WATERING DOWN DIVISIONS IN CYPRUS:

BI-COMMUNAL POLICY NETWORKS & WATER GOVERNANCE IN NICOSIA

By

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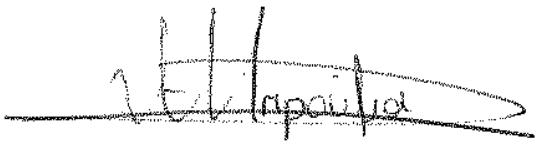

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ABSTRACT

The purpose of this study is to identify the types of bi-communal water cooperation in Cyprus. The island faces conditions of moderate to severe water scarcity that influences every aspect of daily life; it is impossible to take water out of politics or politics out of the management of water resources. To add to this complexity, the politico-military events of 1974, with the resulting *de facto* division of the island, have separated the available water resources between two divergent, yet interdependent, entities.

Based on evidence of existing and well-functioning bi-communal engagement in the wastewater sector despite the post-1974 political disparities and military hostilities, the thesis identifies and analyses this type of engagement with the threefold objective of:

a) Conducting an integrated presentation of conventional water resources management based on information from both sides of the island;

b) Examining selected discursive water themes, through which to highlight the value of viewing them through the theoretical lens of policy analysis; and

c) Evaluating the applicability of the policy network analytical framework in the case of Cyprus, thus contributing through empirical work to the better understanding and potential further development of the framework.

Methodologically, the thesis is based on 55 semi-structured interviews of key stakeholders as the primary source of information, complemented by secondary documentation. The analysis covers the entire island of Cyprus during the post-1974 era up to the summer of 2008, when a new round of official direct bi-communal discussions placed Cyprus into a new political paradigm.

The study shows that informal bilateral communication clusters i) emerged in the post-1974 era in the water sector in the city of Nicosia (shared wastewater treatment and drinking water supply systems), ii) have evolved over time into water policy networks and iii) have spilled-over into the rehabilitation of the old sections of the capital.

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GLOSSARY

ACT	Action for Co-operation and Trust
BDP	Bi-Communal Development Plan
BOT	Built-Operate-Transfer
CIS	Common Implementation Strategy
CoP	Communities of Practice
CYP	Cypriot Pound (used until 31/12/2007) (CYP 0.585274 per EUR 1.00)
DSI	State Hydraulic Works of Turkey
EC	European Commission
EEC	European Economic Community
EIB	European Investment Bank
EU	European Union
EU WFD	European Union Water Framework Directive
EUWI	European Union Water Initiative
FAO	Food and Agriculture Organisation
FEEOC	Federation of Ecological and Environmental Organisations of Cyprus
G8	Group of 8
GDP	Gross Domestic Products
GWP	Global Water Partnership
GWP-Med	Global Water Partnership Mediterranean
IWRM	Integrated Water Resources Management
MANRE	Ministry of Agriculture, Natural Resources and Environment
MDGs	Millennium Development Goals
Mm^3	Million cubic metres
MP	Member of Parliament
MPIGF	Max-Planck-Institut für Gesellschaftsforschung
NGO	Non Governmental Organisation
NMP	Nicosia Master Plan
NSTP	Nicosia Sewage Treatment Plant (Mia Milia/Haspolat Plant)
PFF	Partnership for the Future
PIO	Press and Information Office, Republic of Cyprus
OECD	Organisation for Economic Co-operation and Development
SBA	Sovereign Base Areas
SBN	Sewage Board of Nicosia
UfM	Union for the Mediterranean
UK	United Kingdom
UN	United Nations
UNDP	United Nations Development Programme
UNFICYP	United Nations Peacekeeping Force in Cyprus
UNHCR	United Nations High Commissioner for Refugees
UNOPS	United Nations Office for Project Services
USAID	United States Agency for International Development
USSR	Union of Soviet Socialist Republics
USA	United States of America
USD	United States Dollar
WCED	World Commission on Environment and Development
WDD	Water Development Department
WFD	Water Framework Directive
WWDR	World Water Development Report

For my dad

wish you were still here with us

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CHAPTER I

Introduction: setting the stage for water policy analysis in Cyprus

1. PROLOGUE

In Cyprus it is almost impossible to take water out of politics and politics out of the management of water resources. This semi-arid island at the far eastern side of the Mediterranean is well familiar with the complex art of water management. It is not only the conditions of moderate to severe water scarcity that have made Cyprus alert and responsive to its water predicament. Only 14 years after its independence in 1960, the island faced a more serious challenge; the *de facto* division of its small territory. Division split the available water resources between two divergent, yet interdependent, entities: the internationally recognised Republic of Cyprus and the internationally non-recognised Turkish Republic of Northern Cyprus. This reality, although a *de facto* one, has added an additional layer of complexity in the island's water-politics nexus.

