development is a key agenda for development in the 21st century throughout the developing world.[31]

The antecedents to sustainable development draw on multiple schools of thought and development approaches (McMichael, 2000). Shifts in development thinking since the 1950s have influenced the ways in which water has been constructed as a resource to be developed and the mode by which water resources projects and programs are undertaken. Development theories have primarily concentrated on national economic growth and modernisation which has looked at mobilising natural and physical resources, including human labour, in order to help developing countries catch-up with developed countries (Brohman, 1995; Escobar, 1995; McMichael, 2000; Pieterse, 1996; Schuurman, 2000).

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[31] See, for example, Osorio, Lobato and del Castillo (2005) for a recent overview of the debates surrounding sustainable development.

During the 1950s and 1960s, development was predominantly undertaken as a national programme that was generally state-planned and top-down in organisation and administration. The focus of national development was largely the construction of large-scale infrastructural projects such as dams, bridges, highways and power plants, import substitution industrialisation, and commercial agriculture, including large-scale plantations (see, for example, McMichael, 2000; Todaro, 1997). The emphasis on modernisation and growth meant that social and political aspects of development were not explicitly targeted within development programmes supported by donors and implemented by recipient governments. Instead, it was believed that positive effects would trickle-down to the general population thus leading to improvement in welfare.

Development strategies which focused on national growth were endorsed and supported by development experts in both developed and developing countries. The key post-War 'developers' were the United States, the Organisation for Economic Co-Operation and Development (OECD), the World Bank, the International Monetary Fund (IMF) as well as regional development banks (Bose, 1997; Cooper and Packard, 1997; Finnemore, 1997; McMichael, 2000; Pieterse, 1996; 1998).

The roles of the World Bank and IMF in influencing development approaches and discourse are particularly significant since these institutions supervised the post-War globalised economic system by, among other things, stabilising national finances, revitalising international trade, and underwriting national economic growth in the Third World (McMichael, 2000; Nabudere, 1997). As major underwriters of development projects, the World Bank and IMF played a significant role in influencing the direction of development policy and programs taken within developing countries (Cooper and Packard, 1997; Finnemore, 1997; McMichael, 2000). Consequently, there are claims that the implementation of IMF/World Bank development strategies and programs were linked ideologically to the interests of the United States and other advanced capitalist countries, which sought to open up developing nations to transnational capital flows while at the same time retaining economic, political and military superiority (Brohman, 1995; McMichael, 2000).

The underlying assumption in Western development theory was the universality of capitalist development and a singular development trajectory (Brett, 2000). The emphasis on nation states as the unit of development complemented a nationalist upsurge amongst developing countries as they gained independence from colonial rule; nationalism and development became politically intertwined (Bose, 1997; McMichael, 2000). Consequently, delivery of development assistance through bilateral and multilateral donors favoured recipients whose governments resembled Western, bureaucratic governments, which many post-colonial governments inherited from former colonial rule hence the easy acceptance of nationally-focused development (McMichael, 2000).

For this reason, early water resource development projects undertaken in developing countries after the 1950s were generally based on Western experiences and expertise. Approaches to water resource management, therefore, tended to focus on supply management; that is, overcoming problems of supply to users and developing ways of increasing supply. To this end, the construction of dams and capture of surface water was promulgated as the most important way to ensure a more consistent water supply, especially during dry periods for industry, irrigation, fishing and recreation, hydro-electric power production, navigation in rivers, flooding and water for other needs (Altinbílk, 2002; World Commission on Dams, 2000). Moreover, the historical significance of dams in civilisations dating back thousands of years served to support the notion of constructing dams to secure supply for development.

The construction of single- and/or multi-purpose dams tended to be undertaken as a public project as part of a national development programme because of the high capital investment and technical expertise required (Oud and Muir, 1997) As such, the state was frequently responsible for construction, maintenance and management of water works and irrigation systems with funding and support from multilateral and bilateral funding bodies. Construction of dams and canals for irrigated agriculture was intensified by population growth and changes in patterns of consumption and the corresponding need to increase food production (Rosegrant and Ringler, 1998).[32] Funding agencies such as the World Bank and regional development banks supported the development of large and small dams through the provision of loans and funding.

The preference for large dams as a development objective reflected paradigmatic thinking: modernisation, technocentric, Western engineering. In addition, such undertakings can be seen as a display by (central) governments of power and might (Abu-Zeid, 2001; Altinbílk, 2002; Beekman, 2002; Keller, Sakthivadivel and Seckler, 2000; Mehta, 1999; Molle, 2002; Ward, 1997; Winpenny, 1997). The centralisation of such infrastructure supported the myth of the national development project and corresponded with an emergent lack of faith in local, informal institutions and traditional approaches which were then superseded by modernist Western development discourse (McMichael, 2000; Mosse, 1997). Construction of such large projects, however, were frequently accompanied by a raft of negative social and environmental impacts (see, for example, Bouwer, 2000; World Commission on Dams, 2000).

While modernisation and economic growth governed the direction and nature of development, environmental and social impacts were generally externalised. As such, the environment was largely seen as providing a limitless stock of resources to facilitate economic growth. The sheer scale of development projects in the 1950s and 1960s meant that the number

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[32] Agriculture remains the largest user of water in developing countries including the Philippines and irrigated agriculture is reported as the largest use of water by humans accounting for between 70 and 80 percent of worldwide water withdrawals (Cosgrove and Rijsberman, 2000; Rosegrant, 1997; WMO, 1992).

of adversely affected people was considerably large, as was the geographic scope. Population growth further exacerbated pressure on natural resources as demand for space—for residential and industrial purposes—and demand for export-focused and domestic consumption increased (Bryant, 1998; Killick, 2001; Kousis, 1998; Sachs, 1999; Wiggins and Proctor, 2001). In addition, urbanisation, high population densities, and urban sprawl into peri-urban areas contributed to a decline in soil and water quality in urban catchment areas and worsening air and water pollution.

The growing recognition of the importance of social and environmental conditions as key facets of development broadened the scope of development. Environmental and social or human rights discourses sought to also consider links between human transformations of spaces and pressure on natural resources and the environment. Access to natural resources, resource management, and environmental degradation were considered in relation to social dimensions such as power, access, property rights and institutional arrangements as well as in economic terms in order to better understand how development could be more effective in promoting well-being beyond strictly economic growth (Brohman, 1995; Escobar, 1988; Esteva, 1992; Peet and Watts, 1993; Schuurman, 2000; Slater, 1995). In this regard, the growing understanding of the multiple dimensions and complexity of poverty in the Third World corresponded with an increasing awareness and internationalisation of human rights issues more broadly (Finnemore, 1997).

By the end of the 1970s, development had shifted from a national, inward-focused enterprise concentrating on modernisation and growth through industrialisation to outward-focused development concerned with social as well as economic measures of development. As a consequence, development as a state implemented national programme was replaced by *laissez faire* neoliberalism and increasing global interdependency created through trade and financial links. Global economic integration and interdependency intensified with the advance of neoliberalism in the 1980s and 1990s, which led to substantial economic reforms within developed and developing countries. Radical reforms spearheaded by President Reagan in the United States and Prime Minister Thatcher in Britain ushered in a change from Keynesian welfare economic state and interventionist policies leading to administrative, institutional and structural changes that precipitated shifts in Canada, New Zealand, Australia and other industrialised countries (Berger and Beeson, 1998; Hay, 2004; Jessop, 2002; Kotz, 2002). This led to a conceptual shift in development thinking in donor countries, and called into question the role and effectiveness of state governments and the appropriateness of national-scale development (McMichael, 2000).

The declining dominance of modernisation discourse which positioned development as a state-led undertaking occurred because of the increasing importance given to non-economic aspects of development as well as a re-conceptualisation of the role of economics in achieving

development as a consequence of neoliberalism in industrialised countries. The ascendancy of neoliberalism within developing countries was driven by the influence of donor countries and multilateral agencies such as the World Bank, along with the perceived failure of aid and development to bring about a significant reduction in poverty, achieve sustained economic growth, and lead to an improvement in overall welfare (Berger and Beeson, 1998). Government failure in developing countries was blamed on rent-seeking behaviour, cronyism, corruption and other forms of negligent governance (Keefer, 2004; Krueger, 1990). In order to overcome government failure, market-led development orthodoxy was advocated whereby economic reforms favouring financial deregulation, trade liberalisation, privatisation and contraction of government in fixing the development agenda were promoted (Farazmand, 1999; Gore, 2000).

The World Bank, through its structural adjustment lending, in conjunction with the IMF's structural adjustment packages, furthered the spread of neoliberalism into developing regions during the 1980s. These organisations were able to do this by placing conditions on loans meant to assist in debt-servicing such as requiring recipient countries to restructure their economies in accordance with World Bank and IMF preferences. More often than not, these interests aligned with those of powerful industrialised nations such as the United States (Farazmand, 1999; Harris and Seid, 2000; Kotz, 2002; Önis and Senses, 2005). Economic orthodoxy during the 1980s and 1990s, particularly in leading industrialised countries and international financial institutions such as the World Bank and IMF reflected the principles of the so-called 'Washington consensus,' which identified 10 policy priorities[33] (see, for example, Held, 2005; Williamson, 1993; World Bank, 2001b). As a consequence of the Washington consensus and neoliberal reforms, developing countries became subject to greater levels of economic integration than had previously been experienced as privatisation and liberalisation opened the way for increased trade and investment opportunities. The vulnerability of developing economies to the vagaries of the global market, therefore, increased significantly. As a consequence of structural adjustment, reduction in public spending on social programs, including food subsidies, and the shift to export-led production at the expense of producing for domestic consumption, the 1980s saw an increase in poverty levels and a decline in social factors of development such as health, nutrition and education (McMichael, 2000). Moreover, governments in developing countries were increasingly called upon to decentralise,[34] to increase the role of the private sector, to enable foreign investment opportunities, to liberalise trade and

[33]The ten points as outlined by Williamson (1993) are: (i) fiscal discipline, (ii) public expenditure priorities towards education, health and infrastructure, (iii) tax reform, (iv) financial liberalisation, (v) competitive exchange rates, (vi) trade liberalisation, (vii) foreign direct investment, (viii) privatisation of state enterprises, (ix) deregulation, and (x) legal security for property rights.

[34] For a discussion on the pervasiveness of decentralisation as a development objective, and concepts associated with decentralisation (such as democracy, civil society, deconcentration, among others) see, for example, Bardhan (2002), Eaton (2001), Hadiz (2004), Kulipossa (2004), Legaspi (2001), SLSA Team (2003) and World Bank (2001a).

other capital flows, and to overhaul public administration systems thereby transforming the role of the government (World Bank, 1995).

In the midst of the sweeping neoliberal reforms of the 1980s, a dichotomy which positioned the state and the market in opposition served to justify private sector involvement (Leadbeater, 2004; Weiss, 2000). 'Rolling-back' the state, which was constructed as inefficient, ineffective, unwieldy and bureaucratic, was seen as a necessary pre-condition to economic (and social) development. Where the state was seen to play a part, it was primarily in an enabling role; for example, introducing reforms promoting trade and economic liberalisation along with institutional reforms to bring about greater economic integration. Consequently, a shift occurred for international donors and others within the development fraternity from a focus on government to governance as the key variable in achieving development; in particular good governance (Weiss, 2000).

What is meant by governance and good governance, however, is not always clear. Jessop (1998:29) argues that the use of governance has tended to be "'pre-theoretical' and eclectic." Eckerberg and Joas (2004) contend that governance has been used in a number of different ways to describe the changes by organisations to adapt themselves to external changes and as a theoretical concept to highlight the changing role of the state. They further claim that there has been "only one common aspect, that is change from a traditional way of management or government into a new, modern, way of management or government" (Eckerberg and Joas, 2004:406)

Broadly speaking within development, a focus on governance draws attention to the importance of institutions and the processes of decision-making which underpin development endeavours. This is demonstrated by the World Bank's definition of governance as being "the manner in which power is exercised in the management of a country's economic and social resources for development" (World Bank, 1992:1). However, there are claims that governance has been used uncritically and interchangeably with government, but a new vision of government initially imbued with Washington consensus principles focused mainly on reducing the role of the government in the provision of goods and services in favour of the private sector (van Klinken, 2003; Weiss, 2000).

More recently, neoliberalism has been subjected to greater interrogation which moves beyond the simple state-market dichotomy to consider the interaction and blurriness of these two entities. While neoliberal ideals dominate economic policy in both developed and developing countries, neoliberalism has been revealed as not monolithic or universal. Instead, differing trajectories of development and political economic processes have given rise to 'local neoliberalisms' embedded within broader networks and structures of neoliberalism (Brett, 2000; Peck and Tickell, 2002). To this end, Peck and Tickell (2002) demonstrate how neoliberalism has been transformed from a focus on deregulation and dismantling the dominion of the state

(roll-back neoliberalism) to "an emergent phase of active state-building and regulatory reform" (Peck and Tickell, 2002:384) characterised as 'roll-out' neoliberalism. Rather than seeking the wholesale replacement of government, therefore, greater attention is given to finding ways to make what remains of government operate better. To this end, good governance has been variously constructed as comprising or promoting decentralisation, democratisation, increased transparency and accountability, eliminating corruption, improving law and order, legal reforms amongst others, in order to reform governments and their administrations to make them work better (van Klinken, 2003; Weiss, 2000; World Bank, 1992).

Kooiman (1999) provides a theorisation of social-political or interactive governance which is useful for moving beyond focusing simply on how government governs (itself, the market and its citizens) and which acknowledges the interdependence of societal actors. Kooiman's definition of social-political governance is:

> All those interactive arrangements in which public as well as private actors participate aimed at solving societal problems, or creating societal opportunities, and attending to the institutions within which these governing activities take place (Kooiman, 1999:70).

Such an approach to governance focuses on interactions and relationships within particular contexts taking into account the diversity, complexity and dynamics of social political systems. Similarly, van Klinken (2003) identifies alternative conceptualisations of (local) governance as providing an opportunity for moving beyond government to consider government-civil society relations thereby uncovering the complexities and interdependencies that exist within and between the state, market and society. Additionally, work on multi-level governance (Eckerberg and Joas, 2004; Farrell, 2004; Lundqvist, 2004; Stenson and Watt, 1999), transnational networks of environmental governance (Betsill and Bulkeley, 2004), and urban governance (Swyngedouw and Heynen, 2003) further explore the complex governance forms and ways of governing that emerge in locations with an emphasis on relationships and synergies between various actors, often across different scales.

In the context of urban water supply and water issues more generally, a focus on governance precipitated a shift towards a software approach to water management in which a range of actors were seen as having the potential to play a role at a variety of scales. In the next section, I discuss how notions of governance have been articulated in considering problems of urban water supply in developing countries.

3.3 The paradigm shift to water governance

As stated in Chapter 1, water governance has its roots in environmental governance and a concern with governance more generally. Water governance offers a solution towards overcoming the problem of water insecurity in which water governance is used to refer "to the range of political, social, economic and administrative systems in place to develop and manage

water resources, and the delivery of water services at different levels of society" (Rogers and Hall, 2003:7). In this section, I discuss the way in which water governance has been deployed and used to formulate approaches to dealing with urban water. I am particularly interested in allocation and implications of this for how water is valued as a good, integrated water resource management, and administrative and political institutions.

The focus on water governance in addressing water problems has occurred in the context of the growing attention given at the global level to the implications of water scarcity and the impending 'water crisis' following the internationalisation of environmental and social problems more broadly. The failure for millions of people to satisfy their basic water needs has been the premise for international conferences and conventions since the 1972 UN Conference on Human Environment and the 1977 Conference on Water at Mar del Plata, culminating in the UN International Drinking Water and Sanitation Decade (Calder, 1999; de Villiers, 1999; Mehta, 2000; Ohlsson, 1995; Rosegrant, 1997; UNCSD, 1997). For the most part, the principles and subsequent recommendations underlying these supra-national undertakings, as summarised in Table 3.1, mirror contemporaneous political and development ideology. This meant that approaches to improving access to water in cities in developing countries, along with water resource management more broadly reflected the prevailing development paradigm at the time.

Table 3.1: Overview of major conferences and forums concerning water and sanitation

Year	Meeting	Key water-related outcomes
1972	UN Conference on Human Environment	Principle 2: The natural resources of the earth, including the air, water, land, flora and fauna and especially representative samples of natural ecosystems, must be safeguarded for the benefit of present and future generations through careful planning or management, as appropriate.
1977	UN Conference on Water at Mar del Plata, Argentina	Resolution calling for the development of national water resource assessments and for national policies and plans to give priority to supplying safe drinking water and sanitation services to all people. This led directly to the "International Drinking Water Supply and Sanitation Decade."
1981 to 1991	UN International Drinking Water and Sanitation Decade	To provide every person with access to water of safe quality and adequate quantity, along with basic sanitary facilities, by 1990
1990	"Global Consultation on Safe Water and Sanitation for the 1990s", Delhi	"New Delhi Statement": an appeal to all nations for concerted action to enable people to obtain access to safe drinking water and sanitation.
1991	"International Conference on Water and Environment", Dublin	"Dublin Principles": **Principle No. 1** - Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment. **Principle No. 2** - Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels. **Principle No. 3** - Women play a central part in the provision, management and safeguarding of water. **Principle No. 4** - Water has an economic value in all its competing uses and should be recognized as an economic good.
1992	UNCED Conference, Rio de Janeiro ("Agenda 21")	Chapter 18, Agenda 21: Protection of the quality and supply of freshwater resources: application of integrated approaches to the development, management and use of water resources.
1995	UN 4th Conference on Women, Beijing	Recognition of the burden suffered by women and girls as a consequence of inadequate access to safe water supplies. Calls for action to ensure availability of access to safe drinking water, to include women's priorities in decision-making, to promote research into the role of women in water management.
1997	First World Water Forum, Marrakech, Morocco	Perspectives on world water and challenges for the 21st century
1998	Stockholm Water Symposium	Creation of Commission on Water for the 21st Century.
1998	World Water Vision	"World Water Vision" – an initiative of the World Water Council (see, for example, Abu-Zeid (1998) and Cosgrove and Rijsberman (2000)).
2000	Second World Water Forum, The Hague	Presentation of findings from "World Water Vision." Discussion of key challenges in meeting basic water needs. Identification of the potential for private sector participation in overcoming challenges.
2000	United Nations Millennium Declaration	Declaration of the Millennium Development Goals, including the target of halving the proportion of people without access to safe water supplies by 2010 (a target falling under Goal 7).
2001	International Conference on Freshwater, Bonn	Identification of actions needing to be taken to secure water for human use in and subsequent recommendations covering matters of governance, funding, the role of the international community, capacity building and technology transfer, and gender (MENCNS and MECD, 2001).
2002	World Summit on Sustainable Development (WSSD), Johannesburg	Adoption of the Johannesburg Declaration of Sustainable Development. Reaffirmation of commitment to the Millennium Development Goals and the principles of sustainable development (after Rio) which includes securing access to safe drinking water for all (UN, 2002b).

2003	International Year of Freshwater	A year in which government and non-government groups and organisations sought to raise awareness about the importance of sustainable water use and an opportunity to accelerate the implementation of integrated water resource management. Also year in which the Third World Water Forum was held.
2003	Third World Water Forum, Kyoto	Launch of the UN's first World Water Development Report*: Water for People, Water for Life.*
2005 to 2015	International Decade on Water for Life	The goal of the International Decade on Water for Life is to give greater focus to water-related issues, with an emphasis on women as managers of water, in order to achieve internationally agreed water-related goals (for example, the MDGs) (UN, 2003).

The evolution of water governance has occurred coterminous to the shifts in development discourses discussed above. For example, the 1972 UN Conference on Human Environment and the 1977 Conference on Water at Mar del Plata (culminating in the UN International Drinking Water and Sanitation Decade) reflected the influence of increasing environmental and social consciousness at the time. These conferences corresponded with the transition away from implementing projects and programs concerned primarily with increasing access through infrastructure and increased supply delivered through national governments. Similarly, the International Conference on Water and Environment 1992, which gave rise to the Dublin Principles, reflected the emergence of neoliberal ideology influencing government reforms in developed and developing countries. Consequently, the conference had an economistic approach to the problem of meeting water needs whereby involvement of non-state actors, particularly the private sector, in provision of water services was emphasised.

Since 1992, the Dublin Principles have been particularly significant in influencing conceptions of water governance in addressing the problem of water scarcity and insecurity. Principle One acknowledges water stocks as being limited and constructs water as a desirable and scare resource requiring holistic management. Principle Two acknowledges the importance of a participatory approach to water development and management with the involvement of users, planners and policy-makers at all levels, while the role of women in the provision and management of water is also highlighted in Principle Three. Principle Four states the importance of considering water as an economic good by recognising the economic value of water in all its competing uses. Within this principle, recognition of the basic right of all humans to have access to clean water and sanitation is deemed vital. Inefficient water use and environmental degradation were seen as a failure to recognise the economic value of water; viewing water as an economic good would, therefore, lead to more efficient, and more equitable, use of water while also encouraging conservation and protection of water resources (WMO, 1992).

Following the Dublin Conference in 1992 and the 1992 UN Conference on Environment and Development in Rio de Janeiro, a number of international water agencies were formed.

These included The Global Water Partnership, the World Water Council and the World Water Commission. Ostensibly these agencies were created to facilitate dialogue between various stakeholders in seeking to overcome problems of water insecurity and promote the sustainable management of water resources. Indeed, the emergence of these and other supra-national and international governance institutions have been influential in raising awareness and determining resource control and management at the local level (Jasanoff, 2004).[35] In the process, conceptions of water scarcity have been constructed through global debates, conferences and declarations, with international commitment to improve access to water and sanitation manifesting in supra-national recommendations and covenants. These in turn influence national policy-making and sub-national implementation (Bakker, Barker, Meinzen-Dick and Konradsen, 1999; Neto and Tropp, 2000; UNCSD, 1997; van Damme, 2001).

Key water narratives arising from the 1990s include: developing strategies to more effectively manage water resources which deemphasise supply in order to safeguard future supplies; devising effective administrative and political institutions which enable greater participation of stakeholders; and allocating water amongst competing uses in an efficient and equitable manner (García, 2005). These narratives transcend scale as postulations made by supra-national institutions are internalised by governments and non-governmental organisations at national and sub-national levels. This causes global concerns to become localised in policy and governance institutions guiding development and management of water resources. However, rather than simply implementing neutral or technical policies for the global/local good, these institutions make normative assertions about how knowledge should be mediated and are ideologically bound (Forsyth, 2004). This has both positive and negative implications, as discussed below.

In terms of managing water resources, integrated water resource management (IWRM) has emerged as the dominant paradigm guiding current research and management approaches to water resources and represents a shift away from management approaches characterised by high levels of fragmentation between different agencies and sectors (Al Radif, 1999; Bandaragoda, 2000; Calder, 1999; Rosegrant, 1997; UNCSD, 1997; White, 1998; WWAP, 2003). Previous approaches to water resource management within river basins tended to be based on administrative boundaries which often failed to correspond with hydrological features (Swallow, et al., 2001). Consequently, planning and development of land and water were disaggregated to multiple agencies based on resource type. This led to piecemeal approaches to river basin development and management and often failed to lead to an optimal outcome,

[35] In addition, such conferences and global institutions have given rise to transnational networks of sub-national governments and non-state actors engaged in implementing global environmental initiatives and programs. Examples include Local Agenda 21 strategies (Patterson and Theobald, 1995) and the International Council for Local Environmental Initiatives (Betsill and Bulkeley, 2004).

resulting in inefficient resource use, economic losses and environmental degradation. In addition, the move towards IWRM is in part a reflection of the growing awareness of the social and environmental impacts that large-scale engineering works had on river networks and reshaping natural landscapes (White, 1998).

In contrast to earlier water resource management approaches, IWRM takes a river basin approach and recognises that these systems are comprised of many interdependent components—biophysical, social, economic and political. IWRM, therefore, attempts to integrate subsectors and fragmented policies within a national framework for social and economic development (WWAP, 2003). In this way, IWRM more readily enables the representation of local water user groups and stakeholders. This is because IWRM takes an inter-sectoral approach, while integrating the technological means, socioeconomic aspects, environmental concerns and health considerations, within the whole of catchments (Al Radif, 1999). Moreover, IWRM requires government agencies responsible for water resources including groundwater to shift their focus from a supply-orientation, resource-custodian and to engage users and stakeholders in management processes (Foster, Chilton, Moench, Cardy and Schliffer, 2000; Foster and Chilton, 2003).

IWRM seeks to addresses demand management as well as supply problems and solutions and draws upon both indigenous and new technology for water allocation and conservation (Al Radif, 1999). Whereas supply management largely conceived water management from a technical fix-it perspective dominated by engineers and economists, demand management focuses on how water can be managed in an integrated and sustainable way building on institutional capacities to satisfy human needs, promote food security, and protect the environment (Bakker, et al., 1999). As such, a demand management approach includes implementing incentives to rationalise demand, to increase efficiency and to mitigate adverse environmental impacts requiring input from a range of stakeholders and disciplines (Oudshoorn, 1997). In an urban setting, management includes reducing system losses, water recycling, water saving technology, and implementing economic tools such as pricing and cost recovery (Oudshoorn, 1997).

Integrated water resource management, incorporating demand management, is seen as offering a more effective approach to managing water resources than previously. However, Rahaman and Varis (2005) note the importance of reducing the gap between theoretically agreed policies espoused by supra-national governance institutions and their implementation. Moreover, they acknowledge the risks in developing overly general or universal guidelines for implementing IWRM signalling the importance of taking into account the differences inherent in those areas in which and integrated approach is being sought (Rahaman and Varis, 2005). In this regard, devising effective administrative and political institutions which emphasise and enable integration are also seen as necessary in order to ensure water needs are met into the

future (WWAP, 2003). As previously discussed, property is identified as particularly important in governing water resources, since rights, access, responsibilities and liabilities are imbued within notions and institutional arrangements related to property (see Chapter 1; Rosegrant, 1997; WWAP, 2003). Property and other formal institutional arrangements governing water management and use are intimately linked to water allocation; however, the means by which allocation is determined depends on the ways in which water, the users and uses are ordered and valued. Because water is a multi-faceted resource encompassing an array of social, environmental, economic and cultural values, allocation is highly contentious.

Water allocation decisions must prioritise between human consumptive uses, non-consumptive uses and ecosystem services. Broadly speaking, human consumptive use[36] can be divided between three major sectors: agricultural use, industrial use and domestic use. Agriculture[37] is estimated to account for 70 percent of water withdrawals worldwide, with industry[38] being the second largest user at 22 percent and domestic use 8 percent (WWAP, 2003). These proportions vary across regions. In the case of domestic household consumption, the focus in this research, water is used for a variety of activities including drinking, cooking and food preparation, cleaning, bathing, sanitation and watering of household gardens. As lifestyles improve, water consumption also tends to increase as more households use washing machines for laundry purposes, install showers for bathing, buy and subsequently clean vehicles for individual use and so forth (Altinbílk, 2002). Without adequate supplies of good quality water for drinking and cooking, risks to health from water borne diseases increase.

Ostensibly there has been a paradigmatic shift from water development to water allocation and the significance of ensuring an open and participatory decision-making process which gives priority to economic and ecological considerations (Saleth and Dinar, 1999). However, allocation decisions are complicated by the different ways in which water can be conceptualised; that is, water can be viewed as a public good, a social good, a merit good, a free good, an economic good, a commodity, an environmental resource and an entity that possesses cultural, spiritual or symbolic value for communities and peoples (Mehta, 2000).

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[36] Consumptive use refers to water use which results in water being unavailable to other users because it evaporates or is incorporated into products or organisms, is lost to sinks, or becomes unusable because of pollution (Cosgrove and Rijsberman, 2000; Seckler, 1996). Most uses of water are not completely consumptive; for example, a proportion of household water may immediately return to nearby water sources and systems albeit in a slightly degraded form.

[37] For further information about irrigated agriculture, increasing food demands and water-use efficiency see, for example, de Villiers (1999) Rosegrant (1997) and WMO (1992); social, economic and political aspects of water resource management and irrigation water see, for example Bakker et al. (1999) and Meinzen-Dick and Bakker (2000).

[38] Industry can range from large and small scale industries in both rural and urban areas as well as cottage industries and micro-enterprises (Meinzen-Dick and Bakker, 2000). For further information concerning increasing demand for industrial water and the implications of industry on water quality see, for example, WWAP (2003).

Allocation based on socio-environmental principles maintains the fundamental importance of water for human existence as a basic need and a social good, where the recognition of water as a human right is paramount. Such a position recognises non-economic values of water including cultural, spiritual and 'non-productive' uses of water.[39] Recently, the significance of water as crucial to human existence was reinforced by the United Nation's General Comment 15 on the Right to Water, adopted in November 2002 by the Committee on Economic, Social and Cultural Rights such that "the human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses" (UN, 2002a; UNDP, 2004; WHO, 2003).

By viewing water as a public good, it is implied that it should be available for all. A public good is a good that is non-rivalrous in consumption and its provision is non-excludable.[40] This means that consumption by one person does not diminish the amount available for other users[41] and that it is difficult or impossible to exclude users from consuming the good; therefore, it can be consumed simultaneously by everyone. Examples of public goods include national defence, clean air, postal systems, street lamps, knowledge goods among others (Bates, 1994; Blaikie and Brookfield, 1987; Cooter and Ulen, 1996; Drahos, 2004; Leadbeater, 2004). In addition, water (and sanitation facilities) have been characterised as 'merit' or 'beneficial' goods, which implies "that the society as a whole values private consumption by individuals above and beyond those benefits reflected by personal preferences and external health and environmental benefits" (Johnstone, et al., 1999:295).

Allocation based on economic principles has received strong support as an outcome of the pervasiveness of neoliberal ideology and the notion of treating water as an economic good as espoused by the Dublin Principles (Dinar, et al., 1997; Kessides, 2004; Perry, Rock and Seckler, 1997; Rogers, de Silva and Bhatia, 2002; UNCSD, 1997; World Bank, 2004). The implications of treating water as an economic good have been the subject of intense debate (Aegisson, 2002; Barlow and Clarke, 2002; Budds, 2004; Budds and McGranahan, 2003a; Dinar, et al., 1997; McNeill, 1998; Public Citizen, 2003; Rogers, et al., 2002; Shiva, 2002; WMO, 1992). Those in favour of treating water as an economic good argue that employing market principles when allocating water will lead to positive outcomes for the environment and lead to equitable

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[39] See, for example, Lansing (2000; 1991) for his research about the functional, social, and cultural significance of the temple system of irrigation in Bali beyond water for irrigated agriculture; Zwarteveen and Meinzen-Dick (2001), Meinzen-Dick and Bakker (2000) and Bakker et. al (1999) for a discussion on the use and importance of irrigation water for non-crop and 'non-productive' activities such as watering livestock, micro-industry, fishing, bathing, laundry household gardens and drinking; Whitely and Masayesva (1998) for research on the cultural significance of water to the Hopi people in the United States.

[40] A public good may also be non-rejectable. That is, individuals cannot abstain from consumption even if they chose to. An example of such a public good is national defence (Bannock, Baxter and Davis, 2003).

[41] Therefore, public goods also have low/no subtractability.

solutions since such an approach takes into account scarcity and opportunity costs associated with water; therefore, water would be allocated and used more efficiently. Those opposed to treating water as an economic good, however, cite the potential for the poor to be priced out of urban water supply, for commons to disintegrate with the introduction of private property rights, and for the non-economic values of water to be overlooked.

The debate over whether water should be treated as an economic good is another example of how global discourses and structures exert their influence into local settings. Barlow and Clarke (2002), among others, argue that institutions such as The Global Water Partnership, the World Water Council and the World Water Commission promote privatisation and other tenets of neoliberalism through close links with global water corporations and financial institutions. In addition, the World Bank and IMF have played a strong part in influencing policies to promote privatisation within developing countries by encouraging economic reforms and promoting allocation based on economic principles as per Principle Four of the Dublin Principles (Bayliss, 2002; Budds and McGranahan, 2003a; Swyngedouw, 2005a).

At the same time, there is also a movement towards increasing citizen engagement in the management of natural resources, with the role of women and the needs of the poor identified as key concerns (Kelly, 1999). Mehta, Leach, Newell, Scoones, Sivaranakrishnan and Way (1999) cite an 'international constellation of regulations' as having emerged with respect to environmental management whereby two contradictory processes have converged, as demonstrated by international conventions, laws and structures of fiscal discipline, and schemes to increase local participation in the management of natural resources.

In the context of water, global constructions of water scarcity tend to mask localised experiences and the complexity of water within ecological, social, and political contexts (Mehta, 2000). This is because the superimposition of supra- and national governance institutions, coupled with in-country decentralisation programs, although well intentioned, can amplify uncertainties at the local level by failing to take account of contextual factors such as relations of power, ability to claim access to resources and so forth. An example given by Calder (1999) is how discourse has been deployed in the context of water resource management so that the lack of forests is linked with degradation of water resources, and increasing forest cover with improved water resources. Consequently, 'mother statements' exaggerating the benefits of trees has influenced water resource management approaches, however inappropriately. In a similar vein, Forsyth (2004) shows how discourses of scarcity and deforestation in northern Thailand are deployed by international (and national) environmental movements. In this example, pressure on fragile and pristine environments is used to formulate policies restricting land use practices in the north, in which 'local' people, their 'community' and practices are constructed

externally and rendered largely invisible (or as a source of 'the problem') in the name of preserving wilderness areas for the greater good of the country.[42]

As the discussion above demonstrates, decisions concerning water allocation are highly contested particularly in light of the Dublin Principles and subsequent arguments supporting the notion of water as an economic good and recognising the economic cost of water in all its uses. Concerns over water pricing and tariffs have been compounded in recent years as the private sector has begun to play an important role in the provision of municipal water, along with the privatisation of common pool water resources more generally. In the next section, I consider the changes that have occurred in municipal water provision in developing countries by focusing on the debate surrounding the appropriateness of the private sector providing urban water and arguments for and against charging household consumers for water for their basic needs. In particular, I am interested in the implications for water governance of engaging the private sector in provision of urban water.

3.4 Urban water services in developing countries

Urban water is generally, although not always, supplied by waterworks utilities. These waterworks utilities distribute municipal water services to household consumers and are themselves bulk users of water resources. The main objective for municipal waterworks systems is to provide equitable access to water for populations. Ensuring water for municipal use requires financial and environmental sustainability so that waterworks utilities can continue to provide water for consumers.

The provision of municipal water has been both a private and a public undertaking. The public provision of water for municipal uses can be traced to the 19th century. The incidence of epidemics of diseases such as cholera and typhoid in cities in England, Europe and the United States as well as a general deterioration of health, especially amongst the poor in densely populated parts of cities such as London, precipitated a reform in sanitation. This spurred research into health matters and explorations into the links between pollution contamination and health. A consequence of the attention given to sanitation was the shift to public ownership and management of most waterworks and practically all sewerage systems by the end of the 19th century (Hukka and Katko, 2003; Rogers, et al., 2002). Colonial governments instituted public waterworks systems that remained after independence; therefore, public ownership and management of municipal services was replicated in developing regions.

Water systems are considered to be natural monopolies whereby the high costs involved in transporting water via a network preclude the presence of more than one producer (Bannock, et al., 2003; Brook Cowen and Cowen, 1998; Hall, 2001; Johnson and Handmer, 2002; Rees,

[42] See also Driver (2002), who discusses the way in which squatter settlements in Trinidad are blamed for contributing to environmental degradation in watershed areas.

1998). The monopolistic characteristics of water provision are, therefore, an important justification for public sector provision. This was further reinforced during the 20th century by an increase in government financing and because of the notion of water being a public good (Hukka and Katko, 2003; Lee and Floris, 2003).

Financing the costs incurred in daily operation, maintenance and repair of water networks in municipal areas are derived largely from tariffs and connection charges. Lee and Floris (2003) comment that municipal water has never been provided as a free good. In addition, they remark that it is unrealistic to provide drinking water as a free public good because the investment needed for operation and maintenance of waterworks systems is highly capital intensive. In addition to operation and maintenance costs, utilities also must pay capital costs associated with municipal water services including pumping stations, reservoirs, treatment works and pipes. These costs are often recouped from consumers through tariffs. In addition, tariffs also act as a management tool that can directly and indirectly affect consumer behaviour and access to services, particularly by the poor (Brocklehurst, Janssens and Kolsky, 2002). Determining water tariffs is complex and the structure of tariffs can take a number of different forms. Water charges can comprise a fixed charge, where the amount is determined by land values or taxes, or volumetric charge, in which consumers are charged depending on the volume of water consumed. Table 3.2 summarises the charging system and method of billing for the major fixed and volumetric charges. There are two main tariff structures used for municipal water services: single-part tariff or two-part tariff. A single-part tariff could be either fixed or volume-based whereas a two-part tariff includes both a fixed charge and volume-based component. Most tariff structures are two-part.

Tariff structure	**Fixed**	**Volumetric**	
Connection type	Unmetered connections.	Metered connections. Periodic meter reading conducted to check consumption and bill accordingly.	
System of charging	Rates assessed against land value.	Uniform Volumetric Charge (UVC).	Block Charge.
Bill payment	Generally annual payment of rates/taxes to waterworks utility.	Uniform across all units of water consumed.	Unit price adjusted based on quantity consumed: • *Increasing Block Tariff (IBT)* – per unit rate increases by consumption block. • *Decreasing Block Tariff (DBT)* – per unit rate decreases by consumption block.

Table 3.2 : Charge types for water tariffs
Sources: Boland and Whittington (2000), Brocklehurst et al., (2002), and OECD (2003).

Increasing block tariffs (IBT) are widely used in OECD countries and are encouraged in water reforms in developing countries (Dinar, 2000; OECD, 2003). With an IBT, the price increases in blocks as consumption increases whereas with a decreasing block tariff the price decreases in blocks as consumption increases; therefore, the first block is priced more highly. A decreasing block is generally considered unsuitable for water supply in urban areas in developing countries or water scarce areas since such a tariff does not create the right incentives to address demand management (see Brocklehurst, et al., 2002). In contrast, as a means of demand management, IBT will (theoretically) lead to more efficient use of water as compared to a uniform tariff. This is because the marginal price of consumption increases commensurate to quantity of water consumed under an IBT structure. When marginal prices are low—for example, under a uniform tariff—individuals will consume more (Liu, Savenije and Xu, 2003) whereas if marginal prices are high, they will consume less.

In reality, public utilities have struggled to raise revenues and recover cost through tariffs and connection charges. This has led to the failure to adequately price water and to collect revenues from consumers, which is seen as being due to the lack of political will of politicians to sanction action against delinquent consumers for fear of jeopardising their political careers (Winpenny, 2003). Despite the historical justification for public sector involvement in water supply and sanitation to ensure fair distribution and safeguard public health, particularly for the poor, the public sector has failed to achieve these goals (Franceys and Weitz, 2003). Many public waterworks systems have been unable to provide potable water to large numbers of people and water quality is often below acceptable standards. Services are frequently unreliable and water distribution irregular such that rationing and low water pressure, especially during peak times, is common. As a consequence, public waterworks utilities have been criticised for being unable to make the most of economies of scale, and incapable of ensuring full coverage of water (and sanitation) to residents because of its inability to overcome or mitigate problems of supply and distribution. In addition, the public sector has also been criticised for failing to recover costs associated with production, operation, distribution and maintenance (Cesano and Gustafsson, 2000; ECLAC, 1996; Hukka and Katko, 2003; Lobina and Hall, 2000; Rees, 1998).

As a consequence of the failure to ensure universal access to municipal water networks, those households not connected must either rely on private abstraction methods such as their own wells or illegal connections, rainwater collection, or purchasing water from small-scale vendors or bulk water suppliers (Lee and Floris, 2003). These households tend to pay more for water per unit consumed than households who are connected and are forced to subsist on lower volumes of more highly priced water (Barlow and Clarke, 2002; Budds and McGranahan, 2003a; Winpenny, 2003). Barlow and Clarke (2002) demonstrate how the poor are further disadvantaged since they are less likely than the rich or middle classes to be able to afford to construct tanks and purchase bulk water, which, although expensive, is cheaper than purchasing small quantities from small-scale vendors.

The underlying assumption of an IBT is that the rich consume more than the poor and, therefore, will cross-subsidise consumption by poorer households. However, this is not always the case. Brocklehurst, Janssens and Kolsky (2002) remark how tariffs and subsidies that have the intention of helping the poor often have the opposite effect. For example, some households, especially the poor, may not be connected to the network systems because connection costs are prohibitive; therefore, multiple households will share a single connection (Bayliss, 2002; Brocklehurst, et al., 2002; Liu, et al., 2003). Under an IBT system, households sharing a connection will pay more than if there was one connection per household since the block rate increases commensurate with overall consumption.[43] This leads to a cross-subsidy effect whereby the poor effectively subsidise consumption by the rich (Brocklehurst, et al., 2002; Komives and Whittington, 2002). An additional difficulty in pricing water to household consumers to ensure equitable access is determining the price at which the blocks should be set to ensure affordability and equitable provision.[44]

As an outcome of pricing and revenue collection failures, lack of investment into infrastructure, corruption and other government failures, public water systems in much of Asia, Africa and Latin America are only capable of delivering unsafe water irregularly and provide inadequate sanitation services (Lee and Floris, 2003). Moreover, system losses through leakage as a consequence of deterioration of water networks are frequently high for public waterworks services in Asia. Illegal connections to mainline and distribution lines also result in losses and less efficient operation. It is argued that better management of water supply services could reduce system losses, which have been estimated at being between 30 percent and 50 percent (Rosegrant, 1997; WMO, 1992; World Bank, 1997). In the absence of effective production and distribution meters, however, it may be difficult to determine system losses with certainty. Furthermore, long-term monitoring and regulation of abstraction and illegal connections may be beyond the capacity of public waterworks systems as a consequence of budgetary constraints with respect to resources and personnel particularly in situations where water production costs are greater than income from sales (Kessides, 2004; Lee and Floris, 2003; Winpenny, 2003).

In light of the shortcomings of the public sector in providing water to urban households, the private sector has been identified as playing an important role in water provision not least by augmenting funds needed for investment in urban infrastructure (Winpenny, 2003). The Camdessus Report (Winpenny, 2003), the World Bank (World Bank, 2004), and the World

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[43] Liu et al (2003) further note the way in which IBT fails to adequately take into account occupancy rates of poorer households—which they suggest are higher than richer households—and suggest instead a tariff based on consumption per capita rather than per connection (see Liu, et al., 2003).

[44] In some instances lifeline tariffs have been set to provide a limited volume of water for free to ensure that the poor are able to have access to water. One such example is South Africa, where 6,000 litres of water is provided free per household per month regardless of income (Budds and McGranahan, 2003b).

Water Assessment Programme (WWAP, 2003), among others, highlight the opportunities that private sector participation brings to developing and enhancing municipal water services both in developing and industrialised countries, with an emphasis on efficient allocation and use of water. The MDG target of halving the number of those without access to safe drinking water and sanitation is further used as evidence to justify private sector participation (Cosgrove and Rijsberman, 1998; Kessides, 2004; Winpenny, 2003). However, uncertainty exists as to whether private sector participation can redress the public sector failures identified above and ensure equitable access to all, especially the poor, particularly given the limited success so far of privatisation ventures to bring about promised positive improvements (Barlow and Clarke, 2002).

Initial enthusiasm over the private sector's ability to bring rapid improvements has been tempered somewhat in recent years, to the extent that the term 'privatisation' has been largely replaced by the euphemistic use of 'private sector participation' (Bayliss, 2002; Hall and Lobina, 2004). In the context of urban water services, the focus of this research, privatisation or private sector participation can refer to a number of different models including the public sector sub-contracting to the private sector, public-private partnerships, divestiture, and deregulation (Budds and McGranahan, 2003b; Lee and Floris, 2003). The extent to which an operation can be termed private varies as illustrated in Table 3.3, which outlines the key responsibilities for private participation, progressing from mixed private-public to fully-private as one moves from the left to right column. Brief explanations for each model are also provided in the table (see Budds and McGranahan, 2003a:89; Lee and Floris, 2003).

	Service contract	Management contract	Lease	Concession	BOT/BOO	Divestiture
Asset Ownership	Public	Public	Public	Public	Private and public	Private
Capital Investment	Public	Public	Public	Private	Private	Private
Commercial Risk	Public	Public	Shared	Private	Private	Private
Operations and maintenance	Public and private	Private	Private	Private	Private	Private
Contract Duration	1-2 years	3-5 years	8-15 years	25-30 years	20-30 years	Indefinite

Service contract: Short-term agreements. The private contractor takes responsibility for a specific task, such as installing meters, repairing pipes or collecting bills for a fixed or per unit fee. Assets remain publicly-owned.
Management contract: transfer by the government of certain operation and maintenance responsibilities to a private company while retaining responsibility for investment and expansion. Assets remain publicly-owned.
Lease and affermage contracts: Similar to management contracts, but the private operator takes responsibility for all operation and maintenance functions, including billing and revenue collection. Assets remain publicly-owned.
Concession contracts: The private contractor manages the entire utility and is required to invest in the maintenance and expansion of the system at its own commercial risk. Longer-term contracts in which assets either are transferred back to the state or a further concession is granted. The role of the government is predominantly regulatory. Assets remain publicly-owned.
BOT (Build–Own–Transfer)/BOO (Build-Operate-Own): Similar to concession contracts; however, the private contractor is responsible for constructing the infrastructure from scratch. The private partner then manages the infrastructure, with the government purchasing the supply. Assets generally transferred to the government at the end of the contract.
Divestiture model: The government transfers the water business, including the infrastructure, to the private company on a permanent basis through the sale of some or all of the shares in the company

Table 3.3: Allocation of key responsibilities for private participation options
Source: Budds and McGranahan (2003a:89) and Lee and Floris (2003).

Private sector participation in water services has generally comprised a mixture of the different alternatives presented above. For instance, management contracts often incorporate elements of a concession contract; concessions could be part of a lease contract; and joint public-private companies could be formed through partial divestitures. Privatisation of water services in developing countries has predominantly been undertaken through the granting of service contracts, management contracts and concession contracts, generally seen as conforming to the 'French Model' of privatisation because of the nature of private-public water services that have emerged in France (Winpenny, 1997). Privatisation in water provision involving divestiture is generally referred to as the 'British Model' of water privatisation, so-named because of the sale of public water assets in England and Wales in 1989 as part of larger governmental reforms. The sale of public assets saw the creation of multiple water and

sanitation as well as water-only companies (Bakker, 2000; Bakker, 2001; Hall, 2001; Haughton, 1998; Marvin, Graham and Guy, 1999).

Much of the controversy surrounding water privatisation, particularly in developing regions, concerns the domination by only a handful of large water multinationals, mostly French and British: in particular Suez, Veolia, Thames Water, Saur, United Utilities, Biwater/Cascal and Bechtel (see Barlow and Clarke, 2002; Hall, 2001; Hall, Corral, Lobina and de la Motte, 2004; Shiva, 2002). Barlow and Clarke (2002), de Villiers (1999), Gleick, Wolff, Chalecki and Reyes (2002), Shiva (2002), among others oppose the idea of private sector involvement in municipal water supply (through divestiture and granting of concessions and management contracts) arguing that water should be provided by the government, preferably for free.

Swyngedouw (2005a) argues that privatisation has precipitated the transformation of previously unowned or commonly-owned resources such as water into private ownership and control to the detriment of communities. Swyngedouw draws on the work of Harvey (2003) by referring to this process as accumulation by dispossession. As a consequence, water has become an important resource over which national and global neoliberal policies are tested and has affected how people relate to and are able to access water, with the poor and other marginal groups likely to be disadvantaged (Swyngedouw, 2005a).

An example of how private sector participation affects relations to water is the way consumers' expectations, particularly in terms of quality and service, change. The cases of water shortages as a consequence of drought in West Yorkshire, England, in 1976 and again in 1995-1996 demonstrate how private ownership can elicit a different response from the public and change public expectations. During the 1976 West Yorkshire drought, the public water company appealed to its consumers to conserve water resulting in a reduction of around 25 percent. In 1995, privatised Yorkshire Water Services Ltd. were confronted by drought and made a similar appeal; however, on this occasion the public made very little reduction in their usage (Hall, 2001; Haughton, 1998). Hall (2001) suggests that the company was seen as a greedy exploiter of the water monopoly so was not entitled to public support. In addition, Haughton (1999; 1998) and Bakker (1999; 2000) debated the significance of the media and other sources in constructing the discourse of drought and crisis, particularly in opposition to Yorkshire Water, in influencing consumers' perceptions regarding the performance of the private water company.

An investigation into the changing nature of risk allocation and distribution in the management of domestic supply security in England and Wales after privatisation of water utilities also reveals ways in which private sector participation has affected how people relate to water (Johnson and Handmer, 2002). In their investigation, Johnson and Handmer (2002) used blame scenarios to delve into the manner in which risk could be redistributed in the post-privatisation institutional context. This involved looking at how the restructuring of water

utilities in England has affected risk allocation and who ultimately bears risk or is blamed in the event that households' needs are not met. This study revealed the redistribution of risk was dependent upon whether the focus was on demand, distribution or supply. Furthermore, the institutional arrangements for managing water supply in England and Wales are such that "the responsibility for managing risks to this supply is unclear and ambiguous" (Johnson and Handmer, 2002:364).

The experiences of West Yorkshire Water Services Ltd and privatisation of water and sanitation in the United Kingdom and Wales more generally have been the subject of numerous investigations into a range of aspects related to regulation and de-regulation, effects for households, equity implications, and the neoliberalisation and commodification of natural resources (Bakker, 1999; Bakker, 2001; Graham and Marvin, 1994; Hall and Lobina, 2004; Marvin, et al., 1999). Similarly, there is a plethora of research which investigates private sector participation in cities in developing countries. For the most part these have focused on French-style cases largely because divestitures of urban water services in developing countries are less common and complete divestitures of water systems have not been conducted outside of Britain (Mycoo, 2005; Nickson and Vargas, 2002). These investigations have tended to focus on the way in which private sector participation has failed to improve the services for consumers and they support the anti-privatisation stance. Of these, perhaps the best known 'failed' case is the privatisation venture in Cochabamba, Boliva in 1999.

In November 1999, Aguas del Tunari was granted a 40-year concession contract to provide water to the city of Cochabamba. Aguas del Tunari was a consortium led by International Water Limited, a multinational company co-owned by Bechtel (US) and United Utilities (UK) (Nickson and Vargas, 2002).[45] After privatisation, the tariff structure was changed and tariffs increased across the city rising by an average of 35 percent, although there was huge variation across Cochabamba. The tariff increases escalated public resistance and demonstrations and culminated in the death of a 17 year old protestor (Barlow and Clarke, 2002; Lobina, 2000; Nickson and Vargas, 2002). Complex political, social and economic factors, including problems with regulation, and a lack of transparency concerning Aguas del Tunari's operations with respect to the related project, the Misicuni Project, exacerbated difficulties and conflict in Cochabamba (Lobina, 2000).[46]

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[45] International Water Limited was formed as a 50-50 partnership between United Utilities (UK) and Bechtel (US). United Utilities eventually sold its stake in IWL to Edison (Italy) (Hall, et al., 2004).

[46] The Misicuni Project involved the construction of a dam, construction of a hydroelectric power station and digging of a tunnel to transfer water from the Misicuni River to Cochabamba through a mountain. Lobina (2000) reports that, under the terms of the arrangement, the cost of the Misicuni Project was to be covered in advance by water users in Cochabamba.

Another notable case is when two concession contracts were granted for water provision in Manila, the Philippines, representing the largest water privatisation undertaking in the world. In August 1997, Manila's Metropolitan Waterworks and Sewerage System (MWSS) coverage area was divided into two zones – east zone and west zone – and 25-year concession contracts awarded to two private companies. The concessionaire for Manila's east zone is Manila Water Company, which is a consortium composed of the local company Ayala Corporation and International Water Limited. The concessionaire for the west zone is Maynilad Water Services Inc., which is a joint venture between local partners Benpres Holdings Corp., controlled by the Lopez family, and French water firm Suez (formerly Suez Lyonnaise des Eaux) (Asian Water, 2002; Hall, et al., 2004).

Two important justifications for the Manila privatisation were the age of the waterworks system and the inability of the publicly owned company to adequately serve households across the metropolis. The system in Manila was considered one of the oldest in Asia, having been established in 1897. The system suffered high losses through leakage and the network required improvements and rehabilitation in order to continue to serve household consumers, which in 2002 was estimated as being over 13 million people (Asian Water, 2002). Manila Water and Maynilad Water Services both promised to provide 24-hour supply and universal connection across the concession areas, to reduce system losses, undertake a program of investment in the network of over US$7.5 billion, and assumed responsibility for MWSS's debts (Hall, et al., 2004). However, since commencing operations there have been numerous contract re-negotiations with the result that expansion targets have not been met, targets for reducing system losses have not been met, tariffs have increased and both companies have failed to meet their debt obligations citing financial difficulties as a consequence of foreign exchange losses particularly after the Asian financial crisis (Hall, et al., 2004; Public Citizen, 2003). Both companies continue to provide water to citizens in Manila; however, it is estimated that one fifth of residents in Manila still lack water connections. Moreover, there are concerns about water quality and incidences of water borne diseases as well as high levels of consumer dissatisfaction and resentment because of rate increases in excess of 700 percent for those consumers in the East zone of the city and over 400 percent for those in the West (Freedom from Debt Coalition, Jubilee South and Asia Pacific Movement on Debt and Development, 2006). For these reasons, the privatisation in Manila is frequently hailed as a failure (Hall and Lobina, 2006; Public Citizen, 2003)

Evidence from Latin America suggests, however, that private companies do provide improved services to the poor through expanded coverage areas and more reliable service (Lee and Floris, 2003). Latin America is frequently hailed as a region in which there is potential to successfully enable private sector participation in the provision of public goods and services such as water. This said, an adequate regulatory environment is lacking, which undermines attempts at improving water services as demonstrated by the Buenos Aires water concession. In

1993, Aguas Argentina, a company led by Suez (France) and Veoila[47] (France), was granted a 30-year concession for water services in Argentina. As part of this, an independent regulatory authority was established. In the first year of operation, Aguas Argentinas reported a loss of more than US$30 million. Aguas Argentinas asked for a tariff increase, which led to a modification of the contract including conditions regarding extension of service. In 1997, the company asked for another modification, and again in 1998 (Lee and Floris, 2003). Recurrent negotiations and the government's undermining of the regulatory authority have led to criticism of poor regulation. While Aguas Argentinas did extend coverage into poorer regions, negative impacts that have arisen have been felt most greatly by the poor. Many poor households have fallen into serious arrears and have been disconnected from the network. Connection costs increased dramatically and as a consequence, a universal service and environment improvement fee was brought into effect to spread costs and effectively cross-subsidise connection costs. To compensate for the high cost of connection, the company has allowed payment of connections to be made in kind in lieu of full connection fees (Lee and Floris, 2003).

The cases given above – Cochabamba, Manila and Buenos Aires – represent three well known examples where private sector participation has failed to bring the improvements promised. The crux of the debate surrounding private sector involvement in water supply lies in concerns over tariffs, connection fees and subsidies whereby consumers fear that privatisation will lead to higher prices (and fewer subsidies) and operators worry about their ability to recover costs if tariffs are set too low (Komives and Whittington, 2002). Moreover, the profit-seeking nature of capitalist firms engaging in the provision of water is seen as undesirable and contrary to the public good characteristics of municipal water. In particular, profit maximisation and increasing consumption in order to generate profits of private firms are seen as ultimately detrimental to the environmental sustainability of water resources while at the same time disregarding non-economic values and uses of water (Barlow and Clarke, 2002; Shiva, 2002). Consequently, private sector participation in the supply of water and neoliberalism more generally are commonly equated with the commodification of nature, which is viewed as an undesirable outcome. For example, Gleick et al. (2002) provide a definition of commodification as the "process of converting a good or service formerly subject to many non-market social rules into one that is primarily subject to market rule" (Gleick, et al., 2002:3). However, such an assumption is overly simplistic since commodification is used in differing ways and connotes a variety of different meanings and conceptions beyond a strictly capitalist/economic position.[48]

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[47] Veoila was formerly Compagnie Générale des Eaux and then Vivendi.

[48] For work that considers how nature is implicated by neoliberalism and which theorises commodities beyond a capitalist economic perspective see, for example, Bakker (2005), Castree (2003; 2004), Heynen and Robbins (2005), Jackson (2002; 1999), McCarthy (2005) McCarthy and Prudham (2004), and Swyngedouw (2005a).

The tendency to conflate commodification with privatisation is observed by Castree (2003), who argues further that 'commodity,' 'commodification' and 'commoditisation' have been analysed in myriad ways giving rise to a protean concept, therefore, making it difficult to make "substantive normative claims about the benefits/ills of commodification and commoditization" (Castree, 2004:22). Similarly, Bakker (2005) demonstrates how neoliberalism, commodification and commercialisation[49] are used virtually interchangeably, but how each condition could be enacted separately and are not necessarily concomitant.

Following Bakker (2005) and Castree (2003; 2004), it is useful to recognise commodification as a process which is contested, partial and transient, and which has important sociocultural dimensions beyond a capitalist economic framework. Bakker (2005) further argues that, rather than rendering consumers as passive in the process of neoliberalisation of water "consumer's meanings and values of water do not easily succumb to messages of economic reductionism" (Bakker, 2005:545). Continuing this line of argument, the cases above provide useful insights into why the private sector has come to be involved in the provision of municipal water supply and some of the controversy surrounding privatisation; however, focusing on the polemical nature of the debate – that is, whether private sector participation is a good or a bad thing – obscures the complexity of water services provision. Budds and McGranahan (2003a) argue similarly; that the debates on privatisation may be missing the point, while Mehta and la Cour Madsen (2005) comment how the public versus private debate distracts from efforts to enhance water security and equity.

The value of such a debate is also compromised by the increasing emphasis being placed on the importance of state involvement through regulation echoing Peck and Tickell's (2002) model of roll-out neoliberalism mentioned above. Regulation in urban water supply is, therefore, necessary to ensure provision of water in urban areas that is universal and equitable, including regulations to cover drinking water quality standards as well as standards relating to the provision of service (Bakker, 1999; ECLAC, 1996; Lee and Floris, 2003; Mehta and la Cour Madsen, 2005; Swyngedouw, 2005a).

Whether privatisation can promote justice and enhance people's access to water is uncertain. What is certain is that private sector participation in urban water provision has occurred because of the dominance of neoliberal discourse in economic development policy in both developing and developed countries.

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[49] Commercialisation is used by Bakker (2005) to refer to changes in public management practices which introduce commercial principles (such as efficiency), methods (such as cost-benefit analysis) and objectives (such as profit-maximisation). These changes are characteristic of the 'new public management' model of public administration, as discussed in Chapter 6.

3.5 Summary

The different strategies devised and implemented for achieving national development objectives have had a variety of implications for water, its management and use. The means by which development has been undertaken has transformed from a national, centrally planned and directed process focusing on stimulating economic growth and modernisation to a regional exercise where planning, implementation and responsibility have been devolved to regional and local government units. Importantly, the role of the state and the way in which the state functions in pursuing development has changed significantly over the past 50 years. The recent neoliberal turn in the 1980s has expedited the role of the private sector's participation in development and dismantled the Keynesian welfare model that had predominated. Such transformations have come about as a result of shifts in discourse from academic quarters, practitioners, and other development agents. In particular, the World Bank has played a key role in influencing development theory and practice since the 1950s. At present, the focus has shifted from seeking to roll-back the state to finding ways to make the state work better; hence, the emphasis on governance and making it good.

Current water governance discourse can be seen as emerging from notions of governance and environmental governance because of its concern with improving institutions, decision-making processes, administrative systems and other water resource management software. The convergence of neoliberal development discourse with a focus on water governance has created opportunities for new modes of urban water services provision beyond the public sector by enabling new institutional arrangements to be formed. The World Bank, IMF, Global Water Partnership, among others, identify private sector participation as providing necessary investment capital in order to expand and improve water services and thereby achieve the MDG target for water. However, this position is contested by those who fear that private sector participation ultimately increases insecurity and exacerbates inequities and problems of access especially for the poor and who instead argue for public sector provision and universal access to free water. A middle ground approach which positions enhancing water resource management and providing access to urban households as the primary concern is needed. This approach must recognise the importance of creating effective institutional arrangements to regulate the behaviour of waterworks utilities, public or private, in order to safeguard the interests of people and the environment. In so doing, such an approach offers a way past the polemical pro- or anti-privatisation debate.

In the following two chapters, I shift from a global focus on development and water governance to a more localised account of how these discourses and practices have been mediated by local factors within the case study location. I begin in the next chapter by considering the hydrological and other physical factors in Tagbilaran as these are important in terms of sustaining urban water needs. This also involves identifying some of the factors affecting groundwater, and considering how integrated water resource management is articulated in Tagbilaran.

Chapter 4 The Hydrological and Physical Environment of Tagbilaran

4.1 Introduction

In the previous chapter, I demonstrated how discourses of development and water governance constructed at the supra-national level influence how the problems of urban water supply and meeting water needs in developing countries are conceptualised. To further explore the localisation of global environmental discourses and the dynamism of the local/global dialectic in producing hybrid systems, I now move to consider national and sub-national policy and governance institutions. I consider it important to first determine the contextual environmental and hydrological characteristics and the management approaches affecting urban water supply in this case study.

Tagbilaran, as with other cities in the Philippines, is confronted with the problem of ensuring water security for its residents despite a relatively high level of rainfall. Reasons why Tagbilaran has struggled to achieve this are diverse and include poor water resource management, ecological uncertainty, institutional inadequacies, and low investment in infrastructure in the face of an increasing population and demand. In this chapter I outline the hydrological and physical environment in Tagbilaran to provide the physical context for understanding water governance and municipal water supply in Tagbilaran. I demonstrate how, as a groundwater-dependent city located in a karst area, Tagbilaran is confronted by uncertainties related to the hydrological process which ultimately impact upon management approaches. I consider the factors which affect groundwater quantity and quality and identify, in particular, saltwater intrusion as a consequence of over-pumping, groundwater contamination because of improper solid waste disposal and inadequate sewerage and sanitation, and urban expansion into recharge areas as anthropogenic activities which threaten water security. Finally, I consider how the management of groundwater in Tagbilaran is addressed in light of integrated water resource management. I reveal that, despite the recent paradigm shift to a more holistic approach to water resource management, groundwater remains a difficult resource to manage.

4.2 Water resources in Tagbilaran

The city of Tagbilaran is located within the Tagbuane River basin, which has an area of 137.28 km^2 and also comprises the municipalities of Corella, Sikatuna, Cortes and Loboc. Surface water runoff for the Tagbuane river basin is estimated as being 294 mm per year per m^2; the average surface runoff for the city area is estimated as being 23,522 m^3 per day (Province of Bohol and SWECO, 1999a). There are no natural bodies of freshwater in Tagbilaran other than small ephemeral rivers and creeks draining into the sea, which indicates that almost all effective rainfall likely infiltrates underground (Province of Bohol and SWECO, 1999a). Springs are

common, including some that are very large with high discharge rates, with springs occurring along the coastline discharging groundwater to the sea.

Tagbilaran is entirely dependent on groundwater for its water needs. The use of groundwater in Tagbilaran mirrors practice elsewhere in the Philippines where groundwater is used for domestic and industrial demand while water for irrigation is provided by surface water, and illustrates its significance in urban environments (JICA, NWRB, DPWH and Republic of the Philippines, 1998; NEDA, 2002). In this regard, groundwater represents an important water source in Tagbilaran, Bohol and the Philippines, particularly in light of increasing water demand.[50] Groundwater storage for the entire country is estimated at 1,222,896 million cubic metres with an annual recharge of 31,694 million cubic metres (JICA, et al., 1998; NEDA, 2002). Contrastingly, it is estimated that the total run-off in river basins is approximately 455 million cubic metres.

Given the importance of groundwater for Tagbilaran's water needs, the geology underlying the city is significant in terms of groundwater storage capacity, flows and the potential for contamination. Tagbilaran's geology is karst limestone[51] dating from the Pleistocene epoch. Karstic features such as sinkholes and low-lying areas with hill topography are characteristic. Karst is formed through the dissolution by groundwater of soluble carbonate rocks including limestone (calcium carbonate) and dolomite (magnesium calcium carbonate) to form a subsurface drainage system. Rainwater becomes acidic as it picks up carbon dioxide from the air and from percolation through soils, largely as a result of biological activity, which forms limestone solution when it comes into contact with calcium carbonate. Water follows lines of weakness such as fractures and faults forming channel ways and conduits as it dissolves the rock. Sinkholes and caves are common characteristics in karst environments. Aquifers in karst environments are capable of providing large supplies of water; however, flow patterns are unpredictable and highly variable when compared to aquifer systems in other hydrogeological environments (Foster, et al., 2000; Foster, et al., 1998; Foster, 2001; Foster and Chilton, 2003; Tuinhof, Dumara, Foster, Kemper, Garduño and Nanni, 2003; Urich, et al., 2001).

Karst aquifers differ from aquifers in other hydrogeological environments in a number of ways: first, water is not uniformly distributed below the surface; second, much groundwater movement is through caves and conduits below ground and the flow rates can be very rapid; third, groundwater movements tend to be complex and direction and paths for travel are difficult to predict from the surface; and, fourth, the ease of water flow and lack of natural filtration make groundwater in karst environments very vulnerable to groundwater pollution (Heath,

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[50] Water demand nationwide is expected to grow from 43,400 million cubic metres per year in 2000 to 88,400 million cubic metres per year by 2025 (JICA, et al., 1998).

[51] The geology in this area has been classified as Maribojoc limestone (Province of Bohol and SWECO, 1999a).

1983). The heterogeneity of subsurface characteristics in karst environments means that there is the possibility for considerable spatial variability such that a well with prolific quantities of water could be adjacent to one that is entirely dry (Dubash, 2002).

A key source of hydrological data for Tagbilaran is the *Philippine Water Master Plan*, which has determined that the limestone in the area is not a good medium for retaining water (JICA, et al., 1998). According to this source, groundwater in Tagbilaran flows via conduit and cave systems and, therefore, flow velocities more closely resemble surface water with reservoirs and recharge areas corresponding to sinkholes and depressions which are interconnected via cave and channelling systems. Flow routes are subject to change as a consequence of dissolution enlarging conduits, caverns and caves over millions of years, as well as through other natural process such as subsidence, sinkhole collapse and tectonic activity. Anecdotal reports support the effect of tectonic activity on Tagbilaran's hydrology, with reports of changes in the amount of discharge from springs and flow patterns after earthquakes. In addition, coastal aquifers are at risk of over-pumping causing groundwater reservoirs to reduce and the water table to fall, which can alter groundwater flow-directions and lead to saltwater intrusion (Collin and Melloul, 2001). While there have been attempts to document the hydrological characteristics in Tagbilaran, as discussed later in Section 4.2, there are deficiencies in data and knowledge because of the difficulties posed by karst environments in obtaining comprehensive information.

Tagbilaran has also benefited from several overseas consultancy missions engaged in documenting the hydrological characteristics of Tagbilaran and the rest of the province at provincial, municipal and *barangay* levels. In 1998, an inventory of water resources in Bohol was undertaken jointly by Swedish Consultants SWECO and the Provincial Planning and Development Office (PPDO) referred to as the *Water Supply*, *Sanitation and Sewerage Sector Master Plan* for Bohol Province (BW4SMP). This project followed on from earlier studies undertaken in the early 1990s by JICA and AIDAB that sought to determine water sources, quantity and quality across the Province. The BW4SMP produced reports for Tagbilaran and each of the 47 municipalities in Bohol down to the *barangay* level and covered physiographic, socio-economic and institutional aspects related to water resources and their management in the province.

A number of assumptions were made in the formulation of the BW4SMP because of limited availability of information about the groundwater system in Tagbilaran; therefore, a degree of uncertainty exists.[52] The water table in a karstic region is often difficult to define in

[52] These assumptions are made explicit in the BW4SMP report and relate to calculations made in terms of determining the water level, runoff, infiltration and evaporation. The veracity of some of these assumptions was questioned by an engineer with whom I spoke on several occasions.

part because cave systems and conduit flows give rise to a complex subsurface drainage system. Water could be perched above the water table where there are surface depressions or the water table could be discontinuous because of the heterogeneity of the limestone. Analysis of the standing water levels in wells in the city indicates that there are two aquifers underlying Tagbilaran; a shallow aquifer and a deep one. Water quality is generally good, although some wells have salty water (City of Tagbilaran, 2001; 2003; Johnson, 2003; Province of Bohol and SWECO, 1999a)

Projects such as the BW4SMP form the basis for determining the location of pumping stations, quantities to be abstracted, and planning and management of water sources across the Province. This is in lieu of comprehensive studies examining the groundwater regime in Tagbilaran. Georesistivity surveys have also been undertaken at various times to determine how much water is available and where. Representatives from the waterworks utilities reported that these findings have also been used to guide the government in planning for the development and management of water including locating sites for pumping stations (WW#2; WW#3).

Characteristics such as those described above give rise to uncertainty in managing karst groundwater resources. Approaches to groundwater management in Tagbilaran in the past have failed to adequately take into account the complexity of the hydrological system or the factors which adversely impact groundwater resources. For instance, saltwater intrusion in Tagbilaran was noted in the study undertaken by Travaglia, Peebles, Bate and Ferrer (1987) as well as by AIDAB and JICA in the early 1990s.[53] Considering the significance of groundwater as the primary source of water for domestic consumption, and forecast increases in demand as a consequence of population growth and changes in consumption patterns, efforts to secure water supplies and prevent for contamination in the city are, therefore, needed. In the next section I outline some of key factors affecting groundwater recharge in Tagbilaran and, as a consequence, the amount of water available for urban water supply.

4.3 Factors affecting groundwater in Tagbilaran

Ensuring groundwater security for continued use in Tagbilaran is contingent upon safeguarding water quality and water quantity. This involves considering factors which affect recharge, storage capacities (including discharge and extractions), and surface water since groundwater and surface water exhibit high levels of interaction as they cycle through the hydrological cycle. Modification of one of these components will, therefore, likely affect the others (Park, 1997).

See also the report produced by Johnson (2003), in which a groundwater study was conducted for a small portion of the city.

[53] Although frequently referred to and cited in later reports, my efforts to locate the AIDAB and JICA reports from the early 1990s were unsuccessful.

The most significant source of groundwater recharge in Tagbilaran is rainfall because almost all effective rainfall infiltrates underground. Tagbilaran is classified as a Type IV climate under the Corona Classification System,[54] which is based on seasonal distribution of rainfall. As a Type IV climate, rainfall is more or less evenly distributed throughout the year. Tagbilaran is relatively dry compared to other parts of Bohol and receives around 1,300 millimetres of rainfall per year, with the wettest part of the province receiving around 3,500 millimetres per year (JICA, et al., 1998). Rainfall data from the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) were obtained for Tagbilaran and the average annual rainfall and average monthly rainfall were calculated and are presented in Table 4.1 and Figure 4-1.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
100.9	80.0	70.5	72.9	76.7	126.4	124.9	112.4	123.4	175.9	191.1	122.5

Table 4.1: Average annual monthly rainfall, Tagbilaran

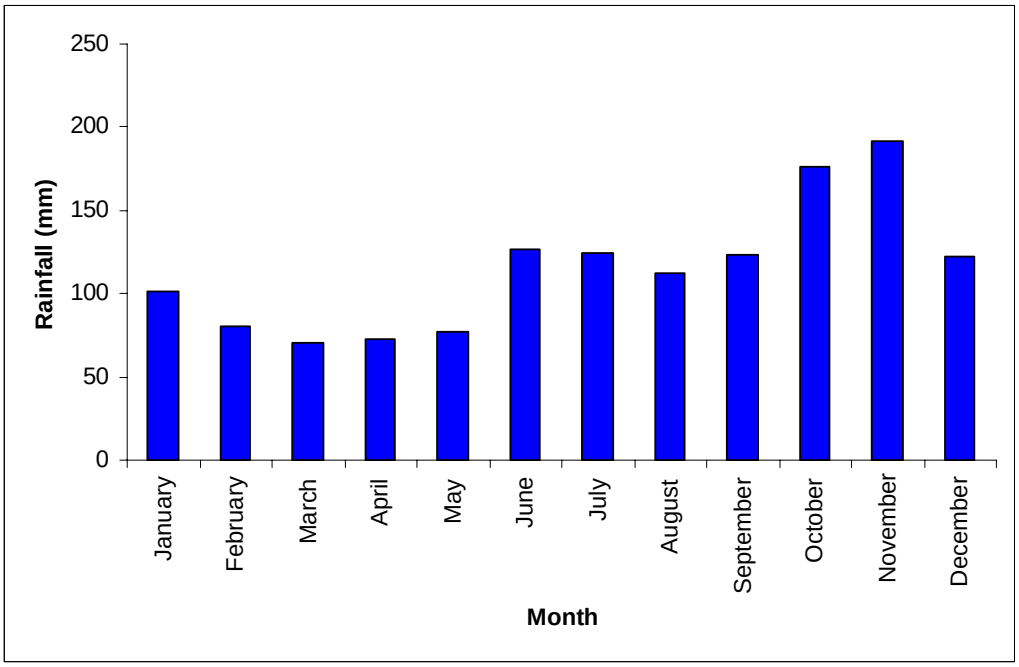

Figure 4-1: Average monthly rainfall, Tagbilaran
Source: PAGASA (2003).

As the data above show, the annual distribution of rain at Tagbilaran has two peaks – June/July and October/November. The highest average monthly rainfall is in November (191.1 mm) and the driest month is March (70.5 mm).

Where all effective rainfall infiltrates underground, recharge rates should correspond to rainfall, assuming recharge and discharge patterns have not been altered or modified through

[54] This classification applies to the entire province.

anthropogenic activities. In Tagbilaran, sinkholes and sunken areas have been identified as groundwater recharge areas and comprise 35.12 hectares of the city's total area of 3,720 hectares, and are depicted in Figure 4-2 below (City of Tagbilaran, 2001).[55] Of these, many have been cleared of vegetative cover, while others are also used as dumping sites for household refuse including sewerage and liquid waste. Alteration of recharge patterns has also occurred as a consequence of modifications associated with urbanisation and urban growth, which are made worse because the city's land use plan has not identified sites for current or future water extraction. There are intentions to delineate areas for water abstraction in order to prevent activities that may be detrimental to underground water sources (City of Tagbilaran, 2001).

[55] Sinkholes and natural recharge areas in Tagbilaran were identified as part of the AusAID/ADB-funded "Philippine Regional Municipal Development Project."

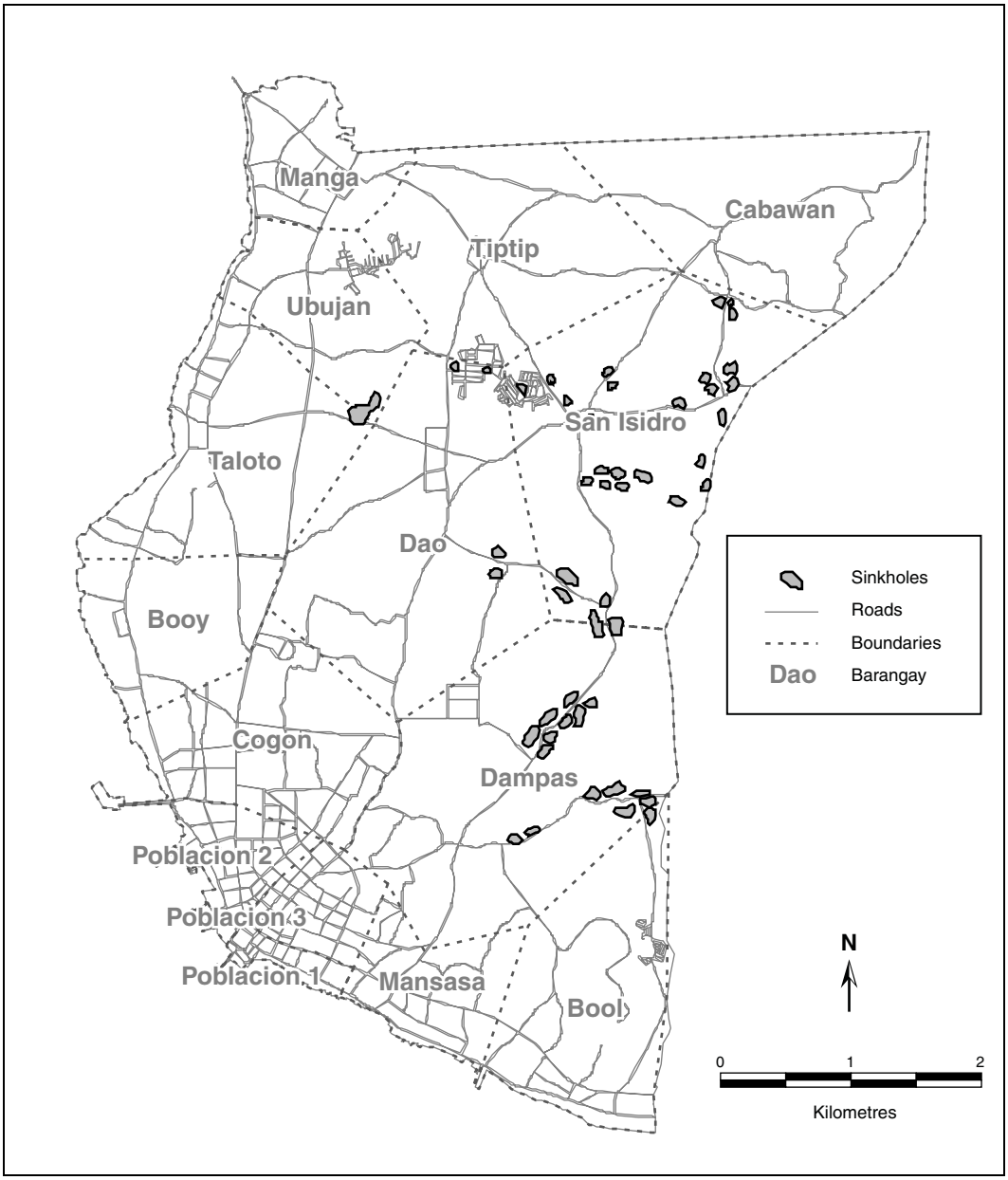

Figure 4-2: Location of sinkholes in Tagbilaran City
Source: Obtained from Tagbilaran City Government, 2004.

As noted above, flow rates in Tagbilaran are predicted as being fairly rapid because water travels through caves, channel ways and other conduit systems; therefore, the capacity for the karst in Tagbilaran to store water is fairly low. Points of discharge are mostly springs and ephemeral water courses, with those springs occurring along the coastline discharging into the sea. Water stored in the aquifer is extracted to meet urban water needs, with the majority of water extracted by the waterworks utilities in Tagbilaran although a number of private and communal wells also exist in Tagbilaran. The private wells are mostly hand-pumped and can be shallow or deep. In the report produced by Province of Bohol and SWECO (1999a), the aquifer

is deemed as having insufficient capacity to supply water to the city at present or for projected population growth to 2030.

Groundwater systems are vulnerable to degradation from a number of anthropogenic sources, which vary depending on the nature of the above ground activity in relation to the aquifer catchment area: that is, whether the aquifer is located in a rural, urban or peri-urban environment (Morris, et al., 2003). Urbanisation has a significant impact on the surrounding environment including groundwater (see Chapter 1, Section 1.2). The high rate of population growth in Tagbilaran gives rise to a number of anthropogenic threats which have the potential to adversely affect water quality and quantity. In Tagbilaran, these include saltwater intrusion as a consequence of over-pumping, groundwater contamination because of improper solid waste disposal and inadequate sewerage and sanitation, and urban expansion into recharge areas.

Burke et al (1999) argue that social, institutional and political factors are the primary obstacle to sustainable management of groundwater resources, particularly since groundwater flow domains are unlikely to conform to administrative and jurisdictional boundaries. Similarly, Foster and Chilton (2003) observe how many of the main problems which have arisen in relation to groundwater and urban development have come about because of improper identification and management by urban water and environmental managers of wastewater and the connection between groundwater abstraction and urban drainage and infrastructure particularly in low-lying cities.

Because conditions can vary between locations and information for non-specialist users is frequently deficient there could be little public awareness of the benefits and limitations of groundwater (Burke, et al., 1999). This is particularly so in a karst environment such as Tagbilaran, where there is high degree of subsurface heterogeneity and for which knowledge about flow velocities and patterns are uncertain. Therefore, Foster and Chilton (2003) argue there is a need for the public to be aware of groundwater interactions and processes and the potential for pollution to adversely affect water quality:

> Aquifer and groundwater supply pollution protection requires making groundwater more visible to stakeholders and the broader public, and thereby mobilizing their participation in pollution control (Foster and Chilton, 2003:1971).

In acknowledging the significance of human activities and management as it affects groundwater resources, in the next section I consider water resource management approaches in Tagbilaran.

4.4 Integrated water resource management (IWRM) in Tagbilaran

Integrated water resource management (IWRM) is the dominant approach to water resource management at present, as discussed in Chapter 3, Section 3.2. An important facet of IWRM is the identification of the watershed unit as the most appropriate level at which to undertake water management and research (Bandaragoda, 2000; Calder, 1999; Molden, 1997; UNCSD, 1997).[56] In the Philippines, the Department of Environment and Natural Resources (DENR) defines a watershed as,

> … the area of land from which rainwater can drain, as surface runoff, via a specific stream or river system to a common outlet point which may be a dam, irrigation system or municipal/urban water supply off take point, or where the stream/river discharges into a larger river, lake or the sea (FMB-DENR, 1998).

In addition, IWRM recognises the importance of conjunctive uses and management of water resources incorporating groundwater resources along with surface water since the two systems interact and are linked (Jehangir and Horinkova, 2002; Shah, Molden, Sakthivadivel and Seckler, 2000).

Despite recent shifts in water resource management towards approaches that integrate hydrological, social, economic and political systems, groundwater remains a problematic resource to manage because of the invisibility of groundwater processes and uncertainty surrounding water quality and quantity. Moreover, the potential for water quality degradation is high in karst environments, as is the risk of depleting groundwater stocks if information concerning quantity is unreliable. In many countries including the Philippines, there is a lack of data and information concerning the store of groundwater resources or the rates and location of groundwater withdrawals (Burke, et al., 1999; Froukh, 2002). Furthermore, while the management of surface water has been subject to comprehensive interrogation in terms of defining units of development and management groundwater management has tended to occur in a more ad hoc manner with less than perfect information on aquifer characteristics.

In Tagbilaran, few provisions for the management of groundwater resources have been made. This is mostly because of problems with institutional capacity across all levels of governance in the Philippines. The Philippines exhibits a high degree of sectoral fragmentation in the management and protection of water resources.[57] In addition, strategies for water resource management in the Philippines tend to focus on surface water and watershed

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[56] See also Bandaragoda (2000), Estrada and Posner (2001), Keller, Keller and Seckler (1996), Molden (1997), Perry (1996) and Park (1997) for explanations of watersheds, basins, and catchments.

[57] Institutional fragmentation in the context of water resources in the Philippines is discussed further in Chapter 6, Section 6.1.

management, and have been primarily concerned with protecting, maintaining or improving water supply and regulating forest activities and land use.

Water management policies are largely derived at the national level and guide practice and management at the sub-national level. At the national level, the Department of Environment and Natural Resources (DENR) is the primary government agency responsible for the conservation, management, development and proper use of natural and environmental resources in the Philippines, including those in reservations, watershed areas and lands of the public domain. DENR is also responsible for the licensing and regulation of the utilisation of natural resources as per *PD 705 Revised Forestry Code of the Philippines 1975* (hereafter referred to as *PD 705 1975*) (Republic of the Philippines, 1975c; World Bank, 2000). DENR's mandate is premised on the classification of land as initially derived through the 1987 Constitution, which classified land of the public domain as agricultural, forest or timber, mineral lands, and national parks of which only agricultural lands are alienable. *PD 705 1975* further classifies land and has been adopted as the land classification for the country. The two major classifications are Certified Alienable and Disposable Land and Forestlands, which comprise the following: Unclassified, Fish Ponds, Forest Reserves, Civil Reservations, Timberland, Military and Naval Reservations, and National Parks/Game Refuge and Bird Sanctuary/Wilderness Area (NEDA, 2002). The area of land falling under each of these categories is presented in Table 4.2 for both the Philippines as a whole as well as the Province of Bohol. Land with a slope in excess of 18 percent is classified as forest or timberlands and falls under the mandate of DENR. Other lands which are needed for forest purposes include areas needed for national parks, national historical sites, game refuges and wildlife sanctuaries, forest station sites, along with areas proclaimed by the president.

Land Classification	Area (hectares), All of Philippines[(a)]	Area (hectares) Bohol[(b)]
Certified Alienable and Disposable - Total	14,145,078	310,455
Forestlands[i] – Total (comprising the following):	15,854,922	101,271
Unclassified	1,089,118	--
Established Forest Reserve	3,272,912	19,410
Established timberland	10,227,847	78,454
Classified National Park/Game Refuge and Bird Sanctuary/Wilderness Area	893,221	--
Military and Naval Reservation	130,330	--
Civil Reservation	165,946	--
Fish Pond	75,548	3,407
TOTAL AREA	30,000,000[58]	411,726

Table 4.2: Land classifications and areas in the Philippines and Bohol
[i] The total area for Forestlands comprises the sub-classifications shown in this table. Source: [(a)](FMB-DENR, 2003a); [(b)]FMB-DENR (2003b).

To illustrate the significance given to watersheds in the Philippines, approximately 70 percent of the country is officially considered as watershed areas, including 421 principal and 18 major river basins (NEDA, 2002). The rate and degree of degradation of the country's watersheds is extensive. Most notable is soil erosion which is estimated as affecting between 60-80 percent of the country's total land area (FMB-DENR, 1998). For this reason, watersheds are identified as important areas subject to conservation and protection by virtue of *PD 705 1975*, which establishes criteria for determining critical watersheds, presidential proclamations as watershed/forest reserves, and as provided under *RA 7586 National Integrated Protected Areas System* (*NIPAS*) *1992* (Republic of the Philippines, 1992b).[59]

In response to watershed degradation throughout the country, DENR formally institutionalised an IWRM approach to water resource management and is seeking to coordinate activities between offices involved in water resources management (DENR, 2002b). Watershed degradation has been attributed to a wide range of complex physical and socio-economic factors; therefore, an integrated water resource management is felt to be more appropriate and effective than a fragmented sectoral approach. At present, IWRM projects are fairly localised and there is a tendency to focus on promoting the use of the natural resources (soil, vegetation, fauna and water) within the watershed for economically productive purposes balanced with conservation (PCARRD, DOST, DENR, FMB, DA, UPLB, CFNR and FDC/ENFOR, 1999). Even so, this represents a positive shift towards viewing and managing watersheds in a more

[58] As unlikely as it seems, the total land area under classification which is reported in FMB-DENR's (2003a) *Land Classification: 1978-2003* is exactly 30,000,000 hectares.
[59] In Bohol, three major watersheds in the interior of the province have been declared as protected areas; these are the Wahig-Inabanga (57,675 hectares), the Loboc Watershed (10,387 hectares) and the Duero Watershed (3,630 hectares) (Province of Bohol, 2004b).

holistic manner. To this end, there is a desire to have in place river basin institutions to facilitate resource planning and management throughout the country.

As demonstrated above, the jurisdiction of DENR is largely confined to watersheds proclaimed as critical watersheds and watersheds located in areas with a slope in excess of 18 percent, and watersheds have been the primary focus for water management efforts. However, in the case of Tagbilaran, where slope is considerably less than 18 percent, the land above the aquifer – including recharge areas – is beyond the jurisdiction of DENR and instead is the responsibility of local government units. While groundwater is mentioned in DENR publications and has been inventoried, including within Tagbilaran and Bohol, and identified as an important source in the Philippines, management approaches that take into account the interconnectedness of groundwater and surface water, in particular the connectivity at points of recharge and discharge, is virtually non-existent. IWRM and a watershed approach in the Philippines, therefore, tend to focus more on surface water and watersheds rather than groundwater. Such an outcome is not restricted to the Philippines, and echoes Burke et al (1999:309): "it could be argued that water management has, in general, been more comfortable with dealing with surface water than groundwater."

In Tagbilaran, there is growing recognition amongst those in local government of the significance of groundwater and the need to better understand the geology and processes present in order to better manage water resources (LG#1). In pursuing an integrated approach to water resource management which takes into account groundwater resources, Tagbilaran is a beneficiary of efforts driven at the Provincial Government level, as well as by NGOs, to increase management capacity of government staff, educate members of the community, and to improve information in order to reduce uncertainty.

Bohol is currently a partner to the "DILG-GTZ Water Program towards an Integrated Water Resources Management (IWRM) 2004 – 2006," which is a bilateral project between the Government of the Philippines through the Water Supply and Sanitation Project Management Office, Department of Interior and Local Government (DILG) and German development consultancy organisation GTZ. The Bohol Integrated Water Resource Management Team was created by Executive Order No. 42 and is comprised of personnel representing agencies in the Provincial Government,[60] DILG, LGUs and stakeholders and is based at the PPDO. The primary objective is to improve the living conditions of the rural population in selected areas in the Philippines by supporting the communities and local organisations to improve the quantity and quality of their water supply and sanitation; however, the positive externalities from this project will also benefit Tagbilaran since the development of technical skills and capacity at the

[60] These agencies include Provincial Planning and Development Office, Provincial Health Office, Provincial General Services Office, Bohol Environmental Management Office, Provincial Engineering Office, Office of the Provincial Assessor (PG#5).

provincial level can be transferred to overseeing water resource management in Tagbilaran (PG#5).

4.5 Summary

Despite the paradigmatic shift towards integrated water resource management and a focus on demand as well as supply management, groundwater remains a difficult resource to manage, particularly in a karst environment such as Tagbilaran in which there is a high degree of ecological uncertainty. In the absence of groundwater studies and a paucity of hydrological information specific to the city, reports which underpin planning decision contain assumptions and data gaps concerning inputs (recharge) and outputs (discharge and extraction). In the Philippines in general, there has been a tendency to focus on surface water and watershed management; however, for groundwater dependent cities with low-lying topography such as Tagbilaran, such an approach is inadequate. The tendency to focus attention on surface water is not unique to Tagbilaran or the Philippines, and reflects the difficulty of performing groundwater studies and understanding subsurface drainage patterns. In addition, because the majority of the processes occur underground, there is a tendency to be complacent about how activities above ground affect quantity and quality of the water below.

The implementation of planning and development policy in Tagbilaran, as guided by national mandates, is discussed in Chapter 6, Section 6.3. In the meantime, I continue in the following chapter to elucidate the local factors affecting water governance in Tagbilaran by presenting a snapshot of the social and economic characteristics of the city. The implications of Tagbilaran's urbanisation are explored, with particular attention given to saltwater intrusion as a consequence of over-pumping to meet increased demand, groundwater contamination because of improper solid waste disposal and inadequate sewerage and sanitation, and urban expansion into recharge areas.

Chapter 5 The Process and Consequences of Urban Growth in Tagbilaran

5.1 Introduction

Having determined the physical characteristics and constraints they impose on urban water supply in Tagbilaran, in this chapter I continue to provide location-specific information in order to contextualise national and supra-national policy and discourse. In this chapter I focus in the social and economic characteristics of Tagbilaran since water consumption patterns and water availability are affected by economic development, notably urbanisation and urban growth. I discuss the process of urban growth and some of the factors propelling this in Tagbilaran, including its significance as an important regional city. I then provide an overview of the current socio-economic environment within Tagbilaran before considering some of the implications of urban growth and general development on groundwater resources in Tagbilaran.

5.2 The drivers of urban growth in Tagbilaran

Tagbilaran City is a component city[61] and the provincial capital of the Province of Bohol, located in Region VII Central Visayas. Region VII comprises four provinces—Bohol, Cebu; Negros Oriental and Siquijor—and is located in the centre of the Philippines between the two main islands of Luzon and Mindanao (see Figure 1-1). The total land area of the Central Visayas is 14,923.10 square kilometres; Bohol comprises 411,726 square kilometres. Region VII is a region of considerable significance within the Philippines; however, historically growth and development in the Province of Bohol and the City of Tagbilaran have been marginal to Metro Cebu, Cebu. This trend has been overturned somewhat in recent years, with Tagbilaran emerging as an important city within the region particularly in terms of acting as a stepping stone for migration to other parts of the country (Gultiano and Urich, 2003).

The Philippines was divided into administrative regions shortly after President Ferdinand Marcos declared martial law in 1972. The enactment of *PD 1 Integrated Reorganization Plan* (*PD 1*) *1972* facilitated the creation of the National Economic Development Authority (NEDA)[62] and institutionalised regional development policy (Republic of the Philippines, 1972). There are presently 15 administrative regions along with one autonomous region (the Autonomous Region of Muslim Mindanao (ARMM)) in the Philippines. The regions are administrative only and are not regional governments with elected regional representatives. Each region has a NEDA regional office (Alburo, Rejante and Arriola, 1995; Manasan and

[61] In the Philippines, a component city is defined as a city with a population below 200,000 people in which city voters hold the right to vote for provincial elective officials. City classifications are provided in Appendix H.

[62] NEDA was created under *PD 107 1973* subsequent to the *PD 1 Integrated Reorganization Plan1972* (Republic of the Philippines, 1973b).

Chatterjee, 2003; Santos, 1995). In addition, regional development councils (RDCs) were also established under this act. The purpose of RDCs is to coordinate policy formulation, development planning and monitoring in the regions. In addition, RDCs act as counterparts to NEDA's regional offices. Present-day Philippine administrative regions are listed in Table 5.1.[63]

Region	Region Name and Main Centre
ARMM	Autonomous Region in Muslim Mindanao (Butuan)
CAR	Cordillera Administrative Region (Baguio)
NCR	National Capital Region
Region I	Illocos (San Fernando, La Union)
Region II	Cagayan Valley (Taguegarao, Cagayan)
Region III	Central Luzon (San Fernando, Pampanga)
Region IV	Southern Tagalog (Manila)
Region V	Bicol (Legaspi City)
Region VI	Western Visayas (Iloilo City)
Region VII	Central Visayas (Cebu City)
Region VIII	Eastern Visayas (Tacloban City)
Region IX	Western Mindanao (Zamboanga City)
Region X	Northern Mindanao (Cagayan de Oro)
Region XI	Southern Mindanao (Davao City)
Region XII	Central Mindanao (Cotabato City)
Region XIII	CARAGA

Table 5.1: Philippine Administrative regions (and centres), present day

The total population for Region VII in 2000 was reported as 5,701,064 with an average annual growth rate of 2.18 percent for the period 1990 to 2000. By comparison the national annual growth rate for the same period was 2.34 percent (and National Statistics Office, 1990; 1995; 2000). Table 5.2 presents population and growth rates for the provinces within Region VII along with the major urban centres for each of the provinces namely Metro Cebu, Tagbilaran, Dumaguete and Siquijor respectively. The most rapid period of growth for all the provinces in the region occurred during the years 1995 to 2000. During this period, the Central Visayas had the fourth highest annual growth rate across the Philippines.

[63] See Figure 1-1.

Province/Capital city	Total Population			Annual Growth Rates		
	1990	1995	2000	1990-1995	1995-2000	1990-2000
Bohol	**948,403**	**994,440**	**1,137,268**	**0.89**	**2.92**	**1.83**
Tagbilaran	56,363	66,683	77,700	3.2	3.33	3.26
Cebu	**2,646,517**	**2,921,145**	**3,356,137**	**1.87**	**3.02**	**2.40**
Metro Cebu	1,274,345	1,435,903	1,693,881	2.26	3.60	2.88
Negros Oriental	**952,272**	**1,025,247**	**1,126,061**	**1.94**	**2.03**	**1.98**
Dumaguete	80,262	92,637	102,265	2.72	2.14	2.45
Siquijor	**73,932**	**73,756**	**81,598**	**-0.04**	**2.19**	**0.99**
Siquijor	18,860	18,860	21,150	0.0	2.49	1.15
REGION VII CENTRAL VISAYAS	**4,594,124**	**5,014,588**	**5,701,064**	**1.65**	**2.79**	**2.18**

Table 5.2: Population and Annual Growth Rates for Provinces and Capital Cities of Region VII, Central Visayas, Philippines, 1990, 1995 and 2000
Sources: National Statistics Office (1990, 1995 and 2000).

Throughout the 1990s, the Central Visayas performed well economically, contributing over P335 billion in 2004 placing it fourth in terms of gross regional domestic product (GRDP) after Metro Manila, Southern Tagalog, and Central Luzon (NEDA, 2006).[64] Industry and the service sector represent the largest contributors to GRDP while the shares of agriculture, forestry and fisheries in GRDP have been declining (NEDA, 2003; 1992). Financial and commercial activity is heavily concentrated in Metro Cebu, which has been positioned by the Philippine Government as an alternate site of economic development and growth to Manila.

The level of urbanisation in the region is uneven with over one-half of the region's population residing in rural areas; however, the level of urbanisation has slowly been increasing. Siquijor has the lowest level of urbanisation while Cebu has the highest. Nearly half of the total population of the Province of Cebu is located in only 14 percent of the land area, namely Metro Cebu. High population density in and around Metro Cebu has arisen largely as a consequence of the concentration of economic growth and development in the Region. Tagbilaran City is anticipated to have an increasing share of the Region's prospective migrants to urban centres and to serve as a feeder city for larger Philippine cities including Metro Cebu (Gultiano and Urich, 2003).[65]

Tagbilaran is highly accessible to other parts of the Central Visayas Region as well as the rest of the country. The province's main port is in Tagbilaran and acts as an important hub between Tagbilaran and Cebu City, Manila, Cagayan de Oro City (Mindanao), Dapitan (Mindanao), Dumaguete City (Negros) and Siquijor (Siquijor). Fast ferry passenger boats

[64] Gross regional domestic product given in current prices.
[65] Dumaguete has also been identified as an urban centre that will likely experience growth through urban migration.

comprise most of the traffic into and out of the port. Tagbilaran also has an airport which services short and medium range flights within the Philippines including Manila.

The city's location is also significant within the province. As mentioned in Chapter 1 (Section 1.2) and as indicated in Figure 1-2, Tagbilaran City is located in the southwest portion of Bohol (Province of Bohol, 2001). Settlement patterns have favoured the south partly as a consequence of good navigation and access since a large number of islands offshore make navigation and access in the north more difficult. As a consequence, the southern portion of Bohol is heavily populated, comprising approximately 70 percent of the population.[66] Public access to other parts of the province is possible by public transport – buses, jeepneys[67] and vans – with the Province's major bus terminal located in Dao, Tagbilaran. Ongoing road maintenance and improvements will reduce travel times and enable greater ease of travel between Tagbilaran and interior towns.[68] In the following section, I provide an overview of the current socio-economic environment in Tagbilaran.

5.3 The socio-economic environment in Tagbilaran

As reported in Chapter 1 (Section 1.2), the population of Tagbilaran is estimated as being over 87,000 with a population growth rate in excess of three percent per year. The population is spread across 15 *barangays*; these are Poblacion I, Poblacion II, Poblacion III, Cogon, Cabawan, Manga, Tiptip, Mansasa, Taloto, San Isidro, Ubujan, Bool, Booy, Dao, and Dampas (see Figure 5-1). Population densities within the city vary. Development is concentrated in Poblacion I, Poblacion II, Poblacion III, and Cogon. The central business district is situated in Poblacion II. Cogon has the largest residential population[69] of 16,228 persons while Poblacion I has the highest population density of 213 persons per hectare (City of Tagbilaran, 2001). Table 5.3 presents area, population and population density information for the *barangays* of Tagbilaran.

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[66] Figure derived by author using data from NSO 2000 Census (National Statistics Office, 2000).
[67] A jeepney is a form of public transport originally made from US military jeeps left behind in the Philippines after World War II.
[68] It is difficult to estimate travel times because of road work undertaken in different areas at different times during my stay in Bohol. However, the condition of most roads had generally improved and travel times reduced since I first travelled to Bohol in 1997, when a 50 kilometre trip (Tagbilaran to Bilar) took up to two-hours by public bus.
[69] Commercial activities are also present within Cogon. Cogon market and Plaza Marcela, a large department store, are very busy commercial centres as well as smaller trading and service outlets and *sari-sari* stores.

Barangay	Area (hectares) [a]	Population [b]	Population Density Persons/hectare
Bool	348.8	3,361	9.6
Booy	146.4	6,736	46.0
Cabawan	267.3	798	3.0
Cogon	204.4	16,228	79.4
Dampas	443.7	5,808	13.1
Dao	390.9	4,674	12.0
Manga	117.3	4,594	39.2
Mansasa	82.9	4,673	56.4
Poblacion I	25.9	3,203	123.7
Poblacion II	70.2	5,828	83.0
Poblacion III	70.7	6,234	88.2
San Isidro	429.4	3,776	8.8
Taloto	244.5	5,095	20.8
Tiptip	282.1	3,068	10.9
Ubujan	145.6	3,624	24.9
TOTAL	3,270.1	77,700	23.8

Table 5.3: Area, population and density for *barangays* in Tagbilaran
Sources: [a]City of Tagbilaran (2002); [b]National Statistics Office (2000).

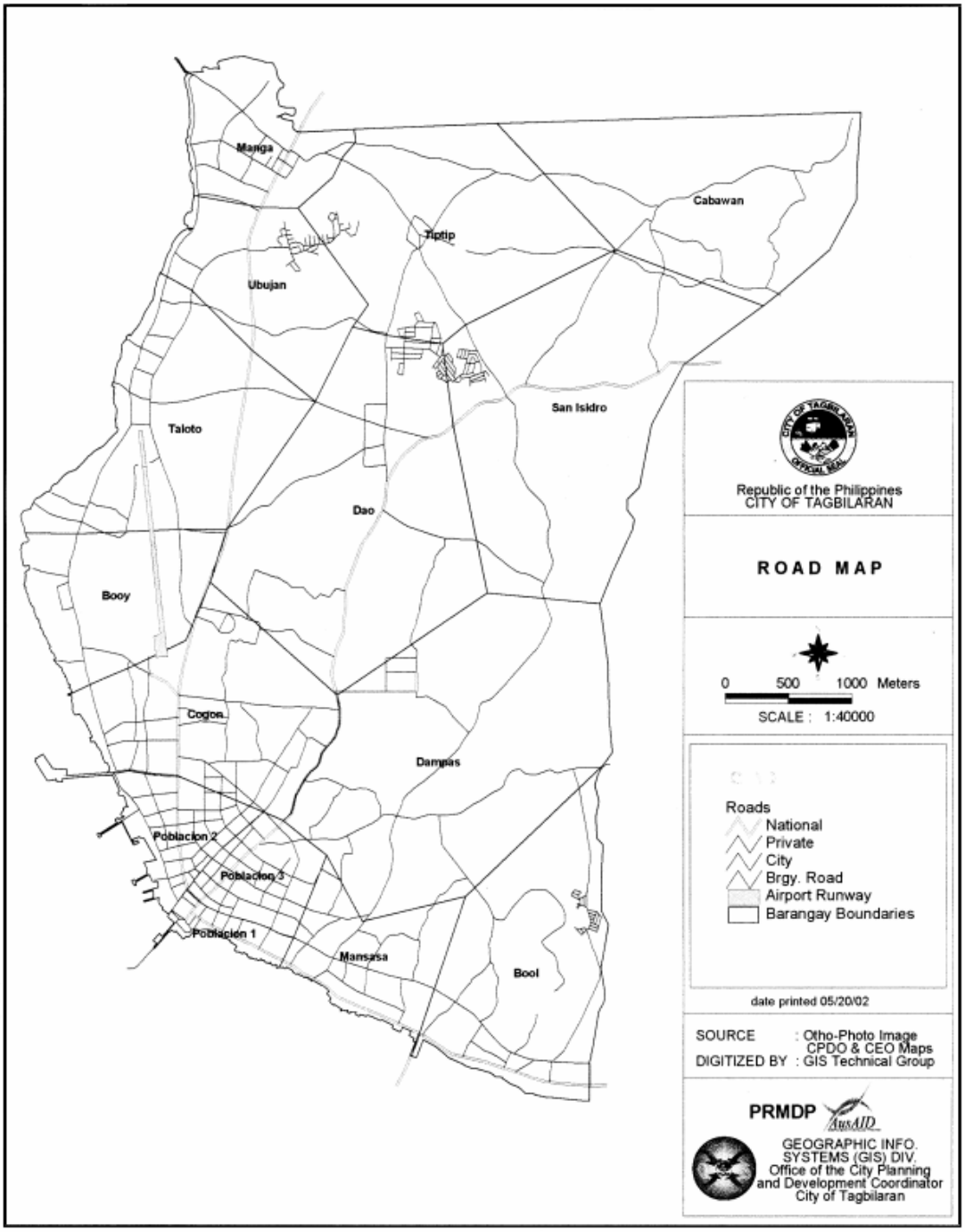

Figure 5-1: Map showing *barangay* boundaries, Tagbilaran City, Bohol
Source: City Planning and Development Office, City Government of Tagbilaran (2004).

As the provincial capital, Tagbilaran is the centre of governance for the province. Government institutions and offices located in the city include the Tagbilaran City Government offices in Dao, the Provincial Government Capitol complex in Poblacion III as well as provincial offices for national government departments. These include the Department of Agriculture and the Government Service Insurance System. Health, social services and

educational facilities are also well represented. The city has a total of eight hospitals and clinics, as well as other health professional services and is the location for five tertiary institutions including two universities. Commercial activity is more concentrated in Tagbilaran than elsewhere in the province because of its size, accessibility and its position as the provincial capital. There are five shopping malls within the city, as well as several hotels and restaurants, fast food chains, and over 15 banks (City of Tagbilaran, 2001).

The economy of Tagbilaran is largely service- and trade-based, with very little industry and manufacturing occurring within the city. Agriculture in Tagbilaran is marginal with the amount of agricultural land declining as a consequence of conversion to non-agricultural uses. With nine of Tagbilaran's fifteen *barangays* located along the coastline, fishing plays a role in the local economy albeit relatively minor (City of Tagbilaran, 2001).

Entrepreneurship is generally low; however, investment by both local and foreign investors is slowly increasing and is being encouraged by government and the business community. Small businesses and home based enterprises are common and include activities such as dressmaking, boarding houses, sale of cooked food items, and *sari-sari* stores.[70] Boarding houses or rather, providing boarding facilities—a room and meals—is a fairly widespread practice across the city and was encountered through the course of conducting surveys as well as through observations. Boarders are often young people in their late teens or early twenties from other parts of the province who reside in Tagbilaran to continue their education or for employment opportunities. The money paid by boarders provides an additional source of income. Similarly, sale of cooked food items for lunches or other meals, and the operation of a small store or *sari-sari* from a residence or shop-front nearby also provide additional income sources for households. Plate 5-1 shows a *sari-sari* store operating from a residential dwelling in Poblacion I, Tagbilaran.

[70] A *sari-sari* store is a small store selling a wide range of household and other items, generally operating from private residential premises.

Photo by Fisher, 2004.

Plate 5-1: *Sari-sari* store in Poblacion I, Tagbilaran.
Sari-Sari stores operating out of households are a common small-scale business enterprise undertaken in Tagbilaran. This store is located in Poblacion I, and is fairly typical in size, design, and product range to others across the city.

Tourism has been identified as a major development driver for the Province of Bohol as well as Tagbilaran City largely as an outcome of the designation of Panglao Island[71] as the Panglao Island Tourism Estate.[72] Development at Panglao has been identified as a priority by the national government as part of its National Tourism Strategy to develop destination areas (NEDA, 2004b). It is envisaged that Tagbilaran will play a vital role in tourism by acting as a gateway to Panglao and the rest of the province. There are also plans to develop tourism facilities within Tagbilaran itself, namely the establishment of hotels and restaurants (City of Tagbilaran, 2001). Growth in all sectors, particularly tourism have implications on water resource management in Tagbilaran since there is a need to increase the capacity and efficiency of water supplies, particularly potable water, to meet tourist satisfaction. Some of these implications are addressed in the following section.

[71] The island of Panglao comprises the municipalities of Panglao and Dauis. The island is connected to Tagbilaran by two causeways in Dauis. Panglao is indicated on Figure 1-2, which provides the location of Tagbilaran within the Province of Bohol.
[72] Panglao became a Tourist Zone by Proclamation No. 1801 (VII) dated November 10, 1978 (Republic of the Philippines, 1978a).