However, water recognises no boundaries or divisions and efforts made by the two sides to manage it separately have proven environmentally unsustainable, highly exhaustive in financial and energy resource terms, and only partially effective. An integrated bi-communal approach to water management would maximise the benefits from using the limited available resources and the responsiveness towards existing and emerging water challenges. More importantly it could pave the way for political rapprochement, as the importance and priority attributed to water in Cyprus is only second to the political question.

Based on evidence of existing and functioning bi-communal engagement in the capital, Nicosia—and this despite the post-1974 political disparities and military hostilities—the thesis will identify and analyse examples of bi-communal cooperation with a focus on the water sector and, particularly, wastewater. Given the context of the case study, the thesis finds theoretical orientation in policy analysis and will demonstrate the value of viewing water management in Cyprus through this lens. Moreover, and in response to the political complexities of the case study, the analytical frameworks of policy networks and communities of practice as alternative forms of governance will be employed. The empirical analysis will evaluate the applicability of these frameworks in the case of Cyprus and consider the role of water as a point of convergence within sensitive politico-security contexts.

The analysis of the thesis covers the entire island during the post-1974 era, up to the summer of 2008, when a new round of official direct bi-communal discussions placed Cyprus into a new political paradigm. More specifically, and following a four-year political standstill after the rejection of the Annan Plan in 2004, new impetus was provided with the election in 2008 of a Cypriot President (in the Republic of Cyprus) who proclaimed a new political rapprochement. The United Nations (UN) encouraged the two sides to re-open the unification negotiations and preparations began in April 2008 with the establishment of 13 working groups and the participation of a total of 150 Greek-Cypriot, Turkish-Cypriot and UN officials. In September 2008 the leaders of the two communities began direct negotiations under UN auspices; the outcome is pending[1].

2. RESEARCH QUESTION & OBJECTIVES OF THE THESIS

The research question of the thesis seeks answers on: (i) whether functioning bi-communal engagement on water exists in Cyprus despite the *de facto* division; (ii) what are the operational modalities of any such engagement; and (iii) whether it constitutes an alternative and operational governing form amidst a delicate political reality.

Therefore, the thesis' objective is threefold:

- *To conduct an integrated presentation of conventional water resources management based on information from both sides of the island*

This presentation contextualises the thesis' geographical scope and the thematic focus on water over the entire island of Cyprus and paves the ground for the theoretical and analytical explorations. Moreover, it will illustrate both the magnitude of the water problem and the efforts made, by both sides, to maximise the use of conventional water resources. It is noted that this will not be an exhaustive discussion on water supply and demand, nor will it produce new data or information. However, the collation of this information—for both sides—in a single document, whilst drawing heavily from interviews with hands-on experienced officials from across the island, has not so far been undertaken in scholarly work.

- *To examine selected discursive water themes and through this to highlight the value of viewing them through the theoretical lens of policy analysis*

[1] Kathimerini, 2008; http://www.mfa.gov.cy/mfa/mfa2006.nsf/cyprus02_en/cyprus02_en?OpenDocument

The deeply political context of the Cyprus case study, and the strong linkage between geography and politics as they pertain to water resources management—particularly since 1974—have produced a complex water-politics nexus. However, politics (and water politics as contextualised through specific policies) do not exist in a vacuum; rather they are embedded within a social system of multi-stakeholder governance characterised by interdependent actions selected from a multiplicity of options and alternatives. Therefore, policy-related theory seems appropriate, for its capacity to elucidate the complexity of governing and in order to account for the central role of politics in water policy-making. In Cyprus the web of policy (inter)actions is also determined by a border which, although drawn in a *de facto* manner, ultimately determines the respective choices of the two sides with regard to water provision.

Using policy analysis, the thesis' second objective will be pursued through a comparative analysis of three selected water policy discourses across the *de facto* division: desalination, water transfer and water recycling. These discourses reveal the magnitude of political interplay among stakeholders. Moreover, they are relevant to the study's research question because they provide evidence on gradual steps towards alternative forms of water governance (complementing or questioning the official policy making) that could potentially extend across the *de facto* division.