5.4 The implications of Tagbilaran's growth on its water supply

Unreliable water sources, insufficient supply, and poor quality of water serve as obstacles to water provision in Tagbilaran and have implications on the social as well as economic well-being of the city. Inadequate water supply stymies growth in tourism and industry and provides insufficient support for the agricultural sector. Furthermore poor water quality has serious implications on the health and well being of the city's residents.

Water demand in Tagbilaran is increasing commensurate with population growth, a strengthening economy and technological advances. The cost of development of groundwater resources for urban and rural provision is generally low particularly when compared to surface water and can be accomplished by both public and private developers. For this reason, the development of groundwater in both developed and developing countries has tended to be done on a smaller scale than surface water. The development of springs and wells requires relatively low capital costs as compared to surface water undertakings such as dams, weirs and reservoirs; therefore both public and private interests were able to utilise groundwater supplies. Modes of extraction include developed and undeveloped springs, shallow dug wells, artesian wells, where water in a confined aquifer rises to the surface under its own pressure, and deep wells in which pumps are used to lift water to the surface. Water abstraction has increased over time in line with technological advances, for example, well drilling, pump technology, rural electrification and improved understandings of hydrogeology (Foster, et al., 2000).

In Tagbilaran, the municipal waterworks utilities use deep wells to supply water for urban consumers; some households also have access to springs and shallow wells and at least one commercial enterprise has its own deep wells.[73] In Tagbilaran demand for municipal water supply has steadily increased from 7,792 m^3 per day in 1997 to 10,993 m^3 per day in 2003. The rate of increase in demand is currently estimated at 2 percent per month and is partly due to the corresponding high rate of population growth and concomitant housing constructions as well as the expansion of the service area to existing dwellings and commercial buildings. Changes in lifestyle have also led to an increase in water consumption; for example the increase in the numbers of washing machines, private vehicle ownership and washing of vehicles, rising popularity of showers as opposed to dipper style bathing are all activities that use greater quantities of water. There are also fears that the presence and gradual increase of squatter housing along the foreshore will further threaten water quality (see Plate 5-2).

[73] The Coca Cola plant in Tagbilaran has three of its own pumping stations and also taps into one of the waterworks utilities' network to supplement its consumption (WW#1).

Photo by Fisher, 2004

Plate 5-2: Litter in harbour, Tagbilaran.
The encroachment of stilt housing into the harbour has implications on water quality, particularly in terms of sewage and improper disposal of household waste and litter as illustrated above.

The relationship between water and development is complex since water is an integral input for economic growth and human well-being, and development can increase pressure on water resources both in terms of quantity and quality. As mentioned in Chapter 4 (Section 4.2), groundwater resources in Tagbilaran are vulnerable to a number of anthropogenic threats as a consequence of urban growth and development. The threats identified were saltwater intrusion as a consequence of over-pumping, groundwater contamination because of improper solid waste disposal and inadequate sewerage and sanitation, and urban expansion into recharge areas.

Saltwater intrusion into aquifers as a consequence of over-pumping was identified in Tagbilaran as early as the 1980s and is due to pressure to meet increasing demand. Saltwater intrusion is also a problem experienced in coastal areas in Metro Cebu and Metro Manila as well as other parts of the Philippines (Clemente, Abracosa, David, Inocencio and Tabios, 2001). To overcome this problem, waterworks utilities have sought to locate pumping stations at least two kilometres from the coastline and to change their pumping practices. To this end, an interview with a representative of one of Tagbilaran's waterworks utilities identified the importance of changing pumping practices "to ensure that there is not pumping beyond the safe yield; therefore, there is no overdrafting" (WW#2).

In urban areas throughout the Philippines the inappropriate disposal of household waste is reported as a major cause of water pollution primarily because of leachate contamination from

unsanitary landfills (Coxhead and Jayasuriya, 2003). Improper disposal of household solid waste threatens the quality of groundwater sources in Tagbilaran, where household and commercial refuse is currently dumped in an unsanitary, open dumpsite – a sinkhole – in *barangay* Dampas (see Plate 5-3). Groundwater sampling conducted at wells near the site in 2001 showed high levels of lead and other contaminants as a consequence of leachate entering the underlying groundwater (Fraser, 2004). This has implications for water quality extending beyond the dumpsite area as a consequence of hydrological flow patterns. In addition, there are a number of families living at or very close to the dumpsite currently engaged in the collection and sale of recyclable materials at the dumpsite as an informal livelihood activity (as depicted in Plate 5-4). These families tend to be very poor and reliant on public wells in order to obtain water for their household needs, and are, therefore, exposed to the risk of low quality water as a result of leachate contamination.[74]

Photo by Fisher, 2003.

Plate 5-3: Tagbilaran City dumpsite, Dampas, Tagbilaran.
The dumpsite in Dampas has been the primary destination for Tagbilaran's solid waste for over 20 years and is now a source of concerns as related to air, land and water pollution as well as human health.

[74] I observed at least one decommissioned well near to the dumpsite on an excursion there in late 2004, and I was informed that this was closed because of heavy metal contamination.

Photo by Fisher, 2003.

Plate 5-4: Garbage pickers working in the Dampas dumpsite, Tagbilaran. Garbage pickers separate recyclable materials at the Dampas dumpsite in Tagbilaran as a livelihood activity and frequently live nearby. This exposes them to a myriad of health risks.

There are also concerns about contamination of groundwater resources because of inadequate sewerage treatment. Tagbilaran lacks a sewerage system and instead relies on septic tanks. Despite Building Code regulations requiring properly sealed and constructed septic tanks, in many cases septic tanks are not properly constructed and are instead simple ground excavations without cement flooring or walling or worse, natural sinkholes are used as disposal sites. The risk of contamination of underground water sources is, therefore, high given the karst nature of Tagbilaran and the ease with which liquids percolate in this type of landscape.[75] There is a general lack of understanding amongst people, however, regarding the hazard that liquid waste poses to underground sources, which has been blamed for the problem of improper construction of septic tanks (City of Tagbilaran, 2001). This sentiment was reinforced by conversations with those in government (PG#1 and PG#2).

Urban land use development and construction of new buildings and dwellings in the city's recharge areas also has the potential to adversely affect groundwater availability. The

[75] There have been reports in the *Bohol Chronicle* of high faecal coliform counts in other parts of the Province such as Dauis and Panglao (Bohol Chronicle, 2000a; 2000g; Ligalig, 2005d), but I did not encounter any such reports for Tagbilaran. However, there were anecdotal reports and suggestions from other people that I spoke to that there were high faecal coliform counts in the harbour caused by improper septic systems in adjacent *barangays*. Water quality testing for drinking water is undertaken to ensure water supplies are safe; I was told that Tagbilaran water sources were well within accepted health standards.

expansion of paved areas and soil compaction affect surface permeability, infiltration and subsurface water recharge, which increases the risks of stormwater flooding of surface runoff water particularly in locations with poor drainage systems and affects recharge and discharge patterns (Foster, 2001; Niemczynowicz, 1999). In Tagbilaran, there are some incidences of flooding partly due to the natural low-lying topography of the city but also because of human modifications such as paving, undersized drainage pipes and blockages as a result of silt and rubbish. The ways in which economic and social growth and water governance have been addressed and reconciled in Tagbilaran are related to the ways in which development and water governance discourses are articulated in national and local-level policy.

5.5 Summary

Urban growth in Tagbilaran since the early 1990s has been significantly more rapid than the national average. This growth has its roots in regional processes whereby the Central Visayas has gained in importance for the national economy as well as provincial processes whereby Tagbilaran is the most significant urban area in Bohol. This growth has also been propelled by improvements in communications, technology and accessibility and will likely continue into the future. The local economy is largely service- and trade based although it is anticipated that tourism will play a major role in the city's economy in the future partially as a spill over from tourism development on neighbouring Panglao Island. Changes in economic circumstances and improved waterworks distribution networks, together with a growing economy and population are the key factors forcing demand for municipal water higher. However, negative externalities associated with this growth have already started to affect groundwater resources in Tagbilaran.

In Part Three, I theorise hybridity and water governance in order to conceptualise the water governance system that has emerged in Tagbilaran. In the following chapter I consider the interactions between the formal institutions and mechanisms regulating water resources and development in the Philippines with the ways in which water resources are represented in policy at varying levels. Chapter 6 focuses on mapping institutional hybridity across multiple scales. Chapter 7 focuses on hybridity in the context of Tagbilaran's waterworks system.

Chapter 6 Hybridity and Water Governance in a Development Context

6.1 Introduction

So far in this thesis, I have delineated the shifts in international development and water governance discourse and provided information about Tagbilaran to contextualise how these discourses are articulated and acted upon. In this chapter and the next, I theorise hybridity: the factors which have shaped hybrid governance systems and how hybridity has manifest in Tagbilaran's water supply system and water governance system.

Following Kooiman (1999) and van Klinken (2003), I present a systemic view of governance concerned with synergies and interactions between government and society in which multiple actors have agency in shaping development outcomes. This chapter begins by mapping the narratives of development and water governance. First, I examine how discourses of development have been articulated and mediated in policy and practice at the national, provincial and city levels. I then map the formal governance institutions in the Philippines to regulate water resources to demonstrate the complexity and fragmentation that currently exists before examining how water governance discourse is being articulated within the Philippines. I then conceptualise the hybrid system of governance that has emerged in the context of development and water policy in Tagbilaran.

6.2 Hybridity, governance and development

Hybridity implies the mixing of elements to create a new entity (Hutnyk, 2005); in the context of this thesis it has been applied to a system of governance. As noted in Chapter1 (Section 1.2) and Chapter 3 (Section 3.1), the term governance has been used to consider both the changing role of the state, and adaptations made by organisations which have brought changes in management and government. These attributes, while clearly linked, are not mutually dependent. In the first instance, the contested discourses of neoliberalism and globalisation provide opportunities for re-conceptualising the role of the state and the emergence of hybrid forms of governance. This can be done by considering the increasing significance of the private sector in the provision of services and creation of public goods, and the dialectic of global and local (glocal)[76] processes shaping societies; that is, substantive changes in terms of who is governing whom. In the second instance, hybrid governance can be seen as related to adaptations made by organisations. Adaptations and changes in management and government and can be seen as reforms in public sector administration. In this instance, models of administration have taken a more businesslike approach to public management based on a neoliberal, market-led agenda; in particular, the 'new public management' model of public

[76] See, for example, Swyngedouw (2004).

administration (Crook and Ayee, 2006; Haque, 2004; Polidano and Hulme, 1999). Both of these processes can be seen to have occurred within the Philippines, Bohol and the city of Tagbilaran and are addressed in turn below.

The changing role of the state in the Philippines has been an ongoing process, which has been brought into sharper relief in the present, highly globalised era. Philippine development has been shaped by inherent social, cultural, political and geographical factors as well as exogenous influences, most notably colonisation (Spanish era 1521-1898 and US era 1898-1946). Since gaining independence from the US in 1946, development in the Philippines has been characterised by persistent poverty and uneven development, spatially, socially and across sectors. The post-independence planning and development framework directing the official development agenda reflected the ideology espoused by key development agents in the 1940s and 1950s, particularly the US and the World Bank (see Chapter 3). For this reason, development premised on modernisation and economic growth was favoured, in which the government was seen to play a vital role in determining development priorities as well as implementing development programs and projects.

Early strategies to modernise the Philippine economy manifested in a shift from an agricultural to industrial bias in an attempt to address the spatial diversity in regions in which import-substitution industrialisation was pursued. Uneven growth across the country presented challenges to nationally implemented strategies and precipitated the shift towards regional development from the 1960s onwards in concert with national development strategies and planning (Constantino-David, 2001; Manasan and Chatterjee, 2003).[77]

As an indication of the strong role played by the government in directing development in the Philippines, the National Economic Development Authority (NEDA) has been the key body responsible for economic and social development since 1973. NEDA formulates national annual, medium- and long-term economic and social development plans, and monitors approved national, sectoral and regional development plans and programs. Rather than a strictly centralised program of development, however, the Philippines has been pursuing a regional approach to development since 1972 (see Chapter 5, Section 5.1).

To reduce spatial and distributional inequality, regional development in the Philippines became institutionalised in 1972 with the creation of administrative regions with NEDA offices, and regional development councils (RDCs). The RDCs were established to increase local and regional participation in plan formulation by engaging local leaders, as represented by provincial governors and city mayors, with national officials, as represented by regional directors of central government departments and agencies (Alburo, et al., 1995). Through

[77] For a discussion on the causes of uneven growth in the Philippines see for example (Cuervo and Hin, 1998; Mercado, 2002; Reid, 2001).

RDCs, the government sought to coordinate policy formulation, development planning and monitoring in the regions of the Philippines. Moreover, the RDCs acted as counterparts to the NEDA board at the sub-national level (NEDA, 2004a). Ostensibly, the creation of RDCs and efforts to increase regional participation in development represents a shift towards a more decentred approach to development whereby power and control is transferred from the central government to lower levels of political administration. The irony in this instance, however, is that the creation of RDCs and subsequent attempts to increase regional development efforts occurred during the dictatorship of President Ferdinand Marcos shortly after the declaration of martial law.

The extent to which the RDCs were effectively able to direct and implement regional development strategies autonomously was relatively constrained through the 1970s. During this period a centralised system of planning, budgeting and expenditure prevailed with decisions about development projects made by national officials and government agencies. Furthermore, local governments were limited in their ability to raise revenue and national funds were unpredictable (Rood, 1998). The EDSA[78] uprising and the end of the Marcos regime in 1986 heralded a new political regime and a new Philippine Constitution with the abolition of the 1973 Constitution and the enactment of the 1987 Constitution in February 1987. In addition, the role of the RDCs was greatly enhanced with decentralisation, which followed the enactment in 1991 of *RA 7160 The Local Government Code of 1991* (Republic of the Philippines, 1991).

The enactment of the Local Government Code (LGC) represents an important shift in the way in which governments function in the Philippines, and the role played by the state in development. Since the passing of the LGC, local government units have a greater role in formulating their own local plans and making decisions over issues affecting their communities (Legaspi, 2001). The LGC devolves authority and functions to local government units, which are mandated to provide certain basic services such as water. Under the LGC, the participation of the private sector in local governance, particularly in the delivery of basic services, is encouraged.[79] In addition, the LGC emphasises the importance of promoting people's organisations and non-governmental organisations to become partners in matters concerning local governance (Legaspi, 2001; Rood, 1998).[80]

The role of the state post-Marcos has also changed as a consequence of structural reforms, in which privatisation, deregulation and liberalisation have been emphasised. Philippine economic policy has steadily been influenced by the World Bank and IMF, mostly as a consequence of high levels of indebtedness, and is therefore inclined towards neoliberal reforms

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[78] EDSA stands for Epifanio de los Santos, the name of the road upon which the uprising against President Ferdinand Marcos took place, which ultimately led to Marcos being deposed as leader.
[79] Chapter 1 section 3 paragraph (l) (Republic of the Philippines, 1991).
[80] Chapter 4 section 34 (Republic of the Philippines, 1991).

(Kelly, 2000). As a consequence, NEDA and the national government support greater private sector participation in developing infrastructure citing the expense associated with its development as a major rationale (NEDA, 2001; 2002). In this regard development policies in the Philippines mirror international development trends more broadly whereby increasing engagement by the private sector in public service provision is embedded in the development legacy of the Philippines.

As well as political decentralisation and changes in the role played by the state (and private sector) in development in the Philippines, the way in which the state functions has also changed. Haque (2004) observes how the Philippines' public administration has been greatly influenced by the US, and how the Philippines, along with other countries in Southeast Asia have followed reform initiatives undertaken in industrialised countries including the US. Most notable are efforts to build capacity of public sector workers (manifesting most often as various sorts of training exercises), managerial decentralisation, new public management and other changes which strive to reduce bureaucracy and apply a business-like approach to the government (Haque, 2004; Polidano and Hulme, 1999) .

In the context of water, the localisation of concepts and approaches borne out of global environmental governance has also been influential in shaping development approaches in the Philippines. Water resource management in the Philippines has incorporated recommendations and information from the broader international community through international forums – Rio, Dublin, World Summit on Sustainable Development, World Water forum – as well as through international financial institutions; again, the World Bank and the IMF. Discourses of IWRM, allocative efficiency, and private sector participation and other tenets of neoliberalism have, therefore, been absorbed into water and development policy nomenclature. In this way development and water governance in the Philippines can be seen to have followed the trajectory of discourses promulgated by multilateral development agencies, international forums, conventions, conferences, and subsequent governance institutions. However, the formal institutions governing water remain integral to configuring the ways in which water is regulated and managed. For this reason, in the following section I explicate the formal water governance institutions regulating municipal water supply that currently exist in the Philippines.

6.3 Formal water governance institutions for municipal water in the Philippines

Formal water institutions in the Philippines establish the state as the prevailing water authority through three legal mechanisms: first, the Regalian Doctrine; second, the Constitution; and, third, the Water Code of the Philippines. The Regalian Doctrine is a legal concept that was first introduced by the Spanish through the *Laws of the Indies* whereby the Crown claimed ownership over lands and resources except for those lands that had been granted or titled to private parties by royal grants and concessions (Chiong-Javier, 1999). The Regalian Doctrine

was first enshrined in the Philippine Constitution in 1935, and has been reaffirmed in both the 1973 and 1987 Constitutions. The Philippine Constitution of 1987 further strengthens the State's ownership claims over water resources through Section 2 Article XII "National Economy and Patrimony" (Republic of the Philippines, 1987b). Finally, *PD 1067 The Water Code of the Philippines 1976* (hereafter referred to as Water Code) is the key piece of legislation to assert state ownership over water resources and to outline the framework for appropriation, control and conservation of water resources as well as rights, rules and regulations of water users and owners (Republic of the Philippines, 1976).

The Water Code acknowledges the importance of water as a vital resource for national development as well as its importance for basic needs. Resource boundaries and rights for ownership and use are clearly defined by the Water Code, with the state recognised as the owner of all water bodies including continuous or intermittent water, surface water, groundwater, atmospheric water, and seawater. The Water Code grants exclusive control over water to any person who captures or collects water by means of tanks, cisterns or pools where water has been legally appropriated and so long as the water is being beneficially used for the purposes for which it was appropriated. All persons, including government instrumentalities or government-owned or controlled corporations, are required to secure a water permit to appropriate water thereby guaranteeing their right to water; however, there are exceptional circumstances where appropriation of water or use of natural water bodies is permissible without first securing a water permit. These include water for bathing, washing, navigation, watering domestic animals or where water is appropriated by hand carried receptacles (Republic of the Philippines, 1976: Article 14).

The National Water Resources Board (NWRB)[81] is the overarching water authority in the Philippines and is the regulatory and coordinating body responsible for the management and regulation of water resources[82] (JICA, et al., 1998). Figure 6-1 illustrates the organisation of the NWRB, which is headed by the Secretary of DENR. [83] Sitting below the NWRB are some 30 government agencies and departments. Matters of water allocation are separated from management and protection of watersheds and water resources, which are separated further by sector leading to a high degree of fragmentation. The major agencies and departments responsible for municipal and rural supply, irrigation, hydropower, flood control, water quality, and watershed management have been summarised in Table 6.1.

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[81] The National Water Resources Council came into being by virtue of *PD 424 1974* (Republic of the Philippines, 1974) and was subsequently renamed and reorganised as the National Water Resources Board pursuant to *EO No. 124-A 1987* (Republic of the Philippines, 1987a).

[82] Some functions of the NWRB such as granting and monitoring water permits have been devolved to Department of Public Works and Highways, DENR, and National Irrigation Administration.

[83] NWRB currently sits under DENR by virtue of *EO 123 of 2002* (Republic of the Philippines, 2002). Before *EO 123 2002*, NWRB functioned under the Office of the President and earlier still, under DPWH (Navarro, 2003; Sy, 2003).

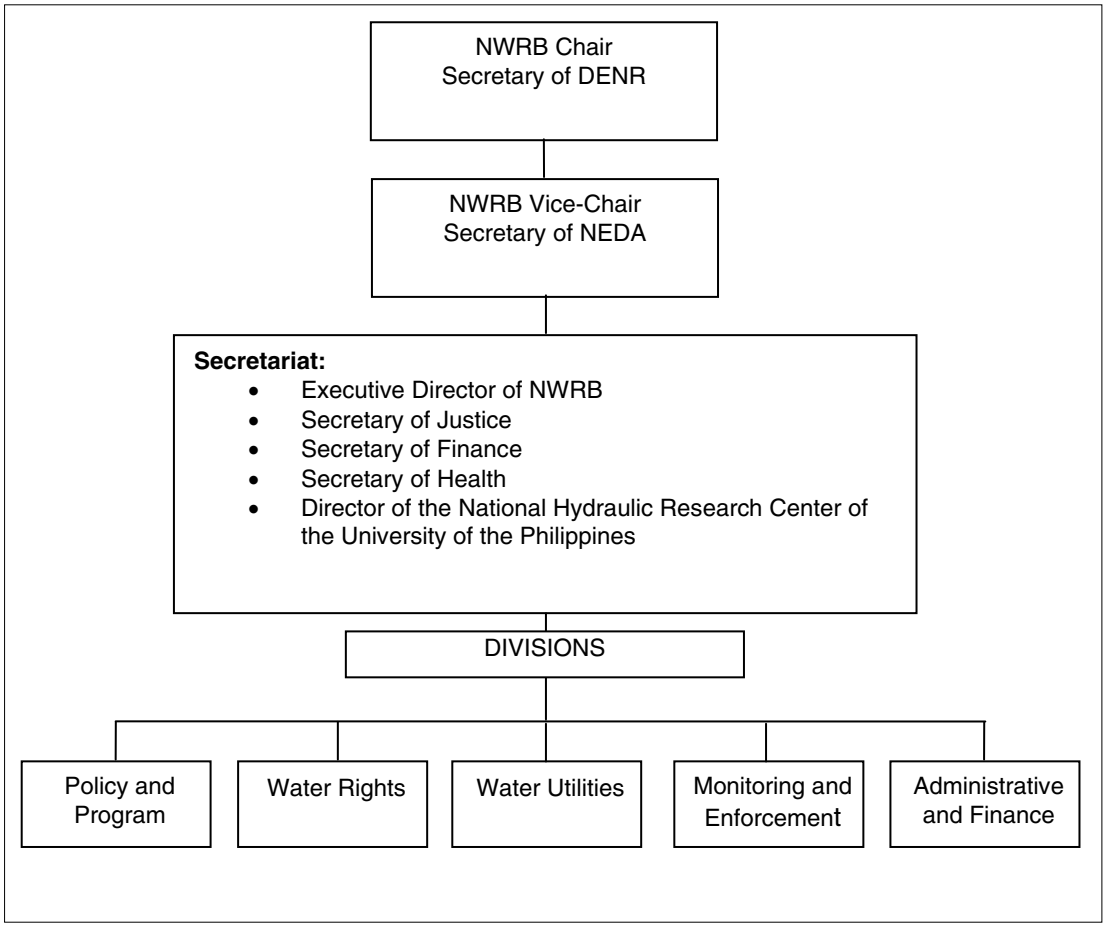

Figure 6-1: NWRB organisational chart
Sources: Navarro (2003) and World Bank (2003).

Sector	Agency/Department/Organisation	Function and role
Water for municipal and rural supply	National Water Resources Board (NWRB)	Water permits; regulation of well drilling; conservation and protection of water resources; monitoring of water resources; issuance of Certificate of Public Convenience and Certificate of Public Convenience and Necessity.
	Local Water Utilities Administration (LWUA)	Lending and establishment of Water Districts to develop Level III (and II) water systems in urban areas.
	Department of Interior and Local Government (DILG)/LGUs	Provisions under the LGC mandate LGUs to provide public services.
	Department of Public Works and Highways (DPWH)	Deputised authority able to issue water permits and monitor use.
	National Irrigation Administration (NIA)	Deputised authority able to issue water permits and monitor use.
	Water Districts (WD)	Develop and manage water systems for urban areas. Deputised authority able to issue water permits and monitor use.
Irrigation	Bureau of Soils and Water Management, Department of Agriculture	Management of soil and water.
	NIA	Construction and management of major irrigation systems. Oversee Irrigation Water User Associations.
	DPWH	Mandated to undertake design and construction of infrastructure, including flood control projects, water resources projects and other public works.
Hydropower	Department of Energy	Mini-hydro resource development projects
Flood Control	DPWH	Mandated to undertake design and construction of infrastructure, including flood control projects, water resources projects and other public works.
Water Quality and Pollution	Department of Environment and Natural Resources (DENR), Environmental Management Bureau (EMB)	Water classification, quality criteria, monitoring, pollution assessment, implementation and enforcement. Also responsible for environmental education and information regarding water quality and management.
	Department of Health	Guidelines for water quality; public information.
Watershed Conservation, Protection and Management	DENR, Protected Areas and Wildlife Bureau (PAWB)	Responsible for management, conservation, and development of forest lands and watersheds including critical watersheds and proclaimed reserves.
	National Commission on Indigenous People	Responsible for overseeing formulation and implementation of policies to protect and promote the rights of indigenous cultural communities and indigenous people including watersheds in ancestral domains.

Table 6.1: Major formal water governance institutions in the Philippines[84]

The NWRB is responsible for reviewing and approving water resource development plans and programs. The basis for much of the development and planning for water resources in Philippines hinges on the report referred to as the Water Master Plan Study undertaken in 1998

[84] See JICA, NWRB DPWH and Republic of the Philippines (1998) for further information about these agencies.

(JICA, et al., 1998). A key function of the NWRB is the gathering of hydrological information for the country as well as undertaking river basin surveys and appraisal of water and related resources. In addition, the NWRB is responsible for granting water permits and strives to achieve optimum utilisation of water where the underlying principle of beneficial use informs allocation decisions. At present, the water permit system is the primary tool relied upon to regulate and allocate water resources (Sy, 2003). As the overarching water authority, NWRB is also responsible for regulating municipal waterworks systems.

Waterworks systems in the Philippines are categorised into three service levels as shown in Table 6.2 below. Level III service is seen as the most appropriate system in urban areas; however, implementing universal household connections is a difficult and expensive task. Urban water provision is primarily the responsibility of local government units. In 2003, the World Bank reported that water supply to approximately 1,500 local government units (LGUs) in the Philippines was managed either by municipal departments in the LGUs (about 1,200), or by autonomous water districts (around 300)[85] (World Bank, 2003).[86]

Service Level	Description
Level I	Point Source – a protected well or developed spring without a distribution system, which serves around 15 households. Level 1 services are generally located within rural areas or areas where houses are thinly scattered.
Level II	Communal faucet – system made up of source, reservoir and basic communal distribution network. One faucet serves 4-6 households and is generally suitable for rural and urban fringe areas where households are clustered.
Level III	Individual household connections – a system comprising a source, reservoir and a piped distribution network and household taps, suited for densely populated urban areas.

Table 6.2: Water Service Levels in the Philippines
Source: NEDA (2002).

There are three main government agencies responsible for overseeing waterworks systems. These are the Department of Interior and Local Government (DILG), Department of Public Works and Highways (DPWH), and the Local Water Utilities Authority (LWUA).[87] Each of these agencies has different roles and responsibilities associated with the production and distribution of water for municipal use. Moreover, their mandate to function is limited to different levels of service. While DILG provides overall guidelines to LGUs on all of their activities including water, LWUA is primarily concerned with providing funding and technical assistance to water districts for Level III services and DPWH is responsible for Levels I and II. These roles and responsibilities are outlined in Table 6.3 below.

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[85] Water districts are local corporate entities established to operate a water supply system in one or more provincial city or municipality, and are government owned or controlled corporations (LWUA, n.d).
[86] Water supply in the Metro Manila area is managed by the Metropolitan Waterworks and Sewerage System (MWSS). See World Bank (2003) and NEDA (2002).
[87] The exceptions are MWSS, and water districts and rural waterworks services associations, which fall under the jurisdiction of the Local Water Utilities Authority.

Government Agency	Authority to function	Roles and responsibilities
Local Water Utilities Authority (LWUA)	*PD 198 1973* and as amended[a]	• Specialised lending institution mandated to promote and oversee the development of provincial waterworks systems. • Responsible primarily for water services to provincial cities and urban communities with a population of 20,000 or more. • Provide assistance for development of Level III services. LWUA may also provide technical and expert advice to other water utility developers (van Vugt, 1998). • Provides services to water districts and rural waterworks and sanitation associations. • Over 590 water districts currently formed (LWUA, n.d).
Department of Interior and Local Government (DILG)	*RA 7160 The Local Government Code 1991*	• Provides guidelines for LGUs on their activities and enables them to make decisions over issues affecting their communities.
Department of Public Works and Highways (DPWH)		• Government department undertaking major infrastructure projects. • Mandated to undertake planning, design, construction and maintenance of infrastructure, such as roads and bridges, flood control, water resources projects, irrigation dams and other public works, in keeping with the national agenda for development. • One of the agencies deputised by NWRB to grant water permits and to monitor the activities of water permit holder.

Table 6.3: Government agencies' roles and responsibilities for municipal water

[a] Amendments are contained in *PD 768 1975* (Republic of the Philippines, 1975a) and *PD 1479 1978* (Republic of the Philippines, 1978b).

In addition to the regulatory controls imposed through each of these government departments, all waterworks utilities proposing to provide water for municipal supply are required to apply to the NWRB for a Certificate of Public Convenience (CPC) or Certificate of Public Convenience and Necessity (CPCN). The CPC/CPCN authorises the operation and maintenance of a waterworks supply service not requiring a franchise to operate.[88] The NWRB is mandated to monitor and regulate permits and the level of abstraction including for water utilities; however, the efficacy of NWRB to fulfil its mandate is constrained by the centralisation of its functions. Under the conditions of the CPC, the NWRB is responsible for regulating water rates to be charged by waterworks operators. In return, waterworks utilities are required to pay an annual supervision regulation fee.

[88] A CPCN is issued for the operation of a public service for which a franchise is required. Examples are electric, telephone, telegraph and other services that require excavation or the laying of permanent installation in public streets, roads and other public properties (NWRB, n.d).

The conditions for granting a CPC are reproduced from NWRB (n.d) in Box 6-1 below. [89]

Box 6-1 Conditions for granting CPCs/CPCNs

The NWRB, by virtue of PD 1206 Public Service Act (also known as Commonwealth Act No. 146) (Republic of the Philippines 1977), is vested with the jurisdiction, power to control, regulate and supervise waterworks utilities systems, nationwide, in the following:

1. Adjudicate and grant CPCs/CPCNs to applicant/operator of waterworks utility systems and services; the power to impose penalties for administrative violations and promulgate rules and regulations relative thereto;
2. Supervise and control all waterworks utilities and their franchises, and other properties, regulate and fix the water rates to be charged by waterworks operators, except those falling under the jurisdiction of the Metropolitan Waterworks and Sewerage System (MWSS) and the Local Water Utilities Administration (LWUA) and Water Districts;
3. Exercise original jurisdiction overall disputes relating to water rates of waterworks utilities except on water rate cases involving MWSS and LWUA (water districts) shall be appealable to the Board;
4. Impose and collect Annual Supervision Regulation fees or charges from waterworks systems and Public Utility operators (pursuant to Sec. 40, 2(e), CA 146 as amended)

Source: (NWRB, n.d).

Despite a relatively low water demand for domestic consumption in urban areas as a proportion of total water stocks, the Philippines has struggled to provide its people with adequate supplies in both rural and urban areas (World Bank, 2000). This is partly due to the lack of investment in infrastructure and improvements because of limited finances available to LGUs. The ability of waterworks utilities to provide urban water is also affected by problems such as pollution and water source degradation as well as capital expenses associated with infrastructure development. The current state of urban water in the Philippines has come about as a consequence of rapid population growth and urbanisation, which are a consequence of economic development strategies. For this reason cities in favoured economic growth areas, such as Manila and Cebu, are currently confronted with problems of securing water supplies for household consumers. However, other less-favoured areas have also suffered from lack of investment in urban infrastructure, which has been exacerbated by the growth of smaller cities such as provincial capitals including Tagbilaran, and municipalities and cities surrounding large metropolitan areas such as Mandaue City, which is adjacent to Cebu (Gultiano and Urich, 2003).

A number of studies funded by foreign development agencies have investigated institutional arrangements as they relate to water in the Philippines. These studies have consistently highlighted the fragmented nature of water resources institutions in the Philippines and the overlapping mandates for organisations involved in water resource management and

[89] The difficulties in understanding the system of governance regulating urban water services for those beyond the national government level are exacerbated by errors or incorrect use of language in official publications, such as in Box 6-1, as a consequence of producing documents in an 'official' language (English) which may not necessarily be the spoken language of communication.

development. Fragmentation and a sectoral approach to water resource management has meant that there have been overlaps and conflicts among agencies and a piecemeal approach taken to water management that does not necessarily consider the interaction between hydrological, social and economic systems.

Reports by Sy (2003), Navarro (2003) and World Bank (2003) as well as a report by Dayrit (2001), former executive of NWRB, identify systemic and internal problems with the NWRB including a small staff with limited financial resources that is centrally located in Manila leading to non-existent regional presence. The weak institutional environment and poor dissemination of information concerning procedures and requirements concerning water rights and permits gives rise to confusion amongst the public. Furthermore, there is a lack of effective communication and dissemination of information to the public over the importance of water resources and scarcity.

NWRB is generally regarded as having been unable to fulfil its entire mandate, concentrating mainly on the approval of water rights primarily around Manila, with little emphasis on enforcement (Navarro, 2003; Sy, 2003; World Bank, 2003). Furthermore, The Water Code has been seen as being weakly enforced, with NWRB unable to mediate conflicts in water demand, and provide sufficient planning and coordination of water resources management (World Bank, 2003).

As noted in Chapter 4 (Section 4.3), the discourse of integrated water resource management has found resonance with DENR and in current thinking on water governance in the Philippines. There is a desire to have in place river basin institutions; however, at present the Laguna Lake Development Authority near Manila is currently the only such institution with enforcement powers in the Philippines (World Bank, 2003). In 2003, House Bill 6126 to create an integrated water management authority in Cebu was submitted to Congress (Republic of the Philippines, 2003). The bill sought to create a water authority that would develop and manage water resources, including the protection and rehabilitation of watersheds. It was met with opposition because of fears from some mayors that House Bill 6126, once enacted into law, would mean local government units would lose control over water resources in their jurisdiction. There were also fears about how the bill would affect small water associations in communities and hasten privatisation of water supply (BALITA, 2003; Baquero, 2003; Calipayan, 2004). The bill is currently under consideration in the Senate.[90] The passing of *RA 9275 The Clean Water Act 2004* (Republic of the Philippines, 2004b), which emphasises a river basin approach and advocates the creation of water quality management areas, is expected to more easily facilitate the formation of river basin authorities. However, it is likely that any

[90] Known as S. No. 290, the bill as of 27 October 2005 was read on First Reading and referred to the committee on Government Corporations and Public Enterprises and the committee on Public Services (Republic of the Philippines, 2004a).

moves to adopt a river basin approach in the future will encounter similar political and social opposition as experienced in Cebu.

Despite DENR's orientation towards IWRM and the Province of Bohol's engagement with GTZ among others to institutionalise IWRM in Bohol as part of an on-going water resources strategy, the current institutional complexity overlaying water governance is a constraint to IWRM efforts. This is perhaps indicative of the need to re-think the appropriateness of the NWRB. However, a shift to a river basin approach is not easily achieved and, in the Philippines, may be more difficult because matters of water resource management can be highly political. While the case of Laguna de Bay is hailed as a success story, watershed management efforts in Cebu have encountered numerous difficulties as a consequence of the politicisation of water management issues and of water as an asset for development. Thus, while policy and development rhetoric construct a discourse of water governance that favours IWRM and community engagement in water resource management and matters of water supply, practical implementation is slower in coming. It seems unlikely that supplanting the NWRB for another overarching authority without taking into account the way in which power and politics affect decisions concerning water will resolve the institutional deficiencies identified. In the following section I consider how development policy and water governance institutions are brought together in Tagbilaran, giving rise to a system of hybrid governance.

6.4 The hybridisation of development and water policy in Tagbilaran

Development and water policy in Tagbilaran are a hybrid of supra-national, national and local influences. The result is a mélange of institutional mechanisms and interested parties converging in Tagbilaran to form strategies to facitilate the attainment of commonly held development goals. Sustainable development underpins development planning and policy in Tagbilaran, in which the delivery of basic services, improving quality of life, ensuring political, social, cultural and economic well-being and protecting and conserving the environment are priorities. Such an approach aligns with national objectives, where the persistence of poverty provides the impetus for development and a mixture of economic and social factors have been identified as important in the alleviation and reduction of poverty across the country (NEDA, 2001; Virola, Gañac and Bacani, 2000).

The local/national dialectic is exemplified in the formal planning hierarchy, wherein formal development plans are devised by all local government units and provincial governments in concert with the national bureaucratic development framework. As mentioned in Section 6.1, NEDA remains the key body responsible for present-day economic and social development planning in the Philippines. As such, NEDA formulates national annual, medium- and long-term economic and social development plans, and monitors approved national, sectoral and regional development plans and programs. These plans serve to coordinate government

agencies, LGUs, the private sector and affected communities in the formulation and implementation of infrastructure plans and projects and other national development strategies namely, agri-industrial development, tourism, and environmental management while bearing in mind Philippine Agenda 21 and the Philippine Strategy for Sustainable Development (Alburo, et al., 1995).

An important formal mechanism for development in Tagbilaran is the city's *Comprehensive Land Use Plan*, *2001-2011*. Comprehensive land use plans (CLUP) are drafted at the local government level to guide the spatial development of cities and municipalities in keeping with social, economic, environmental and infrastructural development goals and are based on the hierarchy of planning in the Philippines (City of Tagbilaran, 2001). Water resources and their management in Tagbilaran are implicated by the development approach pursued and the activities occurring within the city.

The City Government of Tagbilaran has amongst its goals achieving economic growth and fostering employment opportunities, providing a range of social services and facilities, developing efficient infrastructure, and protecting land and water resources (City of Tagbilaran, 2001). The City's goals are consistent with the development agenda of Bohol, wherein the main economic drivers for the Province are identified as eco-tourism and agri-industrialisation (Province of Bohol, 2004a), with sustainable development and poverty reduction underlying the Province's development ethos. A key strategy for Tagbilaran City in meeting these goals is tourism. Tourism has been identified largely as an outcome of the designation of Panglao Island as the Panglao Island Tourism Estate, but also because of the role played by the city as a gateway to the rest of the province (see Chapter 5, Section 5.2). To this end, plans to develop tourism facilities within Tagbilaran, such as hotels and restaurants, require reliable potable water supply (City of Tagbilaran, 2001). Consequently, demand for good quality water and stable supply is being driven by this sector. Moreover, economic growth and the creation of employment opportunities are driving industrial/commercial and domestic demand because of industrial/commercial developments and urban growth as a result of rural-urban migration.

Overarching development planning in Tagbilaran is the Bohol Medium-Term Development Plan (BMTDP). This plan charts the course of the Provincial Government's plans and programs and steers Tagbilaran as a component city and all other municipalities in Bohol towards achieving the provincial development agenda. The provincial plan is an LGU planning mechanism developed by the provincial government with input from civil society, the private sector and other government agencies,[91] and identifies development objectives and strategies for the province in alignment with the national agenda. The scope of the BMTDP is broad and

[91] Including provincial development councils where one exists.

covers economic, social and environmental facets of development.[92] The planning horizon for the current BMTDP is the period 2004-2009.

The BMTDP takes a sectoral approach towards development planning, reporting on the current situation in each sector, as well as identifying objectives and projects and programs to meet those objectives.[93] The BMTDP acknowledges the problems associated with urban population and population density, the increasing demand for urban services and problems of unplanned settlement and land degradation as a consequence of sprawl. This is particularly relevant for Tagbilaran City as the most significant urban area in the province in terms of both size and its role as the provincial capital, major port and area of greatest commercial activity. In terms of urban water in Tagbilaran, several projects and programs have been identified which affect Tagbilaran. These have been summarised in Table 6.4, along with the key implications for Tagbilaran in terms of urban water supply.

[92] An important companion to the BMTDP is the *Provincial Physical Framework Plan, 2003-2022,* which is concerned with regulating and integrating the Province's land use policy agenda to guide the allocation, utilisation, development and management of the physical resources in the province.

[93] The sectors within the context of the BMTDP planning and development framework are: Social Development Sector, Economic Development Sector, Environment and Natural Resources Management Sector, Development Administration Sector, and Infrastructure Development Sector.

Table 6.4: BMTDP projects and programs significant for urban water in Tagbilaran

Sector	Project/Programs	Key implications for Tagbilaran's water security
Environment and Natural Resource Management	• To rehabilitate 3,400 hectares of open and denuded areas within the watershed and forest reserves	• Positive outcome for entire province by ensuring water security and creating opportunities for improving livelihoods in rural municipalities, which may reduce rural-urban migration.
	• Implement community-based reforestation program	• Positive outcome for entire province by ensuring water security and creating opportunities for improving livelihoods in rural municipalities, which may reduce rural-urban migration.
	• Develop and implement a karst landscape management program	• Knowledge and capacity building for decision-makers, planners and communities about karst, which can be transferred into all karst environments in the province including Tagbilaran.
	• Protect and rehabilitate small watersheds that are potential sources of water supply	• Positive outcome for entire province by ensuring water security and creating opportunities for improving livelihoods in rural municipalities, which may reduce rural-urban migration. • Could provide future water sources for water supply to Tagbilaran and other municipalities.
	• Implement the Provincial Water Supply, Sewerage and Sanitation Sector Plan	• Improvements in water quality and efficiency in Tagbilaran and across the province.
	• Implement the integrated Ecological Solid Waste Management Act with the involvement of *barangays*	• Minimisation of groundwater contamination as a consequence of leachate entering the water system.
	• Conduct a comprehensive hydrological study for the whole province	• Help to reduce some of the existing uncertainty because of paucity in data and assist in planning and decision-making to ensure more sustainable use and management of water resources.
	• Implement laws and proposed measures in support of the campaign against water and air pollution	• Means for ensuring ameliorative action to reduce the potential for water pollution and to increase awareness concerning pollution amongst residents in Tagbilaran and throughout the province.
Infrastructure	• Construct drainage facilities in Tagbilaran City	• Reduce flooding and contamination associated with storm water run off.
	• Provide a province-wide master plan and detailed engineering studies for water, wastewater treatment plants and sewerage using the surface water of Loboc, Abatan and Inabanga Rivers	• Loboc identified as a potential future source of water for Tagbilaran and other municipalities.
	• Expand the service coverage for water supply in urban areas	• Social benefits to households in urban areas (such as Tagbilaran) through the provision of urban water supply as well as providing opportunities for economic growth and development.

As Table 6.4 indicates, the management of Tagbilaran's water resources are prioritised within the province's overall development objectives directly through the implementation of projects and programs specifically targeted to Tagbilaran, and indirectly through province-wide initiatives. The prioritisation of infrastructure development and environmental management to ensure water security in Tagbilaran and the province more generally is seen as important for ensuring social and economic development, improving livelihoods, and is an important component in alleviating poverty.

The Province's focus on poverty reduction reflects its own concerns with poverty and its ranking within the poorest 20 provinces in the country,[94] as well as the national priority development objective of the *Medium-Term Philippine Development Plan 2004-2010*. To this end, the Province's "Program Framework on Poverty Reduction" and President Arroyo's "10 Point Agenda" (see Box 6-2) have been formally incorporated into the BMTDP. Moreover, the BMTDP has also integrated the MDGs into its policy formulation and program objectives.[95] As part of its program for reducing poverty, the Provincial Government of Bohol in collaboration with the Bohol Local Development Foundation and the Holy Name University Research Center are currently developing a province-wide database using 12 poverty indicators, including determining access to water sources for domestic use, to identify at risk members of society. The "Local Poverty Reduction Action Plan" database enables target *barangays* and households to be identified for livelihood support and delivery of basic services and is a collaborative effort between the Provincial Government, local governments and non-governmental organisations (Bagaipo, 2006).[96]

Beyond formal development planning in Tagbilaran which conforms to the top-down development planning hierarchy governed by NEDA, development, water governance and environmental discourses emanating from the global arena have also been localised in the city. Examples include the formulation of the *Environmental Management Code* of the City of Tagbilaran and the implementation of supra-national initiatives which address urban environmental management, planning and development issues and the presence of civil society groups.

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[94] Late in 2005, Bohol was ranked 41 out of 79 provinces based on the 2005 Philippine Human Development Report, thereby elevating its status out of the 20 poorest provinces in the country (Sanchez, 2005).

[95] The MDGs are mentioned in Chapter 1 (Section 1.2). See also United Nations (2005). For an overview of the Philippines progress in achieving the MDGs see, for example, Collas-Monsod, Monsod and Ducanes (2004).

[96] To date databases have been completed for 37 municipalities in the Province. The project commenced in 2003 and currently receives funding from the British government (Bagaipo, 2006).

Box 6-2: President Arroyo's 10-Point Development Agenda

In her inauguration speech on 30 June 2004, President Gloria Macapagal-Arroyo outlined her "10 Point Development Agenda" to guide her during her 6-year term (2004 – 2010) and which also underpins the Medium Term Philippine Development Plan 2004. Poverty remains a particular development concern.

The 10 Point Agenda seeks to address development issues related to livelihood, education, fiscal policies, decentralised development, and creating national harmony. The ten points are:

1. Ten million jobs shall have been created (through loans to small business owners and by the development of 2 million hectares of land for agricultural business).
2. Universal education (through the construction of new school buildings and classrooms, improving educational resources including books and computers, and providing scholarships to poor families).
3. Balancing the budget.
4. Development of the transport networks and digital infrastructure.
5. Provision of power and water supply to all *barangay*s.
6. Decongestion of Metro Manila and promoting the spread of economic activity to other centres of government and business in Luzon, the Visayas and Mindanao.
7. Development of the Subic-Clark area as a competitive international service and logistics centre in the Southeast Asian region.
8. Computerisation of the electoral process.
9. Peace agreements in Mindanao and other insurgency areas.
10. Closure over the divisive issues generated by EDSA 1, 2 and 3.

Source: NEDA (2004b:1-2).

The *Environmental Management Code* of the City of Tagbilaran was approved in 2000 following three years of preparation and development and is a locally negotiated legal and policy framework derived to ensure holistic management of environmental and natural resources in the city and to promote sustainable development. Its primary purpose is to improve the quality of life across ecological, social and economic contexts (City of Tagbilaran, 2000). The protection of water resources through the prevention of pollution and regulating abstraction are specifically identified, and conform to the requirements and regulations determined through the national Water Code. Provisions for ensuring water security are also indirectly addressed through measures which aim to protect the city's environment and natural resources such as building regulations, and provisions governing land use and solid waste management.

The City code complements the *Bohol Environment Code*, which was enacted in 1998, and was the first provincial environment code in the Philippines. The *Bohol Environment Code* provides the framework for Bohol's development objectives and mandated the creation of the Bohol Environment Management Office (BEMO) within the Provincial Government. BEMO shares responsibility with LGUs, DENR and other government agencies for the protection, development, management, rehabilitation and conservation of environment and natural resources in the province, along with regulating and supervising the use of natural resources, and enforcing environmental and natural resources laws, rules and regulations *inter alia* (Province of Bohol, 1998). In practice, BEMO is the provincial body which implements

environmental programmes that have been devolved to LGUs through the LGC as well as functions and responsibilities devolved from DENR. Freshwater resources fall beyond BEMO's mandate.[97] Instead planning for water and other environmental resources, as well as monitoring of programs is undertaken through the Environment Section of the PPDO. The PPDO is responsible for ensuring the integration of all plans—comprehensive land use plans, provincial medium-term development plans, annual plans and so on—within the province.

The Provincial Government of Bohol and the City Government of Tagbilaran can be seen, therefore, as approaching development in accordance with the national hierarchy, but also extending beyond these strict mandates to create institutions (policy, frameworks, programs and so on) which reflect, and are shaped by, local social, cultural, and political factors. Moreover, the involvement of civil society in development and governance, as mandated by the LGC and the Constitution, has played a vital role in influencing the formulation of development policies and projects, as well as implementing projects and programs aimed at improving environmental, social and economic conditions. The presence of environmental and other NGOs demonstrates the vibrancy of environmental and social movements amongst civil society in Bohol.[98] In addition, many of these NGOs have affiliations and links with other organisations around the world and are able to enhance their level of knowledge about environmental issues which strengthens their ability to lobby policy-makers, or to secure funding for development projects.

Furthermore, development in Tagbilaran has also been shaped by engagement with transnational networks of sub-national governments aimed at overcoming urban environmental problems in order to promote more sustainable practices in urban areas. For instance, three major initiatives which have been undertaken since 1998, and which have had significant impact on the city, are the UNDP 'Strengthening Local Environmental Planning and Management Project' (1998), the AusAID/ADB 'Philippine Regional Municipal Developing Project (PRMDP)' (1998) and the International Council for Local Environment Initiatives (ICLEI) 'Cities for Climate Protection' (1999). Each of these initiatives places an emphasis on enhancing local government capacity to improve urban management and environmental concerns; however, none of these initiatives has water resources as their central focus. Nevertheless, these initiatives illustrate how local development can be shaped by supra-national influences.

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[97] The sectors which BEMO focuses on are mining, forestry, coastal resource management and solid waste management.

[98] The Asia Forest Network, Bohol Nature Conservation Society (BONACONSO), Bohol Initiators for Sustainable Agriculture and Development (BISAD), Bohol Alliance of Non-Government Organizations (BANGON) and Soil and Water Conservation Foundation (SWCF), Bohol Integrated Development Foundation Inc., (BIDEF), Philippine Tarsier Foundation, Inc., are some of the NGOs actively involved in environmental and resource management in the province.

Plans and policy statements encompassing social, environmental and economic strategies for development such as those discussed above are pertinent to the operation and provision of water for municipal purposes in Tagbilaran City. In particular, protection from saltwater intrusion and foreign contamination are vital to ensure the integrity of water sources for the city. The problem of saltwater intrusion has been acknowledged but the means by which this should be solved are not explicitly addressed in environmental policy in Tagbilaran except to say that new wells shall not be located in areas in which saltwater intrusion has already occurred. Instead, the problem of saltwater intrusion is bundled together with other water quality concerns. Water quality guidelines for drinking water are a public health concern and are dealt with by the Department of Health. Waterworks utilities are responsible for ensuring compliance with Department of Health regulations concerning water quality; therefore, responsibility rests primarily with the waterworks utility to ensure the water they provide is not saline. To this end, waterworks utilities may opt to replace higher-powered pumps or to reduce their drawdown at pumping stations, or to abandon pumping in salt-prone areas.

According to one informant, a number of pumping stations in Tagbilaran have been rehabilitated to ensure pumping does not exceed the safe yield thereby mitigating over-drafting and the risk of saltwater intrusion. At least one pump has been downgraded from 30 horsepower to 15 horsepower after drawdown tests revealed salt water intrusion (WW#3). In addition, some pumping stations have already been phased out since the level of salt was beyond permissible amounts as determined by the National Standard for Drinking Water of the Philippines and World Health Organization Standards (WW#2).

Pollution of groundwater sources because of poor solid waste management is another area of concern in Tagbilaran. As well as negatively impacting on the physical environment, poor solid waste management presents risks for human health and safety including the contamination of groundwater sources. In terms of safeguarding water resources in Tagbilaran, the enactment of *RA 9003 Ecological Solid Waste Management Act of 2000* provides national guidelines and recommendations for improving solid waste management which seeks to mitigate negative social and environmental impacts associated with solid waste and unsanitary waste disposal (Republic of the Philippines, 2001). The provisions of this act will soon mean that open dumpsites such as at Dampas, Tagbilaran, will be prohibited. A requirement of *RA 9003 2000* is the establishment of sanitary landfills by January 2007. Because of the expense associated with designing, constructing and maintaining sanitary landfills, *RA 9003 2000* has provision for landfill clusters to be formed, whereby cities and municipalities are able to share facilities. At present, there are six proposed landfill clusters for the Province. Tagbilaran City is in Cluster A (see Table 6.5). An informant from the City Government confirmed that studies concerning design and location are ongoing and include localised analysis at potential sites of the subsurface drainage and karst system in order to ensure groundwater contamination does not occur (LG#1). The City Government is also working on enhancing education at the household

level on better solid waste practices as well as working towards improved separation of recyclable and non-recyclable material.

Cluster	Cities and Municipalities
A	Tagbilaran, Cortes, Corella, Maribojoc, Dauis, Panglao, Alburquerque, Baclayon
B	Tubigon, Loon, San Isidro, Clarin, Calape,
C	Carmen, Sagbayan, Batuan, Dagohoy, Bilar, Sierra Bullones
D	Talibon, Getafe, Buenavista, Inabanga, San Miguel, Trinidad, Danao
E	Ubay, Alicia, Bien Unido, Mabini, Pilar, Pres. Garcia
F	Jagna, Garcia-Hernandez, Duero, Anda, Guindulman, Candijay
G	Dimiao, Lila, Loay, Loboc, Valencia
H	Sevilla, Sikatuna, Balilahan, Catigbian, Antequera

Table 6.5: Landfill clusters for Bohol
Source: Obtained from BEMO, 2004.

Awareness and concern amongst local residents about the importance of sanitary practices and the potential impacts on health as a consequence of water pollution are generally lacking, signalling the need for a massive and sustainable education campaign (City of Tagbilaran, 2001). Improving sewerage treatment beyond the household level has been identified in the BW4SMP as an area for intervention not least because of the negative effects on health that poor sanitation can cause. According to the Tagbilaran CLUP, diarrhoea and vascular disease are the two leading causes of morbidity in Tagbilaran City, of which 40 percent of cases are attributed to diarrhoea caused by water borne diseases. The increasing incidence of kidney problems has also been noted.

> The high incidence of diarrhea [*sic*] is attributed to fecal [*sic*] contamination of the underground source wherein there is no sophisticated water treatment except chlorination. Aside from contamination, the water supply has a high turbidity due to its mineral content collected from the water which is predominantly of limestone formation. Most of the kidney cases in the city are caused by the turbidity of the drinking water (City of Tagbilaran, 2001: 65).

There are plans to establish an efficient sewerage system, including treatment plant, which will have positive effects by minimising the risk of groundwater contamination from this source (City of Tagbilaran, 2001). The CLUP identifies the establishment of an efficient sewerage system, including treatment plant, as an important sectoral goal, which will have positive effects by minimising the risk of groundwater contamination from this source (City of Tagbilaran, 2001). Improvement of the drainage network has also been identified within the CLUP, the BMTDP and BW4SMP as being a priority.

There is a desire amongst NGOs and City Government to preserve recharge areas and sinkholes in the city in order to ensure the integrity of groundwater in Tagbilaran. This has arisen in light of the growing awareness of the interconnectedness of the groundwater system and the anthropocentric risks associated with urbanisation. It has, therefore, been suggested that these areas be designated as tree parks, declaring them as non-inhabitable areas and prohibiting

development and construction on these sites. The City Government could then purchase these areas and pay compensation to landowners. For those not willing to sell, they would be asked to conform to and follow the City's land use plan.

> *If natural recharge areas are covered by development or buildings it would be, if you can imagine, our water sources would be more critical. We will have problems.* [*This is*] *the only way to preserve underground water* (LG#1).

Some sinkholes, however, are owned privately and owners cannot be prevented from developing them. Similarly, DENR is unable to intervene since privately owned recharge areas in Tagbilaran fall beyond their mandate, which is primarily concerned with watershed management in critical watershed areas and those areas with slope in excess of 18 percent (see Chapter 4, Section 4.3).

> *Water sources in Tagbilaran are privately owned so we have no jurisdiction. We encourage people to plant trees and to preserve water and not to deplete water sources. But in watersheds, we have direct input. We plant trees, construct gabions and other projects like that* (LA#2).

As a consequence, the interconnectedness of the sinkholes has given rise to discussions on how best to protect groundwater resources as demonstrated in the following quote:

> *Our sinkholes are connected. If* [we] *only protect* [a] *portion it will not be enough because they are saying that the sinkholes are interconnected* (LG#1).

Enhancing supplies from other groundwater and freshwater sources external to Tagbilaran City has also been identified as an important strategy. Concerns over the inability of Tagbilaran waterworks utilities to secure adequate water supply from within Tagbilaran, declining water quality of wells and concerns over public health precipitated the decision to locate production facilities in the neighbouring municipality of Corella, located 10 kilometres from Tagbilaran.[99]

As well as providing water resources to Tagbilaran, Corella is implicated in Tagbilaran's growth because it is anticipated that a growth corridor from Tagbilaran to Corella will emerge as a consequence of outward growth and development along the Tagbilaran-Corella road. The Municipality of Corella comprises an area of 3,772 hectares. The 2000 census recorded a population of 6,048 and the number of households as 1,263 with an average population growth rate of -0.97 percent per year for the period 1990-2000 (National Statistics Office, 2000). The municipality comprises eight *barangays*. These are: Anislag, Canangca-an, Canapnapan, Cancatac, Pandol, Poblacion, Sambog, and Tanday. Table 6.6 presents area, population and population density information for the *barangays* of Corella.

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[99] Other potential sites for future development identified include the Loboc River watershed.

Barangay	Area (hectares)[(a)]	Population[(b)]	Population Density Persons/hectare
Anislag	214	892	4.17
Canangca-an	800	736	0.92
Canapanapan	544	709	1.30
Cancatac	657	854	1.30
Pandol	331	549	0.67
Poblacion	310	817	2.64
Sambog	298	872	2.92
Tanday	568	619	1.09
TOTAL	**3,722**	**6,048**	**1.60**

Table 6.6: Area, population and density for *barangays* in Corella
Sources: [(a)] Municipality of Corella (2001); [(b)] National Statistics Office (2000).

In contrast to Tagbilaran, the economy of Corella is largely agricultural mostly for direct consumption although surplus produce is sold either locally or in Tagbilaran. The main crops grown are rice, corn, root crops and some green leafy vegetables. Livestock such as pigs, goats, *carabao*, chickens, cows and ducks are commonly raised in the municipality for individual consumption and commercial marketing to nearby towns especially Tagbilaran. Approximately 700 hectares of land within Corella is classified as timberland (Municipality of Corella, 2002; 2001). Corella also relies on groundwater supplies for household water consumption and is located in a karst limestone environment.[100]

Like Tagbilaran, Corella's water resources are exposed to the risk of pollution and contamination because of a lack of adequate drainage and sewerage networks (Municipality of Corella, 2002; Province of Bohol and SWECO, 1999b). Similarly, solid waste management is an area of concern for the municipal government. This concern has been addressed somewhat through the inclusion of Corella in the Tagbilaran landfill cluster discussed above. Along with the risks posed by these urban-type activities, groundwater sources in Corella are also vulnerable to contamination because of agricultural practices including pesticide and fertiliser use, as well as land clearing, and resource extractive industry.

As in other parts of the Province, environmental problems and governance concerns have filtered into government planning and non-government activities in Corella. For instance, the Corella CLUP posits sustainable development of the municipality for current and future generations as the rationale underpinning planning and development in the municipality; the preferred development strategy for the municipality is to enhance sustainable agro-industrial development and tourism within the community (Municipality of Corella, 2002).

[100] The geology underlying Corella is Maribojoc limestone and Carmen Formation (Province of Bohol and SWECO, 1999a).

In addition, there is a marked level of awareness concerning environmental problems—both local and global—within the municipal government and general population. This is partly as a consequence of NGO and peoples' organisations' interventions and environmental education and information campaigns undertaken by the Municipal Agriculture Officer and the Municipal Health Officer. Programs have included sanitation, with a focus on toilet facilities, and how water sources can come to be polluted (LG#3). NGO initiatives such as the three-year *Corella Youth Environmental Internship Project*[101] aimed at raising the level of environmental awareness amongst young people in Corella and a local group of youths, *Kobataan sa Corella Nagpakabana sa Kinaiyahan*,[102] continue to have a focus on environmental issues and to positively influence behaviour in the municipality. In addition, the promotion of more sustainable agricultural practices such as composting and the use of organic fertiliser (*guano*) are on the rise and have positive externalities for water resources by reducing the risk of contamination through the use of inorganic fertilisers.

Environmental awareness in the municipality is also due to the presence of a native, endangered faunal species which is the target of conservation efforts. The threat to the Philippine Tarsier, a small primate which inhabits Corella, is specifically recognised and accounted for by the municipal and national governments. The Philippine Tarsier, *Tarsius syrichta*, is an endemic threatened species listed as 'Lower Risk/Conservation Dependent' by the IUCN,[103] and was declared a specially protected faunal species with the passing of *PP 1030 1997*,[104] which facilitated the establishment of appropriate sanctuaries to preserve and protect the species as prescribed under the provisions of *RA 7586 National Integrated Protected Areas System* (*NIPAS*) *Act of 1992*.[105] The establishment of the tarsier sanctuary on 134 hectares of forest land in Corella complete with a visitor complex and local tour guide serves as an eco-tourist attraction in Corella. Likewise, other forested areas populated with tarsiers are also envisaged as eco-tourist attractions.

Efforts to protect forested areas for tarsier habitation and other conservation practices, to promote eco-tourism, and to raise environmental awareness about the use of fertiliser have created positive externalities for water resources by prohibiting or restricting activities which could adversely affect groundwater quality. In addition, with considerably lower population

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[101] The Corella Youth Environmental Internship Project was undertaken in 1997 by the Soil and Water Conservation Foundation, a Cebu-based NGO, with funding from the Children and Youth Foundation of the Philippines.
[102] Youth of Corella who are concerned with the environment.
[103] This classification indicates that while the species is not yet critically endangered or vulnerable, it may qualify as such unless measures are taken to conserve numbers. See http://www.iucnredlist.org for listings and classifications of threatened species.
[104] *PP 1030 1997 Declaring the Philippine Tarsier (*Tarsius Syrichta*) as a Specially Protected Faunal Species of the Philippines* (Republic of the Philippines, 1997).
[105] *RA 7586 1992: National Integrated Protected Areas System (NIPAS) Act of 1992* (Republic of the Philippines, 1992b).

density and size than Tagbilaran, impacts on recharge patterns are not as altered in Corella and the pressure on resources from Corella consumers is lower.

The formal arrangement linking Tagbilaran's growth and Corella's water are Memorandums of Agreement (MOA), the first of which was signed in January 1997. The implications of the MOA and inter-jurisdictional transfer of water between Corella and Tagbilaran on water governance institutions are wide-ranging. However, despite the linkages created there is an absence of explicit inter-jurisdictional water resources planning being undertaken between Tagbilaran and Corella. Instead, the Provincial Government, through the mechanisms described above, is responsible for overseeing the coordination of activities and planning for water resources while the waterworks utilities are responsible for production and meeting consumer demand.

6.5 Summary

Development strategies in the Philippines have primarily focused on economic growth firstly as a national project spearheaded by government policy and intervention, moving towards market-led growth strategies. As a consequence of changing development paradigms and transformations in the country's political economy, the way in which the public sector functions has also changed such that government administration in the Philippines has adopted a more business-like approach in the way it performs. In addition, decentralisation and devolution have ostensibly shifted decision-making power, authority and responsibility for services to lower levels of government.

For local governments, managing groundwater resources in a manner that ensures sustainable supplies into the future has been shown to be very difficult given social, political and institutional factors particularly where hydrological data are also deficient. These deficiencies are recognised and recommendations to overcome these problems have been made and articulated in policy statements at the national and sub-national level. Most notably, integrated water resource management is seen as holding great potential for overcoming uncertainty in water resource management and allocation in the Philippines. This paradigm shift from a sectoral to a river basin approach is regarded as important to overcome some of the inefficiencies that currently belie comprehensive water management across the Philippines including Tagbilaran. To this end, calls for institutional reform abound, including the proposed creation of a new apex body to replace the NWRB.

In Tagbilaran, development policy and water governance have been informed by a variety of sources both formal and informal. The Provincial and City governments' environment codes can be seen as an internalisation and rearticulation of national and supra-national discourse aimed at guiding development and decision-making at the local level with modifications made to suit the context within which they are located. At the same time, comprehensive land use

plans and medium-term development plans set the agenda for development in Tagbilaran and Bohol, in keeping with national mandates and in conformance to the national development planning framework. In addition, the presence of environmental and other NGOs as well as transnational networks have further influenced development processes and planning in Tagbilaran. By drawing on different sources and engaging a variety of actors, a hybrid system of governance is emerging in Tagbilaran. This system of governance has as its overall objective to improve development conditions within Tagbilaran as well as the rest of the Province of Bohol. As this chapter demonstrated, this has manifest in strategic alliances between the state (as represented by national and sub-national governments), NGOs and the private sector to ensure the long-term provision of urban water supplies as an integral development objective through myriad means. These include the creation of formal institutional mechanisms (water policy and legislation), NGO advocacy and involvement in environmental and social development planning (such as the environment codes), and legislation to create and regulate an enabling environment for private sector participation. In the following chapter I continue to explore the concept of hybridity with respect to the municipal water supply networks existing in Tagbilaran.

Chapter 7 Municipal Water Supply in Tagbilaran

7.1 Introduction

As demonstrated in the previous chapter, the localisation of discourses in Tagbilaran have been mediated by local contextual factors giving rise to the formation of a hybrid governance system comprising public-private, global-local and other mixed institutions. Improving the efficacy of urban water governance requires acknowledging this emerging hybrid system and recognising the importance of context and local conditions.

This chapter builds on the previous one by providing an in-depth account of municipal water supply in Tagbilaran to elucidate the hybrid waterworks system that has emerged in the city, which is embedded in the localised, hybrid governance system presented in Chapter 6. I draw on multiple sources including interviews with informants from the waterworks utilities, local and provincial government, non-governmental organisations as well as local newspapers. I begin by identifying three key factors which have led to hybrid water supply in Tagbilaran: the presence of two waterworks systems, sourcing water from multiple local government jurisdictions, and the involvement of the private sector. I then provide an account of the hybrid system currently operating in Tagbilaran before revealing some of the transformations which have occurred as a consequence of hybridity, particularly from the point of view of water planners and managers in Tagbilaran City.

7.2 The emergence of a hybrid waterworks system in Tagbilaran

The hybrid water system currently existing in Tagbilaran began with a single waterworks utility over 80 years ago. The first waterworks system in Tagbilaran was the Provincial Waterworks System (PWS), which was established in 1924. In December 1932, the PWS was granted a franchise by the Public Service Commission allowing the Provincial Government to operate, administer and maintain a waterworks system through the Provincial Public Utilities Department (PPUD)[106] for the then municipality of Tagbilaran and the town of Dauis.

The first step towards a hybrid waterworks system occurred in 1962, when the *barangay* waterworks was established to supply water to areas not served by PWS. This new system covered the districts of Tiptip, Manga, Ubujan and Taloto as per the Presidential Assistance on Community Development, later becoming the Tagbilaran City Waterworks System (TCWS). In 1982, TCWS started to operate as an adjunct of the City Engineering Office then in 1988, it

[106] The Provincial Public Utilities Department was responsible for administering and maintaining the Provincial Waterworks System as well as the Provincial Electric System. The coverage area for both utilities was essentially limited to Tagbilaran.

began operating as an autonomous unit directly under the City Mayor's Office (City of Tagbilaran, 2003; Province of Bohol, 2000a).

When PWS was initially granted the franchise to operate in Tagbilaran, the water system comprised two wells and two reservoirs. Over time the system expanded with increases in the number of pumping stations, reservoirs and pipe distribution networks; however, water rationing, low water pressure, and water stoppages during brownouts,[107] were common problems. In 1997, the Provincial Government secured a five-year P35 million loan to expand and rehabilitate PWS pipelines and pumping stations supplying water to Tagbilaran. One area of concern was the level of system losses occurring, which were around 46 percent before the Provincial Government commenced the rehabilitation programme. Upgrading and rehabilitation were completed in 1998 with the total cost approaching P80 million. According to one informant, these costs covered the replacement of distribution lines and the construction of some additional distribution lines within the city as well as the construction of five pumping stations in the neighbouring municipality of Corella with transmission lines to Tagbilaran (WW#2).

Locating pumping units and reservoirs in an adjacent municipality enabled the PWS to improve their service and expand their network substantially, and led to further hybridisation of Tagbilaran's municipal water supply. The Provincial Government negotiated an agreement with the Municipality of Corella to establish reservoirs and five pumping stations in Corella, which was ratified through a five-year Memorandum of Agreement (MOA) signed in 1997. The first of the Corella-based pumping stations became operational in March 1997, with the remainder being operational by the end of May 1997. The water production facilities in Corella provided PWS with an additional 5,000 m^3 per month, which substantially supplemented production at Tagbilaran-based wells and enabled residents in Tagbilaran to have 24-hour water supply for the first time (Bohol Chronicle, 1997a; 1997c). The gradual improvements in the PWS service and system losses which occurred as a result of the programme of rehabilitation and construction of additional wells in Corella are illustrated in Table 7.1.

Year	Source of Water	No. of Pumping Units	Service	Systems Loss
Before 1993	Tagbilaran	10	4-6 hours	46%
1993	Tagbilaran	17	4-6 hours	46%
1997	Tagbilaran Corella	16 5	24 hours, 90% of service area	29%
1999	Tagbilaran Corella	16 5	24 hours, 90% of service area	25%

Table 7.1: Overview of the PWS services
Source: Province of Bohol (2000a).

[107] Power failures are referred to as brownouts.

The Provincial Government's obligations under the terms of the 1997 MOA also extended to providing for the Municipality of Corella's water needs. Along with the five pumping stations established for Tagbilaran municipal water, the Provincial Government also established a well, pumping station and reservoir to be turned over to the Corella Waterworks System. In addition, the municipality was granted free access to water flowing to Tagbilaran.

Unquestionably, households in both Tagbilaran and Corella benefited from the decision to develop pumping stations in Corella since improvements in water production enabled more secure water supply to households. Citing an awareness of the need to anticipate future growth and demand and the difficulty for the Provincial Government to undertake continuing upgrading, expansion and investment, in 2000 Governor Rene L. Relampagos undertook to privatise the PWS.

The entrance of the private sector into Tagbilaran's municipal water supply is another important factor which has contributed to the emergence of a hybrid waterworks system in Tagbilaran. In December 2000, Bohol Water Utilities Inc. (BWUI), assumed operation of the waterworks system from the Provincial Government. BWUI is a public-private joint venture company formed as the result of the partial divestiture of the Provincial Waterworks System (PWS). The parties to the joint venture agreement were the Provincial Government of Bohol and Salcon.[108] The Provincial Government has a 30 percent equity share of BWUI while Salcon's share is 70 percent.

Despite accusations that the decision to privatise was conceived and implemented hastily, counter-claims assert that the move to privatise was consistent with long-term planning devised earlier, some respondents noting that such a move was already mooted around 1995. A review of the *Bohol Chronicle* from 1997 onwards documents the negotiations and discussion between the Provincial Government and interested investors (for example, Arigo, 1997a; 1998; 1997b; Bohol Chronicle, 1997d; 1997e).

The rationale behind the decision to privatise was that the Province did not have the means to sustain the water (and electric) supply for two main reasons. Firstly, the Provincial Government lacked the money needed to sustain the quality of service. In particular, repayment of the five-year P35 million dollar loan to rehabilitate the system in Tagbilaran created a burden on the Provincial Government's finances. In addition, concerns existed as to whether the Provincial Government could sustain the service and capital costs over the long term. The Provincial Government claimed that the cost of production was higher than sales and that they were unable to recover costs. Costs were exacerbated by system losses and delinquent

[108] Salcon here refers to the consortium comprising Salcon Philippines, Inc., Salcon Limited, and Salcon International, Inc. that were parties to the signing of the joint venture agreement in 2000 (Province of Bohol, 2000b).

consumers with outstanding accounts. A key objective for the Provincial Government was to reduce system losses, which had been significantly reduced following the rehabilitation programme undertaken in 1997/1998 but remained at around 24 percent of water produced in 1999 (Province of Bohol, 2000a). The water losses were largely because of leaking and undersized pipes and general poor condition of the system not rehabilitated in 1997/1998, as well as illegal connections, hence the Provincial Government recognised the need for further system rehabilitation including the replacement of pipes, many of which had been there for 40 years.

Secondly, the Provincial Government did not have the means for expansion to cover additional towns as desired since more than P10 million was diverted annually to fund the operation and maintenance of the PWS, whose beneficiaries were largely limited to Tagbilaran (Province of Bohol, 2000a). Despite being called the 'Provincial' Waterworks System, the coverage area of the PWS was essentially limited to Tagbilaran City and parts of Dauis, a neighbouring municipality. The Provincial Government has a responsibility to all 47 municipalities in the province for ensuring, among other things, the production and distribution of water. Provision of water to each of these municipalities is, however, expensive.

When asked about the decision to privatise the waterworks utility, a senior person in the Provincial Government responded by saying that the Provincial Government sought to secure a long-term solution to the problem of water supply in Tagbilaran in light of ongoing maintenance, needed expansion, and financial constraints (PG#1). Moreover, this respondent felt privatisation removed the bias for urban area allocation and utilisation of funds, enabling funds to be freed-up for disbursement to other municipalities (PG#1). This reflects the sentiments of the Province as documented in a report produced in 2000 (Province of Bohol, 2000a). Furthermore, privatisation was seen as a means of overcoming some of the political problems encountered by local governments in running public enterprises. In particular, the observation was made about how difficult it is for local government units to run public enterprises such as water because "politics is a reality in the Philippines" (PG#1) and attempts to raise tariffs or to address delinquency of accounts and other politically unpopular decisions could have political consequences for incumbent political leaders.[109] This sentiment was shared by others within the city government as well, as the following quote demonstrates:

[109] Reports of the converse have also been documented in the Philippines, that is, where water systems have been used for political leverage. Mercado (1998) reports cases in Negros where *barangays* who voted for the elected politicians were given access to water, while water to those *barangays* who supported the opposition was withheld.

> *[People are] used to it being the government, because if they fail to pay their bill they can approach the governor and say they will vote for him if he will let them get away with not paying. The people can exert political pressure. They [politicians] are vulnerable to political pressure from down below – the people are the source of them staying in power (LG#5).*

Moreover, the lack of ability to adequately plan for water resources (and other natural resources) was seen as being due to politics:

> *The planning framework is 3 years* [*which correlates to the term of a politician*]. *There are very few who are able to think 10 years into the future* (CS#3).

Not only are Tagbilaran and the Philippines as a whole seen as being highly political, but the political environment and many within government are seen as being prone to corruption. *The Global Corruption Report 2004* (Transparency International, 2004b) reported the Philippines as having the dubious honour of having two of its former presidents in the list of 10 most corrupt world leaders: President Ferdinand Marcos (1972-1986) at number two and President Joseph Estrada at number ten (1998-2001).[110] In 2004, the Philippines was ranked as equal-11th most corrupt country[111] in the world based on the Transparency International Corruption Perceptions Index, which is determined from perceptions of corruption as seen by business people and country analysts (Transparency International, 2004a). The propensity for corruption is seen as arising from the nature of relationships of power. Politics in the Philippines has been characterised as having a relatively loose system of power relations in which allegiance is owed to a person rather than an institution. This gives rise to patron-client or 'bossism' relationships in which both parties have mutual responsibilities, not one of absolute sovereign power of one person over another (Kelly, 2000; Rood, 1998; Steinberg, 1990; Stone, 1973). A more cynical appraisal was provided by a representative of an environmental NGO:

> *There is a tendency for those in power to have fiefdoms over which they make all the decisions and hold all the power, and they do not like interference from external* [*sources*] (CS#2).

Therefore, the process to privatise the waterworks utility in Tagbilaran also sought to ameliorate the potential for corruption.

The process leading up to the privatisation of the public utilities dates back to 1996, when the Province of Bohol was granted technical assistance under the "Governance and Local Democracy (GOLD)" Project (Bohol Chronicle, 1996; Province of Bohol, 2000a). This project was initially designed to provide assistance with establishing the Province's investment

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[110] It is estimated that between US$5 to 10 billion was allegedly embezzled during the Marcos administration, and US$78 to 80 million during the Estrada administration at 2004 prices (Transparency International, 2004b).

[111] Also ranked with the Philippines were Eritrea, Papua New Guinea, Uganda, Vietnam and Zambia (Transparency International, 2004a). Bangladesh and Haiti ranked equal first in 2004 as the most corrupt counties in the world (Transparency International, 2004b).

promotion capability and a series of municipal cluster workshops were held in which the Province's vision and mission as well as primary and secondary development strategies were defined and agreed upon. The project continued to support Bohol's desire to study alternative ways of mobilising resources for the rehabilitation and expansion of the utilities departments, including the PWS in Tagbilaran. Financial studies were conducted by a technical working group[112] to ascertain the province's rehabilitation and expansion needs and to assist in determining ways of financing the mobilisation of resources to meet those needs (Province of Bohol, 2000a).

In considering the best way to proceed with the proposal to privatise the water utility, several financial options were evaluated. These were:

1. Outright sale;
2. Bond issue;
3. Cooperative;
4. Water district/Metro Cebu Water District model;
5. Rehabilitate-Operate-Transfer Arrangement (a variant of BOT);
6. Stand-Alone entity (Debt Financing);
7. Pure joint venture;
8. Joint venture on a Rehabilitate-Own-Operate-and-Maintain arrangement (Province of Bohol, 2000a).

The advantages and disadvantages of each option were discussed before the decision to pursue a joint venture on a Rehabilitate-Own-Operate-and-Maintain (ROOM) arrangement was agreed upon (Province of Bohol, 2000a). Drafting of tender documents began in December 1999, with invitations to bid for the proposed joint venture projects published in January 2000. The tendering process was compliant with relevant legislation, namely *RA 7718* '*Build-Operate-Transfer' Law 1994* (Republic of the Philippines, 1994).

Initially, seven major corporations showed interest in both the water and electricity joint venture proposals. A pre-qualification conference was held in January 2000 whereby the Pre-qualification, Bids and Awards Committee informed the interested bidders on how the tendering process would proceed and responded to queries.[113] Bidding for the proposed venture was to commence on 14 February 2000; however, on 13 February 2000, the Provincial Government postponed bidding.

The reason given by the Provincial Government for postponing bidding was to conduct a series of meetings to provide the public with further information about the joint venture

[112] The technical working group comprised technical staff from the Governor's office, the Provincial Planning and Development Office (PPDO) along with several technical staff hired by the Provincial Government and several GOLD Consultants (Province of Bohol, 2000a).
[113] Minutes of the Pre-Bid Conference for the Privatization of the Power and Water Utilities held on 14 January 2000 at the Provincial Planning and Development Office Conference Room. Copy held by author.

proposal. From 12 February to 20 February, public consultations were held in all 15 *barangays* of Tagbilaran City, as well as with several government and non-government organisations. In addition, a joint meeting of the *Sangguniang Panlalawigan* of Bohol and the *Sangguniang Panlungsod* of Tagbilaran was held on 28 February 2000, during which a formal presentation of the joint venture project was made by the Provincial Government to City Government officials (Province of Bohol, 2000a).

The tendering process resumed with the submission of bids by interested parties on 10 March 2000. Despite initial interest from four companies for the water joint venture, Salcon was the only company to tender a bid. After evaluating the water bid and considering whether re-bidding should occur, the bid was found to be compliant with the selection criteria established by the Provincial Government as well as the rules for tendering according to *RA 7718 1994* (Republic of the Philippines 1994); therefore, negotiations were conducted between the Provincial Government and Salcon (Arigo, 2000d; Bohol Chronicle, 2000b; 2000n; 2000p).[114] After numerous delays, which are outlined below, the Provincial Government eventually entered into a joint venture arrangement with Salcon in December 2000.[115] The final terms and conditions of the joint venture are summarised below:

- Lower rates by P0.30 per m3;
- Additional discount for consumers using less than 10 m3 per month (from flat rate of P71.80 to P65.00);
- Rate stability; no increase in rates for at least two years;
- Comprehensive rehabilitation, upgrading and expansion;
- Absorption of all employees with the same or better employment terms;
- Assumption of Provincial Government's loan for the 1997 rehabilitation of the PWS (P21 million);
- Up-front cash of P80 million;
- Free 30 percent equity in the joint venture company, valued at P24 million (Province of Bohol, 2000a).

The privatisation of the PPUD/PWS created some controversy in Tagbilaran. However, perhaps not as much as might be expected and certainly nothing to compare with the events outlined in Chapter 3 (Section 3.3) concerning privatisation in Manila or Cochabamba (see, for example, Assies, 2003; Barlow and Clarke, 2002; Lobina, 2000). Events leading up to the privatisation including the bidding and tendering processes were debated in the local

[114] Minutes of the meeting of the Pre-qualification, Bids and Awards Committee on the course of action to take on the lone bid proposal for the water project held on March 23, 2000 at the Provincial Planning and Development Office. Copy held by author.
[115] The Provincial Electric System (PES) was privatised at the same time as PWS. A joint venture agreement between the Provincial Government and Salcon saw the creation of Bohol Light Co., Inc. or BOLICO.

newspapers and over the local radio, with the strongest and most sustained opposition coming from the Tagbilaran Alliance of Concerned Taxpayers (TACT).[116]

Attorney Victor de la Serna, along with five other lawyers in Tagbilaran who comprise TACT, has been strongly opposed to the privatisation of PPUD since the outset. Their opposition to private sector involvement stems from concerns over the private sector's ability to meet the needs of the poor, as demonstrated in the quote below:

> *I am against* [*privatisation*] *in poor countries. With the government, they are motivated by public service. Public pressure can be asserted through elections so can force accountability. I have no objection to private companies as long as they are well controlled and well regulated* (CS#4).

TACT publicly vocalised their position against the privatisation process in December 1999, after articles were published in Tagbilaran's local newspapers outlining the Provincial Government's intentions to commence tendering for the joint ventures (Bohol Chronicle, 1999a; 1999b). From December 1999 to January 2000, TACT produced position papers against the proposal which were distributed to households and published in local newspapers. Also during this period, TACT spearheaded a signature campaign and claimed to have obtained over 10,000 signatures against the privatisation. Through these means, TACT expressed their concern that water rates would likely increase at the hands of a profit-motivated private company, thereby adversely affecting household consumers particularly the poor (de la Serna, 2001). On 24 December 1999, TACT, among others, was invited by the Provincial Government to attend a public forum to discuss the proposal to privatise the waterworks and electricity utilities. Dissatisfied with the format of the forum and the limited time placed on participants to state their objections, and still opposed to the idea of essential basic services provision being left to the private sector, TACT continued to object to the privatisation process through the media, word of mouth, and the legal process.

Opposition to the privatisation of the waterworks manifested in a series of lengthy court battles regarding the legitimacy of the joint venture agreement and the motives of key people involved in negotiating the agreement. The first use of the legal system by TACT occurred during the bidding phase. On 9 February 2000 a case was filed for an injunction against the privatisation scheme to prevent the bidding from proceeding, with a court hearing scheduled for 14 February 2000. However, in light of the Provincial Government's decision to postpone bidding, the injunction was withdrawn, with TACT choosing to wait until the final bidding had been done to proceed with further action (de la Serna, 2001).

The period of negotiation between Salcon and the Provincial Government concerning the details of the joint venture arrangement was disrupted by injunctions and appeals instigated

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[116] TACT was formerly known as the Association of Concerned Tagbilaranons (ACT) and is referred to thus in several newspaper articles cited in this thesis.

mostly by TACT but also by the City Government and others. A temporary injunction was issued by the Regional Trial Court on 19 July 2000 ordering the Provincial Government to postpone finalising and signing the joint venture agreement contract. The injunction was brought before the court by members of TACT, among others (Arigo, 2000c; de la Serna, 2001). Around this time, the *Bohol Chronicle* published an article expressing the City Government's opposition to the joint venture as it was proposed (Bohol Chronicle, 2000d) in which Mayor Torralba was reported as wanting to be considered as a potential partner in the agreement and requesting more time to consider how the City Government could achieve this. This statement echoed earlier pronouncements made on behalf of the city government where they asserted their right to be considered a partner by virtue of the waterworks utility operating within their jurisdiction (Arigo, 2000b). In the meantime, the injunction brought by TACT was countered by the Provincial Government and eventually overturned by the court on 8 August 2000 (Arigo, 2000a).

Undeterred by the court's decision to lift the injunction against the Provincial Government and Salcon, TACT continued to petition the court thereby delaying the final signing of the contract and assumption of operations by BWUI. After losing in the Regional Trial Court, TACT filed their case to the Court of Appeal and a 60-day temporary injunction was issued on 25 October 2000 (Bohol Chronicle, 2000f). Upon expiration of the injunction on 26 December 2000, BWUI commenced operations of the waterworks utilities, more than four months later than originally intended (Bohol Chronicle, 2000c; 2000e; 2000f; 2001a; 2000i; 2000j; 2000k; 2000m; 2000o).

Another legal tactic employed by TACT to prevent the joint venture from proceeding was to file charges of graft and corruption against several key people engaged in the privatisation process. On 26 October 2000, a complaint was filed with the Visayan ombudsman in Cebu citing graft and corruption against Governor Relampagos, 11 provincial board members and other capitol officials (Bohol Chronicle, 2000h; de la Serna, 2001). It was charged that the bidding process for the joint venture had been conducted in an inappropriate and unfair manner particularly as there was only one bidder – Salcon. The fact that Salcon had signed a memorandum of understanding with the Provincial Government to conduct a feasibility study for water production and distribution in 1997, it was argued, further indicated favouritism and corruption of the tendering process. TACT also argued there were discrepancies between the assessed value of the waterworks utility and the amount paid by Salcon. They alleged that both the water and electricity were valued at over P1.4 billion while Salcon paid only P150 million (Bohol Chronicle, 2000h). In addition, it was alleged that Governor Relampagos had personally benefited from the joint venture (Bohol Chronicle, 2000h) through the receipt of 'kick backs' from Salcon. Accusations were made that Governor Relampagos had built a mansion in Baclayon with money received from Salcon. These claims were eventually proven to be false; however, the memory of these rumours remained long after such that in 2003 a Tagbilaran

resident pointed out the house to me and explained how it had been the mansion at the centre of the privatisation controversy.

In another attempt to undermine the privatisation of the water utility, a campaign was spearheaded by TACT and other individuals opposed to the privatisation of the PPUD encouraging consumers not to pay their bills as a sign of protest (Bohol Chronicle, 2001b). Advertisements to this effect were placed in the *Bohol Chronicle* and were countered by an advertising campaign from BWUI insisting that consumers continue to pay their bills or risk disconnection. As it transpired, this vociferous group of individuals were themselves delinquent consumers who, according to a later article published in the Bohol Chronicle, owed thousands of pesos for outstanding accounts (Arigo, 2001).

As the review above shows, the emergence of a hybrid water supply system in Tagbilaran has occurred because of historical and contextual reasons. Rather than a natural monopoly in which one public utility existed to provide water to the city, water governance and institutional arrangements in Tagbilaran are complicated by the presence of both public and private utilities. This is further complicated by the multiple local government units that represent different scales of governance and geographical locations. Indeed, even before the water-sharing and privatisation came into effect water governance in the City of Tagbilaran was complicated by the fact that both Provincial and City governments both owned and operated separate waterworks utilities. This is contrary to the expectation of a natural monopoly in a city the size of Tagbilaran.

In the following section, I present details of the current water supply systems in Tagbilaran and, by implication Corella.

7.3 Present-day hybridity and water supply in Tagbilaran

Municipal water supply in Tagbilaran is a hybrid system characterised by a mixture of two utilities. One of these is public while the other is a public-private hybrid that draws on water sources in multiple jurisdictions to fulfil its role as a water service provider. Both BWUI and TCWS function under the rules and regulations of the NWRB with respect to municipal waterworks systems. As such, in order to provide water for municipal use both providers possess a valid Certificate of Public Convenience/Certificate of Public Convenience and Necessity (CPC/CPCN) (see Chapter 6).

At present, more than 80 percent of Tagbilaran's residents are connected to either the BWUI or TCWS network and consume water which is sourced from Tagbilaran or Corella or both. The vast majority of households in the city enjoy Level III service. BWUI has a substantially larger coverage area than TCWS and is estimated to cover approximately 90 percent of water distribution for the city, with TCWS covering the remainder (Province of

Bohol, 2000a). In some *barangays*, water distribution is provided by both waterworks utilities and two sets of pipes exist for example in parts of Cogon. The distribution and services within the city are given in Table 7.2 and illustrated in Figure 7-1 (City of Tagbilaran, 2001).

Barangay	**Waterworks provider**
Bool	BWUI/TCWS
Booy	BWUI/TCWS
Cabawan	TCWS
Cogon	BWUI/TCWS
Dao	BWUI/TCWS
Dampas	BWUI
Manga	TCWS
Mansasa	BWUI
Poblacion I	BWUI
Poblacion II	BWUI
Poblacion III	BWUI
San Isidro	BWUI/TCWS
Taloto	TCWS
Tiptip	TCWS
Ubujan	TCWS

Table 7.2: Waterworks systems for Tagbilaran City by *barangay*

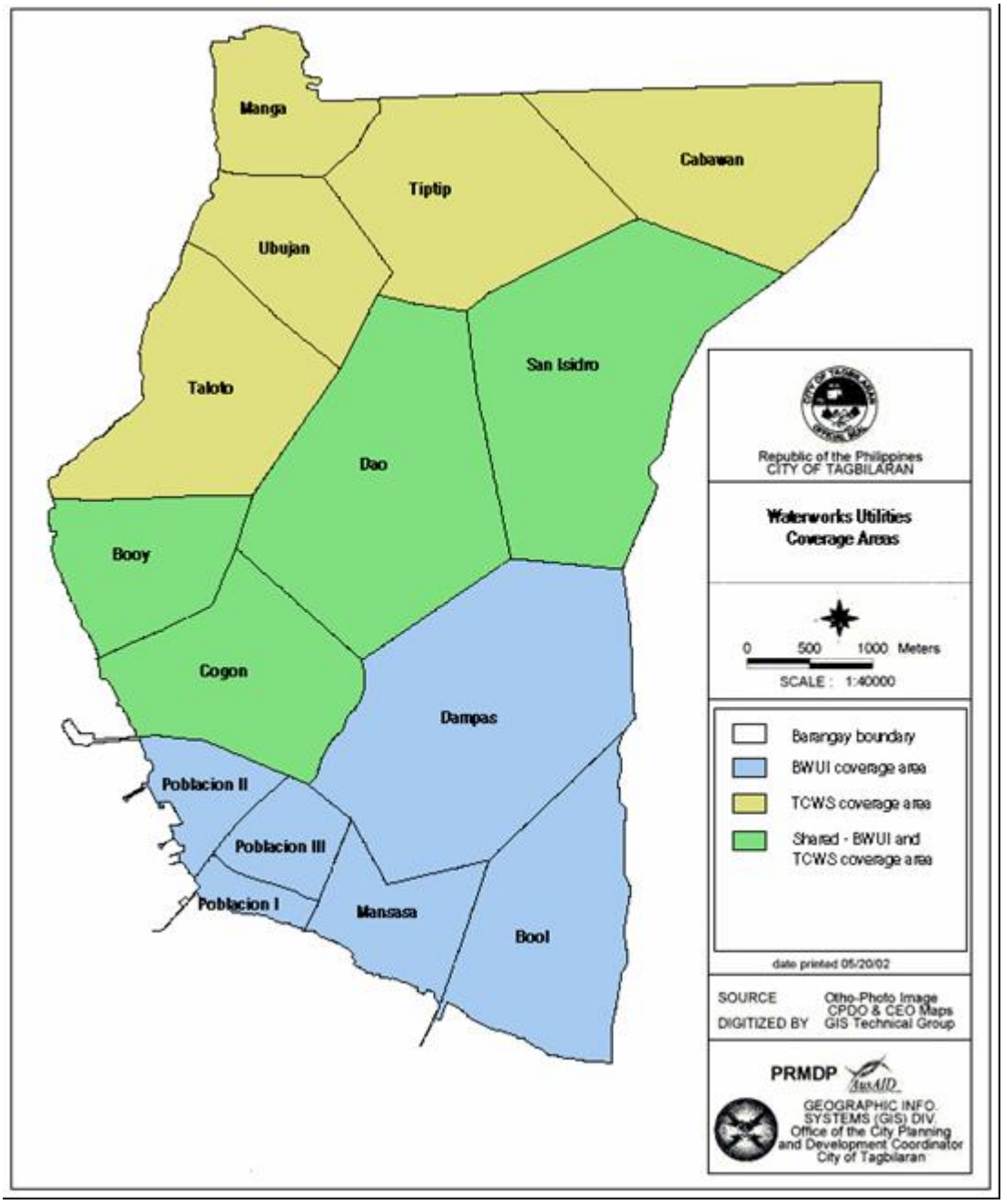

Figure 7-1: Coverage areas for BWUI and TCWS, Tagbilaran City

Production of water for household consumers is increasing for both BWUI and TCWS, as is their respective coverage areas and number of household connections. BWUI currently has a total of 20 operational pumping stations, of which 16 pumping stations and reservoirs are located in the Tagbilaran *barangays* of Dao, Dampas, Mansasa, and Cogon. Five pumping stations are also located within the municipality of Corella.[117] According to a BWUI informant,

[117] Although BWUI has five pumping stations in Corella, only four are currently operational.

the number of household connections in Tagbilaran has increased by more than 28 percent from 7,600 in December 2000 to more than 9,750 in September 2004 (WW#5). On average there are 70 new connections per month while meter relocations and transfers average around 100 per month. By comparison, TCWS has 18 pumping stations located in Tiptip, Dao, Bool, San Isidro and Cabawan and seven reservoirs within the city. According to an informant at TCWS, the number of connections for TCWS was approximately 3,547 in September 2004, with an average of 20-25 applications received per month reflecting the level of construction and building in rural areas (WW#4). Production and demand estimates for both BWUI and TCWS are illustrated in Figure 7-2.

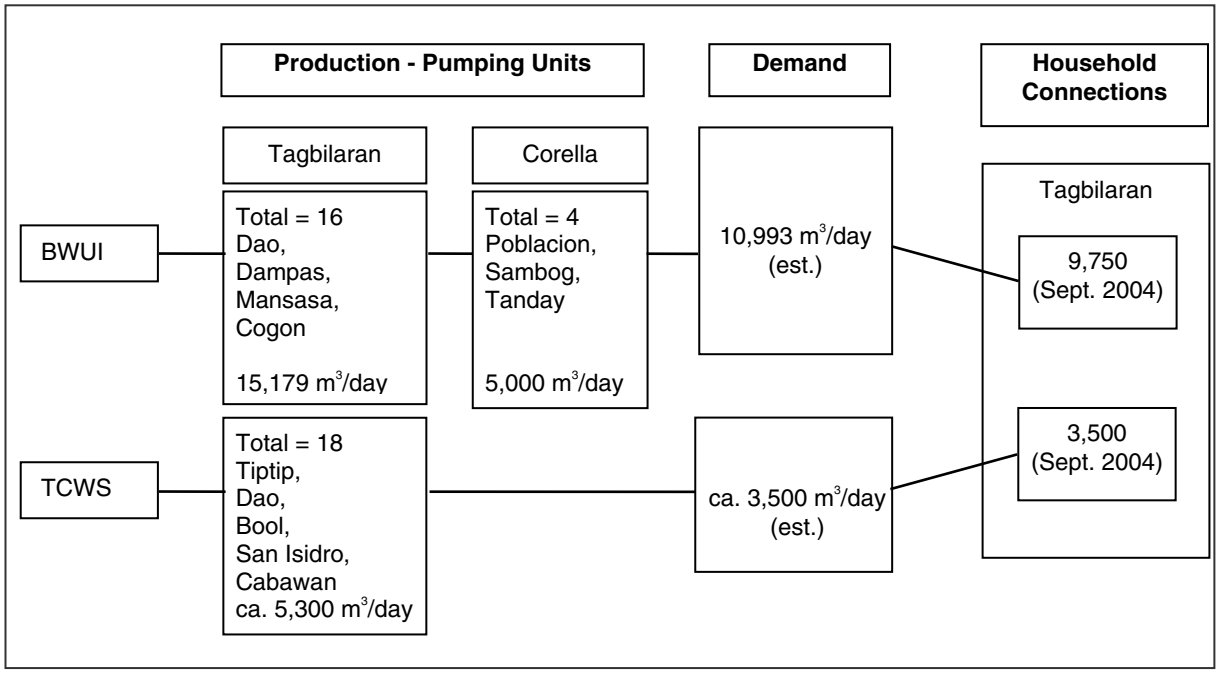

Figure 7-2: Tagbilaran's waterworks' production and demand

Expansion of both systems is being gradually undertaken and production for both utilities has increased as a result of improving efficiency of pumping units in both Tagbilaran and Corella. As one informant explained, this is seen as an important way in which households in Tagbilaran, including disadvantaged families and those in rural *barangays*, can obtain access to municipal water (WW#4).

The hybrid urban water system which has emerged in Tagbilaran implicates Corella as both a source of water for municipal supply and also as a recipient of household water. In Corella, approximately 97 percent of households have Level III connections and are served by the Corella Waterworks System (CWS), which is operated by the municipal government and was established in 1957. According to an informant in CWS, service to some parts of *barangays* is constrained due to elevation and remoteness (LG#2). The CWS has six pumping stations located in the *barangays* of Sambog, Tanday, Poblacion, Cancatac, Anislag and

Canangca-an, which meet more than half of the municipality's demand. In addition and under the terms of 2004 MOA, Corella is also entitled to 15,000 m^3 per month of bulk potable water free of charge (LG#6; Obedencio, 2005). The demand for water in Corella is considerably lower than Tagbilaran and was estimated in 1998 to be 572 m^3 per day (Province of Bohol and SWECO, 1999a). Given Corella's low population growth rate and relatively low demand, a water deficit is not forecast; therefore, it is anticipated that groundwater pumping in Corella to supply water for both Corella and Tagbilaran can be maintained for several years (Province of Bohol and SWECO, 1999b). Corella also allows access to its pipes to the municipalities of Alburquerque, Cortes, Sikatuna, Baclayon and Balilahan.

The current condition of the pipe networks in Tagbilaran is generally very good although both the waterworks utilities in Tagbilaran are affected by system losses to some extent. It is estimated that the system losses for TCWS is around 30 percent, while BWUI stands at 25.94 percent. In Corella, estimates place losses at approximately 40 percent. Losses include leakage and illegal connections. Rehabilitation of network systems, including pumping stations, wells, reservoirs and replacement of pipes, are means by which leakage can be addressed. Interviews with informants at TCWS indicated that leakage is a problem for TCWS, although the system is relatively new so is less of a problem than in other systems (WW#1; WW#3).

Further rehabilitation, replacement works and expansion of the service network were among the conditions of the joint venture agreement agreed upon by Salcon and the Provincial Government. The First Schedule of the contract stipulates that BWUI will seek to increase its productivity through rehabilitating the network and reducing system losses to 20 percent during the period 2000 to 2004, as well as conducting studies to assess the feasibility of supplying bulk water to neighbouring municipalities (Province of Bohol, 2000b). Some distribution lines were replaced and the mainline rehabilitated as required. In addition, steel pipes were replaced so that PVC pipes have been installed across the entire BWUI network. According to an informant at BWUI, the success of the rehabilitation program was such that planned works were largely completed after only one year of operation; therefore, BWUI commenced network expansion in their second year, well ahead of schedule (WW#5).

In the absence of leakage but where discrepancies between supply and demand exist (as determined through metering), it is assumed that there are illegal connections and people unlawfully taking water. BWUI has production and demand meters which help them to keep track of their network efficiency with greater precision than either TCWS or CWS. District metering enables BWUI to accurately account for system losses due to leaks and illegal connections and to approximate their geographic location. According to one informant, as of October 2003, there were 65 people with illegal connections (WW#3).

In order to minimise illegal connections, waterworks utilities regularly inspect the pipe networks and have also sought to foster an environment in which consumers feel compelled to

report illegal connections by emphasising the importance of using water wisely. Interviews revealed that both BWUI and TCWS encourage household water conservation, storing water in tanks, and reporting leaks (WW#1; WW#3). Where people are found to have stolen water from one of the networks, their illegal connection is removed by a plumber in the presence of the police. A staff member at TCWS explained that the waterworks utilities could decide to fine and/or take legal action in accordance with legislation relating to stealing water and electricity (WW#4). Households could then formally apply to be connected to the water distribution network but were required to pay an up-front reconnection fee.

The problem of illegal connections in Tagbilaran[118] has been minimised recently with the installation of stub-out meters. Stub-out meters are a cluster of household metered connections located on a pipe branching off the mainline. The meters are close to the mainline making it difficult to bypass meters and tap feeder lines. In the past, meters were located close to houses so it was possible for people to tap pipelines and bypass the meter. Plate 7-1 shows a cluster of meters in Mansasa.

Photo by Fisher, 2004

Plate 7-1: Stub-out metres along the road, Mansasa, Tagbilaran.
Stub-out meters reduce system losses as a result of illegal connections. In the photograph above, over 30 household connections are clustered together.

[118] No data concerning illegal connections were obtained in Corella.

An informant from BWUI described how in one subdivision of Tagbilaran served by BWUI (with Level III connections) system losses had been as high as 70 percent largely as a consequence of illegal tapping and leaking pipes (WW#2). As part of BWUI's rehabilitation program in the area mainlines were totally replaced, thus reducing the pipe size, and stub-outs were incorporated. After rehabilitation, losses were reported to be only five percent (WW#2). According to staff at BWUI, there are plans to implement stub-out connections if possible to the whole service area (WW#5).

TCWS's response to the problem of illegal connections has also been to utilise stub-out meters. The transfer of meters from households to the mainline has been gradual; therefore, there are still some meters located near the house. New concessionaires granted within the last four years have meters installed near the mainline. Where meters are defective, they have been replaced and transferred. In the case of re-connection, a condition of re-connection is the transfer of meters (WW#1).

The number of households connected to either BWUI or TCWS has been steadily increasing over time. The conditions under which households become connected to either BWUI or TCWS are largely dependent upon location and cost. For those households located within BWUI's coverage area, an application for connection is made to BWUI and for those within TCWS's coverage area an application is made to TCWS. To become connected to the BWUI service network consumers are required to submit an application to BWUI and, upon approval, pay a connection fee of P320 plus materials. BWUI provides the materials for installation such as pipes and the water meter, which are paid for by the consumers either in cash or in instalments over three to five months. The distance from the mainline determines the cost for pipes. The average cost is P1,500-P2,000. Installation by BWUI of service lines incurs extra costs. Consumers are able to reduce installation costs by laying the service lines, the lines on their property, themselves. This was explained by the Operations Manager of BWUI:

> *BWUI has established an easy instalment plan for the cost of materials required in water connections, to consumers who could not afford to buy the materials. The instalment will be divided into five (5) equal payments, and shall be included in the monthly billings* (WW#5).

Consumers are responsible for the payment of repairs that occur on service lines from the water meter; BWUI is responsible for repairs to the mainline only (WW#5). A similar set of conditions applies for new TCWS consumers. The fee for a new connection is P470 plus extra for materials. As with BWUI, TCWS is responsible only for the mainline and repairs performed on service lines are the responsibility of the consumer (WW#4).

The tariff structure for each of the waterworks utilities in Tagbilaran and Corella is an increasing block tariff (IBT). The rates charged in Corella by CWS are considerably cheaper

than either of their Tagbilaran counterparts, with TCWS rates cheaper than BWUI.[119] The minimum rate for BWUI is P65.00 for consumption between 0-10 m^3; the minimum rate for TCWS[120] is P62.00 for consumption between 0-10 m^3. The rate structure for each waterworks utility is given in Table 7.3 (BWUI), Table 7.4 (TCWS) and Table 7.5 (CWS). Figure 7-3 presents a comparison of the IBT rates charged by BWUI, TCWS and CWS for each block of water consumed.

Consumption Block (m^3)	Price (P)
0-10	65.00 (minimum rate)
11-20	7.60 per m^3
21-30	8.78 per m^3
31+	17.87 per m^3

Table 7.3: BWUI tariffs[121]

Consumption Block (m^3)	Price (P)
0-10	62.00 (minimum rate)
11-20	7.00 per m^3
21-30	8.00 per m^3
31-40	12.00 per m^3
41-50	16.00 per m^3
51-60	18.00 per m^3
61-70	18.00 per m^3
71-100	18.00 per m^3
101+	23.00 per m^3

Table 7.4: TCWS tariffs

Consumption Block (m^3)	Price (P)
0-5	25.00 (minimum rate)
6-15	6.25 per m^3
16+	7.50 per m^3

Table 7.5: CWS tariffs

[119] Water rates are regulated by NWRB. See Chapter 6 (Section 6.2).
[120] Rates as per January 2004. In January 2004 NWRB approved TCWS' application for a rate increase lodged in 2002.
[121] In 2005, BWUI submitted an application to NWRB for an increase in rates; however, as of June 2006 the increase had not yet been approved.

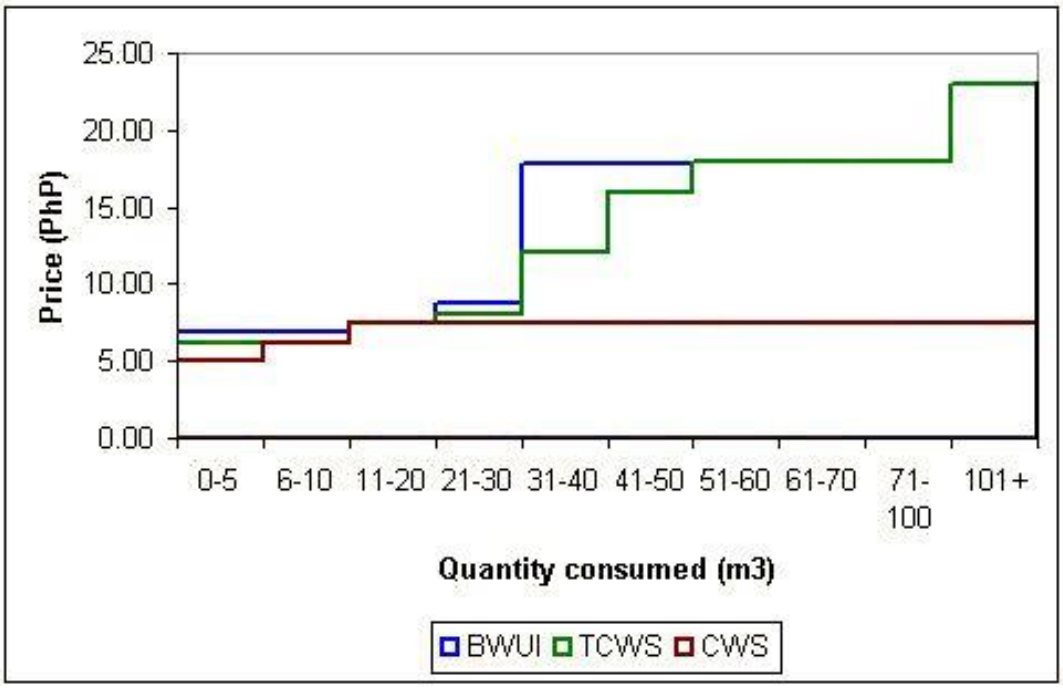

Figure 7-3: Comparison of IBTs for BWUI, TCWS and CWS

Payment of tariffs by households in Tagbilaran and Corella has historically been low and delinquent consumers were recognised as a problem for the effective operation of the PWS/BWUI and the TCWS. It was not uncommon for TCWS and PWS to have clients that were many months, if not years, in arrears despite reminder notices being sent out. By late 1998, the *Bohol Chronicle* reported that the PPUD had unpaid accounts totalling P15 million for power and P6 million for water (Bohol Chronicle, 1998).

Failure for waterworks utilities to collect all charges is a common reason for financial deficits; however, the ability for public waterworks utilities to improve collection rates may be constrained by public opinion. Improving collection rates is usually one of the most significant changes introduced by private companies (Hall, 2001). In Tagbilaran the impetus for improving collection efficiency came in 1998, when the PPUD implemented a policy of disconnection of service for both water and electricity consumers who failed to make reparations for accounts in arrears (Bohol Chronicle, 1998). Despite this policy, collection rates remained low. According to one informant, the TCWS have also concentrated efforts on collecting arrears and ensure timely payment of current accounts commencing in 2001 (WW#1).

The move to become stricter has seen a marked improvement in compliance from consumers of both waterworks systems. Failure to pay accounts within 90 days leads to disconnection from service for both BWUI and TCWS consumers. Reminders to pay the bill on time are included in the bill. In the case of TCWS, disconnection serves as a physical notice.