- *To evaluate the applicability of the policy network and communities of practice analytical frameworks in the case of Cyprus, thereby contributing, through empirical work, to the better understanding and potential further development of the frameworks*

The thesis' research question examines whether bi-communal co-operation exists in Cyprus with respect to water and, if so, what form it takes. Evidence informs the starting point of the thesis, that since 1977 informal bilateral communication clusters have emerged in water services in Nicosia (i.e. the shared wastewater treatment and drinking water supply systems) despite the island-wide intense politico-security conditions. The continuation of this practice for over thirty years has fostered the two communities' stable and regular interaction. Evidence also suggests that this engagement has spilled over into sectors other than that of water alone, and, specifically, into urban planning and the rehabilitation of the old sections of the capital.

Given the specificities of the case study, the thesis employs the analytical frameworks of policy networks and communities of practice in addressing the research question.

These frameworks offer useful tools for seeking to elucidate the type of engagement that is taking place in Cyprus. Their suitability will be evaluated through empirical analysis of the three areas of bi-communal engagement in the capital (i.e. wastewater treatment, drinking water supply and Nicosia's rehabilitation scheme).

3. SIGNIFICANCE AND ORIGINALITY OF THE THESIS

The significance of the thesis lies in its analysis of bi-communal engagement over water in Cyprus primarily using the policy networks analytical framework through the theoretical lens of policy analysis. The approach does not follow conventional methods of water or policy analysis; rather it focuses on alternative governing forms (the policy networks) that operate outside hierarchies and official policies. The flexibility and adaptability of such an approach offers more plausible and practical solutions to contested issues (like the management of challenged water services) in the politically contested setting of Cyprus where formal contact between the two sides is not possible.

The originality is in the comparative presentation and analysis of water-related information collected from both sides of the *de facto* divided island. Scholarly work on Cyprus focuses on separate thematic analyses of the two sides (including water), while integrated work is only carried out with reference to the political question and the attempts at settlement.

Furthermore, the thesis is significant in its theoretical contribution because:

- It supports, through empirical evidence on the role of multi-actor interaction, a critical geopolitical stance which questions the centrality of the state as the only legitimate unit of analysis.
- It maintains a critical stance towards mainstream policy analysis and combines different aspects/elements of policy analysis when exploring the case study. This is further enhanced through the use of the three analytical frameworks.
- It strengthens, through empirical evidence, elements of policy analysis that suggest or can support alternative forms of governance.
- It enhances, through empirical evidence, the argument that policy is socially constructed through active actor/agency engagement and less determined by the structure/system.

- It favours the incrementalist approach to policy through practice and action (as opposed to the stagist approach that sees policy as a logical/linear sequence of stages).
- It offers empirical evidence on the transcendence of the often linkage between public policy and government conducts.
- It provides further insights upon the political nature of water management through the analysis of three case-specific water discourses (desalination, water transfer, wastewater recycling).

With reference to the analytical frameworks, the thesis makes its contribution by:

- Providing empirically-based evidence on the role and potential of policy networks as suitable forms of governance in contested political environments. Moreover, the empirical analysis seeks to counteract the criticisms made against the framework and to complement the voices that favour the evolution of policy networks into more solid (even theoretical) constructions.
- Making linkages between policy analysis and governance through supporting the concept of governance as self-organising networks. This linkage strengthens the potential of the policy network framework. At the same time the thesis outlines the essence of water governance as a sector-specific application of governance that may offer practical and manageable solutions.
- Offering empirical evidence on the applicability of the communities of practice analytical framework and the role of knowledge and know-how for their operation. Moreover, a perspective on the social construction of knowledge is strengthened and knowledge is disentangled from issues of power.

Finally, the thesis is also significant in the Cypriot context because:

- It constitutes the first post-1974 attempt to combine water-related information from both sides in one study.
- Its collection of information gathered in interviews has involved the documentation of personal perceptions and opinions on aspects of bi-communal engagement that is not available in secondary sources. The key contribution of the interviews (and the innovation of the research process) is that they assist with recording the informal bi-communal interaction that is taking place in Nicosia. Due to the non-recognition issue, this interaction is not registered or documented elsewhere.
- Given the inherent cultural similarities between the two sides, their common history (despite the effects of 1974), and the aspiration expressed by the Turkish-Cypriots to engage into a development paradigm similar to that of the

Greek-Cypriots, it seems that the two sides are following the same trajectory although at different speeds. Due to the international isolation, the Turkish-Cypriots are lagging a few steps behind and therefore previewing the benefits and shortcomings of specific water policy options, may be useful in avoiding future political debates and social turbulence.