After disconnection of service the consumer is given two days to pay the outstanding amount before being charged the reconnection fee. This became procedure since it was felt that sending reminder notices was a waste of time and resources as they could easily be disregarded as had occurred in the past. When the new system was implemented, a payment schedule for arrears was worked out. Delinquent clients were required to make a down payment of 50 percent and to repay the remainder in instalments.

Both BWUI and TCWS charge consumers a reconnection fee. The reconnection fee for BWUI is P50 and for TCWS the fee is P320, which needs to be paid up-front since the household connection will not be re-activated without receipt of payment. BWUI has experienced a substantial improvement in collection efficiency because of water delinquency campaign and the policy of disconnections and reconnections. After BWUI took over from the government, the government collected arrears and payments for the initial three months. After the third month, bill collection was handed over to BWUI. According to a BWUI informant, after the first month of BWUI operation there was 34 percent collection efficiency, which has steadily improved until the present where collection efficiency is now 100 percent (WW#5). The penalties for late payments vary. For BWUI, the present penalty is two percent per month. For TCWS, a 15 percent surcharge of the amount of the bill for the month in arrears is charged. On the topic of bill payment, a senior officer at TCWS commented that "it is important to monitor payments and delinquency" (WW#1), which once again is an acknowledgement of the difficulties faced by the government in implementing unpopular policies.

Along with changes in attitudes towards payment of water accounts, consumption patterns in Tagbilaran have changed over time, either as a result of changes in household fortunes or as a result of changes and improvements by the waterworks utilities. Overwhelmingly, however, consumers' consumption of water is primarily to meet demand for household activities such as bathing, cleaning, washing clothes, cooking and other day-to-day activities. Empirical material obtained in this research revealed that water was predominantly used for domestic chores in which "washing clothes" was reported as the activity which people felt consumed the most water in the household (98 percent), with "bathing" ranked second (77 percent). Along with general cleaning (including pig pens, vehicles and household), these activities are important basic needs that ensure the health and well being of householders. Figure 7-4 shows the activities that were reported as consuming the most water.

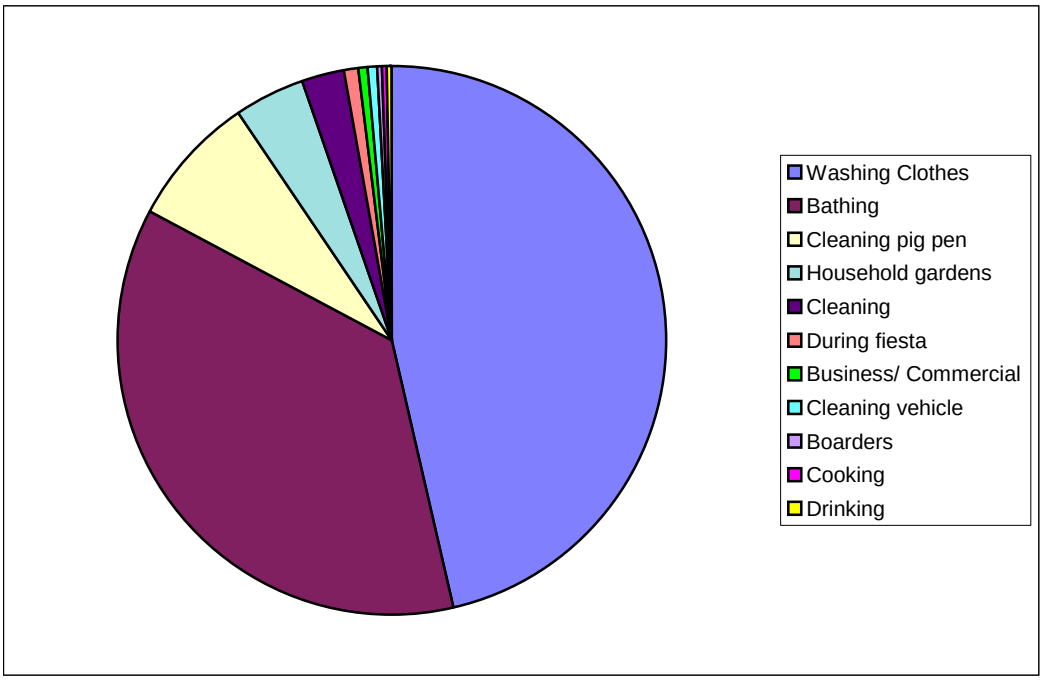

Figure 7-4: Household activities that consume the most water, Tagbilaran and Corella

As well as household chores, water is also used in urban areas for activities more commonly associated with rural areas; in particular, gardens and raising pigs and other livestock. Household gardens are common in Tagbilaran and Corella and were a commonly reported activity for 94 percent of households. Household gardens in Tagbilaran are largely ornamental and not for household food consumption. In Corella, household gardens were distinguished from those in which crops and food for household consumption were grown. Numerous residents in Tagbilaran (and Corella) raise pigs for consumption, generally during fiesta (see Plate 7-2). "Cleaning the pig pen" was generally perceived as consuming a lot of household water. Neither of these activities is subsistence or needs-based and instead reflects lifestyle and socio-cultural values held by respondents. *Fiesta* is an important celebration within Bohol; each town and *barangay* has a patron saint and *fiesta* is a celebration in their honour. *Fiesta* is a day of feasting with friends, family and other visitors, which requires water for cooking, cleaning and preparation. *Lechon baboy* or barbecue whole pig is a popular food. May is the month of *fiestas* in Bohol, with a *fiesta* occurring everyday across the Province. May 1 is *fiesta* day in Tagbilaran, which is celebrated in *barangays* Poblacion I, Poblacion II, Poblacion III, Dampas, Cogon and Mansasa with Dao and San Isidro holding *fiesta* shortly thereafter. Several respondents remarked that water consumption was high during *fiesta*. The association between fiesta and increased water demand was noted on several occasions through observations as well as through articles in the *Bohol Chronicle* (Bantugan, 2001). Likewise,

better supply during *fiesta* was often promoted as evidence of improvements to waterworks services.

Photo by Fisher, 2004.

Plate 7-2: Pigs in pigpen at respondent's house, Tiptip, Tagbilaran

Improvements to water supply in Tagbilaran, in terms of production, distribution and service coverage, have provided greater water security for more people in Tagbilaran than has ever been provided in the past. However, the hybridisation of Tagbilaran's water systems complicates the ways in which water is conceptualised and planned for. This will be explored further in the following section.

7.4 Transformations in planning and management following the hybridisation of Tagbilaran's water supply

While the hybridisation of water supply in Tagbilaran has led to improvements in water services and provision, it has also directly and indirectly precipitated changes in the ways in which water has been conceptualised and planned for by local level authorities and decision-makers. Access to potable water is seen as important for household well-being as well as more broadly for the development of the local economy. This view is shared by both the public and private water utilities. it is also shared by those at the provincial and city government levels to which the statement below is indicative:

> *Water as a basic need in every community is vital in improving economic conditions. Good water supply can attract many investors, which would generate jobs and could increase per capita income in the community. Good water supply will boost the moral of the people and in turn improve the social, public and environmental conditions in the area (WW#5).*

Amongst those responsible for the planning and management of water resources and safeguarding people's ability to access water for their basic needs, the multifaceted characteristics of water were universally recognised, and are eloquently captured in the following quote provided by a senior officer within Tagbilaran City Government: "Water is an economic good, with a social conscience, and a public heart, and is also an important part of our environment" (LG#5). In addition, municipal water is seen as being a public good whereby the government, either alone or in cooperation with others, is regarded as having a responsibility to ensure households, especially the poor, have access to water services.

> *The* barangay *officials or the TCWS personnel should assist disadvantaged families* (WW#4).

> *Some government agencies and NGOs* [*have*] *taken care of the needs of disadvantaged families. So far*, *BWUI has no policy or any program for this purpose* (WW#5).

> *I will give you a classic example. A group of 12 families involving some 60 or 70 people in the dumpsite. They used to get water from 2 deep wells that are already contaminated by heavy metals. We requested the city government*, *because they are poor*, *to provide water pipes then the water utility*, *BWUI*, *will install* [*them*]. *This is the way that we can help*: *a partnership…It is up to the city government and the national government to assist - a pooling of resources* (LG#5).

Securing supply in Corella after the expiration of the initial MOA in 2002, it can be assumed, was an important step towards safeguarding the public's ability to have access to water services into the future. Negotiations for a second MOA enabling BWUI to extract water in Corella were conducted between the municipal government of Corella, BWUI and the Provincial Government (as a joint venture partner) during 2003 and 2004. In their initial proposal, the Corella government demanded the payment of a volumetric royalty fee for water abstracted from within Corella, a fee payable for future well development, entitlements to free bulk water, and limits to the amount of water BWUI was able to abstract. A process of proposals and counter-proposals and negotiations ensued. A technical working group was established and chaired by Mayor Rapal in Corella to consider and evaluate options. The final terms of the Memorandum[122] agreed upon by Corella and BWUI stipulated that: BWUI shall provide to Corella up to 15,000 m^3 per month of potable water in bulk for free; BWUI shall pay

[122] It is my understanding that the second MOA was signed late in 2004; however, I was unable to substantiate this. Reports in the *Bohol Chronicle* in 2005 (Bohol Chronicle, 2005; Obedencio, 2005) refer to the terms of the MOA as being officially in place without specifying when it was signed.

Corella a royalty fee of P0.25 per m^3 of water extracted from within Corella from the existing and operating five deep wells (less the free water); and a royalty fee of P0.50 per m^3 for water extracted from new wells which may be installed in the future (LG#6). The term of the 2004 MOA is 25 years.

Negotiations over the royalty fee were contentious, with opinions over whether Corella had the right to receive royalties divided amongst those with whom I spoke. On the one hand, there was the sense that all water belongs to the state and all can share in the national wealth; therefore, no one other than the state is entitled to receive royalties:

> *Royalties are recognition of ownership. Who owns water? Is water in its raw form owned by anyone other than the state?* [*Corella*] *believes quite strongly that as well as having a part share in the national wealth that it should also get a royalty. By law, they are only entitled to share in the national wealth. Water ignores political boundaries - it is like chance that the pumping stations happen to be located in Corella* (PG#2).

> *People don't have a God-given right to ask for money. People here tend to do that. There is a sense of "you got that from us so you must pay us." That is the perspective during the privatisation process. Not even sure if the water is from you. It just happens to be situated under Corella. It could be from all over the province* (PG#3).

> *In Corella – it is "our" water. This kind of behaviour is exhibited in lots of different ways… There is a strong territorial idea; people are easily prickled by perceived violation of rights but are not very conscious of obligations... The state owns water* (PG#3).

On the other hand were those who felt that Corella was entitled to payment for water as demonstrated in the quotes below.

> *Corella should ask for a royalty of around P5 or so per cubic metre. The former MOA was ridiculous - exchanging water for pipes. Corella should be entitled to some kind of payment for not destroying their environment. Tagbilaran is dependent on Corella's good faith* (CS#2).

> *They* [*Corella*] *should* [*be paid*]. *The conditions of the previous MOA were unfavourable and the municipality was foolish in not insisting upon a royalty. Corella has been tapped because of degraded quality in Tagbilaran as a consequence of social and environmental pressures* (CS#1).

For those in favour of Corella receiving payment it was generally seen as compensation for environmental protection rather than as an acknowledgement of ownership.

One further reason why the negotiations over a royalty may have raised controversy is because of the change in relationships with respect to water and water provision as a consequence of the joint venture agreement. That is, privatisation changed the way in which some households related to the waterworks utility and, by extension, the way in which they

perceived water provided by BWUI.[123] Such a shift in public perceptions mirrors the English scenario outlined by Johnson and Handmer (2002) (see Chapter 3, Section 3.3). In these instances, the transformation in relationships between households and the waterworks utility after privatisation precipitated opportunistic and speculative behaviour from individuals especially with respect to property and access to network infrastructure targeted at BWUI. Such behaviour was documented in an article written by Jes Tirol (2001)[124] for the *Bohol Chronicle*. Tirol recounts a story of a private landowner who denied access to BWUI to carry out repairs on the grounds that he was the landowner and BWUI had not secured his permission or paid him compensation for pipes located on his property (the pipes had been part of the PWS network). The stalemate ended only after the Provincial Government intervened, and when the individual was promised employment by the Provincial Government:

> The water distribution lock was found in his land and he was not compensated for his trouble. He closed the distribution lock and fenced his land and did not allow the BWUI personnel to enter his land. For 2 days the whole Bool District had no water. The Provincial Government, in order to save the situation negotiated with the land owner (maybe they realised their error because it ought to be BWUI who should negotiate - JBT). The land owner was given an employment in the Provincial Government as compensation for the use of his land (Tirol, 2001).

A similar scenario occurred late in 2005, when a landowner in Corella prevented BWUI from accessing a pumping unit for repairs by fencing it off for more than three months. The pumping unit was located on public land; however, the Corella resident fenced off part of the *barangay* road leading to the pumping unit, thereby depriving BWUI access to carry out repair and maintenance work. It is estimated that, as a consequence, production was reduced by 10,000 m^3 per month, affecting approximately 2,450 households or more than 13,000 people (Ligalig, 2006b). A court order issued in February 2006 granted BWUI access to the pumping unit for repairs. Such overt acts of defiance could be seen as forms of resistance to privatisation. However, considering the way in which the actions of these individuals adversely affected large numbers of people for extended periods of time, and that resolution came only after compensation or legal intervention, it seems more likely that the incidents were driven by personal motivations rather than ideological difference.

The acts described above differ to calls made by TACT to households encouraging them to not pay their bills or to attend protest rallies since this was done en masse and households could opt into or out of committing to action. It was suggested, therefore, by NGOs and government

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[123] Changes in households' expectations regarding aspects of water distribution after privatisation are discussed in Chapter 8 (Section 8.2), while an elaboration of the effects of privatisation in 'commodifying' water is taken up in Chapter 9 (Section 9.2).

[124] Tirol published a number of articles in the *Bohol Chronicle* challenging the reasons for the privatisation of the PPUD/PWS, the bidding process, the potential negative impacts for consumers, and the legitimacy of the sale. The account given above was part of an article which questioned whether BWUI had authority to have access to pipes on privately-owned land.

personnel with whom I spoke that the only way in which private sector participation was tenable was through a joint venture agreement since this enabled the government (in this case, the Provincial Government) to intervene as required. In addition, there was the sense that the public may respond better to the government than to a private enterprise on aspects of operation and management and that such an arrangement could also reduce opportunistic and speculative behaviour.

A further act which signals a (perceived) transformation in people's relationships to water occurred in September 2004 when Mayor Dan Lim issued an executive order[125] to prevent BWUI and BOLICO from imposing disconnection of services to their clients on the grounds of failing to pay their bills without first securing approval from City Hall. Such a move by the city government can be viewed as an attempt to decommodify water and restore it as a public or social good. Through the order Mayor Lim sought to create an ad hoc committee to review the amount owed by residents along with their economic status and other factors deemed relevant. It was also proposed that the committee could then consider each case and make recommendations on disconnections within three working days of receipt of an application for the disconnection of water and electric services. The order invokes the Constitution, particularly notions of "distributive justice" and "social responsibility of property ownership", as its premise upon which to take notice of complaints made by poor city residents with respect to notices of disconnection, who claimed they were subjected to (threats of) disconnection even if only one-month in arrears (Ligalig, 2004).

In an interview given to the *Bohol Chronicle* published on 12 September 2004, Mayor Lim was reported as being cognisant of the persistence of poverty and harsh economic conditions in Tagbilaran. This, he felt, may adversely affect poor households' ability to pay for services such as water and electricity. Accordingly, he acknowledged the duty of government to provide basic services to the people such as water and electricity. To this end, and taking into account the authority afforded the government to safeguard the well-being of their citizens by the constitution, Mayor Lim asserted that the executive order sought to ensure justice for the residents of Tagbilaran from BWUI, who were construed as being anti-poor (Ligalig, 2004). Notably, however, Mayor Lim did not propose a similar process to vet disconnections from the TCWS network despite similar policies regarding disconnections.

The executive order recalls the move to prevent disconnections in England and Wales in reaction to the risk of cherry picking and social polarisation post-privatisation. During the 1990s, disconnections and 'water poverty' became contentious issues which received a lot of

[125] Executive Order Regulating the Exercise of the Prerogative of Public Utilities Operating in the City to Refuse or Suspend Service Due to Failure or Inability to City Residents to Pay Their Bills, in Order to Give Substance and Meaning to the Doctrine of Distributive Justice and to Afford the Poorest Sectors of Tagbilaran the Privilege of Sanctuary and Temporary Refuge (City of Tagbilaran, 2004).

negative publicity after the privatisation of water companies in England and Wales. Alternative options were devised including pre-paid water systems; however, it was argued that such systems mask the number of disconnections since consumers can choose to self-disconnect. Studies into the problem of water debt in England revealed low income as opposed to increases in water bills as a significant factor in explaining water debt (Bakker, 2001). Water companies in England and Wales are now banned from disconnecting consumers for non-payment of bills (Bakker, 2001). In Tagbilaran, the City Government failed to implement the executive order preventing immediate disconnection; therefore, BWUI continues to disconnect water services to those who fail to meet their obligation (Ligalig, email communication, 2 August 2005).

The Provincial and City governments continue to look for ways to ensure equitable access for households in Tagbilaran to waterworks networks as part of their broader governance efforts. To this end, the province's focus on poverty reduction and identifying those in need at the *barangay* level and lower may provide opportunities for targeting efforts towards disadvantaged groups, which can lead to improved access to safe drinking water.

7.5 Summary

The intersection of local and non-local narratives of development in Tagbilaran has given rise to a hybrid waterworks system in Tagbilaran comprising two waterworks systems, inter-jurisdictional water sharing, and private sector participation. Access to piped water and reliability of supply across the city has improved substantially albeit iteratively corresponding with the incremental hybridisation of the waterworks system. This process of improvement through hybridisation has, however, been contested. The privatisation of the Provincial Waterworks System resulted in a lengthy court battle regarding the legitimacy of the divestiture and claims of corruption, speculative and opportunistic behaviour by individuals, and proposed measures by the City Government to protect Tagbilaran residents from unfair treatment at the hands of BWUI. Moreover, the contested negotiations over the payment of a royalty fee intensified after privatisation signalling a change in the way in which water is regarded as a resource and further, a change in the ways users relate to water resources. In the meantime, the complexity of institutional mechanisms governing water resource management and distribution in Tagbilaran magnifies the environmental complexity elucidated in Chapter 4 and poses a challenge to water managers and planners. Overcoming this challenge was generally seen to require a partnership led by the local government and involving non-governmental groups across all sectors rather than falling to an individual waterworks utility. To this end, the hybrid governance system that has emerged in Tagbilaran can be seen as a strategic response by diverse parties to overcome the fragmented and overlapping water governance structure present in the Philippines in order to ensure urban water supply. Consequently, water governance institutions are locally driven, flexible, and adapt national and supra-national frameworks to more adequately fit 'local' conditions.

In Part Four, I consider household perceptions of urban water governance and related concepts derived from ethnographic material obtained in Tagbilaran and juxtapose these with official discourse and practice before presenting a synthesis of findings and my final conclusions. In the following chapter, I uncover household water consumption patterns and the factors influencing their behaviour. I then examine household knowledge about water security and the threats to water security they perceive to exist.

Chapter 8 Local Perspectives about Hybrid Water Services, Access and Security

8.1 Introduction

In Part Three, I established how the formal institutional mechanisms governimg water—such as policy and legislation—have come to be hybridised in Tagbilaran, and the hybridisation of the city's urban water services. Although water resources management in watersheds and of recharge areas is important to ensure sustainable water supply, Chapter 6 revealed deficiencies in achieving a comprehensive approach at the local level because of institutional complexity, and social and hydrological uncertainties. Despite this, the Provincial and City governments have focused on achieving water security for urban households by expanding water networks so that a greater number of residents have access to safe and adequate supplies of water for their basic living needs. Chapter 7 revealed how network expansions have been achieved and the subsequent hybridisation of the waterworks network in Tagbilaran.

In this chapter and the next, ethnographic material from Tagbilaran is brought to light to enable household conceptualisations of urban water governance and development to be considered against formal notions. By uncovering household perspectives concerning water governance and hybridity, I show how water governance and municipal water services, as conceptualised at the household level, differ from those considered in Chapters 6 and 7. I begin by revealing household perceptions concerning the presence of two waterworks utilities in Tagbilaran. This involves considering the implications of having two waterworks utilities for households in terms of access and water security, as well as the implications of two utilities on the social and environmental dimensions of water governance. I provide insight into access and water security from a consumer perspective as well as elucidating factors deemed as threatening their water security.

I begin in this chapter by firstly determining where households obtain their water from, what they do with it, and how they decide to allocate water within households. I will show how both intra-household and extra-household factors influence consumer perceptions of water security, and that these perceptions are intimately linked to individuals' or households' own experiences. I then show the ways in which households consider access to water and water services in Tagbilaran have changed and the reasons behind these changes. From here, I consider household perceptions of activities and actions seen as threatening future access to water and the knowledge held at the household level about threats to water access and security. Finally, I consider how people think access to water and future water security can be safeguarded. This includes identifying actions that can be taken and agents deemed responsible for implementing them, which are instructive in developing approaches to ensure sustainable

access and water security in the long term. This enables me to shed light on the limitations and shortcomings of water governance and development discourses espoused at the supra-national and national level, and to illustrate the importance of context and local narratives of development in the mediation of these discourses.

8.2 Accessing water for household needs in Tagbilaran and Corella

Access to water is achieved through multiple sources, with municipal waterworks connections being the most important for all households including those who are not connected. Households surveyed in Tagbilaran and Corella were asked to report all their sources of water for household use and the activities for which water was used in order to ascertain both the nature of demand and how household water demand is met. The intention was to see whether households supplement their water obtained from the waterworks utility with other sources of water such as wells and through rainwater, and what factors influenced households in choosing other sources of water. Initial assumptions were that economic factors would take priority in household decision-making. Cost and affordability were found to influence household decision-making concerning consumption to a large extent. However, bottled drinking water was the most frequently reported alternate source of water despite the increased costs borne by households. This finding is seemingly counter-intuitive and indicates that other factors were significant in household decision-making concerning water consumption. These are explored below.

Waterworks' coverage in Tagbilaran and Corella are more than 80 percent and 97 percent respectively. Not surprisingly, therefore, BWUI, TCWS and CWS were reported as the main source of water for household consumption for nearly all of the households surveyed. One hundred and fifty-two households had single connections,[126] ten households shared connections between two or more houses, and three households were not yet connected to a waterworks utility (see Table 8.1). Waterworks networks are only one way in which households are able to access water. Table 8.2 summarises other sources of water reported by households.

Waterworks Utility	Single connections	2 or more households	Not yet connected
BWUI	92	5	1
TCWS	35	5	2
CWS	25	-	-

Table 8.1: Number of houses per waterworks connection

[126] In addition, a small number of these households also sold water to neighbours who were not yet connected to a waterworks utility. The amount charged was based either on a daily rate or volumetric rate.

Other Water Sources	Number
Bottled Water	64
Rainwater	14
Well	10
Spring	4
Vendors/Private Sale	3

Table 8.2: Other reported sources of water (BWUI, TCWS and CWS)

Several reasons emerged to explain why households choose to supplement their water from multiple sources in addition to municipal services. These were related to the coverage of the waterworks' networks, the pattern of water use that has developed amongst households, and cost. As indicated in Table 8.3, households with shared connections are divided evenly between BWUI and TCWS and nearly all are located in urban/low population areas. Similarly, those households not yet connected are also located in urban/low population areas (see Table 8.4). In both cases this reflects the limitations of the waterworks utilities' network coverage.

Barangay	Respondent	Waterworks Utility	Barangay Classification
Booy	TAG002	BWUI	Urban/low
Booy	TAG003	BWUI	Urban/low
Booy	TAG004	BWUI	Urban/low
Poblacion III	TAG034	BWUI	Urban/high
Cogon	TAG094	BWUI	Urban/high
Dao	TAG109	TCWS	Urban/low
Taloto	TAG123	TCWS	Urban/low
Tiptip	TAG129	TCWS	Urban/low
Ubujan	TAG134	TCWS	Urban/low
Ubujan	TAG141	TCWS	Urban/low

Table 8.3 Households with shared connections

Barangay	Respondent	Waterworks Coverage Area	Sources	Barangay Classification
Bool	TAG037	BWUI	Rainwater; Vendors/Private Sale	Urban/low
Taloto	TAG122	TCWS	Vendors/Private Sale	Urban/low
Ubujan	TAG135	TCWS	Vendors/Private Sale; Well (shared by approximately 10 households)	Urban/low

Table 8.4 Households not yet connected to a waterworks network

Network coverage in Tagbilaran is generally better in urban/high density *barangays* than urban/low density; conversely, communal and private wells are more frequent in urban/low *barangays*. Lower population density and dispersed settlement in these areas means that the costs associated with laying new pipes and expanding the network are relatively high whereas demand may be relatively low. For this reason, wells and communal distribution (Level II)[127]

[127] See Table 6.2 (Chapter 6, Section 6.2) for a description of service levels.

were established. Therefore, the present use of wells is a carry-over of past water collection practices. Both TCWS and BWUI intend to extend their network coverage areas in the future. The practice of rainwater collection, particularly in large tanks, was also more prevalent in areas of lower settlement density or in areas with a history of collecting water by this means because of poor water services; for example, interruptions and rationing.

The cost of connecting to the municipal waterworks systems was cited as a factor influencing household access to municipal water services. While those households not connected expressed a desire to become connected to the water network at some stage in the future, they felt the price of connection was prohibitive. As this informant explains:

> *It is good to have your own water but have to pay for connection and apply to TCWS. It is expensive, maybe P3,000 to P4,000* (TAG122 (TCWS): Taloto).

Plate 8-1 shows the jerry can used by one respondent, TAG122, for collecting water from her neighbour's outdoor hose. She purchased five jerry cans daily and paid her neighbour monthly. The water is used for household laundry, as depicted in the photo, as well as for drinking.

Photo by Fisher, 2004.

Plate 8-1: Water purchased from neighbour by jerry can, Taloto, Tagbilaran

Judgements regarding water quality influenced the activities for which it was used by consumers. Water from wells and rainwater was used primarily for washing clothes, cleaning, watering gardens and other activities that do not require higher quality water. Households not connected to municipal water services purchased water for drinking from neighbours who were connected to one of the networks, whereas numerous households that were connected to one of the networks in Tagbilaran purchased bottled drinking water. This suggests that water is not viewed as a homogenous entity.

Use of low quality water from secondary sources such as wells, rainwater and springs was limited to rural/low density *barangays* and urban/low density *barangays*. Rainwater collection was undertaken at the household level and used privately. Use of springs was limited to households in Corella and was primarily used for agricultural rather than household consumption. Most wells were communal; however, several respondents in urban/low density *barangays* reported use of their own private wells to supplement their water from the waterworks utility particularly during brownouts and service interruptions. The respondent depicted in Plate 8-2 supplements municipal water with a private well located on their property as well as with rainwater collected from the roof and stored in a tank.

Photo by Fisher, 2004.

Plate 8-2: Private well, Taloto, Tagbilaran

Households close to a communal well sometimes use water from the well for watering household gardens, washing or cleaning if there was an interruption of service. For example, vendors at the Manga public market and residents that live nearby reported that they would use water from the public well, shown in Plate 8-3, for cleaning and washing.

> *The well in the market is still working and the market vendors are the one who usually use it, mainly for washing, and it is free for everybody. It is no good for drinking. We use it during brownouts for watering the plants* (TAG112 (TCWS): Market vendor).
>
> *As a market vendor we usually use the water coming form the deep well for washing but not for drinking, especially during brownout* (TAG116 (TCWS): Market vendor).
>
> *We sometimes use the water in the deep well located in the market just for washing only* (TAG114; (TCWS): lives close to public market).

Photo by Fisher, 2004.

Plate 8-3: Public well, Manga Public Market, Manga, Tagbilaran

By far the largest secondary source of water in Tagbilaran was bottled drinking water. As shown in Table 8.5, none of the households surveyed in Corella consumed bottled drinking water because it was generally felt that the quality of CWS water was very good. By contrast, nearly half of all households surveyed in Tagbilaran consumed bottled drinking water purchased from water re-filling stations in 5-gallon[128] bottles.

[128] Volume is measured in US gallons in which one US gallon converts to 3.78 litres.

Waterworks Utility	Number who consume bottled drinking water [(a)]	Proportion of sample
All surveyed households (BWUI, TCWS, CWS)	N=166	28%
Tagbilaran City	64 (n=141)	45%
BWUI	47 (n=98)	48%
TCWS	17 (n=43)	40%
Urban/low density *barangays*	43 (n=97)	44%
Urban/high density *barangays*	21 (n=44)	48%

Table 8.5: Bottled water consumption

[(a)] The sample from which the number reported is taken is shown as (n=*x*) and represents analysis by waterworks utility and *barangay* classifications respectively.

The number of water refilling shops or 'stations' operating in Tagbilaran has grown in recent years in line with demand, with more than 10 different operators present in the city.[129] Re-filling stations such as those shown in Plate 8-4 and Plate 8-5 sell bottles of water in 5-gallon/18.9 litre bottles ranging in price from P35 to P45 per 5-gallon container. By and large, the operators of bottle re-filling stations are local operators and relatively small-scale. Bottled drinking water sold in smaller bottles ranging in size from 300 millilitres to 5-litres is also available from *sari-sari* and other stores and supermarkets. This product is not produced locally; however, it is possible to purchase water bottled elsewhere in the province and the Philippines. Imported bottled drinking water is also available in Tagbilaran. Prices for smaller bottles also vary. Anecdotal evidence suggests that not all bottled water is considered to be of equal worth. Certain brands are regarded as being better than others. Such values seem to be price contingent, whereby more expensive brands of water are generally considered 'better' than less expensive brands.[130]

[129] Estimate based on personal observation.

[130] Bottled water in Tagbilaran is generally water taken from the network and treated by reverse osmosis. Bottled water quality standards are regulated by the Department of Health.

Photo by Fisher, 2004.

Plate 8-4: Neilkins water refilling station, Poblacion II, Tagbilaran.
Households regularly purchasing bottled drinking re-use 5-gallon water bottles which are refilled at stations such as the one pictured above.

Photo by Fisher, 2004.

Plate 8-5: Aqua Mellow water refilling station, Poblacion II, Tagbilaran.
Consumers of bottled drinking water in front of a water refilling station operating in Tagbilaran. The consumption of bottled water in smaller bottles is common, with consumers often favouring one brand over another.

The reasons for consumption of bottled drinking vary although the influence of marketing has greatly influenced consumers' decisions. Discussion with numerous people, including waterworks staff,[131] pointed to the increase in bottled drinking water as being partly a consequence of social identity and status. This is reflected in the comment below:

> *I think one of the reasons for drinking mineral water is fashion* (TAG052 (BWUI): Household income class=10; purchases 8 bottles per month).

Advertisements on local radio, in local newspapers and on billboards use adjectives such as "pure", "clean" and "healthy" to market bottled drinking water and evoke images of crystal clear spring water, amongst others. The health benefits of bottled drinking water are promoted, as is the promise of a healthy lifestyle through the consumption of bottled drinking water. It was even suggested by one informant that the advertising of bottled drinking water was based on scare mongering tactics whereby the water from the utilities was alleged to be unhealthy when compared to bottled drinking water.

In general, bottled drinking water is perceived as being of a better quality than water provided by the waterworks utilities, but this did not mean that survey respondents felt water supplied by the waterworks utility was unsuitable for drinking. Eighty-nine percent of all households surveyed in Tagbilaran felt the water quality in Tagbilaran was "Ok", that is, clean, clear, tasted good and was fine to drink. Of those purchasing bottled drinking water, 85 percent thought water quality within Tagbilaran, from both waterworks utilities, was "Ok" yet they still chose to purchase bottled drinking water.

By deciding to purchase bottled drinking water, even when it is felt that the water provided by the waterworks utility is adequate for drinking, consumers are significantly increasing their expenditure on water for household consumption since the cost of mineral water is significantly higher than water provided by all the waterworks utilities within this research study area. For households obtaining water from multiple sources, the intended activity influenced household decisions about which source to use, suggesting that household demand is contingent on quality and price.

Data obtained in Tagbilaran and Corella concerning quantity consumed and price paid enabled me to consider whether costs influence consumption behaviour. Estimates of cost and consumption were derived from survey information.[132] It is significant that there are notable differences between estimates concerning quantity consumed and price paid per month highlighting a degree of uncertainty amongst many residents about how much water they

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[131] I was told that staff at both waterworks utilities drank water from the faucet and not bottled drinking water.

[132] For an explanation of how these values were derived, see Appendix I.

actually use per month. Monthly costs and consumption figures derived from the data are presented in Table 8.6.

Waterworks Utility/Barangay Classification	Quantity (m^3)	Cost (P)
BWUI	26	197.48
TCWS	17	111.00
CWS	13	75.00
Rural/low density	13	75.00
Urban/low density (BWUI)	23	171.14
Urban/low density (TCWS)	17	111.00
Urban/high density	30	232.60

Table 8.6: Derived costs and consumption for municipal water services based on Household Surveys[133]

As this table indicates, BWUI households consumed considerably more water per month than TCWS households and both consumed more than CWS households. Urban/high density *barangays* consumed substantially more water per month than rural/low density and urban/low density *barangays*. A partial explanation is that households within urban/low and rural/low density *barangays* were more likely to supplement the water they received from the waterworks utilities from other sources, such as wells and rainwater (as discussed in Section 8.2). Another possibility is because of household income. BWUI Household Surveys reported a greater proportion of households as falling within Income Class 10[134] than TCWS Household Surveys; changes in lifestyle could also lead to changes in consumption patterns thereby causing an increase in water consumed per month. In terms of amount paid per month, BWUI consumers paid more than TCWS, with TCWS consumer paying more than CWS. This reflects the difference in water rates[135] as well as higher levels of consumption by BWUI compared to TCWS, and TCWS compared to CWS.

Household consumption and costs for households not yet connected to a waterworks network differ considerably from households who are. The former tend to consume less and pay more for the same quantity. Table 8.7 summarises consumption and costs for households not connected to any network.

[133] Excludes water purchased from other sources, including bottled water. Urban/low Density *barangay*s are served by both TCWS and BWUI; therefore, estimates have been calculated for each separately using relevant water rate.
[134] Income Class 10 is the highest income at more than P10,000 per month – see Appendix C.
[135] Water rates are provided in Table 7.3, Table 7.4 and Table 7.5 in Chapter 7 (Section 7.2).

Barangay	Respondent	Income Class	Sources	Estimated cost
Bool	TAG037	3	Rainwater; Vendors/Private Sale	P6 per day (consume approx 38.75 litres per day; 2x 5 gallon jerry cans) Per month=P180 for 1.135 m^3
Taloto	TAG122	2	Vendors/Private Sale	5 jerry cans per day = 25 gallons/94.64 litres and pay P50 per month for 2.84 m^3
Ubujan	TAG135	4	Vendors/Private Sale; Deep Well (shared by approximately 10 households)	P20 (drinking water purchased from neighbour)

Table 8.7: Estimated expenditure on water per month for households that are not yet connected

As stated in Chapter 3 (Section 3.3), under an IBT system in which meters are accurately recording consumption, single connection households are generally much better off than households who share a water meter or who are not yet connected since cost increases incrementally commensurate to consumption (see, for example, Boland and Whittington, 2000; Brocklehurst, et al., 2002; Liu, et al., 2003). Poorer households are more likely to share water connections or to be excluded from waterworks networks, and poorer households are also less likely to be able to afford to establish their own single connections or to purchase and store bulk water (Barlow and Clarke, 2002).[136] The findings from the three households not yet connected to the waterworks network are consistent with other research which states that households not connected to municipal water services, tend to pay more than those that are connected (Barlow and Clarke, 2002; Boland and Whittington, 2000; Brocklehurst et al., 2002; Winpenny).

TAG135 (Ubujan) reported expenditure of P20 per month for drinking water, with the remainder of their household water demand met by a nearby communal well. Although P20 is less than what would be paid if they were connected to municipal water services, the quantity consumed is also considerably less since the water purchased from the neighbour is more expensive. Therefore, as a unit rate, such purchases are more expensive than if the household was connected. Conversely, P20 per month for drinking water is considerably less than purchasing bottled drinking water from one of the bottle re-filling station. TAG122 (Taloto) reported that they purchased five 'large' 5-gallon jerry cans of water per day, approximately 94.64 litres. Over a one-month period, estimated expenditure is P50 per month for 2.84 m^3. TAG037 (Bool) paid their neighbour P6 per day in exchange for two large 5-gallon jerry cans of

[136] Bulk water in Tagbilaran is significantly more expensive than water supplied by BWUI and TCWS. My household purchased water from one of the bulk water suppliers and was charged P300 for 6 m^3. The area in which I lived was not part of a waterworks network; however, the majority of households were unable to afford to purchase bulk water. The owner of a *sari-sari* store bought water in bulk and then sold water in jerry cans to households. All households in my neighbourhood, including my own, collected and used rainwater.

water, which is approximately 38.75 litres per day. Over a one-month period, estimated expenditure is P180 for approximately 1.135 m^3. The amount paid by these households, therefore, is significantly greater than they could expect to pay if they were connected to either BWUI or TCWS. While it is difficult to generalise based on the reports of only three households, the difficulty for households not yet connected was further made known to me through personal accounts and my own observations, as well as through key informants such as below:

> *For people that are not yet connected to waterlines they will often line up to get water in their jerry cans from as early as 5am and will pay close to* $1 *per* m^3 (*P50*) (PG#4).

The purchase and consumption of bottled drinking water had a significant effect on the amount households pay per month. Households purchasing bottled water spent more than double the amount on water per month than households who did not purchase drinking water. A comparison of household consumption and costs for water is provided in Table 8.8.

Barangay Classification	Households not consuming bottled drinking water		Households consuming bottled drinking water (additional to waterworks)		
	Consumption, waterworks only (m^3 per month)	Cost, waterworks consumption only (P per month)	Consumption, waterworks (m^3 per month)	Bottles consumed (per month)	Cost including bottled drinking water (P per month)
Urban/low (BWUI)	23	171.14	23	6	411.14
Urban/low (TCWS)	15	97.00	22	3	268.00
Urban/high	30	232.60	27	9	566.26

Table 8.8: Comparison of water consumption and costs including bottled drinking water per month by *barangay* classification

The decision to purchase bottled drinking water appears to be determined by household's perceptions and opinions of the waterworks utility as well as factors related to location. Particularly relevant was settlement density. Concerns regarding water quality at the faucet as well as water sources were more prevalent amongst respondents from highly urbanised areas. Urban/high density *barangays* are served by BWUI and this group of consumers reported the highest consumption of bottled drinking water. By contrast, respondents from urban/low density population *barangays*, particularly those with very low population densities, had greater confidence in the water quality in their homes and at pumping station locations. Additionally, the proportion of BWUI respondents who reported their Income Class as being Level 10 was much greater than TCWS. Although the average Income Classes are very close – 8 for TCWS and 9 for BWUI – this information is averaged and, considering that Class 10 income is P10,000 per month and above, many households may have incomes that greatly exceed P10,000 per month. Therefore, the average income for BWUI respondents may be considerably higher than the results indicate.

Income is an important factor in determining whether a household purchases bottled drinking water, but it is not the only factor in deciding to purchase bottled drinking water. It may, however, affect the decision over which brand of water to purchase and the number of bottles per month. Additionally, consumers' perceptions of affordability with respect to water provided by the waterworks utilities could further influence household economic decision making regarding water consumption.

There was no clear link between amount consumed and household income with respect to affordability; however, the significance of water as a basic need and the requirement to pay the water bill was frequently expressed across all income classes. Examples of responses include:

> *I would be willing to trade more money for water. Water is vital. It depends on your family and orientation – I am willing to trade more money for water* (Informal conversation (BWUI): Shared water connection between 3 households, paying P350+ per month).
>
> *Affordable. We are ok if the payments increase as long as we have water* (TAG002 (BWUI): 8 in household; Income Class=4; estimated expenditure per month=P137).
>
> *If you can give us 24-hour service, what we pay won't matter. I'm sure it will suffice for the service we get* (TAG031 (BWUI): 6 in household; Income Class=10; estimated expenditure per month=P200);
>
> *Expensive. We are forced to pay for us to have water* (TAG048 (BWUI): 5 in household; Income Class=10; estimated expenditure per month=P190).
>
> *Expensive. We never mind the payment at least we have water because water is life* (TAG062 (BWUI): 5 in household; Income Class=5; estimated expenditure per month=P200).
>
> *Before, we usually fetched water* [*from*] *our neighbour. Now we don't need to because we have* [*a*] *water connection already. It is still affordable, but it is a little expensive compared to before* (TAG096 (BWUI): 6 in household; Income Class=8; estimate expenditure per month=P85).

Of BWUI respondents, 85 percent felt that the amount they paid to BWUI each month was affordable; 93 percent of TCWS respondents felt that their water bills were affordable.[137] By and large TCWS respondents did not feel that TCWS rates were expensive; however, 42 percent of BWUI consumers felt that water rates were expensive yet they were not so expensive as to seriously adversely affect households' abilities to ensure water for domestic use along with other household needs.

As this discussion illustrates, a number of factors within households affect household access to water as well as their decisions concerning its allocation. In the following section I

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[137] CWS households were not asked to comment on affordability.

consider external factors which affect access to water and water services and ask to what extent households in Tagbilaran experienced any improvements or changes to the waterworks services in Tagbilaran.

8.3 Changes and improvements to waterworks services in Tagbilaran

Meeting the needs of urban households in Tagbilaran through improving access to networks and improving water quality has been a priority for nearly a decade. As stated in Chapter 7 (Section 7.1), the Provincial Government undertook a programme of rehabilitation and expansion in 1997. The privatisation of the PWS utility in 2000 was, according to the Relampagos administration, part of a longer-term solution to the problem of water supply in Tagbilaran. Since privatisation, BWUI has, as part of the conditions of the joint venture agreement, also undertaken a programme of rehabilitation of the existing network and expansion of the coverage area.

Security of access through network improvements manifests in a number of different ways with implications on several aspects of daily life. Changes to waterworks services, particularly privatisation and bill payment procedures, have brought changes in the relationship between consumers and waterworks utilities in which consumers' expected level of service and quality from BWUI is much higher than when the government owned and operated PWS.

Improvements undertaken by waterworks utilities of their networks have generally led to more secure access for households to potable water; however, not all changes have been well received. For example, privatisation brought changes to the relationship between waterworks utilities and consumers and in consumer expectations of service and product. However, rather than a simple polarisation of pro- and anti-privatisation supporters, attitudes and opinions concerning privatisation and BWUI are complex.

Network improvements and rehabilitation undertaken by PWS/BWUI, TCWS and CWS have positively affected hundreds of households in Tagbilaran and Corella in a number of ways. These include increasing access through expanded distribution coverage and by ensuring better water security in terms of availability (for example, regularity of flow) and reliability (for example, water quality, water safety, and regularity of flow) (see Chapter 7, Section 7.1 and Section 7.2). Improved water security has led to substantial lifestyle changes, which reflect the convenience of reliable water supply.

Twenty-four hour water service has been a notable improvement for households since it ensures a more reliable and stable supply of water for households to meet their daily living needs. Many respondents said they had been subjected to water rationing in the past so the change to 24-hour supply of water to the house was welcomed, as were improvements in

distribution and access whereby households no longer had to "fetch water" from elsewhere, including neighbours. These sentiments are reflected in the statements below:

> *There's a big difference because now we already have 24-hour supply of water unlike before we need to fetch water in the far area. Faucets are located inside the house* (TAG007, (BWUI), Cogon, U/H).
>
> *The water does not stop anymore unlike before* [*when*] *the water* [*was*] *scheduled and we* [*had to*] *fetch water* (TAG008 (BWUI), Cogon, U/H).
>
> *Water before was scheduled but now is 24-hours* (TAG009 (BWUI), Cogon, U/H).
>
> *We don't need to buy water in our neighbour anymore because the water is continuously flowing* (TAG075, (BWUI), Poblacion III, U/H).
>
> *Good now*. [*When TCWS*] *supply sometimes there was no water at night so we needed to get water from the well, which is near to the house. We have not used the well now since last June* (*2003*). *24-hour supply now* (TAG003 (BWUI), Booy. U/L).[138]

Tagbilaran first attained 24-hour water supply to households in 1997 when additional pumping units began operating in Corella, which was reported as a significant achievement for the Relampagos administration at the time (Bohol Chronicle, 1997a; 1997b; 1997c). Better access and distribution reduces the amount of time that may otherwise be spent on water collection. Furthermore, the time taken out of a day to perform household duties such as cleaning and bathing is also reduced thereby increasing available time for other activities both within and external to the household. Some of the benefits to households of 24-hour water were noted in an editorial in the *Bohol Chronicle*:

> Water rationing which has been a curse in every home is now a thing of the past… Housewives now claim that the entire family can have a real bath anytime of the day. Full bath has never been in the lexicon of housewives until the provincial government tapped the Tanday, Corella water source (Bohol Chronicle, 1997c).

Twenty-four hour water supply in Tagbilaran is not universal. Several respondents noted that they were still subject to rationing or unreliable flows; however, there is a general sense that services have improved, as illustrated below:

[138] TAG003 transferred to BWUI from TCWS in June 2003. Interview conducted in October 2003.

> *We are very glad and happy we have water … which is located inside our house unlike others* [*who*] *are still buying and fetching water from their neighbours* (TAG108 (TCWS), Dao).

> *Improved now …there is always water.* [*It*] *seldom happens that there is no water.* [*With*] *PPUD before*, *every morning there was no water* (TAG050 (BWUI), Bool).

There have been notable changes and improvements in the service and delivery of water by the waterworks utilities as well as water quality, which are important factors in terms of water security. Salty water had been a problem experienced by many residents of Tagbilaran in the past but changes by PWS and BWUI in their operations led to improvements in taste and quality of water (as discussed in Chapter 7, Section 7.1). The initiation of pumping units in Corella and a reduction in the rate of abstraction at pumping stations in Tagbilaran where saltwater intrusion had been identified by PWS in 1997 likely precipitated early improvements. Since 2000, improvements in filtration and treatment of water by BWUI have augmented these earlier efforts in providing better quality water. Improvements in water quality were generally associated with the operation of pumping units in Corella.

> *Before the city water was salty but it's not now because it comes from Corella*, *which is not a polluted area* (TAG062 (BWUI), Booy).

The maintenance of the network and service provided by the waterworks utilities were considered important for households because of the implications that poor network condition had on their ability to meet their water needs. In addition, households felt they were entitled to good service and water supply in exchange for paying their bills and adhering to the rules of the waterworks utilities. In this regard, BWUI was seen to be better in terms of network maintenance and customer service than PWS had been.

> *No good during the government. Good services with BWUI now* (TAG067 (BWUI), Dao)

> *Is good in terms of services because they can react on consumer's complaints. Government was slow with improvements. The private* [*company*] *are using modern ways. Yes*, *very happy now with private* [*company*] (TAG064 (BWUI), Cogon).

Likewise, nearly all TCWS respondents expressed satisfaction with the maintenance of the network and the services they received as consumers:

> *[TCWS'] services are good. Whenever we need assistance with regards to the water they are ready to help us (TAG119 (TCWS), Manga).*

Tagbilaran respondents identified problems associated with waterworks' operations and service, and problems associated with quality, but not environmental aspects of water supply. Operations and service problems included disruption of service, problems with distribution, network maintenance and expense. Disruption of service, mostly due to brownouts, was commonly cited by both BWUI and TCWS respondents across Tagbilaran. Unequal

distribution to households within the city and less than 24-hour service were also problems noted by respondents and reflect concerns over access to, and reliability of, the service network. Problems associated with the physical infrastructure of the network were reported as leakage/losses and maintenance. This reflects the recognition by respondents of the importance of maintaining the system in good running order to minimise problems for consumers.

Water quality problems included concerns over cleanliness of water and discolouration, safety of water for drinking and taste. Water discolouration was reported as mostly an intermittent occurrence associated with brownouts or heavy rainfall. On many occasions, consumers noted that water had appeared rusty or dirty in the past, but had improved greatly in recent times.

Acknowledgement by consumers of the improvements in service received from the waterworks utility also extended to the process of bill payment. In particular, BWUI consumers felt that the system of bill payment at the BWUI office was preferable to the former government system, where favouritism had been a common problem:

> *Paying of bills is better now than before*. "*Way abusado*" - *no favouritism at the office unlike before with the government* (PRIV010)
>
> "Way abusado." *No favouritism*. *In the past*, *people would be entertained first even if there is a line* (PRIV007).
>
> *It's just the same*, *the only difference is the paying of the bills*. [*Now*] *we get a number first and wait till your number will be called*. *This is from Monday to Saturday*. *Before*, *if you had a friend that worked there you could pay your bill first* (TAG040 (BWUI), Bool).

However, the privatisation of PWS has raised concerns about the relationship between the waterworks utility (BWUI) and consumers.

Since privatisation, it is generally felt that rates for water under BWUI are more expensive than under PWS, and that BWUI is far stricter in their bill collection than PWS had been. Conversations about waterworks services with BWUI households invariably led to conversations about strictness and bill payment highlighting that these matters were an upper-most concern for consumers. Two-thirds of all BWUI respondents felt that BWUI was much stricter than PWS, with 30 percent of BWUI respondents recounting that, when the government owned and operated the waterworks utility, consumers were able to "pay anytime we want." Comments that BWUI was strict were often accompanied by statements concerning the threat of disconnection or penalties for late payments:

> *During the government period it is cheaper payment and you can pay anytime you want. Even if for many months you are not paying, you will not be disconnected. No good service. Private is very strict. Must pay water bills every month. If you are not paying for three successive months, you will be disconnected* (TAG045, Bool; Income Class=10).

> *Very strict now. Every month we must pay the water bill. No payment, no water* (TAG058, Poblacion III; Income Class=6).

> *Strict in private and not in the government. BWUI will cut the line if you cannot pay two successive months. You can pay any time in the* government (TAG029, Poblacion II; Income Class=10).

> *During government period we can pay the water bills anytime we want but now, they are very strict and we need to pay every month. Delayed payments means penalty* (TAG066, Dao; Income Class=10).

While respondents were aware of the risk of disconnection if they failed to pay their accounts on time, the length of time an account was in arrears before disconnection occurred was uncertain. Reported times varied from one month to three months; however, it was noted that disconnections were uncommon during PWS operation:

> *The private is very strict while the government is not. Pay anytime you want. Even you are not paying for many months you can still have an access of water* (TAG028, Poblacion II; Income Class=10).

However, not all respondents felt that strictness was necessarily bad since it was felt that the threat of disconnection encouraged consumers to pay their bill on time. In this regard, strictness, including disconnections and penalties, promises fairness and equity for consumers by ensuring that everyone pays for their share. Such sentiments are illustrated in the statements below:

> *It is good because it is run by a private corporation and it is unlike the government, which is prone to corruption. Before, government collections were not very strict for water and power. You could go for two or three years without paying. The private company is more efficient and makes sure that people pay on time* (TAG006, Cogon; Income Class=10).

> *Ok with the privatisation so that people will be paying bills on time. Unlike in the time of the Government when you can pay anytime you want* (TAG071, San Isidro; Income Class=9).

> *Less corruption and people are up to date in paying bills unlike before they can pay anytime they want* (TAG095, Cogon; Income Class=Did Not Specify).

Furthermore, improvements in service including distribution, access and maintenance made BWUI's strictness more tolerable:

> *Salcon*[139] *is the one who did the water management and we like these services. They have good service. And they were able to supply us with water for 24-hours. Though they are very strict at least we have 24-hours supply of water. Unlike in the government, before, the water is being scheduled* (TAG010, Cogon; Income Class=9).
>
> *Good services with Salcon yet very strict at least we already have 24-hours supply of water. The water is not anymore scheduled* (TAG063, Cogon; Income Class=10).
>
> *Strict in terms of paying bills. But their services and maintenance are good which most of the people are benefited* (TAG076, Poblacion III; Income Class=6).

As stated in Chapter 7 (Section 7.2), BWUI's policy concerning bill collection and disconnection follows on from changes implemented by PPUD in 1998 to tackle the problem of delinquent accounts (Bohol Chronicle, 1998). Since 2001, TCWS has also increased its efforts to address delinquent accounts (see also Chapter 7, Section 7.2). Of TCWS respondents, only 26 percent felt TCWS was strict or had become stricter in recent times, which is a considerably smaller proportion than for BWUI. On the face of it, TCWS respondent's comments echoed those of BWUI; however, an important point of difference is that 65 percent of TCWS respondents did not think that TCWS was strict:

> *Two months failure of paying bills disconnection will happen* (TAG108, Dao; Income Class=10).
>
> *Yes, we need to pay water bills every month. Failure to pay will have penalty. Disconnect if fail to pay for three consecutive months* (TAG119, Manga; Income Class=10).
>
> *It became strict with the payment. If you will not pay in two months they will disconnect* (TAG121, Taloto; Income Class=6).

Interestingly, while many respondents commented on disconnection and penalties for late payments, this often had little bearing on respondents' perception of "strict." The quotes below illustrate this contradiction:

> *Not strict but disconnection will happen after three months or more failure of paying bill* (TAG101, San Isidro; Income Class=8).
>
> *Not strict unless you will not be able to pay for three successive months then they will be strict in that case* (TAG102, Cabawan; Income Class=7).
>
> *Fifteen percent penalty for not paying on time. Not strict if you are up to date on paying bills* (TAG104, Cabawan; Income Class=5).
>
> [*Not strict*] *but we need to pay our bills every month* (TAG116, Manga; Income Class=10).

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[139] A number of Household Survey and Privatisation Survey respondents referred to BWUI as Salcon.

> *No*, [*not strict*] *if you always pay on time. Limit to two bills*; *after that*, *disconnection will be done* (TAG129, Tiptip; Income Class=4).

The differences in perspective between TCWS and BWUI respondents concerning strictness, disconnections and penalties point towards differing perceptions of the nature of the waterworks utility; that is, as a public utility, TCWS is perceived as being less strict than the private utility, BWUI. Other comments made by BWUI consumers reinforce this perspective, as respondents point to concerns over the ability of the private company to look after consumers, particularly the poor, since it was felt that as a private company BWUI was more motivated by profit than the government-run PPUD/PWS. There is a sense that water became an economic commodity after privatisation whereas when the government owned and operated the water utility it was a 'free' good. This sentiment is reflected by the many statements made by respondents about paying "anytime we want", which included never. However, payment by consumers for water was required by PPUD – water in Tagbilaran was not free prior to privatisation; the primary difference between the two utilities lay in the collection of accounts. The persistence of free-riders through delinquent accounts and illegal connections was obscured during government operation; the politicisation of the privatisation process and subsequent controversy surrounding the operation by BWUI further obscured the problem of free-riders and instead projected BWUI as victimising consumers by forcing them to pay (more) for water.

Not only did many BWUI consumers feel that BWUI was stricter now than PWS, but 38 percent of all BWUI consumers surveyed felt that water rates had increased since BWUI commenced operations. However, according to interviews with BWUI staff, articles in the *Bohol Chronicle*, and research in the Water Utilities Division of the National Water Resources Board, water tariffs have not increased since BWUI commenced operation in 2001. Conversely, as TCWS increased its water rates in January 2004, reports by TCWS consumers of water becoming more expensive are likely more accurate.

Having ruled out an increase in water rates as the cause of perceived price increases for BWUI consumers, a number of other possibilities emerge that help explain why BWUI consumers reported an increase in their water bills. It is possible that consumers have increased consumption above the minimum quantity because of better availability. As discussed earlier, respondents often had poor recall of the volume consumed per month. Additionally, many respondents noted improvements in availability–24-hour supply–so households could be consuming more water now than in the past, and more than they realise. Furthermore, changes in economic circumstances and changes in lifestyle could lead to increased water consumption and hence, an increase in the water bill. For example, the installation of showers for bathing rather than 'dipper-style' bathing; installation of flush toilets; installation of better toilet facilities or more toilets; purchase and use of washing machines for laundry; and the purchase of vehicles and subsequent cleaning are all changes in lifestyle that lead to increased water consumption for individual households (Altinbílk, 2002). The requirement to pay water bills on

time, under threat of disconnection or penalty, could cause respondents to perceive an increase in the water bill, particularly if the respondent was delinquent in the past. Continual late payments and penalties may also make it seem like households are spending more, as would re-payment of money in arrears or money for re-connection, new connections or transfer of meters.

The continued access to water for household needs is a priority concern for the City and Provincial governments in Tagbilaran, as well as for people living in the city, but access is conditional not only on payment of accounts to a waterworks network but also on the state of water resources. To this end, the interaction between human activities, land use and the environment are significant since such interaction has the potential to adversely affect water quality and quantity. The following section exposes local knowledge and understanding amongst Tagbilaran and Corella residents of potential threats to water access and supply.

8.4 Local knowledge about threats to water access and supply

Access to municipal water in Tagbilaran is contingent upon sustainable management of groundwater resources in Tagbilaran and Corella. Groundwater resources in karst limestone environments are extremely vulnerable to deterioration of water quality and depletion of stocks. In Chapter 5 (Section 5.3), I identified the major sources of potential contamination in Tagbilaran as being saltwater intrusion, solid waste disposal, sewerage and sanitation, and urban expansion affecting recharge and discharge patterns. In Corella, along with the threats listed above, threats associated with agricultural practices such as pesticide and fertiliser use, as well as land clearing, and resource extractive industry were also identified.

Despite the presence of these very real threats, households, by and large, did not comprehend how such threats have come about, how they could be resolved, or that they even existed. For the most part, households were concerned with actions which threatened their ability to have adequate water of good quality for their daily needs in which the manifestation of the 'threat' – the adverse effects on water security – is experienced in the household as a reduction in their available water. To this end, threats were seen as arising either as a result of poor management and service by the waterworks utilities, or because of inappropriate use by other consumers. Tagbilaran residents exhibited a relatively poor understanding about the environmental impacts of human activities in urban areas and the risks to water supplies. By contrast, Corella residents exhibited a considerably better understanding of land use practices and groundwater. Some of the reasons for these differences are discussed below.

The level of awareness amongst households in Tagbilaran and Corella about the interaction between human activities, land use and groundwater has implications for households. It is possible that households are unknowingly increasing the risk of water quality degradation. For instance, the lack of a sewerage network in Tagbilaran and Corella means that households rely

on septic tanks, which, if improperly installed, could cause contamination. The use of sinkholes for disposal of household and other wastes, and the use of inorganic fertilisers and pesticides also have the potential to adversely affect water quality. The continuation of such behaviour poses a major health threat in the future, but such behaviour is preventable. Local awareness about groundwater processes in Tagbilaran and to a lesser extent Corella is, however, relatively limited and knowledge gaps concerning how water resources come to be contaminated exist. The actions identified by households as threatening the quality and quantity of groundwater resources are summarised in Table 8.9 and discussed below.

Respondents	Population increase	Cutting of trees	Kaingin Farming practice	Waste disposal	Pollution
BWUI	52 (53%)	47 (48%)	2 (2%)	25 (26%)	5 (5%)
TCWS	7 (16%)	6 (19%)	-	19 (44%)	10 (23%)
CWS	1 (4%)	23 (92%)	6 (24%)	0	4 (16%)
Urban/high	23 (52%)	21 (48%)	1 (2%)	11 (25%)	4 (9%)
Urban/low	36 (37%)	32 (33%)	1 (1%)	33 (34%)	11 (11%)
Rural/low	1 (4%)	23 (92%)	6 (24%)	0	2

Table 8.9: Land use activities that threaten groundwater resources

As the table indicates, population was identified as posing the greatest threat to groundwater resources. Increased population leads to higher levels of pressure being exerted on the environment and resources, and increases the risk of externalities associated with human activities such as those identified in Section 5.3. Households in *barangays* with greater population density frequently noted the pressure placed on water supply and quality by population. Conversely, people living in *barangays* with lower population density did not perceive population as posing much of a threat to present or future water supply. For example, households in Tiptip[140] were confident that the water sources in their *barangay* would be sufficient into the future:

> *I think that there is still enough water for the future because we always have a lot of water* (TAG127, Tiptip)

> *I don't think we will be out of supply for water because we have a lot of it. Most of the nearby* barangays *are getting water from us* (TAG130)

> *For other areas the water will be limit but in our case, I think there will always be enough water for us* (TAG133)

[140] TCWS has pumping stations located in Tiptip

For the majority of respondents, however, the threat was seen as being the potential for a reduction in the amount of water available for individuals rather than externalities associated with human activities ("more people, more consumers, less supply").

The extent to which households in Tagbilaran understood the links between groundwater, sewage, sanitation and solid waste were fairly limited. Tagbilaran and Corella lack a sewerage network and treatment system, which means households rely on septic tanks. The number of households reporting "Water sealed sewer/Septic tank" was nearly universal (see Table 8.10) but I conjecture that the veracity of these reports is questionable.

Households	Water sealed, sewer/septic tank shared with other household	Water sealed, sewer/septic tank used exclusively by household
BWUI		98 (100%)
TCWS		43 (100%)
CWS	1 (4%)	24 (96%)

Table 8.10: Toilet facilities in surveyed households, Tagbilaran and Corella

Furthermore, as stated in Chapter 5, despite Building Code regulations requiring properly sealed and constructed septic tanks, in many cases septic tanks are not properly constructed and are instead simple ground excavations without cement flooring or walling, or natural sinkholes are used. Such claims are supported by my own observations as well as anecdotal accounts from informants representing the NGO community and government. Part of the reason why households do not comply with Building Code regulations is because the City Government has been unable to enforce compliance across the board, particularly with pre-existing dwellings and buildings, due to administrative and financial constraints. The onus of responsibility falls on individual households who may not fully comprehend the importance of ensuring safe disposal of wastes in order to protect groundwater sources, or who are limited by a lack of economic resources to re-construct suitable and compliant septic tanks voluntarily. The potential for faecal coliforms and other pathogens to contaminate groundwater was not commented upon by the households surveyed, suggesting that people are not fully aware of the implications of poor sewerage facilities.

Other potential sources of contamination were identified as posing threats to water security in Tagbilaran, including stormwater runoff and leachate from solid waste. Flooding and heavy rainfall during the rainy season were perceived as threats because of polluted runoff, which reflected other accounts of the inadequacy of stormwater drainage and the problem of flooding in parts of the city (Torralba, 1998). However, the potential threat posed by stormwater was seen as being the risk of stormwater entering the water network pipes through leaks and joins rather than the risk of contaminating groundwater resources as a consequence of infiltration.

Households' concerns over the potential for groundwater contamination as a consequence of improper disposal of household waste and pollution represents awareness that such actions could negatively impact water quality and ultimately water security. To this end, households reiterated the importance of placing rubbish at the roadside for collection by rubbish trucks to collect rather than littering, burning or dumping rubbish. Organised collection by the "Garbage truck" was the dominant disposal method in Tagbilaran, particularly in areas with high settlement density where methods such as "Burning" are a nuisance for neighbours and space constraints limit methods such as "Composting." Conversely, where settlement density is lower, households employed a number of methods to dispose of household waste.[141] Table 8.11 summarises the methods for waste disposal in Tagbilaran and Corella.

Respondents	Burning	Burying	Composting	Dumping	Feeding to animals	Garbage truck	Other
BWUI	13 (13%)	-	1 (1%)	-	-	89 (91%)	-
TCWS	8 (18%)	-	2 (5%)	2 (5%)	-	39 (91%)	-
CWS	13 (52%)	5 (25%)	14 (56%)	-	2 (8%)	10 (40%)	2 (8%)
Urban/high	3 (7%)	-	-	-	-	44 (100%)	-
Urban/low	18 (19%)	-	3 (3%)	2 (2%)	-	84 (87%)	-
Rural/low	13 (52%)	5 (25%)	14 (56%)	-	2 (8%)	10 (40%)	2 (8%)

Table 8.11: Methods of household waste disposal[142]

Attempts to educate residents about solid waste management and littering were observed around the city (see Plate 8-6); however, litter was seen in many parts of Tagbilaran as was household burning of waste (see Plate 8-7).

[141] A health education campaign undertaken in Corella promoted burning as a means by which to keep mosquitoes away as part of a dengue information campaign, which partially explains why burning rates as a major waste disposal method.

[142] Respondents were asked to report all methods of household waste disposal practised in their household hence the sum of figures is greater than 100 percent as many respondents indicated more than one method.

Photo by Fisher, 2004.

Plate 8-6: Billboard to discourage littering and improper disposal of rubbish, Dao, Tagbilaran

Photo by Fisher, 2004.

Plate 8-7: Fire for burning household refuse, Dao, Tagbilaran.
Burning of waste and leaves is still a fairly common household practice in Tagbilaran. One reason for its continuation is that it helps to deter mosquitoes.

Although households acknowledged the importance of proper waste disposal, there appeared to be little recognition of the potential for contaminants at the city landfill to leach into groundwater. There was also little evidence of awareness that the current landfill site is located in an open sinkhole, although some respondents were aware of plans for constructing a new sanitary landfill (Chapter 5, Section 5.3). This reflects a lack of understanding of the implications of human interaction, particularly urbanisation, on the environment.

Despite not fully comprehending or articulating the implications of urbanisation on water resources many respondents felt Tagbilaran was an unsuitable location to source water. This was mainly because water in Tagbilaran in the past had been salty and of poor quality; therefore, past experiences coloured present perceptions. However, people were unable to give an explanation as to why water quality was poor or had become salty, again suggesting that people did not understand how human activities, including over-pumping, can affect quality or lead to salt-water intrusion.

By contrast, Corella, with a much lower population and population density, was seen as a far more suitable water source for Tagbilaran. This was largely because households in Tagbilaran felt the potential for groundwater contamination and overuse was low because there were fewer people. Households in Corella, however, felt there was still potential for groundwater contamination despite a lower resident population as a consequence of pesticide and fertiliser use. To this end, farmers are increasingly using organic fertilisers and reducing reliance on inorganic fertilisers and pesticides thereby ameliorating the potential for non-point source pollution. Recognition of the threat posed by fertiliser and pesticide use was confined to residents of Corella only.

As illustrated above, knowledge held in Tagbilaran about the potential adverse effects of human-environment interactions was largely linked to population demand or contamination as a consequence of urbanisation. The exception to this was “Cutting of trees”, which was seen as a land use activity posing a great threat to groundwater resources. More than one-third of Tagbilaran households surveyed and nearly all Corella households (92 percent) felt that “Cutting of trees” had negative implications for water sources.

By contrast, knowledge held in Corella about the potential adverse effects of human-environment interactions indicated a better understanding of the implications of land use practices on groundwater. As mentioned above, those surveyed in Corella identified the threat posed by fertiliser and pesticide use on groundwater contamination. In addition, respondents in Corella also identified *kaingin* and quarrying as land use activities that threaten water resources. *Kaingin* or the practice of slash and burn agriculture requires the clearing of land and trees for agriculture. *Kaingin* and cutting of trees is strictly prohibited in parts of Corella that are covered by *PP 1030 Area Declared the Philippine Tarsier as a Protected Faunal Species in the Country* (Municipality of Corella, 2002). Quarrying is carried out in Cancatac and extracted

material is used for filling roads in the municipality and neighbouring towns. Both activities have the potential to alter recharge and discharge patterns, or to increase the risk of contamination of water resources.

Information campaigns to *barangay* development councils about protecting the environment and endangered species such as the tarsiers[143] (as well as the importance of sanitation) have been conducted throughout Corella. Furthermore, there is a history of engagement by environmental NGOs in environmental education through schools and youth groups, which explains the generally good level of understanding by Corella residents of the interaction between land use and groundwater. To my knowledge similar campaigns have not been conducted in Tagbilaran.

Therefore, activities and actions identified as threatening household water security and access to municipal water services were perceived as arising from poor management and service, or inappropriate use of water by other consumers. Table 8.12 summarises the actions perceived by Tagbilaran and Corella households as threatening their water security.

Respondents	Brownout	Careless use of water	Supplying other towns	Poor Maintenance	Poor management at source
BWUI	42 (43%)	48 (49%)	5 (5%)	67 (68%)	
TCWS	32 (74%)	5 (12%)	-	33 (77%)	
CWS	2 (8%)	3 (12%)	16 (76%)	1 (4%)	1 (4%)
Urban/high	19 (43%)	20 (45%)	3 (7%)	29 (66%)	
Urban/low	55 (57%)	33 (34%)	2 (2%)	71 (73%)	
Rural/low	2 (8%)	3 (12%)	16 (76%)	1 (4%)	1 (4%)

Table 8.12: Actions perceived as threatening household water security[144]

More than half of the households surveyed in Tagbilaran had concerns over power failures/brownouts threatening water distribution and the ability of households to fulfil their water needs. For some, brownouts in Tagbilaran did not affect water distribution; however, brownouts in Corella would cause an interruption of flow. For others, interruption in water distribution followed only if the power failure was long or if it was coupled with poor weather such as heavy rains. The concern over brownouts was greater for TCWS households than BWUI and reflects the improvements that have been undertaken of the BWUI network.[145] For the most part, however, service interruptions due to brownouts are largely beyond the control of

[143] See Chapter 6, Section 6.3.
[144] Respondents could nominate more than one action which they perceived to threaten household water security hence the total percentage is greater than 100 percent.
[145] A BWUI informant explained how they had sought to minimise the disruption of water service caused by brownouts. As part of their network rehabilitation, BWUI clustered pumping stations and separated low elevation areas from high elevation areas in an attempt to reduce the occurrence of some service interruptions (WW#3).

waterworks utilities. Given the frequency of brownouts, though, the implications on households is fairly significant since service interruptions as a result of brownouts present an inconvenience and may extend the time taken to perform household tasks such as bathing and washing.[146]

Ensuring household access and water security for everyday use was seen as being contingent on a well maintained and operating network system. "Poor Maintenance" was seen as the greatest threat to household water security for all BWUI and TCWS consumers surveyed, with 68 percent of BWUI consumers and 77 percent of TCWS consumers identifying factors associated with the condition of the network such as leakage and old pipes. Loss of water, poor water pressure, poor water quality, and the risk of contamination were all seen as adverse consequences of leakage and old pipes. Hence, consumers deemed good maintenance and regular servicing of the network by utilities as vital. Loss of water pressure, particularly at peak times, also threatened to prevent households from meeting their daily needs. Low water pressure affects residents in performing their daily activities since it causes delays in household chores such as bathing and washing clothes. Consumers noted that water pressure tended to be much lower in the mornings from 6am until 8am ("*hinay ang tubig sa buntag*")[147] than in the evenings. Respondents attributed this to preparing breakfast as well as people readying themselves for work or school. This corresponds with information obtained from BWUI (WW#3) concerning peak demand times for BWUI as 6am to 7.30am, 11am to 12.30pm and 4.30pm to 7pm, with demand higher on Saturday and Sunday because of washing and cleaning activities.

The findings presented in Table 8.12 suggest that maintenance was a greater concern for TCWS consumers and households in urban/low population density *barangays*. To date, Urban/high density *barangays* and households within BWUI coverage areas have undergone extensive rehabilitation and improvements in keeping with the conditions of the joint venture agreement including working to improve water pressure, while progress in urban/low and TCWS coverage areas has been slower. The expectation of good maintenance extended to preventing or repairing damage suffered as a result of vandalism of pumping stations since failing to repair vandalised equipment affects household water security.

Households were predominantly concerned, therefore, with the condition of the network and distribution and how this affected their access to water. Only one respondent identified "Poor management at the source" as a threat to household water security. The implication is that the waterworks utility extracting water is responsible for managing water resources at the source to ensure continued supply of water in the future. Another respondent strongly alluded

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[146] During my residence in Cogon from June until December 2003, there were several brownouts of varying length per week. Brownouts are usually quite localised and tend to only affect parts of *barangays*.

[147] "*Hinay tubig sa buntag*" translates to "slow water in the morning", that is, low water pressure in the morning.

to the importance of water resource management by the utilities at the source in response to questions regarding water sharing with Corella: "BWUI is not abusive with water and are only taking what they need" (TAG018, Mansasa). Although consumers expressed concerns about the depletion of available water and activities that may threaten water availability, these threats were geographically non-specific or at best Corella-specific. Recognition of the importance of resource management at the site of abstraction was only partially demonstrated by respondents who reported "Cutting of trees" as a threat to water resources; however, respondents did not identify areas in which "Cutting of trees" may be more detrimental; that is, in watershed and/or recharge areas, or elsewhere. Again, this illustrates gaps in local knowledge about hydrological processes in Tagbilaran and Corella.

Concerns related to maintenance, service and infrastructure represent distribution concerns; households also had concerns over how demand affected their access to municipal water supply. Inappropriate use of water or "Careless use of water" by other consumers was considered a threat to households' continued access to water. "Careless use of water" was described as failing to turn off taps, leakage through improper maintenance of the service line (for which households are responsible), leaky faucets, leaving hoses and taps running and other actions which lead to water wastage. Such carelessness and waste, it was felt, would lead to depletion in the amount that was available to all users. Similarly, respondents also identified "Supplying other towns" as a threat to access and water supply. Most of the respondents reporting "Supplying other towns" as a threat were Corella respondents, who were aware of the presence of BWUI pumping units within Corella and of the arrangement whereby Corella supplied water to Tagbilaran (as well as *barangays* in other neighbouring towns). Again, the fear amongst respondents was that the source of water would be depleted in this case through oversupply and overuse; however, unlike "Careless use", individual households were absolved of responsibility. Instead, the parties engaged in water arrangements that facilitated supply to other towns were seen to be responsible. In the BWUI/Tagbilaran case, both the Municipal Government of Corella and BWUI were therefore culpable.

Having determined the actions perceived as threatening water access for households in Tagbilaran, the next section explores local knowledge and perceptions about how people think access to water and ongoing water security can be protected and who is responsible for ensuring this protection.

8.5 Local knowledge about ensuring access and water security

In the process of uncovering the different ways people think they can ensure access and security to water for their household use, a number of different strategies emerged. Some of these were aimed at household consumers and their behaviour while others targeted waterworks utilities and their performance. Another set of strategies were identified which were broader in

scope or more comprehensive and required cooperation with government bodies and/or NGOs. Categorising household responses into these groupings—households, waterworks utilities and comprehensive cooperative strategies—starts to provide an insight into who is regarded as being responsible for protecting access to water supplies and what these responsibilities cover.

Strategies aimed at household consumers were primarily concerned with addressing consumer behaviour and encouraging responsible water use. Table 8.13 presents a summary of strategies aimed at household consumers. The importance of consumers taking a responsible approach to water use is indicated by responses such as "Conserve/Use water wisely", "Report Leaks" and "Close the faucet properly", which reinforce BWUI and TCWS attempts to reduce system losses. Conservative use of water, including water recycling, as well as saving/storing water were identified as beneficial not only in terms of reducing pressure on water supply but also in reducing household consumption and, therefore, the amount paid per month. Such sentiments are reinforced by both waterworks utilities, which encourage households to save and conserve water. Goodwill through following "Rules and regulations", particularly paying the bill on time, was also identified as strategies to ensure that individual households had continued access to water and did not risk disconnection of service.

Barangay	Conserve/Use water wisely	Report leaks	Close faucet properly	Save/store water	Follow rules and regulations
BWUI	76 (78%)	33 (34%)	15 (15%)	16 (16%)	6 (6%)
TCWS	38 (88%)	2 (5%)	9 (21%)	2 (5%)	4 (9%)
CWS	4 (16%)	-	-	-	-
Urban/high	35 (80%)	13 (30%)	11 (25%)	5 (11%)	3 (7%)
Urban/low	79 (81%)	22 (23%)	13 (13%)	13 (13%)	7 (7%)
Rural/low	4 (16%)		-	-	-

Table 8.13: Strategies for household consumers[148]

Strategies targeting waterworks utilities relate primarily to management operations and services. Table 8.14 presents a summary of strategies aimed at waterworks utilities. Respondents generally felt it was important for waterworks utilities to "Improve and maintain the (water) network" to reduce system losses as well as ensure adequate water pressure to households. These strategies reflected household concerns over the waterworks utilities' ability to ensure water supply to individual households; if the system is not maintained adequately then respondents felt they would not be assured of reliable and stable water supply. All "Limit supply to other places" responses were obtained from CWS respondents, and reflect concerns within Corella over sharing water with Tagbilaran and other neighbouring towns that stocks of

[148] Respondents could nominate more than one strategy for household consumers hence the total percentage is greater than 100 percent.

water could be depleted due to poor allocation decisions. The contrasting strategy offered by Tagbilaran respondents was "Finding new sources of water", which again suggests that Tagbilaran consumers are mindful of problems associated with water quality (even if they are unsure of factors that adversely affect quality), and rising consumption pressures associated with population growth.

Barangay	Improve/ maintain network	Limit supply to other places	New sources
BWUI	12 (12%)	-	7 (7%)
TCWS	5 (12%)	-	
CWS	-	12 (48%)	
Urban/high	6 (14%)	-	3 (7%)
Urban/low	11 (11%)	-	4 (4%)
Rural/low	-	12 (48%)	

Table 8.14: Strategies for waterworks utilities[149]

Comprehensive strategies were identified which involved fostering cooperation between waterworks utilities, consumers, the government, NGOs, and others in the community in order to achieve the desired outcomes. Table 8.15 presents a summary of comprehensive cooperative strategies which target a number of different governmental and non-governmental groups.

Barangay	Planting trees	Improved waste management	Family Planning	Stop kaingin
BWUI	44 (45%)	13 (13%)	10 (10%)	2 (2%)
TCWS	6 (14%)	6 (14%)		-
CWS	15 (60%)	-		3 (12%)
Urban/high	19 (43%)	5 (11%)	5 (11%)	2 (2%)
Urban/low	31 (32%)	14 (14%)	5 (5%)	-
Rural/low	15 (60%)	-		3 (12%)

Table 8.15: Comprehensive strategies[150]

[149] Respondents could nominate more than one strategy for waterworks utilities hence the total percentage is greater than 100 percent.
[150] Respondents could nominate more than one comprehensive strategy hence the total percentage is greater than 100 percent.

The strategies put forward by households correspond to the threats identified and discussed above. For instance the notion of "Planting trees" as a strategy to ensure continued supply of water for future use corresponds with the threat posed by "Cutting of trees", while "Stop kaingin" is a response to the practice of kaingin, which involves the illegal cutting of trees; therefore, prohibition would protect existing trees and water resources. "Tree planting" was identified by Corella respondents as a strategy that could be adopted by individuals within Corella. A number of households in Corella[151] have already planted trees on their properties while others expressed a desire to engage in tree planting but were constrained by limitations of property size or because they were not the property owners. In Tagbilaran, however, it is less feasible for individuals to plant trees, particularly those living in urban/high density barangays. For this reason, therefore, it seems respondents have in mind that local government and others (such as NGOs) should implement the "Planting trees" strategy. As mentioned above, respondents frequently failed to identify locations in which "Tree planting" should occur: watersheds, recharge areas or other locations in Tagbilaran and/or Corella. One can infer, however, that respondents felt this decision should rest with LGUs.

To an extent, the identification of tree planting as a strategy to protect water resources can be seen as the internalisation of global environmental discourses at the local level, as discussed in Chapter 3 (Section 3.2) (see, for example, Forsyth (2004)). As such, the benefits of tree planting and the importance of tree-cover in protecting water resources are determined at the non-local level and adopted at the local level. This paradigm links the lack of forests with degradation of water resources, and increasing forest with improved water resources and is reflected also in Philippine policy (for example, FMB-DENR (1998)). This paradigm and the panacea offered by forests has, however, been repudiated in recent years as discussed in Chapter 3 (Section 3.2) (Calder, 1999). To a lesser extent, tree planting and the preservation of forest areas could be perceived by households as one way in which to prohibit activities, thereby protecting water resources from contamination.

Contamination and its prevention underlie the identification of the strategy to "Improve waste management." Improvements in waste management again imply government involvement by providing adequate solid waste management facilities, which households would then be able to use. There is also potential for NGOs to be involved in improving solid waste management through education as well as projects aimed at promoting composting and recycling. As previously stated, there is a growing recognition at the household level of the importance of proper rubbish disposal, including for amenity and health and safety reasons. To

[151] Several of the respondents who had planted trees planted commercial species and were thus engaging in small-scale agro-forestry as a means of diversifying their income sources as well as environmental protection and services.

this end, plans for the construction of a sanitary landfill in Tagbilaran for Tagbilaran and Corella household wastes are well advanced.[152]

The threat posed by population loomed large for many in Tagbilaran, particularly the demand implications population increase poses for water resources but also in terms of other externalities. "Family planning" was, therefore, offered as a means to address the potential threat of population growth:

> [*We*] *must learn about family planning* (TAG063).
>
> *People must have knowledge about family planning* (TAG067).

The implementation of a strategy such as "Family planning" is an individual decision; however, information and education on various methods and approaches to family planning would require support from groups such as health agencies.

For the most part the strategies reported serve the purpose of ensuring household access to water rather than water resource management or broader governance concerns. However, these strategies start to provide some insight into who is thought to be responsible for ensuring the sustainability of water services in Tagbilaran. In Table 8.16 threats have been matched to strategies and the agents seen as being responsible for implementing strategies.

[152] See Section 6.3.

Threat	Strategy	Who is responsible?[153]
Flooding/rainy season	?	Government
Power/Brownout	?	Government
Low/Loss of pressure	Improve/maintain network	Waterworks
Quality	Improve/maintain network	Waterworks
Cutting of trees	Planting trees	Government/NGOs/People
Population increase	Improved waste management	Government/NGOs/People
Waste disposal	Improved waste management	Government/NGOs/People
Pollution	Improved waste management	Government/NGOs/People
Kaingin farming practice	Stop *kaingin*	Government
Quarrying	?	Government
Careless use of water	Conserve/Use water wisely; Report leaks; Close faucet properly; Save/store water; Follow rules and regulations	Households (People)
Supplying other towns	Limit supply to other places; New Sources	Waterworks/Government
Poor maintenance	Improve/maintain network	Waterworks
Vandalism of pumping stations	Improve/maintain network	Waterworks
Poor management at source	Improve/maintain network	Waterworks

Table 8.16: Threats, strategies and responsibility

The findings summarised in Table 8.16 demonstrate that households have concerns with supply, including distribution, and demand aspects of municipal water services. On the supply-side, the table above shows that, to an extent, responsibility for matters of supply or water resource management is considered separately from matters of distribution (water services management). Governments through resource management and waterworks utilities through water services management are both held chiefly accountable for ensuring supply. Households in Tagbilaran (and Corella) appear to place responsibility for ensuring water supply largely on "Government" as part of their broader environmental management and development agenda in which the formulation and implementation of policy is seen as important in guiding decisions that ultimately affect water resources, among other things. "NGOs" and "People" are also seen as having a part to play both in informing policy and adhering to government mandates, which reflects the recognition by households of the active engagement by NGOs in social and environmental projects and programs in Tagbilaran and Corella and other parts of Bohol/the Philippines. "Waterworks utilities" are held responsible for matters of distribution particularly as concerns water quality, maintenance and service. On the demand-side, however, "Households (People)" are seen as being responsible for managing their consumption – demand management at the household level - and meeting their obligations as consumers/citizens.

[153] "Government" is taken to mean Tagbilaran City Government, the Municipality of Corella or the Provincial Government, while "Waterworks" is BWUI, TCWS or CWS since the table presents summarised findings from all waterworks consumers.

These local conceptualisations of urban water governance offer useful insights into how to overcome some of the limitations and shortcomings of water governance and development discourses espoused at the supra-national and national level. Importantly, household perceptions regarding water access and security and threats to these are largely based upon lived experiences; therefore, threats manifest as those things directly affecting households' ability to obtain stable water services for their basic needs. To this end, households are primarily concerned with the water services infrastructure – the waterworks network and its operation – rather than human-environment interactions. Where concerns regarding human-environment interactions did arise, population growth in urban areas was the chief concern. While households well recognised the link between population growth and increased demand, the implications of urbanisation on water resources were less well recognised and understood. For the most part there was an implicit understanding that population size and density can adversely affect water quality and availability; however, the explicit causes and effects of a growing urban population were less well understood. These findings point to the need for policy to be more cognisant of local perspectives and perceptions regarding the environmental and social aspects of water governance rather than relying on direction from national and supra-national discourses.

8.6 Summary

People in Tagbilaran and Corella rely most on municipal water but may also supplement municipal water with water from other sources. On this point, water quality largely determines how water will be allocated and used within households. To a certain extent, however, decisions concerning allocation and use are also determined by price although the choice by some households to consume expensive bottled drinking water instead of municipal water, even when it was considered to be clean and safe, shows there is not a clear relationship between price and consumption. This suggests that municipal water is viewed as a heterogenous commodity which is valued differently by different consumers.

Perceptions concerning water security were greatly influenced by household and individual experiences of water services. There was a general sense that water access and security have changed over time, with service, maintenance and water quality seen as being much improved. BWUI consumers exhibited concerns over bill payment whereby BWUI was perceived as being expensive and strict whereas TCWS, with ostensibly the same policy of disconnection for late bill payment, was not. This difference reflected apprehensions held by many consumers about whether a private company would be able to provide water to consumers and ensure public well-being. These concerns mirror accusations made by anti-privatisation supporters against the move towards private sector involvement found in water governance and development literature. However, further analysis of the perspectives and perceptions held by households in Tagbilaran reveal that a simple anti- or pro-privatisation stance does not exist.

Local knowledge about actions with the potential to threaten water security reveals deficiencies and gaps in understanding about the interactions between human activity, land use and groundwater resources. Instead, households primarily expressed concerns over waterworks services and management as well as the profit-driven nature of the private company. Where concerns relating to physical or hydrological aspects of water governance were raised, these were mostly with regard to fears about excessive consumption leading to the depletion of water available to other users either as a consequence of population increase, wasteful consumption or over-allocation by waterworks utilities to other towns. This reflects awareness on behalf of consumers in Tagbilaran and Corella of the finiteness of water, and an implicit understanding of the importance of allocation and management. Finally, responsibility for ensuring water resources are protected and that households continue to have water in the future was shown to be shared amongst households, waterworks utilities and LGUs and the government, with the government retaining ultimate responsibility under the auspices of ensuring public well-being as a broad objective.

In the following chapter, I continue to explore local perceptions about water governance by considering the institutional mechanisms present in Tagbilaran and Corella regulating water governance in order to discern gaps between formal bureaucratic expressions and local knowledge.

Chapter 9 Perspectives on Hybrid Urban Water Governance Institutions

9.1 Introduction

So far I have shown how households' experiences of water supply and of their physical environment influence decisions about household allocation and perceptions about human-environment interactions and water security. As a consequence, knowledge about water governance held at the household level emerges as localised and specific in which everyday experience shapes ideas around responsibility and agency such that local forms of government and engagement have more meaning for households than national and supra-national discourse. This gives rise to apparent knowledge gaps and deficiencies about water governance, and water supply, in Tagbilaran.

In this chapter I continue to expose the multiple conceptualisations and understandings of water governance present in Tagbilaran and juxtapose these with formal conceptualisations. This juxtaposition highlights the disjuncture between lived experience and policy, and exposes risks for ensuring long-term access and water security. This includes the potential for responsibility to be diffused such that water resources are not adequately managed and waterworks utilities are not adequately regulated. I challenge the dominance of formal constructions of water governance institutions by showing how household conceptualisations of and knowledge about property, rights and ownership related to water are grounded in everyday practice and experience. I then show how these conceptualisations of water governance have influenced household perspectives concerning responsibility and their responses to management and policy decisions in the context of water sharing between Corella and Tagbilaran and the involvement of the private sector in water provision. This leads me to argue that households are more likely to be responsive to institutions which reflect their own knowledge base and understanding. That is, policies and regulations emanating from local government units. This has repercussions for formulating and implementing effective water policy since failure to adequately capture household understandings of water governance, or to enhance households' knowledge concerning formal institutional mechanisms, could ultimately render efforts to ensure continued water security ineffectual.

9.2 Conceptualising property, ownership and rights in the context of water governance

The extent to which household conceptions of urban water governance institutions conform to formal institutions in the Philippines has, in the past, received scant attention. Formal institutions regulating water governance in Tagbilaran comprise legislation and policy that has been issued or informed by the national government, who are in turn influenced by supra-national discourses (see Chapter 6, Section 6.2). The importance of establishing

appropriate institutions in light of the need to allocate water between competing users and uses has been used as justification for overhauling property and water rights in the Philippines to create the right set of incentives to ensure sustainable use of water resources (Navarro, 2003; Sy, 2003). The tendency has been to focus on formal institutions or those informal institutions which have emerged to regulate collective management of, for example, irrigation systems (see, for example, Araral, 2005; Fujiie, et al., 2005; Meinzen-Dick, 1997), with little attention given to how property and other institutions in the context of water governance are conceptualised in urban areas. As consumers of a finite resource, disregarding how urban households conceptualise property and water governance more broadly, and how this affects their behaviour, could have detrimental effects for future water security.

In Tagbilaran, the bases upon which households felt certain groups had the agency to make decisions concerning urban water supply was influenced in large part by household experiences and conceptions of property, ownership, rights and responsibility, which often differed from those formally constructed by the various government bodies. In Section 7.3, government informants and many representing NGOs were shown to be cognisant of the public property status of water resources as discussed in Chapter 6 (Section 6.2). As such, "the State" was identified as responsible for regulating access and use including the granting of water permits which assigns private property rights to permit holders that are spatially and temporally contingent.[154] In most cases, but not all, "the State" was also identified as the ultimate 'owner' of water as per *PD 1067 The Water Code 1976*. By contrast, conceptions of property, ownership and rights which surfaced from the household level suggest that, co-existent with the formal, legal institutions governing water in the Philippines, Tagbilaran is the site of a non-formal system based on lived experiences and grounded in everyday experience that is relatively divorced from national and international ideas.[155]

The emergence of a non-formal system situated in particular contexts reflects the polyvalence and mutability of the concept of property. Hirtz (1998), in dealing with land tenure issues in the Philippines including agrarian reform, claims that local practices are in fact the content of real property as understood locally, and not formal institutional mechanisms such as legislation. To this end, property in the vernacular more commonly represents the object rather than the relations to the object under question. That is to say, water becomes property—physical and tangible—rather than a physical resource to which a number of different rights, relationships, responsibilities and other socio-cultural relations are attached and ascribed. In this regard, property is frequently equated with ownership of a resource; claims to ownership are further strengthened when the resource is in the possession of the resource owner.

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[154] All Filipino citizens ostensibly can apply for a water permit as per the Water Code. Data obtained from NWRB in July 2004 revealed 453 current water permits had been issued in Bohol.

[155] See Meinzen-Dick and Pradhan (2002).

Stone (1973) offers a view of property in the Philippines which favours physical and tangible evidence of ownership; that is, something that is fenced. Where such physical manifestations are absent, property rights are also considered to be absent; therefore, resources are seen to be owned by no one. Stone explains how the concept of public property as being owned by no one translates into a different set of relations and expectations than the concept of public property as being owned by everyone. When a resource is not seen to be owned by anyone, individuals are free to appropriate rights to use until such time as the resource is re-possessed. Everyone has the potential to appropriate rights to the resource and to claim possession, but there is no sense of collective or shared responsibility over the resource which one might expect if public property was seen as being commonly owned. In belonging to no one, public property can be seen as belonging to anyone and everyone who can establish a tangible claim, generally possession, for their private use. Stone describes this as the transitory private possession of public property (Stone, 1973).

The transitory private possession of public property (water) was seen to occur in Tagbilaran, particularly where there was an absence of universal water network connections. In areas with low population density where still functioning public wells were present, water from the wells was perceived as being free to private possession by those living nearby. The sense that water collected from the public wells was unowned until a private individual took possession was strengthened by the fact that, on many occasions, the government agents responsible for upkeep and maintenance had been absent for several years. Therefore, the government's property claims were also seen to be absent. The case presented in Box 9-1 illustrates how water from a publicly-owned well provides 'free' water which is owned by no one and is, therefore, able to be privately possessed by individuals living in a residential compound. This case also demonstrates the complex social relations that arise in areas where public water sources and private household connections are used to meet water needs.

Box 9-1: Public, private and common property relations in an Ubujan compound

In a residential compound near the Ubujan barangay hall, three households demonstrated the complex property relations that water engenders; in particular, the way in which public property and private property relations are expressed at the micro-level.

TAG134, TAG135 and TAG136 are neighbours who reported using multiple water sources, including water from a publicly-owned well located nearby in order to fulfil their household water needs (see Plate 9-1). TAG136 had a single connection, TAG134 shared their connection with another house, and TAG135 was not connected to the local water network (in this case, TCWS). For TAG135 the well was the primary source of water; however, they also depended on municipal water for drinking, which they purchased from TAG136 (at a rate considerably higher than what was charged by TCWS).

Approximately 10 households used the communal well and several of these households either shared their water connections or relied on the deep well and purchasing water from neighbours in order to fulfil their daily water requirements.

Water flowing from the communal pump was perceived as being unowned and available for possession by the community of users living nearby. Water flowing from an individual's faucet, however, was perceived as being for individual use for them to dispose of as they saw fit. Whereas a sense of 'community' or the collective well-being of neighbours was discernible in terms of communal resources such as communal pumps and public (unowned) water, this was not evident where individuals felt they could establish private property rights. This sense of private ownership helps to explain why households sold water to neighbours not connected rather than giving it away for free, where the price charged to neighbours takes into account the price paid by the vendor to the waterworks utility.

Photo by Fisher, 2004

Plate 9-1: A communal pump in Ubujan provides nearby residents with 'free' water.

More generally, household conceptions of property differentiated owners of water depending upon the status of water in the production process from water in the ground to water in the faucet. As such, water and relations of property were linked to political jurisdictions and

stages of the production process. In addition, ownership of water was differentiated from ownership of the waterworks utilities. Consequently, households often identified more than one owner of water in Tagbilaran as demonstrated in Table 9.1 and Table 9.2. Table 9.1 shows the total number of times particular owners were identified while Table 9.2 provides a further breakdown indicating the multiple owners and combinations of owners identified. In both tables, owners have been grouped and aligned according to property regimes identified in Chapter 1 (Section 1.2).

Responses by Waterworks Utility	Owner by Property Type						
	PRIVATE		PUBLIC			COMMON	
	BWUI	Land owner	Corella Government	Provincial Government	Tagbilaran City Government	Corella (people)	God/ Nature
BWUI[(a)]	32		15	11	6	9	128
TCWS		9			11		34
CWS			17			8	5
Total	32	9	32	11	17	17	159

Table 9.1: Owners of water and property types (by waterworks utility)
[(a)]Includes responses from Privatisation Surveys

Property Type	Reported owner(s) of water	Number
Private	BWUI only	20
Private	Landowner only	4
Private/Public	Landowner and Tagbilaran City Government	1
Private/Public	Tagbilaran City Government and landowner	3
Private/Common	God/Nature and BWUI	7
Private/Common	God/Nature and landowner	1
Private/Common	BWUI and Everyone/No one	2
Private/Common	BWUI and God/Nature	3
Common	God/Nature only	119
Common	Corella (people) only	7
Common	Everyone/No one only	26
Public	Corella Government only	15
Public	Provincial Government only	1
Public	Government only	6
Public	Relampagos/Government only	1
Public	Tagbilaran City Government only	8
Common	Corella (people) and God/Nature	2
Common	Everyone/No one and God/Nature	1
Common	God/Nature and Corella (people)	4
Common	God/Nature and Everyone	5
Public/Common	Corella Government and God/Nature	5
Public/Common	Corella Government and people	4
Public/Common	Everyone/No one and Corella Government	2
Public/Common	God/Nature and Corella Government	6
Public/Common	Government and Everyone/No one	1
Public/Common	Government and God/Nature	2
Public/Common	Tagbilaran City Government and Everyone/No one	1
Public/Common	Tagbilaran City Government and God/Nature	4

Table 9.2: Combinations of owners (single/first named and second named) and corresponding property types

The above tables suggest local conceptions of property in relation to water resources were largely seen as comprising common property or public property characteristics (including the characteristic whereby common or public property is unowned), or a combination of both. On many occasions more than one owner was identified; invariably one of those owners was "God/Nature." There was a sense that water was owned by God/Nature but was available for everyone to use, reiterating Stone's (1973) study as well as the notion of water as a common pool resource, and water as a public good. Ownership by "God/Nature", "Everyone/No one" and "Corella (people)" primarily referred to water under the ground. For those who identified the various government bodies as owner, the implication was that the government(s) owned

water under the ground within their jurisdiction, except the Provincial Government,[156] as well as the water within their distribution networks (CWS and TCWS).

The statement that "God owns everything" seemed only to extend to water. It was generally felt that individuals were able to own land and exercise private property rights, such as the right to exclude, and that such property relations were irrespective of God/Nature. Interestingly, however, private property relations to land can also exist outside of formal institutions, that is, owners to land may not have legal title to land and instead ownership is established through the payment of tax declarations or possession. Therefore, despite feeling as if they owned the land, in the strictly legal sense they do not (see Hirtz, 1998). Despite this seeming ambiguity, private landowners were seen to be able to utilise water on their land and to do so freely by virtue of owning their land, again reinforcing how households associate possession with ownership. All who identified "Landowners" as private owners resided in Tagbilaran in urban/low density *barangays* (TCWS coverage area). As mentioned earlier, communal and private wells are still located within these barangays and control and ownership of private wells was observed, which helps explains why consumers may feel individual households can own water.

A hierarchy of ownership appears to exist whereby water is a gift from God for everyone; therefore, God is the ultimate owner. The local government, not the state/national government, however, also owns water in the ground and in their distribution networks and again, is to be shared by everyone. BWUI secured ownership of water through negotiations with the Municipal Government of Corella and the Provincial Government and, therefore, owns the water in the ground at the point of extraction as well as in reservoirs and distribution networks. Once water enters the service lines on a householder's property, the water is owned by individual households, whose claim is legitimated by paying the bill.

The ways in which households conceptualised property and ownership were highly localised and did not reflect national conceptions. This suggests that the way in which responsibility and agency are conceptualised is also localised. This has implications for the way water resources are governed, and water supply is distributed in Tagbilaran because this affects households' perceptions of who has legitimacy to govern water. Where "Government" was identified as the owner of water resources, consumers were influenced by who their waterworks utility was, and the political jurisdiction within which the waterworks utilities operated and pumping units were located. In this way, "Government" referred to the Municipal Government of Corella for CWS consumers, Tagbilaran City Government for TCWS consumers and the

[156] The jurisdiction of the Provincial Government is the entire Province of Bohol; however, where respondents reported the governments of Corella and Tagbilaran as owners there was no implication that the Provincial Government was seen as a co-owner or to supersede ownership by the LGUs.

Provincial Government for BWUI consumers.[157] Similarly, "People" generally referred to people of the town/city in which the consumer lived (Corella or Tagbilaran).

Stone's (1973) conceptualisation goes some way to explaining how water ownership is transformed in the scenario above. While the water is in the ground, it is seen to be owned by no one/everyone; therefore, everyone has an equal claim. Investment into capital infrastructure and the impounding of water in reservoirs and distribution of pipes transfers ownership of that water to the owner of the network. The network becomes a proxy for fences and other markers. Once the water enters onto an individual's private land, the water is owned by that individual. This sense of right or ownership to the water in the faucet is reinforced in two ways: firstly, by the fact that all maintenance and repairs to pipes on individuals' lots are the responsibility of the householder; and secondly, by virtue of the householder paying the bill.

The findings show that ownership, or lack thereof, did not preclude households from being able to have access to water. In this regard, ownership was distinguished and distinguishable from rights. However, ownership did carry different responsibilities for each group. Where public property or common pool resource characteristics were attributed to water, responsibility for water resource management was seen to fall to government – the City of Tagbilaran for both TCWS and BWUI consumers, presumably since the City of Tagbilaran is responsible for the general welfare of people within Tagbilaran, as well as the Provincial Government. As such, the Tagbilaran City Government was seen as being responsible for ensuring their well-being (Ligalig, 2005a). In all, more than half of those surveyed identified the "Government," either separately or in combination with other groups such as "People" or the waterworks utility, as being responsible for ensuring future supplies of water. This sentiment is demonstrated in the following quote:

> *Government*, *they are the one responsible* "kapakanan"[158] (PRIV007).

There was a strong sense that all people should be entitled to water for their daily needs, reflecting the importance of water as a basic need. In general consumers did not seem concerned about having rights to abstract their own water, although exceptions were encountered. For instance, one consumer felt it would be better if everyone was able to have their own well and was not required to pay for the water they consumed (TAG121 (TCWS) Taloto). To this end, people/consumers were also seen as being responsible for ensuring future water supply in concert with the government and waterworks utilities:

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[157] I have assumed that BWUI and Privatisation Survey respondents are referring to the Provincial Government even if this is not explicitly stated, as the former owners of the waterworks utilities. This assumption is based also on other references and comments by respondents regarding the privatisation process and operations of the waterworks utility both under BWUI and the Provincial Government.

[158] *Kapakanan* is a Tagalog term referring to "welfare."

> *The officials in the City and Provincial government [are responsible]. But for me, also the people. What can an official do if no cooperation from the people? (PRIV012).*
>
> *People - everyone should protect the water.* "Dili sayangan ang tubig": *conserve water. Not just the one who manages* (PRIV010).

While there was a sense that people should behave in a manner so as not to threaten the future sustainability of water resources, a sense of responsibility for collective management of water resources was not readily apparent except in cases similar to the one outlined in Box 9-1. The primary concern for individuals was ensuring access to water supply in their homes, which was deemed secured so long as the bill was paid on time; therefore, the main focus for households was on the service they received. Households were seen as being responsible for ensuring they used water wisely and behaved in a manner which did not threaten water resources. While household demand management is important for ensuring water security, there also needs to be some attention given to matters of supply, particularly in terms of water resource management.

Where households' water needs were not satisfied, blame was apportioned to one or more parties depending upon the nature of the grievance. In general it was felt that if water quality was poor or if there was not enough water to supply households in Tagbilaran, the waterworks managers were to blame (that is, TCWS and BWUI). Blame was also largely conceived in the context of distribution rather than supply matters such as resource management. That is, the waterworks utilities were subject to blame for failure to maintain the water network, leakage, poor pressure, interruptions in service, water discolouration, displeasing taste and other problems of quality. Blame concerning matters of resource management was thought to be shared between waterworks utilities as well as people/consumers; the former for perceived inappropriate allocation decisions and the latter for unwise use in the household. Blame and responsibility were associated with the desire to ensure fairer distribution and for supply to be stable and reliable.

To this end, a mutual relationship exists between waterworks utilities and households which is symbolised through bill payment. By paying their water bill, households expect continued access to water and of good service, which is the responsibility of the waterworks utilities to provide. This kind of patron-client relationship is representative of inter-personal relations in the Philippines more generally (Kelly, 2000; Steinberg, 1990). Households promised compliance to rules and regulations set by the waterworks utility such as going through the formal connection process (including paying for materials) and paying the bill on time in exchange for fair access and good supply. Consumers felt that they were paying for the service provided by BWUI (and TCWS) but not for the actual water itself, as the quotes below demonstrate:

> *Everyone owns water… We pay because they are working to bring water to our house or else we would have to go to Corella and fetch water ourselves. Pay the one who is doing the dirty job (TAG032).*
>
> *People use the water, Government and BWUI own the materials used but God owns it* (TAG094).
>
> *Everyone owns the water … we are paying on the services of BWUI not the water* (TAG096).

As discussed elsewhere, the sense of fairness with respect to bill payment had a positive effect on many respondents insofar as it went some way to reduce the propensity for consumers to (want to) free-ride.[159]

The findings presented above suggest that consumers view the Municipal Government of Corella as having agency to make decisions concerning water resources and the delivery of water services in Corella. Furthermore, the Municipal Government also has agency to act in a manner to protect the interests of its residents. In Tagbilaran, the City Government of Tagbilaran was seen as having agency to protect its residents. Insofar as water services and supply impact upon the residents of Tagbilaran, the City Government not the Provincial Government or BWUI was seen as having ultimate authority. The agency of waterworks utilities to make decisions concerning water was limited to matters of distribution and water services, which consumers felt ought to be subject to regulation by the government on behalf of the people. However, households were largely unaware of the national bureaucratic institutions governing water supply and the delivery of water services that exist in the Philippines.

To this end, rules and regulations and how they might be applied to waterworks utilities were understood within relatively narrow parameters. That there are national rules or regulations to which waterworks utilities are mandated to adhere, and what these regulations comprised, was not reported by respondents. There did not seem to be a perceived need for public water utilities to be subject to rules or regulations beyond those that are set within local government planning and policy agendas. The call from households for the city and municipal governments to retain decision-making authority and responsibility for water resources and their management parallels the position advanced by the government and waterworks utilities discussed in Chapter 7 (Section 7.3). A significant exception to this was the case of BWUI extracting water from Corella. In this instance, there was a sense that BWUI should follow rules established under the MOA.

The MOA between BWUI/PG and Corella is seen as an institutional mechanism by which Corella can impose rules on BWUI. The MOA negotiations were, therefore, seen as providing an avenue for the Municipal Government of Corella and its citizens to impose rules and

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[159] As discussed in Chapter 8 (Section 8.2), much stricter rules regarding bill payment and disconnection were important factors for reducing the problem of free-riding.

restrictions. Tagbilaran respondents made no explicit mention of the need to protect the water source in Corella in terms of environmental management; however, it is implied by way of comments such as those below that Corella was seen to have the authority to regulate BWUI's activities so as to ensure water resources were protected:

> [*BWUI*] *need to follow rules so that they can get water in Corella* (TAG002).
>
> *Salcon should follow rules so that Corella will give water* (TAG003).
>
> *Salcon should follow the rules from Corella so that they can get water* [*there*] (TAG019).

Waterworks utilities are not seen as responsible for water resource management per se; rather, they are responsible for matters of distribution. However, insofar as waterworks utilities would be blamed if there was no water, responses such as those above indicate that households felt some form of management or conservation should be undertaken by BWUI. In this regard, households look to those immediately responsible for their well-being – their local government unit – to regulate and enforce such measures rather than relying on the national government to safeguard their interests. This is because a closer relationship exists between local leaders and their constituents.

In the next section, household conceptions and perspectives concerning water governance reveal an implicit understanding of the hybrid governance system which has emerged in Tagbilaran. However, a lack of explicit knowledge about water governance and the hybrid system has culminated in a great deal of misunderstanding, misinformation, suspicion and uncertainty.

9.3 Conceptualising hybridity and water governance in Tagbilaran

Uncovering the ways in which households conceptualise water governance in Tagbilaran provides useful insights into understanding how water and development policy affects household actions with regard to urban water consumption and water resource management. The hybrid waterworks system currently existing in Tagbilaran has its roots in local process and factors elucidated in Chapter 7 (Section 7.1 and Section 7.2). Particularly significant to the emergence of hybrid water supply system and hybrid governance is the water sharing arrangement with Corella, and the privatisation of PPUD/PWS and subsequent formation of BWUI. A great deal of confusion surrounding these issues exists at the household level, further compounding knowledge uncertainties and deficiencies about water governance in Tagbilaran.

Although there was a high level of confusion at the household level concerning aspects of the water sharing arrangement, households were aware that water from Corella was used to meet consumer demand in Tagbilaran and that the MOA signed between the provincial

government and the Municipality of Corella set the terms of the arrangement. The water sharing arrangement between Corella and Tagbilaran signalled the first major transformation towards a hybrid system of water governance by involving another political entity in the water management and supply decisions affecting Tagbilaran (see Chapter 6 and Chapter 7). In general, households associated the use of water from Corella with improvements in the water network, particularly 24-hour water supply. Specific details about the arrangement and its implications for those in Tagbilaran and Corella were, however, less well known. Indeed, on numerous occasions, households in Tagbilaran confused the water sharing arrangement with the joint venture arrangement, or with the transfer of households from TCWS to BWUI such as occurred in Booy in June 2003 (see Chapter 7, Section 7.2). This suggests a limited understanding of the broader governance implications of the water sharing arrangement as related to resource management, supply and demand.