4. METHODS USED AND SOME CLARIFICATIONS ON TERMINOLOGY

Methodologically, the thesis is based on 55 semi-structured interviews of key stakeholders from both communities as the primary source of information, supported and complemented by an analysis of secondary literature. The research follows a qualitative, interpretivist and constructivist approach, which uses triangulation for the data analysis and is complemented by a set of additional methods (case study/focus themes, narrative presentation, grounded theory and cognitive mapping).

Before introducing the case study some clarifications on terms are necessary. Since 1974, the Cyprus question has figured prominently within the international agenda as a 'hot' discourse and, in the political affairs of the Mediterranean, is only second to the Israeli-Palestinian conflict. Attempts at peaceful resolution, mainly driven by third parties, have so far fallen short of expectations and have produced limited results. As is often the case, the international community has adopted no definite, clear-cut stance on Cyprus. Nonetheless, Turkey's military response to the political turbulence of 1974 and the continuous presence of its troops on the island ever since have been strongly condemned through, primarily, a series of UN Security Council Resolutions[2]. Under international law, only one juridical state—not including the British sovereign bases[3]—is recognised upon the island: the Republic of Cyprus. The self-proclaimed "Turkish Republic of Northern Cyprus" which covers 3,355 km^2 (1,389 miles^2) and accounts for about 36 per cent of the island, remains unrecognised by every state, except for Turkey. The situation on the ground is far more equivocal; since 1974 the island has functioned under a *de facto* division with two separate entities running parallel socio-economic and political trajectories.

The author maintains her personal opinion on the political question of Cyprus and the interpretation/evaluation of what has happened since 1974. However, effort has been

[2] http://www.un.int/cyprus/resolut.htm
[3] These are the Dhekelia and Akrotiri Sovereign Base Areas (254 km^2), in which the United Kingdom retains full sovereignty and jurisdiction since 1960. Also no control exists on the Buffer Zone, which accounts for about 3 per cent of the island's surface area. For detailed information (CIA website)

made so that these opinions are not reflected in the thesis. For this purpose, a politically neutral terminology has been chosen, based on geographical connotations. Therefore, the term 'South' is used to refer to areas of the island under the control/administration of the internationally recognised Republic of Cyprus, and the term 'North' to refer to those under that of the internationally unrecognised "Turkish Republic of Northern Cyprus". Any reference to the administration of the North (ministries, departments, utilities, etc) is included between inverted commas and the same applies to any reference to affiliations and official titles of stakeholders. Moreover, and in order to avoid, insofar as that is possible, a politically-loaded positioning with respect to what happened in 1974, reference will be made hereafter to the 'events of 1974'.

5. WHY CYPRUS FOR WATER POLICY ANALYSIS

The case study has been chosen for a number of reasons.

- Firstly, because the prominent role of water in the island's affairs, has—in essence—determined its overall trajectory. Cypriot history is replete with examples of decisions conditioned on the status of water resources (including suggestions on two occasions to depopulate the island).
- Secondly, because of the complexity of water resource management in Cyprus. The water challenges are only partially linked to the limited availability of resources. Inefficient water management, sturdy focused on supply methods rather than demand measures, has also contributed to the existing water predicament. Moreover, the *de facto* division has segregated the already scarce water resources, making the much needed integrated management practically impossible.
- Thirdly, because of the deeply political nature of water in the case of Cyprus. In addition to the usual competition among different users and uses, the events of 1974 have added a (politico-military) security dimension to the water issue.
- Fourthly, because evidence on bi-communal cooperation on water and urban planning in the capital, if encouraged and replicated in other sectors, could offer a plausible way forward, beyond the political impasse. Building bridges between the two communities on issues of common interest could form a solid ground on which to base future attempts at settlement.
- Fifthly, because of the implications posed by EU accession. The obligation for a substantial and politically sensitive restructuring of the water sector is coupled

with the difficulties of implementing the *acquis communautaire* on one third of the island (i.e. on the North).

- Finally, because the example of rapprochement over water in Nicosia, the last divided capital, could—if successful—become a showcase for other parts of the world.