Perspectives about the water sharing arrangement were largely based on personal belief and sentimentality rather than concrete facts. Nearly all consumers in Tagbilaran expressed favourable opinions about the water sharing arrangement with Corella because it was associated with improvements in water supply and quality. In Corella, however, opinions were more differentiated. More than two-thirds of the households' surveyed expressed positive/neutral sentiments regarding water sharing of which one-third thought water sharing was acceptable, and one-third were indifferent or had no opinion. The remaining households were opposed to the water sharing arrangement between Corella and Tagbilaran. For Corella consumers who felt sharing water was acceptable many felt a strong sense of duty as the following quote shows: "It's ok if the water source in Corella can supply enough water" (COR002, Cancatac). For others, there was a strong sense of pride associated with the water sharing arrangement: "Proud to know that we are supplying water in Tagbilaran" (COR021, Tanday). On the other hand, those opposed to the water sharing arrangement expressed concern over the needs of consumers in Tagbilaran taking precedence over consumers in Corella:

> *Disagree that Corella support water to Tagbilaran because there are still other households that don't have access to water in Corella* (COR025, Tanday).

The potential and actual inability for residents of Corella to satisfy all of their daily water needs was the key factor colouring households' opinions against the water sharing arrangement, as the quotes below demonstrate:

> *If* [*Corella*] *continues supplying water to Tagbilaran* [*we*] *might lose water in Corella* (COR011, Poblacion).
>
> *Honestly*, *I disagree* [*with sharing water*] *because* [*the*] *water source will not stay as abundant as of the present* (COR015, Sambog).
>
> *Proud that we can share the water to Tagbilaran but afraid that it might be* [*depleted*] *one day* (COR012, Poblacion).
>
> *Proud to be a resident of Corella because it is known that Tagbilaran* [*gets*] *water in Corella*, *but afraid* [*that*] *the water source will decrease and it would not supply Corella anymore* (COR019, Sambog).

One-quarter of residents surveyed in Corella were also opposed to the water sharing arrangement because it was thought to impede the development of irrigation in the municipality.

> *Why is* [*water*] *being used in Tagbilaran* [*when*] *the rice fields of Corella need irrigation in order to harvest 2 or 3 times a year* (COR024, Tanday)?

By contrast, there was universal support for the water sharing arrangement from within Tagbilaran because of the associated improvements in meeting their basic water needs. Households expressed thanks and gratitude toward Corella for 'sharing' their water: "Corella have a good heart for sharing water with us" (TAG096, Cogon). A number of respondents attributed improvements in water supply and services, including 24-hour supply and improvements in water quality, to the water sharing arrangement with Corella (see Chapter 7, Section 7.2). Moreover, as stated elsewhere, the belief that water in Corella was more abundant and of better quality than water sourced in Tagbilaran was prevalent:[160]

> *Can't think of source in Tagbilaran potable enough* (TAG006, Cogon).
>
> *Corella is nice*, *is not polluted and is a good source* (TAG052, Dao).
>
> *Corella was able to give or share water to us because the water in their area is plenty and it is exceeding* [*what they need*] (TAG021, Poblacion I).

The fact that Tagbilaran consumers had positive opinions towards the water sharing arrangement is not surprising given the persistent belief that water quality in Tagbilaran is of poor quality, and demand is unable to be met by sources located solely within Tagbilaran City boundaries. The ability for Corella to continue to supplement Tagbilaran's water demand, and to meet its own demand, was subject to uncertainty; however, the basis for this uncertainty was the increasing demand within Tagbilaran rather than demand from within Corella or environmental constraints.

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[160] See Chapter 8 (Section 8.3).

> *Corella is supplying us* [*with*] *water but I think this is not enough because the population is growing* (TAG043, Bool).

> [*We are*] *afraid that someday the supply of water will stop or is not enough to supply the whole of Tagbilaran because Tagbilaran has a big population and there are a lot of water consumers* (TAG010, Cogon).

Considering the important role played by Corella in supplementing Tagbilaran's water supply, household knowledge concerning details of the water sharing arrangements was relatively poor, although there were substantial differences between Corella and Tagbilaran. In Corella, more than three-quarters of households were aware of the details of the original MOA between the Provincial Government and the Municipality of Corella and more than two-thirds accurately reported when the arrangement commenced. In Tagbilaran, however, awareness was significantly lower.

As stated earlier, the significance of the MOA for households is that it was identified as the key regulatory mechanism governing water extraction and production by BWUI in Corella. It was generally not seen, though, as a mechanism for governing the management of water resources. Despite its importance as a regulatory tool, household knowledge concerning specific details, particularly in Tagbilaran, was generally low. In Corella a large proportion of households in Corella knew the original agreement expired in January 2003, and that Corella did not receive any form of monetary compensation in exchange for supplying water under the conditions of the first MOA. By contrast, only a handful of BWUI households could accurately recount the terms and conditions of the first MOA. Even in these instances, households tended only to be able to recall that the first MOA had been negotiated during the term of Governor Relampagos:

> *This* [*MOA*] *expired last January* [*2003*]. *It was Relampagos who decided that Corella will be supplying water in Tagbilaran without any consent from the people in Corella. Yes, they are still negotiating as to now* (TAG059, Poblacion II).

The relatively high level of awareness in Corella about the details of the water sharing arrangement indicates greater cognisance of the ways in which water resources in Corella are implicated in urban demand in Tagbilaran. Some of the likely factors contributing to the generally good awareness in Corella are its smaller size, its history of engagement with environmental NGOs and government representatives, and information campaigns related to water and other issues as discussed in Chapter 6 (Section 6.3) and Chapter 8 (Section 8.3). It is also likely that, since Corella is the municipality within which water is abstracted, residents have a greater incentive to learn more about those activities which could threaten their future water security. Therefore, residents are able to draw on formal sources of information such as

the government, *barangay* councils, newspapers and radio, as well as informal sources such as *chismis*[161] in order to become informed.

Levels of awareness concerning negotiations for the second MOA between BWUI/Provincial Government and Corella were considerably lower. In Corella, two-thirds of households were not aware of the negotiations between BWUI/Provincial Government and Corella. Two main reasons help to explain the reduced level of awareness. Firstly, there was a marked lack of interest and resentment exhibited from some households in Corella regarding the water sharing arrangements and corollary negotiations culminating in households choosing to remain ignorant of what was occurring:

> *No, I'm not interested anymore because they never did a public hearing about supplying water to Tagbilaran* (COR016, Sambog).

> *Not interested to know - it's more political* (COR025, Tanday).

Secondly, at the time that households in Corella were surveyed, negotiations between BWUI and Corella were not far advanced.[162] It is highly likely, therefore, that the level of awareness concerning the second MOA rose quite significantly within Corella during the negotiation process, particularly since much of the negotiation hinged on reaching a mutually agreeable royalty fee for extraction. The lack of a royalty fee had been a contentious issue for residents in Corella under the previous MOA; therefore, it can be assumed that household interest would be piqued by active royalty negotiations as part of the second MOA. Furthermore, the May 2004 elections provided a platform for matters, including the water sharing arrangements, to be discussed. By contrast, in Tagbilaran, less than half of households were aware that a second MOA was being negotiated and specific information was patchy.

One aspect of the water sharing arrangement that was universally well known was related to compensation in the form of a royalty, or lack thereof. It was generally well known that, under the conditions of the first MOA, the Municipality of Corella did not receive payment or compensation for water sourced there. Many households in Corella were angered by this and felt they were being exploited by Tagbilaran and other towns. There was strong support for compensation expressed from those opposed to the water sharing arrangement as well as those in favour, as the statements below demonstrate:

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[161] *Chismis* is rumour or gossip and refers to both the product – the piece of information – and the process – the relaying of information – about a particular topic. While much *chismis* relates to personal relationships, the breadth of things that one can 'learn' through *chismis* encompasses a myriad of topics including politics.

[162] Household Surveys to CWS and BWUI respondents were conducted in October 2003; negotiations for the second MOA continued throughout 2003 and most of 2004. As mentioned in Chapter 7 (Section 7.3), the Corella *Sangguniang Bayan* was expected to sign the final agreement late in 2004.

> *Happy because we are able to help but unhappy because we know that in the previous six years they are not paying their water bills* (COR003, Cancatac: Indifferent to sharing).

> *I'm not happy about that* [*water sharing*] *especially when I know that they are not paying* (COR016, Sambog: Opposed to sharing).

Compensation from BWUI to Corella was seen as a means of redressing many of the negative feelings associated with the water sharing arrangement. All CWS consumers felt BWUI should provide financial compensation to Corella for water obtained there. There were several key claims put forward as justification for compensation. Firstly, since the water was located in Corella it is 'owned' by the municipality and, therefore, royalties are due. Secondly, since residents within Corella are required to pay their monthly bill, BWUI/Tagbilaran should also be made to pay:

> *Tagbilaran should pay the water they used just like the community members of Corella did* (COR005).

Thirdly, compensation was also seen as providing a good source of income for the municipality, which could bolster development efforts in the town:

> *They should pay so that Corella can save and have an income out of supplying water to Tagbilaran. Paying per cubic metre but then higher to what we pay* (COR020).

BWUI households also felt compensation to Corella for water sourced there was appropriate. More than three-quarters of BWUI households surveyed said they thought compensation should be given to Corella in order to ensure continued supply. However, it was felt that BWUI was responsible for providing compensation to Corella on the grounds that, since BWUI consumers are required to pay for water, so BWUI should also pay.

> *We are paying our water bill monthly to BWUI then BWUI has the responsibility to pay the Corella Government* (TAG080).

> *BWUI is responsible for compensation because we are paying bills to them* (TAG093).

> *If we are getting water in Corella then they have the right to ask payment* (TAG097).

In this regard, payment of royalties by BWUI was equated with paying water bills by households whereby payment was an act of goodwill and symbolic of a transaction to ensure ongoing access to water.

Although the level of awareness regarding the second MOA was generally low, there was a reasonable level of awareness that the payment of a royalty was being negotiated as part of the MOA process occurring in 2004. The publication of several newspaper articles in the *Bohol Chronicle* in late 2005 and early 2006 have kept details about the latest water sharing arrangement in the public realm. In particular, documentation of the controversy surrounding

the royalty fee negotiations and accusations of graft against Mayor Rapal have brought greater attention to the 2004 MOA.

When the first MOA was signed there was very little controversy even though the original arrangement excluded the payment of a royalty fee. Ostensibly this was because the arrangement was between two government entities and a tacit social contract exists. Since 2000 and the involvement of a private entity in water service provision, water supply and governance issues in Tagbilaran have become far more political. Moreover, the system of relations to water and the ways in which it is viewed have been transformed. This is due to the economic commodification of water, which has intensified since privatisation, but, in line with the arguments of Castree (2003; 2004) and Bakker (2005), commodification of water in Tagbilaran is contested, partial and transient with other important sociocultural dimensions beyond capitalism to include informal exchange relations.

Rather than simply equating privatisation with commodification, water in Tagbilaran and the Philippines can be seen as having been commodified, and able to be privatised, through the implementation of the Water Code, water permits and the CPC/CPCN process however improperly it operates. Additionally, water is subject to commodification because of water and development policy in the Philippines which recognises water as having an economic value. The extent to which water has been commodified is not, therefore, a direct consequence of privatisation; rather, commodification is a consequence of neoliberalisation of which privatisation is one facet. The apparatus facilitating the commodification of water from 'natural' to 'commodity' is the water permit system, which gives individuals and entities the opportunity to have exclusive rights over water resources. Both public and private individuals and entities are subject to the same procedures in order to provide municipal water supply. The distinction between public and private entities is their motivation: public interest versus profit, which is critical to understanding how commodification is viewed as being inherently bad.

It is spurious, therefore, to suggest that the divestiture of the PWS alone transformed water in Tagbilaran from natural entity to commodity without also considering the role of small scale vendors, bulk water sellers, and bottled drinking water re-filling stations in the commodification process since all are private entities which profit from the production and sale of water for household consumption. Similarly, commodification cannot simply be attributed to bill payment since prior to the joint venture agreement, PWS charged consumers for water as determined by a metering system, and new consumers were required to pay a connection fee. Moreover, TCWS and CWS (public utilities), rather than differing significantly from BWUI (a private utility) have fairly similar policies concerning payment, connection, disconnection, service and maintenance of lines contrary to many people's perceptions.

At the household level, perceptions concerning the ways in which water has been commodified, or the extent to which it is seen to be a commodity are again partial and

contested. For the most part, people's perceptions about property and how they viewed their relationship with the waterworks utility influenced their position. For instance, as noted above, many felt they were paying BWUI or TCWS for the service of providing water rather than the actual water itself. It is fair to say, however, that more people were inclined to perceive water provided by BWUI as an economic commodity than water provided by TCWS by virtue of the nature of the entities – private versus public; however, this was not necessarily seen as inherently bad and, as demonstrated in the previous chapter, opinions concerning privatisation and the operation of a private entity were not markedly polarised. Instead, opinions concerning the privatisation of the waterworks utility revealed more than half of all BWUI consumers surveyed[163] as having positive feelings about the privatisation of the waterworks utility and the operation of BWUI, reflecting the positive changes and improvements discussed in Chapter 8 (Section 8.2). Conversely, one-third of households surveyed expressed negative feelings about the privatisation and BWUI which were mostly related to concerns over bill payment and price also discussed in Chapter 8 (Section 8.2).

Additional factors contributed to influence opinions about privatisation which both contradict and support some of the assumptions made concerning private sector involvement discussed in Chapter 3 (Section 3.3). For instance, the minimisation of corruption through a change in management and operation procedures buttressed positive opinions. This contradicts other research which suggests that the potential for corruption increases when the private sector is involved as discussed in Chapter 3 (Section 3.3) (see, for example, Swyngedouw, 2005a). On the other hand, the transformation of the waterworks utility from a public to a privately-owned utility was held to be displeasing for 16 percent of all households surveyed in Tagbilaran because it was felt that the government should provide water as a public good, echoing anti-privatisation campaigners opposed to the dominance of neoliberal ideology in water governance.

The problem of corruption is endemic within the Philippines, or at least the perception that corruption exists, as discussed in Chapter 7. The fear of corruption was a relatively common concern amongst consumers in Tagbilaran; however, rather than viewing the privatisation process and divestiture as corrupt or deceptive, it was felt that BWUI, as a private company, was likely to reduce the potential for corruption. The 'corruption' referred to included dishonest or dubious behaviour by the government/managers as well as other consumers. Corruption, therefore, also encompassed those consumers who did not pay their bills on time or those with illegal connections.

There were some fears related to government management of the waterworks utilities and the potential for the government to inadequately maintain the network because of corruption:

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[163] This includes all responses to the Tagbilaran Household Surveys as well as the Privatisation Survey (198 in total).

> *If the government will manage, anomalies will come out. Equipments will be replaced with cheaper materials* (PRIV008).

Favouritism was also identified as a form of corruption which many felt disappeared once BWUI began operations. Removing favouritisim in bill payment and the fact that BWUI was even-handed in terms of ensuring all consumers were up to date were seen as promoting fairness and equity.

By and large, the consumers who spoke of corruption perceived the government as prone to corruption and favouritism, inefficient, incapable or unable to ensure consumers were up-to-date in their bill payments and providers of poor customer service (22 percent). On the other hand, BWUI was perceived as modern, having good service and maintenance, strict about ensuring all consumers were up-to-date in bill payments and fair. However, the profit-driven nature of private enterprise gave rise to fears over the potential for price increases and the lack of opportunity for consumer recourse.

For those opposed to the privatisation of the public water utility, many were also opposed to the process itself, which was seen as lacking transparency and adequate information dissemination. Although the Provincial Government stated its intention to conduct the privatisation of the PPUD/PWS – including the bidding process – in a transparent manner, the privatisation of PPUD/PWS was mired in controversy from the outset (see Chapter 7, Section 7.3). A key factor colouring people against the privatisation was the perceived paucity of information disseminated by the Provincial Government during the process.[164] As a consequence, many people felt excluded from the process and that the agreement to privatise the public utility had been reached in secrecy. Suspicions were also high following the charges of corruption and graft laid against Governor Relampagos and senior staff in his administration (as discussed in Chapter 7, Section 7.3).

There was a strong sense amongst BWUI consumers that the government should have consulted more thoroughly with people and engaged them in the privatisation process early on. Most BWUI consumers thought the public were not well informed when it came to the privatisation of PPUD/PWS or expressed dissatisfaction at the lack of knowledge and information concerning the privatisation process. Those who felt the public was well informed identified the radio, the newspaper, friends/family/colleagues, and *barangay* officials as sources and methods of information dissemination in which they learned about the privatisation of PWS and creation of BWUI. Consumers suggested a range of approaches and methods they felt the government could have employed to disseminate information to households in Tagbilaran. These were newspaper(s), radio, letter to households and television, as shown in Table 9.3.

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[164] Other charges of poor information dissemination were made with respect to the transfer of households from TCWS to BWUI after BWUI commenced operations.

Method/Approach	Percent
Newspaper(s)	32%
Radio	17%
Letter to household	7%
Television	1%

Table 9.3: Suggested methods for information dissemination

Although the newspaper and radio were used to disseminate information, especially by the Provincial Government, and both were seen as suitable methods for disseminating information, many people still felt disenfranchised or excluded from the process and were unaware of the use of the media as a forum for discussion and debate by anti- and pro-privatisation camps. The *Bohol Chronicle* printed a number of articles, editorials, commentaries, notices, advertisements, position papers, and copies of affidavits from BWUI, ACT/TACT, and private citizens debating the privatisation of the PPUD/PWS and the implications for residents in Tagbilaran, from 1999 until the present day.[165] Similar articles have also been published in the *Bohol Times*. Likewise, a series of radio interviews and talk back programs provided Governor Relampagos with the opportunity to share information and field enquiries from listeners during 2000 (Aumentado, 2000; Bohol Chronicle, 2000l; Chiu and PIO, 2000). The fact that many felt excluded despite attempts by the Provincial Government illustrates the difficulty of ensuring appropriate information and knowledge sharing in a manner that is accessible and understandable to all. Such difficulties were not lost on respondents, as the statement below illustrates:

> *We cannot please everybody. It was announced but some people do not understand* (PRIV014).

Several consumers indicated that they would have preferred a more formalised process of engagement, with 45 percent of respondents saying they would have preferred to have been part of a public consultation process. It was suggested that the City of Tagbilaran should have passed a City Resolution as a first step to discussions and negotiations, with the involvement of *barangay* officials sought as conduits for information and expression of consumers' views. A series of public hearings held by the government could then have been used to inform consumers about the proposal to privatise the waterworks utility early in the process, enabling consumers to be involved throughout. The preference for such a process reflects consumers'

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[165] The earliest report of Salcon I discovered in the *Bohol Chronicle* dated back to 1997 and referred to a proposal to develop the Loboc River as a source for water supply. In 1998, an article published in the *Bohol Chronicle* prefaced future negotiations concerning the prospect of privatisation of the PPUD (Arigo, 1998; 1997b; Bohol Chronicle, 1997d; 1997e). Recent articles published in the *Bohol Chronicle* relate to the proposal of Governor Aumentado to buy back the water utility beginning in late 2003 until mid 2004 (Lakas-CMD Media Bureau, 2004), the passing of a resolution by Mayor Lim prohibiting BWUI from disconnecting consumers (Ligalig, 2004), the progress of the lawsuit brought against Relampagos (Cuthing, 2005), charges against Mayor Rapal (Obedencio, 2005) and BWUI's battles over raising water rates (Ligalig, 2006a; 2005b; 2005c).

wishes to be consulted with, and involved in, decisions that have direct bearing on their lives; indisputably, water for daily needs is of such primary importance that changes to the nature of water delivery justifies such a position. However, the ability for the City Government to conduct public hearings themselves was hindered by the fact that negotiations were primarily between the Provincial Government and Salcon; therefore, the City Government was not a party to the joint venture agreement and negotiations. However, it is possible that the City Government could have lobbied the Provincial Government for greater engagement.

Poor information dissemination and engagement with local community members created a sense of mistrust over the transparency of the privatisation process, and the integrity of the Provincial Government and Salcon. Consultation was not undertaken as extensively as residents would have liked. Although public hearings were conducted by the Provincial Government, awareness about the hearings and the joint venture amongst respondents was virtually non-existent. Public hearings were seen as desirable by residents, even though hearings are more often a means for the transmission of information rather than as a means for influencing change. Furthermore, for marginalised groups who may feel a sense of mistrust or that their point of view is not valued, there still exists a desire to be engaged in such a process (Alonso and Costa, 2004). In Tagbilaran, the lack of widespread consultation may have been due to the difficulties involved in coordinating the bidding process early in the privatisation process, which, consequently, meant that mechanisms to promote the interests of special groups were not adequately included (Budds and McGranahan, 2003a).

In this case, exclusion of stakeholder interests, or at least inadequate inclusion of household consumers throughout the privatisation process, has caused anger and negative feelings to persist in Tagbilaran more than five years after the joint venture agreement was finalised. The negative sentiments and anger expressed by respondents in this research regarding the lack of consultation and engagement correspond with Rowlands' (2004) account of transmission of grievance whereby "blame, vengeance, compensation, or an apology are all possible ways of satisfying the need for recognition" (Rowlands, 2004:219). In this sense, the grievance associated with lack of information and involvement in the privatisation process needs to be distinguished from the grievance associated with the divestiture of the waterworks utility as expressed by those opposed to privatisation *per se*, such as exemplified by the Tagbilaran Alliance of Concerned Taxpayers (TACT).

Opposition to the privatisation and operation of BWUI under the terms of the 2000 joint venture agreement was publicly expressed by Governor Aumentado, successor to Governor Relampagos, as demonstrated by his proposal in 2004 to buy back the water utility. Several articles appeared in the local newspapers leading up to the May 2004 election and the 'privatisation issue' once more became an election issue between Governor Aumentado and the opposition leader, Rene L Relampagos. Of the 100 Privatisation Surveys conducted in 2004, all

were aware of the proposition forwarded by Governor Aumentado to buy back the water and electric utilities. Additionally, many key informants, formal and informal participants spoke of the Governor's proposal to buy back the water utility. Opinions were mixed; many noted the political significance of the privatisation and the affect the controversy and subsequent fall-out had on the 2001 election (see Chapter 7, Section 7.3).

Governor Aumentado's proposal to buy back the water utility provided an opportunity to examine how consumers felt about the transformation of the water utility - from a public to a private enterprise - their preferences, and the factors influencing their opinions and perceptions. Nearly half of all households surveyed felt the government should buy back the water company, despite more than two-thirds of consumers claiming water services provision had markedly improved after privatisation. Responses to questions concerning water quality and service, and whether the government should buy back the water utility were compared in order to discern if there is a relationship between whether people who thought the government should buy back the water utility also thought the water services were better when owned and operated by the Provincial Government. This is summarised in Table 9.4.

Do you think it is better now or better before?	Do you think the government should buy the utility back?			
	Don't know (percent)	No (percent)	Yes (percent)	Total (percent)
Before	3	2	31	36
Now	29	23	8	60
Same	1	-	2	3
Don't know	1	-	-	1
Total	34	25	41	100

Table 9.4: Comparison of service and opinions regarding buying back the water utility

On the face of it, improvements and changes in the operation of the waterworks utility as discussed previously influenced opinions concerning the government's proposal to buy back the utility: those who felt water services and quality were better before were more inclined to think the government should buy the water utility back and vice versa. As the table above shows, of the households that felt services were better before, 31 percent also thought that the government should buy back the water utility. Conversely, of the 60 percent of respondents who thought services and quality were better now, 23 percent thought the government should not buy back the utility and a further 29 percent were uncertain but felt that such a move was dependent on the performance of BWUI. However, the explanations given by consumers for why they thought the government should buy back/re-claim ownership of the water utility suggest other factors influenced their position.

Three-quarters of those who replied "Yes" to the government buy back proposal thought water services were better when the government owned and operated the water utility (as

summarised in Table 9.4). Of these, nearly three-quarters felt the government was a more appropriate body to own and operate the waterworks utility because of the public good aspect of urban water services, indicating that residents felt the government was responsible for ensuring the public good. All of these residents were unhappy with the divestiture and felt the government were the real owners of the waterworks system. Emotive responses from households who felt it was imperative that the government buy back the water company for the common good of the people were obtained from more than half of those in favour of buy back proposal. Examples of responses demonstrating this sentiment are given below:

> *Must buy back the water for the average people like us (PRIV037).*
>
> *If the government want to help the people then they must buy it back* (PRIV041).
>
> *Must buy it back for us* (PRIV090).

It was generally felt that the government would be more accountable to residents and there would be greater opportunity for public involvement in decision-making if the water company was publicly owned. In particular, some fears concerning the lack of accountability to the public by BWUI, a profit-motivated enterprise, were expressed:

> *Yes* [*the government should buy back because*], *in the coming years the private sector can manipulate cost. If it is government* [*owned*], *there will be public hearings. With a private* [*utility*], *the public cannot be involved* (PRIV007).

Moreover, the potential for revenue collection for the Province was cited by three respondents as another reason why the government should buy back the water utility as demonstrated by the comments below.

> *Yes they should so that the government could earn money to be used in improving some parts of Tagbilaran that needs improvement* (PRIV095).
>
> *It would be nice if the government buys it back so that there is income for the province* (PRIV010).

In reality, however, the Provincial Government had struggled to cover the cost of operation and maintenance and to collect water rates from households when they had owned the waterworks utility.

A closer reading of the responses provided by those in favour of the buy back proposal points to the potential for moral hazard, in this instance the risk of free-riders, which would undermine the government's ability to generate revenue or sustain the waterworks system if it did go ahead with buying back the waterworks utility. Nearly one-fifth of all those in favour of the buy back proposal stated that the government should do so because BWUI was too strict and more expensive than the PWS had been; therefore, it was felt that, if the government bought

back the water utility and re-commenced operation, the government would be more lax and less expensive than BWUI.

> *They must* [*buy back the water utility*] *so that the water bill will decrease* (PRIV022).

> *Yes* [*the government should buy back the water utility*], *because with the government we don't have to pay on time. We can be late - three months, four months, five months* (PRIV015).

While only a relatively small proportion of consumers expressed this opinion, I conjecture that the potential for consumers to fall back into past habits of paying "anytime we want" is fairly high based on findings presented in Chapter 8 (Section 8.2) as well as reports by other informants and articles in the local newspapers (Arigo, 2001).[166]

For those consumers who were uncertain about whether the government should buy back the water utility, one-quarter thought the decision should be based on the performance of the water company: "It depends on the situation, whether they are doing good or not" (PRIV021). For the remainder (six percent), public well-being was paramount. It was felt that the government should reclaim the waterworks utility if BWUI acted in a manner likely to adversely affect consumers. For instance, if BWUI increased water rates to an unacceptable level, the government should step in and resume ownership: "If the private company will abuse their power then that is the right time to buy back the water company" (PRIV089). Likewise, if BWUI acted in a manner which threatened future stores of water through careless or inappropriate use then the government should also intervene: "If the private company will be abusive in using the water then the government must get it back from the private company" (PRIV045).

Consumers who felt that the government should not buy back the water utility were confident in the management of BWUI and satisfied with the service they were currently receiving. This supports the view held about the potential for corruption and poor services under the management of the government (see Chapter 8, Section 8.2). Furthermore, one-quarter of those opposed to the buy back proposal felt the government should not buy back the water utility either because the government lacked the funding to do so (as indicated by the comments from PRIV096 and PRIV099) or because the sale was deemed legitimate and not easily reversed (PRIV011):

> *It will take a long time for the government to buy back the water because they don't have enough budget to do it* (PRIV096).

> *It's impossible. Salcon will demand higher price* (PRIV099).

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[166] Arigo (2001) reported that, as of 31 December 2001, the outstanding amount owed to BWUI in delinquent accounts for water totalled P1.957 million.

They can't buy it back – sold is sold; "baligya-baligya" (PRIV011).

The proposition to buy back the water utility re-located the privatisation of the waterworks utility in the political arena and positioned it once more as a focus for electioneering in the lead up to the May 2004 government elections.[167] The general feeling I gathered from surveys, interviews and participant-observation was that the privatisation had cost Relampagos his political career and was a factor in his loss to Governor Aumentado in 2001. In particular, claims of graft and corruption[168] and rumours that Governor Relampagos had received money from Salcon[169] to ensure their bid was successful created uncertainty and distrust amongst the people of Tagbilaran, which extended into the Province and adversely affected his campaign efforts. Governor Aumentado won the May 2004 election and retained his position as Governor of Bohol; however, Rene Relampagos won more votes in Tagbilaran, which participants of my research construed as an act of forgiveness by the people of Tagbilaran over the privatisation of the waterworks utility. Shortly after the election, Relampagos took out a full page advertisement thanking his supporters, which pointed to his belief that his victory in Tagbilaran was vindication of his controversial decision to privatise the PPUD:

> I thank you, the people of Tagbilaran City for the convincing majority votes that you have given me in the last elections. It was a different Tagbilaran that saw me in the 2001 elections. Because of your change of heart, I feel vindicated that you finally saw the soundness of governance my administration did for Tagbilaran.
>
> It was the joint venture that put me down in the 2001 elections, it is the same issue that got me up in this year's poll.
>
> I would like to believe that it was your personal experience of the beneficial effects of the joint venture project that brought you the realization that what my political enemies were saying against me were all lies. Let's continue to be more analytical when it comes to issues that affect our lives (Relampagos, 2004).

As of June 2006, the Provincial Government had not yet bought back the water and electric utilities from Salcon. What is more, the petition put to the Court of Appeal regarding the legitimacy of the joint venture agreement entered into by the Provincial Government of Bohol and Salcon Group of Companies was dismissed in January 2004; therefore, the agreement remains upheld (Cuthing, 2005). There were suggestions that the proposal by Governor Aumentado was a political tactic employed to create controversy leading up to the election and that the Provincial Government had no real intention of buying back the water utility; however, such opinions are speculative only.

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[167] The elections held in 2004 were national, provincial and local government elections.
[168] See Chapter 7 (Section 7.3).
[169] See Chapter 7 (Section 7.3).

Notwithstanding the opposition by groups such as TACT and some concerns expressed by households regarding private sector participation, the operation of BWUI was generally seen as being acceptable to households in Tagbilaran, particularly since there have been notable improvements in terms of service, quality, quantity and reliability since BWUI commenced operations. The continued operation of BWUI was, however, contingent upon continued government involvement in regulating their performance and water pricing. Regulation and government intervention also extended to the water sharing arrangement with Corella wherein the MOA was seen to represent the mechanism regulating BWUI's operation and production in Corella. In this regard, households in Tagbilaran can be seen to endorse a hybrid governance system by supporting inter-jurisdictional water sharing and the operation of a public-private enterprise in providing urban water supplies. However, as this discussion demonstrates, households possess different kinds of knowledge about water resources, governance, and institutions from that expressed through official channels. In the following section I discuss how hybridity affects water governance for households in Tagbilaran by considering the positive and negative outcomes that have arisen.

9.4 Hybrid governance and uncertainty in Tagbilaran

Hybridity as a consequence of the localisation of neoliberal discourse, manifesting in a public-private model of water supply provision, has increased uncertainty at the household level in terms of understanding water governance and ensuring water security. Moreover, the complexity of water governance institutions arising from the joint venture agreement and the water sharing arrangement has influenced opinions concerning the diffusion and redistribution of risks in a manner similar to that described by Johnson and Handmer (2002). As in the British example discussed by Johnson and Handmer (2002), blame scenarios in Tagbilaran revealed that the distribution of risk was dependent on whether the focus was on demand, distribution or supply. Simply put, households could be blamed for inadequacies in demand management, waterworks utilities for distribution inadequacies, and the government for supply inadequacies as a consequence of inappropriate resource planning and management at the hands of both household consumers and waterworks utilities. As a consequence, blame and responsibility shifts between the various stakeholders such that there is little accountability or action to assess risks or ensure long-term water security in a comprehensive manner. One key difference between the Johnson and Handmer's (2002) study and the situation in Tagbilaran relates to the fact that, in Tagbilaran, ultimate responsibility or blame was seen to rest with the local government.

In terms of water security, the operation of a private entity has exposed households to market principles and the profit-nature of private enterprise, which could affect access to water supply, particularly for poorer members of society, resulting from high connection fees, penalties, disconnections and increases in water rates. Households expressed concerns and

awareness of how they may be affected by the profit-driven nature of a private enterprise. Additionally, as demonstrated above, privatisation has caused water in Tagbilaran to be subjected to greater levels of politicisation since the privatisation of the Provincial Waterworks System. In particular, the politicisation of the privatisation and water in Tagbilaran has exacerbated uncertainty about water governance and risk to water security in Tagbilaran as much as the joint venture agreement itself and the water sharing arrangement. The privatisation of the waterworks became an election issue during the 2001 election in which the politicisation of the privatisation process was largely demarcated along party lines. This positioned Relampagos and his supporters as being for the privatisation of PPUD/PWS and his political opponent, Aumentado, against the privatisation of it under the conditions negotiated by the joint venture agreement. Within this climate of political jostling, details concerning the privatisation of the waterworks utility became lost in rhetoric. This is because the politicisation of water has served to obfuscate water management and governance by instead deflecting attention towards the pro- or anti-privatisation debate.

Uncertainties in Tagbilaran about water governance are made worse by the fact that urban water supply is sourced from groundwater in a karst environment in which the physical processes are invisible, and also because of the inter-jurisdictional water sharing arrangement between Tagbilaran and Corella. As demonstrated here, households' knowledge about water systems was based on households' own experiences, which were largely derived from their understanding and awareness of policies and regulations emanating from local government authorities rather than national policies and mechanisms. In particular, household conceptions of property influenced perspectives concerning decision-making authority, responsibility and blame.

9.5 Summary

The findings of this research show that household conceptualisations of property, ownership and rights in the context of water governance are different to the formal institutions in the Philippines. This has implications for managing and regulating water resources, particularly in terms of legitimising authority in planning for water resources and regulating their use. Households in Tagbilaran and Corella tend to look to those immediately responsible for their well-being – their local government unit – rather than the national government to safeguard their interests. Included in these interests is ensuring water supply for basic needs.

Although there is an implicit understanding of the governance system which has emerged in Tagbilaran, knowledge about details of formal institutional arrangements beyond the local government level is low. Instead water governance in Tagbilaran is characterised by misunderstanding, misinformation, suspicion and uncertainty. The knowledge gaps and knowledge deficiencies about formal political, economic, and administrative institutions—what these are and how they function— risks rendering much of the local and national policy

rhetorical. This is because consumers' experiences of water and water governance in Tagbilaran are not accurately reflected in current policy and practice. In the final chapter of this thesis, I synthesise the findings of this research and discuss its contribution.

Chapter 10 Lessons from Tagbilaran on Hybridity and Water Governance

10.1 Introduction

In this thesis, I have chronicled the emergence of hybrid water governance in Tagbilaran City by arguing that different conceptualisations across different scales converge in locations to create innovative and contingent institutional arrangements. In the process of conducting this research, I critically examined assumptions concerning the merits of water governance and integrated water resource management, the types of institutions governing water and how they function, and the implications of private sector participation by bringing to light household experiences of water governance and urban water supply. In this concluding chapter, I synthesise the findings presented throughout this thesis and evaluate these in light of the research questions stated in Chapter 1. I begin by reflecting on the significance of the methodological approach taken in this study and assess how it has enabled me to successfully achieve the stated aim of this research. I then address each of the research questions and discuss their significance in terms of the overall aim of the research. Finally, I suggest possible areas of future research.

10.2 Reflections on the methodological approach

The methodological approach taken in this study, and empirical material collected and analysed within this thesis, has been instrumental in enabling me to conceptualise hybrid water governance and to consider how households are implicated in wider social, economic and political processes related to water and governance systems. In Chapter 2 I outlined how critical and feminist methodologies influenced the methodological approach taken in this research. The research epistemology positioned knowledge as situated and partial (Haraway, 1988), and recognised the possibility for a plurality of views and knowledges about events or issues to exist (Corbetta, 2003; Denzin and Lincoln, 2003; Robinson, 1998).

The notion of hybrid governance introduced in Chapter 1 and expanded upon in Chapter 6 provided the foundation for the model of water governance developed in this research and the framework for analysing the research findings. The definition of water governance provided in Chapter 1 identified political, social, economic and administrative systems in place to develop and manage water as elements inherent to the concept of water governance. By drawing on the work of authors such as Mehta et al (1999) and Cleaver (1998; 2000) I advanced a conceptualisation of governance comprising formal/bureaucratic and informal/socially embedded institutions which are highly interactive (Chapter 1). In addition, Kooiman's (1999) theorisation of social-political or interactive governance introduced in Chapter 3 provided a means by which to investigate the synergies and interactions between government and society in shaping development outcomes and water governance. In Chapter 3, the critique of

development discourses illustrated how water governance has emerged concurrent with an interest in governance and good governance in development more broadly. The significance of this critique is that it showed the ways in which development and water are intimately connected and subjected to economic, social and environmental discourses which influence practical approaches and strategies within developing countries.

Within this framework, the use of a case study enabled me to explore the research questions in a particular setting so as to examine the multiple conceptualisations of water governance and the concept of hybrid water governance. The emergence of multiple and contested knowledges within the case study was shown to be largely related to scale and scale politics, as posited in Chapter 1. The research methodology was fundamental to exposing the multiple ways in which development and water governance are understood and enacted across scales. The methodology also developed the conceptual model of hybrid water governance offered in this thesis. The use of multiple qualitative methods such as interviewing, participant observation, and documentary analysis (Chapter 2) in order to capture different opinions and perceptions about urban water governance in Tagbilaran City (Dunn, 2000) were invaluable to this investigation.

A scaled analysis which acknowledged scale as relational (Howitt, 2002) allowed me to uncover multiple visions of water governance in the process of critically examining water governance (Chapters 3, 6, 7, 8 and 9). In so doing, this research uncovered ways in which the dialectic of 'global' and 'local' discourses and narratives constitutes Tagbilaran and also disrupts simplistic notions of scale as discrete and hierarchical. As elucidated in Chapter 1, the primary focus of the research was the household scale. Therefore, it was important to show how households were engaged in social, political, economic and environmental processes at multiple scales beyond the household, and how households function as water resource managers. Hence, through the use of the qualitative techniques described in Chapter 2, I obtained useful information about how households consume water and the factors influencing their allocation decisions. I provided evidence to show that households often employ multiple sources in order to meet urban water needs in a developing city context (Chapter 8). Moreover, these methods allowed ethnographic material to be used to examine the concept of property and attendant concepts such as access, rights and responsibilities (Humphrey and Verdey, 2004), as well as scrutinise understandings of water governance at the household scale (Chapter 9). This kind of analysis is significant because households are often neglected in favour of collective 'community' or water user groups. However, as this research demonstrates, the reality for many living in urban areas is that a collective does not exist. Instead, urban households are diverse and heterogeneous.

10.3 Scaling development and water governance: how are development and water governance understood and enacted across different scales?

In this section, I synthesise the findings presented throughout this thesis to answer the question of how development and water governance are understood and enacted across different scales (Section 1.2). Based on the analytical framework established in this thesis, the findings show that conceptualising scale as relational and dialectic enables an understanding of how hybrid governance systems can come to be constituted in localities, and the ways in which localities can be multiply scaled. Tagbilaran and Corella are scaled as local government units, each having jurisdiction over aspects of government within their territorially defined boundaries; therefore, both can be seen as 'local' (at least to an extent). In addition, the inter-jurisdictional water sharing arrangement disrupts the jurisdictional boundaries by implicating Corella, a rural place, in the urban processes of Tagbilaran. Moreover, jurisdiction as discrete scale is further disrupted by the role played by the Provincial Government as a partner in the Memorandum of Agreement, and as overarching planning and development authority as a consequence of the decentralisation of state government functions. In this regard, therefore, the scale politics enacted in Tagbilaran/Corella create new spaces within which development and water governance can be practiced.

To this end, the research reveals water governance in developing countries is intimately linked with global and national discourses and practices of development which are used to legitimate and prioritise development objectives, policy agendas and to allocate responsibility (Section 1.1). In particular, neoliberalism, human rights, and environmental discourses have been particularly influential in determining how water is conceptualised as a resource and developed for achieving the development objectives of countries (Chapter 3). The significance of each of these discourses on water governance varies.

The critique of development and water governance presented in Chapter 3 shows neoliberal discourse emanating from the global or supra-national scale as exerting a powerful influence over the ways in which water resources are managed and planned for in the Philippines (Chapter 3 and Chapter 6). Within development, neoliberalism has brought significant changes for the state in terms of the role it plays in achieving development objectives and also in the way it functions in governing subjects. Key actors include the World Bank, IMF and the United States along with other Western development donors who embrace neoliberalism. Consequently, the focus for these development agents has shifted from seeking to roll-back the state to finding ways to make the state work better; hence, the emphasis on governance and making it 'good' (Chapter 3).

In the context of water resources management and water governance the internationalisation of local water problems through conferences such as Dublin 1992, and

declarations such as the Millennium Development Goals imbue global governance institutions with the authority to construct problems of water supply and the means by which water insecurity can be overcome. Neoliberal discourse, therefore, informs water governance as a consequence of the Dublin Principles and the notion of treating water as an economic good and subsequent conventions and declarations supporting this stance (Chapter 3). Furthermore, because neoliberalism has expedited private sector participation in development by expanding the notion of governance beyond government, organisations such as the Global Water Partnership, the World Water Council and the World Water Commission are able to promote privatisation as a means to finance water development projects. Similarly, the World Bank and IMF influence policies to promote privatisation within developing countries by encouraging economic reforms in countries in Asia, Africa and Latin America with mostly poor outcomes, as demonstrated by the cases discussed in Chapter 3.

The discussion in Chapter 3 demonstrates that, despite the dominance of neoliberal discourse within development and water governance, it is not monolithic or hegemonic. The findings of this research show that neoliberal discourse is contested by human rights and environmental discourses which have also emerged at the global level and which extend to the local. These discourses and other social and political factors, therefore, act to mediate global neoliberalism as it is enacted at more local levels as the analyses in Chapters 6 and 7 and findings of Chapters 8 and 9 revealed. The dialectic of 'global' and 'local' discourses and narratives constitutes Tagbilaran as a multiply scaled locality.

The analysis of Philippine development policy presented in Chapter 6 highlights the significance of neoliberal discourse in shaping contemporary development approaches taken in the Philippines and in determining the role played by the state and private sector in pursuing sustainable development. NEDA and the national government of the Philippines actively encourage private sector participation in infrastructure. Additionally, the LGC devolves responsibility to local government units for the provision of basic services such as water and encourages them to consider engaging the private sector to provide these services. The privatisation that has occurred in Tagbilaran is, therefore, embedded in the broader neoliberal development agenda of the Philippines as influenced by global discourses and supra-national development agents such as the World Bank (Chapter 3). However, rather than emulating models of privatisation and neoliberalism practised elsewhere in cities in developing countries, including Manila, the Provincial Government of Bohol chose to pursue a partial divestiture citing the 'Rehabilitate-Own-Operate-Maintain' model as providing the best option to meet the Province's objectives. As presented in Chapter 7 (Section 7.2), these included ensuring investment capital, improving operations and management, and freeing up the Province's resources for use elsewhere (Province of Bohol, 2000a).

In light of the many failed cases of privatisation, some of which were described in Chapter 3 (see also Barlow and Clarke, 2002; Hall, 2001; Hall, et al., 2004; Hukka and Katko, 2003), and based on the analysis presented in this thesis, the privatisation in Tagbilaran can be regarded as a success for the following reasons. Firstly, BWUI exceeded the contract requirements regarding rehabilitation and quickly moved to network expansion enabling more households to become connected to the waterworks system (Chapter 7, Section 7.2). Secondly, despite fears from TACT (Chapter 7, Section 7.1) and others, and, contrary to the opinions of some households (Chapter 8, Section 8.2), water rates and connection fees did not increase soon after privatisation. Thirdly, service and quality improved, as did reliability (Chapter 7, Section 7.1 and Chapter 8, Section 8.2). Fourthly, system losses were reduced substantially and household awareness of the importance of reporting leaks and illegal connections was raised (Chapter 7, Section 7.2 and Section 8.4). Finally, from a cost-recovery perspective, the efficiency rate for bill collection rose to one hundred percent (Chapter 7, Section 7.2). The findings suggest that, under the right conditions, privatisation may provide opportunities for improving access by households to water.

The details and findings concerning the privatisation experience in Tagbilaran are significant for two major reasons. Firstly, as stated in Chapter 3, privatisation resembling the French model is far more common because it is generally seen as being less problematic. This is because the infrastructure is retained by the state; however, the mode of privatisation pursued in Tagbilaran in 2000 more closely resembles the British model of waterworks privatisation as a 'privatisation by divestiture'. Therefore, this suggests that, while global neoliberal discourse has infiltrated provincial level decision-making practices, the Provincial Government exercised its own authority in determining the model to be adopted bearing in mind the conditions of the network and the needs of the city. This reflects the notion of local neoliberalisms discussed in Chapter 3 that arise from differing trajectories of development and political economic processes which are embedded within broader networks and structures of neoliberalism (Brett, 2000; Peck and Tickell, 2002).

Secondly, much of the controversy surrounding water privatisation, particularly in developing regions, concerns the domination by only a handful of large water multinationals as discussed in Chapter 3: in particular Suez, Veolia, Thames Water, Saur, United Utilities, Biwater/Cascal and Bechtel (Barlow and Clarke, 2002; Hall, 2001; Hall, et al., 2004; Shiva, 2002). In Chapter 7, by recounting details of the privatisation process which occurred in Tagbilaran, I showed that water privatisation is not solely within the domain of large water multinationals implementing mega-projects in large cities with financing in the order of millions of dollars. BWUI is a joint venture company formed by a partnership of the Provincial Government and the Salcon consortium, comprising Salcon International, Inc., Salcon Philippines, Inc., and Salcon Limited, corporations duly organised and existing under laws of the Philippines and Singapore. Salcon Philippines Inc. is a subsidiary of Salcon Ltd. I was

unable to connect BWUI to the major water multinationals generally implicated in water privatisation ventures. Moreover, I was unable to find references to the joint venture agreement in Tagbilaran in any academic, business or financial material produced beyond Bohol. If one of the large water multinationals is linked in some way to BWUI, as a shareholder in one of the parent companies, it is likely to have only a small interest; additionally, the size of investment (P155 million or approximately US$3.5 million – see Chapter 7) is relatively small compared to other ventures. Given the invisibility of this project beyond Bohol, and the complex issues uncovered in this research, there is reason to suspect that other small-scale privatisation projects have either occurred or been proposed elsewhere in cities of developing countries. Such cases warrant investigation.

The findings in Chapter 6 and Chapter 7 also illustrated how the local neoliberal experience in Tagbilaran was contested by human rights and environmental discourses. In particular, poverty, equity, and environmental degradation arose as key concerns in development planning and policy documents. These chapters showed that the challenges which faced the Provincial and City governments' efforts to ensure water security for residents in Tagbilaran embody the tensions inherent in sustainable development in terms of balancing social, economic and environmental interests. Acknowledgement of these tensions was eloquently captured in the quote by a senior city government official with the statement provided in Section 7.3: "Water is an economic good, with a social conscience, and a public heart, and is also an important part of our environment" (LG#5). As a specific point of concern for urban water supply, the study reflects the tensions and debate concerning water's status as a public good and/or commodity.

For authors such as Barlow and Clarke (2002), de Villiers (1999) and Shiva (2002), however, for whom human rights discourse is paramount, neoliberalism and privatisation are equated with commodification of water and the degradation of a public good. The findings from this thesis suggest that such an assertion is overly simple in two important respects. Firstly, as discussed in Chapter 6, the apparatus facilitating the transformation of water from natural entity to commodity was revealed as being the water permit system, which existed before neoliberal reforms in the Philippines. Secondly, and more importantly, as explained in Chapter 3, use of the term commodification by authors such as Barlow and Clarke (2002), de Villiers (1999) and Shiva (2002) was shown to be too narrow because it is based on an economistic interpretation of commodity as framed entirely within a neoliberal milieu whereby commodification was always assumed to be bad and to the detriment of consumers. Instead, this research provides evidence to support the arguments presented in Chapter 3 by Bakker (2005) and Castree (2003; 2004) about the importance of resisting the temptation to conflate privatisation with commodification. This thesis found the privatisation process which occurred in Tagbilaran had multiple and complex effects on households and their relationship with the waterworks utilities beyond the narrow definitions of commodification often deployed by anti-

privatisation campaigners (see Chapter 3). Although privatisation did increase speculative and opportunistic behaviour amongst some individuals (Chapter 7, Section 7.2), the findings in Chapter 9 demonstrate that equating commodification with the privatisation of the waterworks utility is spurious. This is because of the presence of other private providers operating in the city, bottled water companies, inter-household water sales and the fact that the public utility also charged consumers for water.

Based on household conceptions of property and informal institutions governing water discussed in Chapter 9, this research shows that water services provision was commodified rather than the actual water itself. House holds spoke of the need to pay the water bill to prevent disconnection and the importance of paying the bill, but households considered this to be a payment for service not a product. These findings are noteworthy because they point to commodification as a process which is contested, partial and transient. They also confirm Bakker's (2005) assertion that household consumers are not helpless in the face of the private sector. Furthermore, household conceptions of property and institutions presented in this thesis substantiate Mehta's (2000) claim of water as a multifaceted resource by revealing how different sorts of property relations are seen to exist at different stages of the urban water production process.

The significance of these findings is that they provide weight to the stance which refutes viewing urban water supply as a pure public good. Consequently, this thesis provides evidence to support Mehta's (2003) assertion that much of the consternation over the publicness or privateness of water is due to the failure to distinguish between water as a resource and water provided to households as a product or service. This research shows that acknowledging water as an impure public good and recognising the relative publicness or privateness of water is a necessary step for moving beyond the pro- and anti-privatisation debate.

To this end, the findings from this study also illustrate how debates on privatisation serve to politicise private sector participation and obscure the complexity of water services provision. Aside from negotiations over the payment of a royalty for sourcing water in Corella discussed in Chapter 7, the challenge of managing groundwater resources to ensure ongoing water security received far less attention in the public arena than the privatisation issue. In addition, while TACT has been pursuing legal action against the Provincial Government since 2000 in the name of the people of Tagbilaran, there are no environmental NGOs, lobby groups, or development networks operating in Tagbilaran with a particular emphasis on water (Chapter 7).

The findings from this research suggest that the fact that Tagbilaran has had water up until this point is due to good luck rather than good management. This statement is not intended as a criticism of either the City or Provincial Government. Rather, it acknowledges the difficult local conditions confronting urban environmental managers in Tagbilaran. While Chapter 3 established that water resource management is a fundamental component of water governance,

the policy analysis provided in Chapter 4 and Chapter 6 illustrated how discourses arising from global water governance institutions, conferences and declarations may not fit local environments easily. Instead, local factors again act to mediate global discourses. This was exemplified by the discussion on the difficulties in implementing integrated water resource management because of institutional deficiencies in the Philippines (Chapter 6, Section 6.2), and local hydrological and institutional factors in Tagbilaran (Chapter 4, Section 4.3).

Consequently, the findings on the challenges of implementing integrated water resource management in Tagbilaran demonstrate that a 'one-size-fits-all' approach to development, even when well-intentioned, is not appropriate. That is not to say that integrated water resource management is ineffectual or that efforts such as those outlined in Chapter 4 (Section 4.3) to implement integrated water resource management in Tagbilaran and Bohol should be abandoned. Rather, contextual factors such as the hydrological and physical environment, types of land use activities, population density, and the nature and pattern of water demand need to be considered and taken into account in order to effectively manage water resources and human activity which may adversely affect future water security.

In the absence of these considerations, the findings of this research suggest that an over-emphasis on network expansion without adequately taking into account water resource management will lead to greater levels of consumption, which will continue to place pressure on resources and ultimately lead to water insecurity (Chapters 4, 7 and 8). In light of the evidence presented in Chapter 7, past and present decisions made by waterworks utilities' in Tagbilaran to focus on network expansion can be seen as largely due to the fact that it is a tangible development outcome which is also politically popular and, therefore, serves to assuage household consumers' concerns about urban water supply. However, the danger in focusing only on distribution without also considering demand (household patterns of consumption) and supply (water resource management and how it is affected by human activity) is merely a short-term solution.

The study further suggests that water resource management approaches and governance in Tagbilaran have tended to be reactive and problem-focused. This is further evidenced by the fact that decisions concerning water supply and location of pumping units in the past have tended to be ad hoc (Section 4.3 and Section 6.3). The research suggests that a shift from a reactive to proactive approach is currently occurring. To this end, the hybrid model of governance that has evolved in Tagbilaran can be seen as arising in response to a particular set of circumstances and problems such as declining groundwater quality and increasing urban water demand and actively seeking to address these into the future; that is, through inter-jurisdictional water sharing and enabling private sector participation. What is more, the findings imply that the hybrid governance system in Tagbilaran is more flexible and amenable

to meeting urban water needs than formal institutions derived at the national level. This is because of its proximity to the household scale.

This is particularly so in light of the analysis in Chapter 9, which revealed household knowledge of water governance as being strongly influenced by notions of property and associated conceptions such as ownership, rights, access and responsibility. However, as discussed in Chapter 9 (Section 9.2), these conceptions differed significantly from the formal bureaucratic institutions for governing water in the Philippines. Instead, analysis at this scale highlighted the importance of everyday experience in framing how development and water governance were understood and in influencing how households managed their water. In particular, analysis at this scale highlighted the importance of local government units in governing water.

The ability of the hybrid model of governance in Tagbilaran to bring improvement to household water access is due to the network of relatively good relationships that exist between: both of the waterworks utilities in Tagbilaran; BWUI and the Provincial Government of Bohol; BWUI, the Provincial Government of Bohol and the Municipality of Corella; and, the City Government of Tagbilaran and the Provincial Government of Bohol. This is not to say that all parties are in complete accordance with each other at all times, but rather, enough good will and common interest in safeguarding household water security exists to mediate conflict and unacceptable practices. In this regard, this research suggests that the relatively small-size of Tagbilaran is also important to the success of the privatisation in Tagbilaran and the hybrid system of governance more broadly. A further inference from the research is that success in these endeavours is due to key individuals within this network of relationships.

The relationships and synergies between these parties, along with households and non-governmental organisations in Tagbilaran and Corella, substantiate Kooiman's (1999) theorisation of social-political governance. This is fundamental to the conceptualisation of hybrid governance developed in this thesis. The significance of Kooiman's approach to governance for this research, with its focus on relationships and synergies, is that it provided the means by which to conceptualise innovative and contextualised structures of governance.

The analysis practised by this research clearly demonstrated that multiple conceptions of water governance exist and that local perceptions differed to supra-national and national constructions. This research also showed that multiple 'locals' exist; that is, the household levels in Tagbilaran and Corella, city/municipal level and provincial level are all local in some way or another. In addition, hybrid models can emerge in response to local problems or conditions and accordingly, these models can assume a more proactive approach to water governance. Hybrid governance has the potential to either improve water security because of a more flexible and proximate governance system, or to increase the threats to water security as a

consequence of institutional complexity, diffusion of responsibility and by exacerbating knowledge deficiencies.

The findings of this research highlight the importance of finding ways to improve household access and water security through creating the right institutional and/or regulatory environment. In the absence of effective institutions to govern groundwater resources, responsibility and management practices may fail to safeguard water for future use. In addition, without adequate methods of communication to inform households and other users about the risks to groundwater resources posed by human activities, water security in Tagbilaran is threatened by declining groundwater quality and quantity. This research shows that, efforts to improve understanding about the interaction between human activities, the environment and groundwater resources first requires discerning what households perceive as being threats to water security and their role in exacerbating or reducing these threats. Moreover, determining who households consider as having agency to govern water resources, and what this entails, is important for identifying ways in which to effectively influence activities that may threaten water quality and future access.

10.4 Knowledges and uncertainties: why is household knowledge important?

In this section I synthesise findings presented throughout the thesis to answer the question why household knowledge is important (Section 1.2). The material presented in Chapter 8 and Chapter 9 provided a rich account of the forms of knowledge held by households, where this knowledge was obtained and how household understandings of water governance, including water resource management, supply and distribution influenced their behaviour. In addition, the juxtaposition of global discourses of development and water governance (see Chapter 3) and official policies and plans at the national and sub-national levels (see Chapter 6) with the household level revealed knowledge as plural, partial and contested.

Household knowledge concerning the interaction between humans and their environment was extensively explored in Chapter 8. The findings revealed that households had a limited understanding of broader environmental issues and how human activity impacts upon groundwater resources. The implications of such knowledge deficiencies are that households may continue to engage in activities that ultimately threaten their continued water security such as improper household waste disposal or improper construction of septic tank facilities (see Chapter 8). However, the promise in terms of improving the efficacy of water resource management is that households were shown to comprehend the interconnectedness of users within a water system. Further, the findings from Chapter 8 suggest that households practise micro-level demand management insofar as households make allocation decisions based on quality, availability and are aware of how each consumer's consumption affects the other.

Household knowledge concerning water governance in terms of the formal political, economic, and administrative institutions in the Philippines—what these are and how they function—was extensively explored in Chapter 9. The findings presented in Chapter 9 revealed that the dissemination of information, concepts, and ideas concerning water governance from the various levels of government explicated in Chapter 6 to the household level was inconsistent and poorly done. This was shown in Chapter 6 as being due to the fact that the formal institutional structures in the Philippines are ineffective and highly fragmented. Moreover, fragmentation has led to confusion about who is responsible for different aspects of water governance amongst household consumers, who, because of poor communication and dissemination, are seemingly oblivious to the formal bureaucratic institutions regulating water governance (see Chapter 6 and Chapter 8).

This was exemplified in Chapter 9 wherein household conceptions of property were revealed as being based on lived experiences and grounded in everyday practices that were relatively divorced from national and international discourses. In addition, water was revealed as being a multifaceted and heterogeneous entity subject to myriad relations depending on how, when and where it is situated. This socially embedded view of property and governance was shown to co-exist with the formal, legal institutions governing water in the Philippines. Rather than suggesting that such conceptions are wrong, the findings from Chapter 9 illustrate property, rights and ownership as being highly complex, transient and contingent. These alternate interpretations of water, water governance and institutional arrangements are important precisely because they highlight the significance that households place on local government units for looking after the well-being of the citizens, as discussed in Chapter 9. Again these findings support the epistemological underpinnings of this research as presented in Chapter 2 whereby knowledge is viewed as plural, situated and partial (Haraway, 1988).

The material presented in Chapter 9 clearly demonstrates that household knowledge about water and water governance is important in order to address the institutional and social aspects of integrated water resource management. This is because, by exposing household actions that adversely affect water security and by identifying knowledge deficiencies related to environmental practices and institutional arrangements, targeted efforts to educate and modify behaviour and practices can be implemented. These could include the City Government engaging more actively with households on the vulnerabilities of karst groundwater systems in urban environments, particularly in terms of household waste and sanitation. These findings echo Burke et al (1999), who identify social, institutional and political factors as the primary obstacle to sustainable management of groundwater resources.

Household conceptions of water governance in Tagbilaran revealed high levels of misunderstanding, misinformation, suspicion and uncertainty. Households were aware that two waterworks utilities operated in Tagbilaran. They were aware that BWUI was a private utility,

and also that there was an inter-jurisdictional water sharing arrangement in place between Tagbilaran and Corella. Despite this, the findings presented in Chapter 9 revealed knowledge deficiencies in terms of the implications of these attributes on their long-term water security. Conversely, the evidence presented in Chapter 6 and Chapter 7 suggests that knowledge deficiencies concerning household environmental knowledges and water use exist amongst those responsible for providing water services (the waterworks utilities) and those responsible for managing it (Provincial and local governments).

Improving the efficacy of water resource management requires knowledge exchange between resource planners and managers and water users including waterworks utilities and households. The findings from Chapter 8 detailing household consumption patterns, environmental knowledge and household practices suggest that it is imperative to consider household perspectives as micro-level water resource managers in concert with those at other scales. This will move some way towards redressing these shortcomings and to create a cooperative environment conducive to ensuring sustainable water resource management and hence, sustainable municipal water supply. This would provide the opportunity for water managers and decision-makers to more effectively engage with households to ensure continued water security in a targeted manner.

The findings from this research support work of those who have critiqued the water governance and institutions in the Philippines and found them wanting (Dayrit, 2001; Navarro, 2003; Sy, 2003). Notably absent in household conceptions of water governance was the national government and the formal bureaucratic institutions which construct the framework for water governance in the Philippines. The research findings suggest that it is the local government level that has the greatest potential to affect management of resources and influence behaviour. This has the potential to safeguard water supplies because it is this level of government that is seen by households as having the authority and the agency to act. In saying this, however, I acknowledge the obstacles faced by local government units in improving their knowledge base and to engage more thoroughly with households not least because of a paucity of data concerning the hydrological characteristics in Tagbilaran (and Corella), a lack of technical expertise, and a lack of financial resources. But, in light of the Provincial Government's ongoing project to construct a poverty database covering the entire province (as mentioned in Chapter 6) it is not necessarily an impossible task.

10.5 Future research

The purpose of this section is to identify future areas of research. In the process of answering the research questions, the findings presented in this thesis point to other areas of future research related to water governance in cities in developing countries. In this section, I identify three key areas of future research: firstly, implementing integrated water resource management with an emphasis on groundwater; secondly, bridging knowledge gaps and

overcoming uncertainties through education; and thirdly, investigating institutions and constraints to household connections.

Attention needs to be given to determining how to more effectively implement integrated water resource management approaches in groundwater environments. Improving data about the location and extent of groundwater reservoirs, particularly in developing countries where such information may be scarce, is imperative. Similarly, improving the capacity of local level managers to understand the special characteristics of groundwater and how it is implicated by human activity is also important. As a corollary, there is a need to consider formal and informal institutions for regulating water use and to engage users at the local level as a means to encourage sustainable use of groundwater resources. This would involve mapping the institutions present and finding ways to effectively communicate the benefits and limitations of groundwater to users.

On a related point, there is a need for further research into ways of bridging knowledge gaps such as those identified through this research, because these concern household awareness about how human activities affect water resources. This firstly involves bringing environmental issues such as groundwater resource management publicly to the fore in urban areas and making known those factors which threaten water security. It is important that households are engaged in such activities. This is essential because their capacity as important agents for water resource management and in influencing local government policy and decision-making needs to recognised and realised. Research into how to establish an information and environmental education framework is also needed. This research would include questioning how this might function, and the suitability of different methods, for example, information campaigns, workshops, public hearings, to engage households, community groups, local government units, and *barangays* in a dialogue about threats posed to groundwater resources and actions to ameliorate threats.

Further research must be conducted on the institutional arrangements governing groundwater resources in urban settings, particularly where collectives or groups for managing or consuming water are absent, since this will provide insights into the decision-making practices of household consumers. This research could focus upon investigating the reasons why households are not connected and the ways in which they obtain water for their water needs. This would provide useful insights into how households might become connected in the future. To this end, investigations into how best to provide access to those households not connected to municipal water supply should continue. This includes, but is not limited to: evaluating the pros and cons of subsidies for connections; the viability of lifeline quantities of water to all households; and the suitability of rebates from waterworks utilities or social welfare assistance from the government.

It is important for other researchers to continue to move beyond the polemical debate that private sector involvement in urban water services provision is good or bad in order to find ways to more effectively promote access to safe drinking water while, at the same time, ensuring adequate governance structures to safeguard sustainable water resource management for future supplies.

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Appendix A: Example of letters of introduction and research outline

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PRIVATE AND CONFIDENTIAL

_____ 2003

Hon. _____

Mayor, _____

Dear Hon. _____

PROPOSED PHD RESEARCH PROJECT, BOHOL, PHILIPPINES

My name is Karen Fisher. I am a PhD candidate at the School of Resources, Environment and Society, Australian National University, Australia. I am currently in Bohol doing fieldwork for my thesis from June to December 2003. My doctoral research looks into issues surrounding development and water resource management in Bohol. I have been based in Tagbilaran for 5 weeks, and would like to formally tell you about my intended research as I seek your accord to undertake research in your municipality.

My research is an examination of development policy using water resource management as a case study. I intend to look at policies in place in dealing with development, urbanisation, urban growth and the corresponding pressure on water resources. I am particularly interested in water transfers between different locations such as the case of Corella water being transferred to Tagbilaran. I intend to look at the social, economic and environmental impacts of water transfers on source locations and destinations in light of the growth and development that is occurring in urban centers such as Tagbilaran and the pressure that is placed on resources.

I have some experience in water resource management issues in Bohol having completed fieldwork for my Master's project in 1997. My Master's project examined the consultation process surrounding the Bohol-Cebu Water Supply Project. My current research begins in Bohol; I plan to also consider water resource management in Cebu to provide a contrast and comparison.

This research is driven by the desire to provide information on local visions and perceptions of water resource management that can strengthen regional development policy in the pursuit of achieving sustainable and equitable development. I have enclosed a brief project outline along with this letter that will provide you with further information. I look forward to meeting you to discuss my research.

Yours faithfully,

Karen T Fisher

PhD Candidate

PRIVATE AND CONFIDENTIAL

Doctoral research project: Brief outline and proposed fieldwork for research in Bohol, Philippines

Karen T Fisher
PhD Candidate
Geography Program
School of Resources, Environment and Society
Australian National University

Contact details in the Philippines:

Thesis title: *Development, equity and the environment: the case of water in the Philippines*

Research overview:

In this research I am concerned with development policy and its effects. I am using water resource management in the Philippines as a case study to explore the conflicts and tensions that can emerge when development policy is put into practice. The research considers the effects that development and urbanisation has had on water resources in the Philippines and proposed methods to address future water demand focusing specifically on transfers of water from one place to another as a method of meeting demand.

The research will consider the problem of water scarcity, competition between different users and uses, institutional arrangements that exist to coordinate development policies and programs, and the social, environmental and economic impacts of transfers on source locations and destinations. One of the main research objectives is to determine how water transfers can be executed so that stakeholders at the source and destination can both benefit and opportunities for development and growth can be realized.

Fieldwork (June to December 2003):

Tagbilaran City is unable to meet demand for its consumers from within its own jurisdiction and so has been transferring water from Corella since 1997. Likewise, Panglao and Dauis are confronted with problems of water scarcity. On the other hand, Corella has been identified as having a plentiful supply of water with low current and projected demand. I am interested in learning the implications for Corella and its future development and land use practices since it has been identified as a source for other urban areas.

I wish to explore how water resources are managed and transfers are negotiated between Corella and Tagbilaran. I am interested in property rights, access rights and equity issues that arise when water is diverted. I will consider the institutions that currently exist and the organisations currently responsible for water resource management and allocation. I will conduct key informant interviews along with interviews with households and residents in

Corella and Tagbilaran City to learn people's perceptions on water resources, management, supply and demand, pricing and transfers between places. I am interested in tourism and development plans and water resources, as well as securing safe and adequate supplies

The information collected from interviews will be used to gain an understanding of the ways in which water is managed and allocated to different places and uses, which will then be considered against documentary evidence such as reports and plans. The information that is gained from this fieldwork will contribute to an expanding field of research concerned with matters of ensuring access to safe water in urban and rural areas in developing countries. Further, this research will provide information on local visions and perceptions of water resource management in the Philippines that can strengthen regional development policy in the pursuit of achieving sustainable and equitable development in the Central Visayas and other regions in the Philippines and elsewhere.

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_____ 2003

To the Barangay Captain

PHD RESEARCH PROJECT, BOHOL, PHILIPPINES

[Research Assistant's name] will be conducting interviews in the barangays of Cancatac, Poblacion, Sambog and Tanday, Corella during October, 2003. The information from these interviews will be used for research being done by Karen Fisher, a PhD candidate from the Australian National University, Australia.

The research will look at the social, economic and environmental impacts of water transfers, in particular water from Corella being used to supply Tagbilaran.

This research is driven by the desire to provide information on local visions and perceptions of water resource management that can strengthen regional development policy in the pursuit of achieving sustainable and equitable development.

Yours faithfully

Karen T Fisher

PhD Candidate

Appendix B: Consent Form

CONSENT FORM FOR INDIVIDUAL INTERVIEWS

Relating to doctoral research undertaken in the Central Visayas, Philippines, by Ms Karen T Fisher, PhD Candidate, School of Resources, Environment and Society, Australian National University.

PhD thesis title: *Development, equity and the environment: the case of water in the Philippines*

It is a requirement of my University that before proceeding with this interview I explain the purpose of this research, how the information that you provide will be used, and my responsibilities to you as a research subject. I must also obtain your informed consent.

The information provided by you in this interview will be secured in a locked facility.

Your personal identification will not be revealed in my thesis unless you give me your express permission to do so; you are free to refuse such permission. You are also free to refuse to participate or to withdraw your participation at any stage.

Do you consent to this interview?	Y/N
Do you consent to be recorded in this interview?	Y/N
Do you give permission for your name to be mentioned in written material?	Y/N
Would you like to review your interview transcript?	Y/N

If you consent to this interview please write your name and sign below.

Thank you

Name: _____

Signature: _____

Date: _____

Appendix C: Description of interview respondents and date of interview

NG#1	Officer in National Government agency in Manila	1 July 2004
NG#2	Officer in National Government agency in Manila	2 July 2004
PG#1	Senior officer in Provincial Government	2 July 2003
PG#2	Senior officer in Provincial Government	29 September 2003
PG#3	Senior officer in Provincial Government	29 November 2003
PG#4	Senior officer in Provincial Government	5 May 2004
PG#5	Senior officer in Provincial Government	27 September 2004
LG#1	Senior officer in City Government	29 July 2003
LG#2	Municipal Government Official	12 August 2003
LG#3	Municipal Government Officer	21 August 2003
LG#4	Officer in City Government	2 December 2003
LG#5	Senior Officer in City Government	6 September 2004
LG#6	Municipal Government Official	10 September 2004
WW#1	Senior officer in waterworks utility	14 July 2003
WW#2	Former senior officer in waterworks utility	15 July 2003
WW#3	Senior officer in waterworks utility	22 October 2003
WW#4	Officer in waterworks utility	24 September 2004
WW#5	Senior officer waterworks utility	24 September 2004
LA#1	Officer in national government line agency present in Bohol	21 October 2003
LA#2	Officer in national government line agency present in Bohol	7 September 2004
CS#1	Member of NGO community	1 October 2003
CS#2	Member of NGO community	2 October 2003
CS#3	Member of NGO community	21 September 2004
CS#4	Member of advocacy group	25 September 2004

Appendix D: Household Surveys – Design, themes and forms

Bohol Water Utility Inc., households, Tagbilaran

Tagbilaran City Waterworks System households, Tagbilaran,

Corella Waterworks System households, Corella

Survey Themes

Household Surveys were administered according to waterworks utility coverage area; therefore, three forms were designed for BWUI, TCWS and CWS household consumers. Household Surveys were structured thematically in order that questions on a similar theme were grouped. The themes were consistent for each sub-set; however, there was some variation in the questions that were asked. Household Survey themes have been summarised in Table D-1, Table D-2 and Table D-3 and expanded descriptions are provided below.

Table D-1: BWUI Household Survey themes

Theme 1	***Socioeconomic and demographic information***
	Number of years the respondent has lived in Tagbilaran; Number of people living in the house; Respondent age, sex, occupation, and level of education; Occupant age, sex, occupation, and level of education; Household income.
Theme 2	***Water supply and household use***
	Sources of water for household consumption – BWUI; rain water; bottled drinking water; well; Consumption per month/amount paid per month and the nature of demand – household uses for water; Identifying improvements and changes to water supply and quality in Tagbilaran.
Theme 3	***Land use and water***
	Perceived problems and threats to water supply, quality, quantity in Tagbilaran; Perceptions on strategies to mitigate or remove potential threats to water supply and services in Tagbilaran.
Theme 4	***Ownership, use, rights and responsibilities***
	Opinions and perceptions on the water sharing arrangement between Tagbilaran and Corella; Levels of knowledge concerning the water sharing arrangement between Tagbilaran and Corella; Ownership of water; Rules, regulations and decision-making; Responsibility for resources and their management.
Theme 5	***Consumer/provider relations***
	Opinions concerning compensation to Corella for access to water there; Affordability and satisfaction; Perceptions and opinions concerning the privatisation of PWS.

Table D-2: TCWS Household Survey themes

Theme 1	***Socioeconomic and demographic information***
	Number of years the respondent has lived in Tagbilaran; Number of people living in the house; Respondent age, sex, occupation, and level of education; Occupant age, sex, occupation, and level of education; Household income.
Theme 2	***Water supply and household use***
	Sources of water for household consumption – TCWS; rain water; bottled drinking water; well; Consumption per month/amount paid per month and the nature of demand – household uses for water; Identifying improvements and changes to water supply and quality in Tagbilaran.
Theme 3	***Land use and water***
	Perceived problems and threats to water supply, quality, quantity in Tagbilaran; Perceptions on strategies to mitigate or remove potential threats to water supply and services in Tagbilaran; Responsibility for resources and their management.
Theme 4	***Ownership, use, rights and responsibilities***
	Opinions and perceptions on the water sharing arrangements; Ownership of water; Rules, regulations and decision-making.
Theme 5	***Consumer/provider relations***
	Opinions on operations and services; Affordability and satisfaction.

Table D-3: CWS Household Survey themes

Theme 1	***Socioeconomic and demographic information***
	Number of years the respondent has lived in Corella; Number of people living in the house; Respondent age, sex, occupation, and level of education; Occupant age, sex, occupation, and level of education; Household income.
Theme 2	***Water supply and household use***
	Sources of water for household consumption – CWS; rain water; bottled drinking water; deep well Consumption per month/amount paid per month and the nature of demand – household uses for water
Theme 3	***Land use and water***
	Perceived problems and threats to water supply, quality, quantity in Corella; Perceptions on strategies to mitigate or remove potential threats to water supply and services in Corella; Responsibility for resources and their management.
Theme 4	***Ownership, use, rights and responsibilities***
	Opinions and perceptions on the water sharing arrangement between Tagbilaran and Corella; Levels of knowledge concerning the water sharing arrangement between Tagbilaran and Corella; Ownership of water; Rules, regulations and decision-making; Responsibility for resources and their management.
Theme 5	***Consumer/provider relations***
	Opinions concerning compensation to Corella for access to water there; Affordability and satisfaction.

Socio-economic and demographic information

Household census information for each household occupant was gathered including number of people living in the household, age, sex, occupation and level of education.

Respondent information was differentiated from other occupant information. Household income information was obtained and has been grouped into classes that correspond with the Provincial and Tagbilaran City Government's classification system as per the *Provincial Medium Term Development Plan* (Province of Bohol, 1997), *Socio-economic Profile for Tagbilaran City* (City of Tagbilaran, 2002) and *Comprehensive Land Use Plan: Tagbilaran City* (City of Tagbilaran, 2001). Classifications are shown in Table D-4.

Table D-4: Household Income classes

Income Class	Income (Pesos per month)	Income (Pesos per year)
1	<1,000	<12,000
2	1,001-2,000	12001-24,000
3	2,001-3,000	24,001-36,000
4	3,001-4,000	36,001-48,000
5	4,001-5,000	48,001-60,000
6	5,001-6,000	60,001-72,000
7	6,001-7,000	72,001-84,000
8	8,001-9,000	84,001-96,000
9	9,001-10,000	96,001-120,000
10	>10,000	>120,000

Respondents were also asked if they received remittances, which also were counted as part of the monthly income.[170]

Water supply and household use

Respondents were asked several questions concerning consumption and cost. The purpose of these questions was to try to determine how much water was consumed per month and the major household uses of water. In Corella, respondents were asked to differentiate between household and agricultural uses of water.

Respondents were asked to estimate the amount of water consumed in the household per month. A number of assumptions where made in the design of the surveys and also when analysing the responses. Firstly, I realised that many people would have difficulty in trying to estimate the volume of water, m^3 per month, 'off of the top of their heads' therefore respondents were asked to estimate the quantity of water consumed and the amount they usually paid for water per month. Respondents tended to have better recall of the amount paid. Secondly, several respondents replied "minimum" for estimations of volume or amount paid. BWUI, TCWS and CWS all have a fixed rate for a minimum quantity consumed. The minimum rate for BWUI is P65.00 for 0-9 m^3, P62.00 for 0-10 m^3 for TCWS and P25 for 0-5 m^3 for CWS therefore there is no way to differentiate between respondents who consumed 5 m^3 per month or

[170] Remittances are an important contribution in the lives of many Boholano families. Family members often leave Bohol to find work in other parts of the Philippines – Cebu, Manila or Mindanao – or travel abroad for work opportunities.

those who consumed 10 m^3 per month using the bill payment method. However, it is felt that for the purposes of determining affordability for households such an approach was acceptable. Thirdly, it is important to bear in mind that respondents' answers were estimates only and are not absolute; however, I feel that the responses are fairly indicative of household-economic decision-making.

Respondents were also asked to identify other sources of water. Early in the survey process it became clear that a large number of respondents consumed bottled water.[171] Therefore a decision was made to collect data concerning consumption of bottled drinking water. Again, assumptions concerning the quantities consumed were made. While the standard drinking bottle size available in Tagbilaran is 5 gallons[172]/18.9 litres, respondents tended to refer to the bottles as being "one gallon" or "the big bottle." On such occasions I have assumed that they are actually referring to the 5 gallon/18.9 litre bottles. Prices for bottled water ranged from P35 to P45 per 5 gallon container. An average price of P40 has been used for calculations concerning expenditure on bottled water; respondents were not asked to identify the brand of water that they purchased.

It is possible that respondents under-reported all their sources of water, particularly in the early stage of data collection. On several occasions I witnessed rainwater collection via a series of drums yet when asked, the respondents said that they were not using water from other sources. Therefore, the questions concerning other sources were asked specifically: "Do you buy mineral water?" "Do you collect rainwater?" "Do you use the deep well?"[173] Where a deep well was proximate to sampled households questions concerning past and current use were asked. Respondents were also asked to identify changes and improvements in water quality and water quantity that had occurred in recent years.

Land use and water

Respondents were asked to identify perceived problems with water in Tagbilaran. Specific questions relating to power failures/brownouts ("Do you have water during brownouts?") and water pressure ("Do you have problems with water pressure?") were asked directly. Questions regarding threats to water supply, quality and quantity in Tagbilaran were asked to determine people's understandings of the relationship between land use practices and effects on water resources. As a corollary, people were also asked to identify ways to mitigate or remove potential threats to water supply and services in Tagbilaran: strategies to ensure water for present and future users.

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[171] Respondents tended to refer to all types of bottled water as "mineral water", which strictly speaking, is incorrect since much of the water that is purchased in Tagbilaran is purified water, that is water from one of the waterworks networks that has been treated (Ferrier, 2001; UN, 2004a).
[172] The unit for measuring the volume of bottled drinking water was US gallons.
[173] This question was asked in places where a deep well was nearby.

Ownership, use, rights and responsibilities

I was interested in exploring how consumers in Tagbilaran conceive of property, rights, ownership and responsibility with respect to water. Questions sought to distil perceptions and opinions about who owned water; who were entitled to access water; who was responsible of ensuring access to water supplies; who should make decisions concerning access; who was responsible for managing water resources; rules and regulations. It was also my intention to tease out how the multifaceted nature of water – as an economic good, a social good, a public good and an important environmental resource – is conceptualised by local consumers, and the bearing this has, in their day-to-day lives.

Consumer/provider relations

Respondents in each sub-group were asked general questions concerning consumer/provider relations: satisfaction with current service, affordability and bill payment including whether consumers felt the provider was strict. The purpose of these questions was to try and gain an insight into the perceptions that consumers had of their respective waterworks utility.

A series of questions were designed for the surveys conducted with BWUI and Corella consumers to address the water sharing arrangement between Tagbilaran and Corella. These questions sought to discover local people's perceptions of the role that Corella plays as a source of water for Tagbilaran, their level of awareness of the legal and technical arrangements in place, and their feelings about the 'sharing' of water between Tagbilaran and Corella. Questions concerning compensation to Corella were also asked. BWUI respondents were also asked questions concerning the privatisation of the PWS. People were asked to comment on the privatisation process as well as the bearing privatisation of the public utility has had on their lives.

Household ID: TAG____

Barangay ID: _____

BWUI = Bohol Water Utilities, Inc.
Are you a BWUI consumer?

Y	
N	

Are you aware that water from Corella is brought here by BWUI's to supply water for Tagbilaran City?

Y	
N	

How long have you lived in Tagbilaran? _____
Do you own this property?

Water supply and household use
What is your main source of water for this property?

Is the amount you get from this source enough for your needs?

How many households/consumers share your water connection?

Do you get water from any other source? (filtered water, water vendors, rainwater, springs, wells)

How much water do you use per month?

How much do you pay per month? (estimate)

What is the quality of the water like? (eg taste; is it 'clean'?)

What do you use the water for (drinking, cleaning, cooking, bathing, household gardens):

Which household activity uses the most water?

Do you think the water in Tagbilaran has improved over the years?

What are the main changes for water supply and quality that have occurred?

Land use and water

Do you think there are any problems with water resources in Tagbilaran?

What are some of the things that can affect water quality and quantity for you and other users, now and in the future (threats)?

How do you dispose of you garbage? (allow for multiple methods)

Burning	
Burying	
Dumping	
Composting	
Feeding to animals	
Garbage truck	
Other	

What kind of toilet(s) do you have?

Do you have a septic tank?

Water sealed, sewer/septic tank used exclusively by household	
Water sealed, sewer/septic tank shared with other household	
Water sealed, other depository used exclusively by household	
Water sealed, other depository shared exclusively with other household	
Closed pit (anti-polo type)	
Open Pit	
Others (pail system)	
None	

What do you think are some of the things that Tagbilaran can do to make sure there is good water supply for people in the city? (including getting water from other places).

Ownership, use and access to water

What do you think of the transfer of water from Corella to Tagbilaran?

Do you know when the transfers began?

Who do you think owns the water that BWUI gets from Corella?

Do you think there should be rules or regulations for allowing access to water? What should they be?

Who should decide the rules?

Are you aware that BWUI has renegotiated a new MOA with the Municipality of Corella?

Do you think that Corella should be compensated for supplying water to Tagbilaran?

Is the amount that you pay per month for water affordable (expensive/inexpensive)?

What do you think of the privatization of water in Tagbilaran?

Demographic and socioeconomic information
How many people live here? _____

Sex:

	M	F
#		

Ages:

RESP		2		3		4		5		6		7		8		9		10	
M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F

What are the occupations of people in the household?

What is the household income? Per month _____
Are there family members not currently living in the house that provide income to **this** household through remittances?

Y	
N	

If **YES**,

WHO (relationship)	
SEX	
AGE	
AMOUNT	
Where are they living/working	
WHO (relationship)	
SEX	
AGE	
AMOUNT	
Where are they living/working	

Education

	Resp	Others				
No formal education						
Graduated Elementary School						
Graduated High School						
College/University Graduate						
Not finished Elementary School						
Not Finished High School						
Not Finished College/University						
Other training						

Household ID: TAG____
Barangay ID: _____

TCWS = Tagbilaran City Waterworks System
Are you a TCWS consumer?

Y	
N	

Are you aware that there are two different waterworks systems here in Tagbilaran City? If yes, what can you tell me about them?

Y	
N	

How long have you lived in Tagbilaran? _____
Do you own this property?

Water supply and household use
What is your main source of water for this property?

Is the amount you get from this source enough for your needs?

How many households/consumers share your water connection?

Do you get water from any other source? (filtered water, water vendors, rainwater, springs, wells)

How much water do you use per month? (How many bottles of mineral water?)

How much do you pay per month? (estimate)

What is the quality of the water like? (eg taste; is it 'clean'?)

What do you use the water for (drinking, cleaning, cooking, bathing, household gardens):

Which activity uses the most water?

Do you think the water in Tagbilaran has improved over the years?

Have there been changes for water supply and quality?

Is the government more strict now about paying the bill?

Land use and water

Do you think there are any problems with water resources in Tagbilaran?

What are some of the things that can affect water quality and quantity for you and other users, now and in the future (threats)?

What do you think are the impacts of more people for water?

How do you dispose of you garbage?

Burning	
Burying	
Dumping	
Composting	
Feeding to animals	
Garbage truck	
Other	

What kind of toilet(s) do you have?
Do you have a septic tank?

Water sealed, sewer/septic tank used exclusively by household	
Water sealed, sewer/septic tank shared with other household	
Water sealed, other depository used exclusively by household	
Water sealed, other depository shared exclusively with other household	
Closed pit (anti-polo type)	
Open Pit	
Others (pail system)	
None	

What do you think are some of the things that Tagbilaran can do to make sure there is good water and enough supply for people in the city?

Ownership, use and access to water

Who do you think owns water? (In the ground? In the tanks? In the pipes?)

Do you think there should be rules or regulations for allowing access to water? What should they be?

Who should decide the rules?

Do you think it is ok to get water from other towns for use here in Tagbilaran if there is not enough here?

Who do you think is responsible for making sure there is enough water for people here in Tagbilaran?

Who is the one responsible for protecting water sources so there is enough for people here in Tagbilaran, now and in the future?

Who would you blame if there was no water or if the quality was bad?

Have you ever had any problems or complaints that you have reported? (If yes, please describe)

Are you happy with the amount of water and the quality in Tagbilaran? Why? Why not?

Are you happy with the service that you receive from TCWS?

Is the amount that you pay per month for water affordable (expensive/inexpensive)?

Demographic and socioeconomic information

1. How many people live here? _____

2. Sex:

	M	F
#		

3. Ages:

RESP		2		3		4		5		6		7		8		9		10	
M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F

4. What are the occupations of people in the household?

	_____

5. What is the household income? Per Month

_____

6. Are there family members not currently living in the house that provide income to **this** household through remittances?

Y	
N	

If **YES**,

WHO (relationship)	
SEX	
AGE	
AMOUNT	
Where are they living/working	
WHO (relationship)	
SEX	
AGE	
AMOUNT	
Where are they living/working	

Education – highest level achieved/currently enrolled

	Resp	Others				
No formal education						
Graduated Elementary School						
Graduated High School						
College/University Graduate						
Not finished Elementary School						
Not Finished High School						
Not Finished College/University						
Other training						

Household ID: COR____
Barangay ID: _____

Corella Waterworks System
Are you aware that water from Corella is used to supply Tagbilaran City?

Y	
N	

Demographic and socioeconomic information

2. How many people live here? _____

2. Sex:

	M	F
#		

4. Ages:

RESP		2		3		4		5		6		7		8		9		10	
M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F

4. What are the occupations of people in the household?

5. What is the household income?

Per Month

<1,000	
1,001-2,000	
2,001-3,000	
3,001-4,000	
4,001-5,000	
5,001-6,000	
6,001-7,000	
8,001-9,000	
9,001-10,000	
>10,000	

Per Year

<12,000	
12001-24,000	
24,001-36,000	
36,001-48,000	
48,001-60,000	
60,001-72,000	
72,001-84,000	
84,001-96,000	
96,001-120,000	
>120,000	

6. Are their family members not currently living in the house who provide income to **this** household through remittances?

Y	
N	

If **YES**,

WHO (relationship)	
SEX	
AGE	
AMOUNT	
Where are they living/working	
WHO (relationship)	
SEX	
AGE	
AMOUNT	
Where are they living/working	

Education

	Resp	Others				
No formal education						
Graduated Elementary School						
Graduated High School						
College/University Graduate						
Not finished Elementary School						
Not Finished High School						
Not Finished College/University						
Other training						

Tenure

How big is your property?

How much land do you till?

Do you own your land?
(Hold title? Pay taxes?)

What crops do you grow?

How many plantings per year?

What livestock do you have?

Water

Supply and household use

What is your main source of water?
[Level 1, 2, 3] Municipal/Private

Is the amount you get from this source enough for your needs?

Do you get water from any other source? (rainwater, springs, wells, vendors)

How much water do you use per month?

How much do you pay per month? (estimate)

What is the quality of the water like? (eg taste; is it 'clean'?)

Have you or anyone in this house been sick from drinking the water (in the last 12 months/longer?)?

What do you use the water for (drinking, cleaning, cooking, bathing, household gardens, crops and livestock):

Which activity uses the most water? Agricultural:

Which activity uses the most water? Domestic/ Non-Agricultural:

Rank water uses from those that use the **most water** to those that use the **least water**. Agricultural uses:

Rank water uses from those that use the **most water** to those that use the **least water**. Non-Agricultural uses:

Land use and water

What are some of the things that can affect water for you and other users, now and in the future?

What do you think is the biggest threat to water sources?

Do you use chemicals such as fertilisers and pesticides? (What kinds)

Have you planted any trees on your land or done anything else to protect water sources or the environment?

How do you dispose of you garbage? (allow for multiple methods)

Burning	
Burying	
Dumping	
Composting	
Feeding to animals	
Garbage truck	
Other	

What kind of toilet(s) do you have?
Do you have a septic tank?

Water sealed, sewer/septic tank used exclusively by household	
Water sealed, sewer/septic tank shared with other household	
Water sealed, other depository used exclusively by household	
Water sealed, other depository shared exclusively with other household	
Closed pit (anti-polo type)	
Open Pit	
Others (pail system)	
None	

What do you think can be done to make sure that there is enough water for everyone now and in the future?

Ownership, use and access to water in Corella

Who do you think owns water (in Corella)?

Do you feel that you have the right to use water that is on your land?

Do you feel that you should ask permission to use the water first?

Do you think there should be rules or regulations for allowing access to water? What should they be?

Who should decide the rules?

Who do you think should be allowed to use water (in a place such as Corella)? (Should it be limited to people from Corella?)

What do you think of the transfer of water from Corella to Tagbilaran?

Do you know when the transfers began?

Do you know the terms of the MOA?

Are you aware that the Municipality of Corella is currently re-negotiating a new MOA?

Do you think that Corella should be compensated for supplying water to Tagbilaran?

In what form?

Do you have family and friends in Tagbilaran?

How often do you travel to Tagbilaran?

Appendix E: Ethical Research Agreement form

ETHICAL RESEARCH AGREEMENT FORM

Relating to doctoral research undertaken in the Central Visayas, Philippines, by Ms Karen T Fisher, PhD Candidate, School of Resources, Environment and Society, Australian National University.

PhD thesis title: *Development, equity and the environment: the case of water in the Philippines*

This form represents an agreement between the Researcher, Ms Karen T Fisher, and

_____, acting as her research assistant from

_____ until _____

By signing this form, I acknowledge that Ms Fisher has explained the ethical issues of this research (particularly as relates to confidentiality, anonymity and obtaining informed consent) and that she has explained the appropriate procedures that need to take place as expressed in the NH&MRC guidelines.

I have seen the NH&MRC guidelines, and understand my responsibility in ensuring that the research is undertaken in an ethical manner. I undertake to act in accordance with these guidelines.

Name of assistant: _____

Signature: _____

Date: _____

Karen T Fisher (Researcher)

Signature: _____

Date: _____

Appendix F: Privatisation Surveys – Design, themes and form

Structured Interview Design: Privatisation Surveys

The Privatisation Surveys were designed in order to uncover people's awareness of the privatisation process and divestiture of the Provincial Waterworks System and operation of Bohol Water Utilities Inc., in 2000. The Privatisation Surveys were conducted within the BWUI waterworks coverage area with households sampled at random. Privatisation Survey themes have been summarised in Table F-1 and descriptions are provided below.

Table F-1: Privatisation Survey themes

Theme 1	***Public involvement and awareness of the privatisation process***
	The privatisation process and the dissemination of information to the public Public involvement and awareness of privatisation Suggested methods for improving information dissemination
Theme 2	***Preference between public and private ownership***
	People's preferences for water provision – private versus public utilities. People's opinion on whether the government should buy back the water utility
Theme 3	***Ownership, Rights and responsibilities for water***
	Ownership of water Responsibility for water management Blame for poor water management
Theme 4	***Consumer/provider relations***
	Service delivery comparing past and present Affordability and satisfaction
Theme 5	***Importance of water to social development of the City***
	Significance of having clean water

Public involvement and awareness of the privatisation process

Respondents were asked to comment on the privatisation process, including their impression of how well information concerning the divestiture was disseminated to the public and whether the government had involved the public enough in the process. The purpose for asking these questions was to find out how much knowledge people had of details of the joint venture agreement and the sources from which they obtained this knowledge. Respondents were also asked to identify more appropriate methods for engaging stakeholders and disseminating information to households in Tagbilaran.

Preference between public and private ownership

Questions under this theme were asked in order to explore how respondents felt about private sector participation in water delivery. Respondents were asked to compare current services provided by BWUI with the services they had received from PWS. Responses to these questions covered all aspects of water distribution, customer services, and bill payment. In addition, respondents were asked to comment on whether they felt the government should buy back the waterworks utility as proposed by Governor Aumentado. The purpose for asking these questions was to try to uncover the reasons why respondents favoured one mode of delivery

over another and to investigate what influence policies regarding bill payment in light of the findings from the Household Surveys.

Ownership, rights and responsibilities for water

Questions under this theme were asked in order to explore ideas in relation to property and institutional arrangements related to water supply, water distribution, and demand management. As well as asking who was responsible for safeguarding water to households, blame scenarios were used whereby households apportioned blame to groups or individuals whom they felt would be culpable in the event that their water supplies were threatened. The purpose of these questions was to encourage households to think about how water is governed and by whom. In addition, the questions concerning ownership enabled further investigation into conceptions of property, rights, and institutions in light of the findings from the Household Surveys.

Consumer/provider relations

Questions under this theme were asked in order to consider how households felt about the services they received from BWUI and whether they felt the amount they paid per month was affordable.

Importance of water to social development of the City

This theme asked respondents whether they felt water was important to the overall social and economic development of Tagbilaran, and whether they felt water quality had improved. The purpose of these questions was to encourage respondents to reflect on the broader significance of water in the social and economic context of Tagbilaran beyond their own household needs, and to ascertain whether households connected improved water services with economic and social changes in the city.

Household ID: PRIV_____

Barangay_____

Questions about the privatization of the water utility in Tagbilaran to form the company that is known as BWUI

Nakagusto ka ba nga ge-privatize ang tubig sa Tagbilaran?

(Do you like the idea of privatization of the water in Tagbilaran?)

Aduna ka bay problema nga naagean pag privatize?

(Do you think there were any problems with the way the privatization was done?)

Maayo bang napahibawo sa atong gobyerno ang bahin sa pag privatize?

(Do you think the public was well informed by the government?)

Unsa kaha ang angay gebuhat sa gobyerno para mapahibawo ang mga tawo ug ayo?

(How do you think the government could have better informed the people?)

Mas maayo ba ang atong tubig nga lahi na ang nagdumala niini or mas maayo pa kaniadto?

(Do you think it is better now that the water is from a private company or better when it was the government?)

Angay ba nga paliton ug balik sa atong gobyerno ang atong tubig?

(Do you think that the government should buy back the water company)?

Kinsa ang angay mobantay/protectar sa atong tubig diri sa Tagbilaran?

(Who do you think is responsible for protecting the water sources in Tagbilaran and making sure there is enough water for everyone, now and in the future?)

Kinsa ang angay basulon kon ang atong tubig hugaw?

Who would you blame if there was no water or if the quality was bad?

Kinsa ang nanag-iya sa tubig?

(Who do you think owns water?) (Different owners if the water is in the ground? In tanks? In pipes?)

Malipayon ka ba sa ilang serbisyo?

(Are you happy with the service now?)

Ang imong bayranan kada bulan affordable ba?

(Is the amount that you pay affordable?)

Importante ba nga aduna tay maayo nga tubig? Nganu man?

Do you think it is important to have good water? Why?(For development in Bohol)

Ang kahinlo sa atong tubig nautro ba? Or mas hinlo pa karon?

Do you think the water quality has improved?

Appendix G: Socioeconomic information derived from Household Surveys, Tagbilaran and Corella

Socioeconomic and demographic information

Socioeconomic and demographic information for 166 households in Tagbilaran and Corella were obtained through Household Surveys. Household Surveys were conducted in 141 households across Tagbilaran (98 BWUI surveys and 43 TCWS) and 25 households in Corella (CWS). The total sample represented a household population of 903: 424 male (362 in Tagbilaran and 62 in Corella) and 479 female (400 in Tagbilaran and 79 in Corella). Table G-1 presents the number of respondents by gender as well as the total household population and population by gender for each waterworks utility.

Table G-1: Household Surveys – summary of demographic information

Waterworks Utility	Number of households surveyed	Respondent (Male)	Respondent (Female)	Household population (male)	Household population (female)	Total household population
BWUI	98	41	57	251	284	535
TCWS	43	10	33	111	116	227
CWS	25	15	10	62	79	141

Respondents

Sixty percent of all Household Survey respondents were female and 40 percent male. As most of the surveys were undertaken on weekdays during working hours, the male head of the house was not always available hence the large number of female respondents. This gender imbalance of respondents is also represented in the large number of respondents that identified their occupation as housekeepers/housewives. On occasions where the male head of the household was present, he would often defer questions to his wife/the female 'head' particularly with respect to consumption of water for household activities since, overwhelmingly, household activities such as washing and cleaning are generally done by females in the households. This includes mothers, wives, daughters, and domestic helpers.

Forty-two percent of BWUI respondents were male aged between 30 and 80 years with an average age of 46.7 years. Fifty-eight percent of BWUI respondents were female ranging in age from 20 to 74 years of age, with an average age of 43.8 years.

Twenty-three percent of TCWS respondents were male aged between 21 and 70 years. The average age for male respondents was 50 years. Seventy-seven percent of TCWS respondents were female aged between 21 and 83 years, with an average age of 51.2 years.

Sixty percent of respondents in Corella were male aged between 27 and 67 years. The average age of male respondents was 32 years. Female respondents (40 percent) ranged in age from 25 to 70 years with an average age of 31.5 years. Table G-2 summarises the age and gender of respondents for each of the waterworks utilities.

Table G-2: Age and gender of respondents

Waterworks Utility	Gender	Age of respondents								
		<=20	21-30	31-40	41-50	51-60	61-70	71-80	80+	Total Gender
BWUI	**M**	0	0	11	17	7	4	2	0	**41**
	F	2	9	16	12	7	9	2	0	**57**
TCWS	**M**	0	1	2	2	2	3	0	0	**10**
	F	0	3	5	10	5	7	2	1	**33**
CWS	**M**	0	0	3	3	7	2	0	0	**15**
	F	0	0	2	1	1	4	2	0	**10**
Total Age		**2**	**13**	**39**	**45**	**29**	**29**	**8**	**1**	**166**

Respondent's occupation

Respondents were asked to report their occupation, which is presented in Table G-3 below, which served to identify various sources of income and the types of economic engagement households had with the broader community economy.

Table G-3: Respondent's occupations by waterworks utility

Occupation	Waterworks Utility			Total Occupation
	BWUI	CWS	TCWS	
Bank	1	-	-	1
Barangay kagawad	1	1	1	3
Driver	5	1	-	6
Engineer	1	-	-	1
Farmer	-	9	2	11
Fisherman	1	-	-	1
Government employee [(a)]	7	2	2	11
Healthworker	1	1	3	5
Housekeeper/housewife	29	5	20	54
Labourer/construction [(b)]	3	1	1	5
NGO worker	1	-	-	1
Not specified	7	-	3	10
Police	1	-	-	1
Retail/sales	3	1	-	4
Retired [(c)]	4	-	1	5
Seaman	2	-	-	2
Secretary	3	-	-	3
Security guard	3	1	1	5
Skilled/technical [(d)]	7	1	-	8
Small business/enterprise [(e)]	9	1	6	16
Teacher	9	1	3	13
Total Respondents	**98**	**25**	**43**	**166**

[(a)] Includes casual employee(s)
[(b)] Unskilled labouring employment including construction and factory work
[(c)] Includes retired government employee(s)
[(d)] Includes electricians, carpenters and other trade-based employment for which vocational training has been completed
[(e)] Includes market vendors and home-based enterprises including dress-making services, *sari-sari* stores and boarding houses

"Housekeeper/housewife" was the most reported occupation by respondents, which largely reflects the time in which the surveys were undertaken, that is, during working hours on weekdays.

"Small business/enterprise" was the second largest occupation reported, and includes market vendors as well as home based enterprises such as dressmaking, boarding houses, sale of cooked food items, and *sari-sari* stores. Those respondents who were market vendors sold their produce at public markets such as the Manga Public Market. Boarding houses or rather, providing boarding facilities—a room and meals—is a fairly widespread practice across the city and was encountered through the course of the Household Surveys as well as through observations.

Farming was the dominant occupation for Corella, which reflects the rural nature of the municipality. Two urban/low density respondents (Cabawan) also reported their occupation as "Farmer" (TAG104 and TAG105). Government employees include casual employees, whose positions are fairly unstable; the change of administration in Tagbilaran City saw the dismissal of some several thousand casual and other employees in July 2004.

Respondent's education

Questions regarding the respondent's level of education were asked to consider the relationship between education and knowledge about environmental and social issues (see Table G-4 below).

Table G-4: Level of education achieved by respondents by waterworks utility

Level of education attained	Waterworks Utility		
	BWUI	TCWS	CWS
No formal education	3	3	-
Not finished Elementary School	3	4	3
Not Finished High School	4	1	2
Not Finished College/University	21	8	6
Graduated Elementary School	8	9	7
Graduated High School	14	4	3
College/University Graduate	42	14	4
Other training	1	-	-
Not specified	2	-	-
Total	**98**	**43**	**25**

However, while the level of respondent's education may go some way to explaining their depth of knowledge concerning environment matters, particularly as they concern water in Tagbilaran, respondent's knowledge may also be due to influences beyond formal education. On several occasions, respondents commented that the knowledge they had was due to their children or other family members or friends. For example, when asked about fertiliser use, one farmer in Corella credited his children with prompting his decision to change from inorganic to organic fertiliser:

…because my children won't allow us to use any chemical to our plantation instead they encourage us to use organic fertiliser (COR018 (CWS): Graduated Elementary school).

Similarly, a BWUI respondent in Poblacion III credited her knowledge of groundwater, the limestone geology in Tagbilaran and the problems associated with cutting trees to the fact that her cousin was a vocal member of an environmental NGO active in Bohol (TAG032). Privatisation Surveys, for which education was not considered, also revealed a tendency for information and knowledge over issues (in this case, privatisation), to be shared through informal networks such as friends, family, work colleagues and *chismis*.

Household income

Respondents were asked to report total household income per month. A number of respondents had difficulty in estimating their household incomes because of the temporary/casual nature of employment for some household members therefore day rates were used and extrapolated to fit into household income classes. The accuracy of income information is uncertain[174] but is used in this thesis to provide a context for price and affordability of water provided by the waterworks utilities and bottled water consumption. I contend that the information obtained is suitable for illustrating the relationship between incomes and purchasing decisions insofar as those households with a higher income are more likely to purchase bottled drinking water in addition to that provided by a waterworks utility. That being said, non-economic decisions also influence consumer's decision to purchase bottled drinking water including perceptions regarding water quality of the utility, the 'health benefits' of bottled 'mineral' water, and social identity (status) associated with purchasing bottled water. Household income information obtained from surveys is also sufficient to demonstrate approximate proportion of household income spent on water consumption. Household income class information by waterworks utility is presented in Table G-5 below.

Table G-5: Household Income class information – Tagbilaran and Corella

Waterworks Utility	Household Income Class										TOTAL
	1	2	3	4	5	6	7	8	9	10	
BWUI [(a)]	0	3	2	6	13	8	2	4	5	52	**95**
TCWS [(b)]	0	2	3	4	5	3	2	4	0	16	**39**
CWS	0	0	3	8	4	4	0	4	1	1	**25**
Total	**0**	**5**	**8**	**18**	**22**	**15**	**4**	**12**	**6**	**69**	**159**

[(a)] Household income not reported by 3 BWUI respondents
[(b)] Household income not reported by 4 TCWS respondents

[174] I suspect that there were occasions when household income was under-reported or where remittances to households, despite being asked for explicitly, were excluded. Conversations with other researchers engaged in gathering socio-economic information, including income, throughout the Province drew similar conclusions.

Household income class information has also been presented according to *barangay* classifications. Table G-6 presents household income class information for rural/low density *barangays*, Table G-7 for urban/high d0ensity *barangays* and Table G-8 for urban/low density *barangays*.

Table G-6: Household Income class, rural/low density

Barangay	**Household Income Class**										
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Total**
Cancatac				6	1						**7**
Poblacion					2	1		1	1		**5**
Sambog			1		1	1		3		1	**7**
Tanday			2	2		2					**6**
Rural/low Total	**0**	**0**	**3**	**8**	**4**	**4**		**4**	**1**	**1**	**25**

Table G-7: Household Income Class, urban/high density

Barangay	**Household Income Class**										
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Total**
Cogon			1	1	3	2	1		1	5	**14**
Poblacion I					1			1		8	**10**
Poblacion II		2		1	2				2	3	**10**
Poblacion III				1	2	1				5	**9**
Urban/high Total	**0**	**2**	**1**	**3**	**8**	**3**	**1**	**1**	**3**	**21**	**43**

Table G-8: Household Income Class, urban/low density

Barangay	**Household Income Class**										
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Total**
Bool				1		1	1		1	12	**16**
Booy					1			1		5	**7**
Cabawan			1	1			1	1	1		**5**
Dampas			1	2	1	2				2	**8**
Dao					2	1	1	2	1	2	**9**
Manga		1			1	1		1	4		**8**
Mansasa					1	1		1		5	**8**
San Isidro		1			1				3	5	**10**
Taloto				1					4		**5**
Tiptip		1		1	2	2			1		**7**
Ubujan			2	1	1			1	3		**8**
Urban/low Total	**0**	**3**	**4**	**7**	**10**	**8**	**3**	**7**	**18**	**31**	**91**
Total - all *barangays*	**0**	**5**	**8**	**18**	**22**	**15**	**4**	**12**	**22**	**53**	**159**

Appendix H: City classifications in the Philippines

Highly Urbanised Cities	Cities with a minimum population of two hundred thousand (200,000) inhabitants, as certified by the National Statistics Office, and with the latest annual income of at least Fifty Million Pesos (P50,000,000.00) based on 1991 constant prices, as certified by the city treasurer.
Independent Component Cities	Cities whose charters prohibit their voters from voting for provincial elective officials. Independent component cities shall be independent of the province.
Component Cities	Cities which do not meet the above requirements shall be considered component cities of the province in which they are geographically located. If a component city is located within the boundaries of two (2) or more provinces, such city shall be considered a component of the province of which it used to be a municipality.

Source: NSCB (2005).

Appendix I: Calculating costs and consumptions

Respondents were asked to report their consumption in terms of volume consumed per month and/or amount of water bill per month. Average amounts of households' estimates are shown in Table I-1 and Table I-2 below.

Table I-1: Average consumption reported by consumers

Waterworks Utility	Quantity (m^3)
BWUI	13.1
TCWS	12.1
CWS	14.3

Table I-2: Average cost reported by consumers

Waterworks Utility	Cost (P)
BWUI	203.1
TCWS	113.9
CWS	77.1

In order to test the veracity of these estimates, I calculated the cost based on reported volume consumed, and estimated volume based on reported costs. Water rates as at October 2004 were used. Average consumption and cost are shown in Table I-3 and Table I-4, respectively.

Table I-3: Consumption derived from reported costs

Waterworks Utility	Quantity (m^3)
BWUI	26.0
TCWS	17.0
CWS	13.0

Table I-4: Cost derived from reported consumption

Waterworks Utility	Cost (P)
BWUI	91.60
TCWS	76.00
CWS	81.25

The differences between estimates and derived quantities and costs are considerable, suggesting that respondents either under-estimated quantity consumed or over-estimated amount paid. I speculate that the estimated cost per month is closer to actual consumption than estimated consumption as a volume. This is based on the assumption that people have better

recall of how much they have to pay per month in terms of household bills and accounts, and also because, on occasion, I had the opportunity to observe household water bills, which were reasonably close to estimates. For the purpose of analysis, the costs and quantities given in Table I-5 will be assumed to be the average for Household Survey households (derived from Table I-2 and Table I-3 above). Costs are in accordance with each waterworks utility's water tariffs and conform to rates charged for the nearest whole cubic metre of water:

Table I-5: Derived costs and consumption for municipal supply based on Household Surveys[175]

Waterworks Utility/*Barangay* Classification	**Quantity (m^3)**	**Cost (P)**
BWUI	26	197.48
TCWS	17	111.00
CWS	13	75.00
Rural/low density	13	75.00
Urban/low density (BWUI)	23	171.14
Urban/low density (TCWS)	17	111.00
Urban/high density	30	232.60

In the case of bottled drinking water consumption, an average price of P40 per bottle has been used when considering expenditure. Prices ranged from P35 to P45 per 5 gallon container, but consumers generally did not identify which brand they purchased or how much they paid for their bottled water.

[175] Excludes water purchased from other sources, including bottled water. Urban/low density *barangays* are served by both TCWS and BWUI; therefore, estimates are based on relevant water rates for each utility.