In order to further highlight the specificities of the Cyprus case study, the following section is devoted to a brief presentation of the island's history, as viewed through different water resources management paradigms. Simultaneously, this section serves as an introduction to the case study. A thorough examination of Cyprus' history is not considered relevant for the thesis because of the political implications that it would entail. Such scholarly literature exists and is extensive; any comprehensive historical elaboration on Cyprus within the framework of the thesis would only be of limited added value. The thesis reserves all references to the history of Cyprus directly linked to the research question and the study's objectives. A more detailed historical overview of Nicosia, the island's capital and the focus of the thesis, is provided instead in the penultimate section of this chapter.

6. A TALE OF DIVISION: CYPRUS, WATER AND THE FIVE WATER MANAGEMENT PARADIGMS

The thesis closely aligns with the philosophical considerations on Modernity/Post-Modernity, as a perceptive way of viewing the world system and the different discourses. Modernity is broadly understood as the revolutionary thinking based on the ground of reason and science and strongly interwoven with the Enlightenment, "*the progressive liberation of the human self from a series of impositions and restrictions, which come under the headings of myth and nature*" (Cahoone, 1998: 182). It has been argued (Calinescu, 1987; Kumar, 1997) that Modernity set off in the sphere of economics (i.e. Industrial Revolution) and soon expanded to politics, culture and society, while its most obvious demonstration has been in philosophy, art and architecture (Knights, 2002: 588).

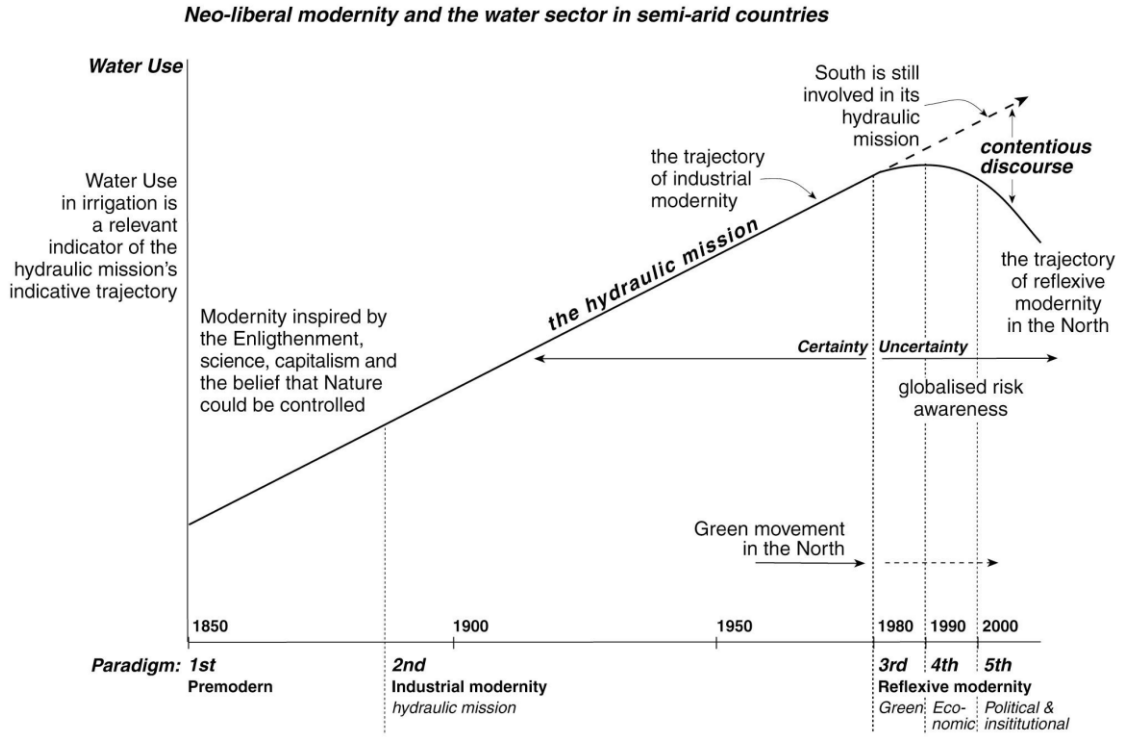
The relevance to water may be illustrated with the schematic representation of five water management paradigms (Allan, 2001), revolving around the emergence, height and questioning of the Modernity project. The thesis argues that these paradigms offer a coherent and plausible way to describe the trajectory of water resources management in Cyprus and one that aligns with the thesis' philosophical

considerations. It is noted that the trajectory does not align perfectly with the paradigms. Allan's scheme is used primarily as a quick overview of the case study and an easy tool for breaking down Cyprus' long water history.

THE FIVE WATER MANAGEMENT PARADIGMS

The Five Water Management Paradigms (Allan, 2001; 2003a) represent narratives on how approaches to water management have evolved over the past 150-200 years in developed and developing countries (referred to, respectively, as the 'North' and 'South', labels not to be confused with those used in the context of Cyprus) which reveal different trajectories of change.

Figure 1: The five water management paradigms



Source: Allan, 2003a: 10

THE FIRST WATER MANAGEMENT PARADIGM

The First Water Management Paradigm is associated with a transformation; from pre-modern communities, with limited technical or organisational capacity, to the era and conditions of Modernity. Pinpointing the moment of the chronological shift to Modernity has involved a fierce scholarly debate.[4] Most scholars, however, have selected the rise

[4] Some scholars place that date to the year 1436, with Gutenberg's adoption of moveable type; some to 1520 and Luther's rebellion against the Church authority; others to 1648 and the end of the Thirty Years' War; others to the American or French Revolution of 1776 and 1789; while modern times start for a few

of industry and therefore placed the start of the modern age at around 1800. An alternative approach (Toulmin, 1990: 3) proposes the 1630s as a more appropriate date because of the turn towards rational scientific enquiry, owing to Galileo's discoveries in astronomy and mechanics, and Descartes' logic and epistemology. A commitment to rationality is often presupposed, in a practical, political sense, by orthodox accounts of the Westphalian peace settlements (1648), often caricatured as representing the moment in which sovereignty and statehood were adopted as structuring principles of political and diplomatic life in Europe[5].

Indeed, Modernity may be seen as "*the particular constellation of power, knowledge and social practices that first emerged in Europe in the 16th and 17th centuries*" (Johnston *et al*, 1991: 388). These forms and structures were subject to several metamorphoses over time and eventually extended over space until—by the mid of the 20th century—they underpinned a dominant global social order (Turner, 1990). Aligning with the time-bound and geographical location of Modernity's emergence, Giddens (1990: 1) defines it as "*the modes of social life or organisation that emerged in the European geographical area from the 17th century onwards and subsequently became more or less worldwide in their influence*". Modernity appears therefore bound to the analysis of the industrial capitalist society as a revolutionary break with tradition and a predominantly agrarian civilisation. It "*was about conquest: the imperial regulation of land, the discipline of the soul and the creation of truth*" (Turner, 1990: 25).

CYPRUS & THE FIRST PARADIGM

For Cyprus, following Allan's (2003a) chronological distinction, the first water paradigm covers the island's history during the Ottoman domination (1571-1878) and part of the British colonial rule (1878-1960). During this time, the waterworks responded, primarily, to the concerns and priorities of rulers and not necessarily to the needs and expectations of the people[6].

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only in 1895 with Freud's "Interpretation of Dreams" and the rise of Modernism in the fine arts and literature (Toulmin, 1990; Kumar, 1997; Preston, 1997). For Jurgen Habermas (1987), for example, the modern era began when Immanuel Kant – inspired by the French Revolution – demonstrated how impartial are the universal moral standards that are used to judge intentions and policies in the political realm. By destroying the ancient regime, the French Revolution opened the road to democracy and political participation. Thus, for Habermas the starting point of Modernity is the last quarter of the 18th century and more specifically the year 1776 or 1789.

[5] Also based on political philosophy and Thomas Hobbes' *Leviathan* (Gaskin, 1996)

[6] Insight provided by a number of interviewees during fieldwork

It is important to note that ever since the 5th century BC Cyprus has been conquered on numerous occasions; each conqueror[7] left its own imprints upon the island's water policy and management approaches (Interviewee 13[8]). As a result, an advanced water infrastructure (in terms of its engineering) was implemented during the pre-modern phase and contrary to the context of the first paradigm (as in Allan's scheme). Most of it continued to be used until the 20th century along with the heavy investment in dams and storage facilities. For example, in that period the constructed waterworks included aqueducts, extensive chain wells (λαγούμια in Greek, lagum in Turkish), sophisticated baths, the systematic channelling and underground storage of rainwater and the minimisation of water distribution losses through the use of earthen conveyors and masonry underground tunnels (PIO, 2000; Kambanellas *et al*, 2003; Frangoulidou, 2004).

In addition to this heritage, the first water paradigm period involved the expansion of the underground system of chain wells in order to support large-scale agricultural cultivation, the repair and expansion of irrigation works, the construction (for the first time) of small-scale storage reservoirs, small diversion dams and distribution channels. The most important turn was the systematic use of groundwater through the drilling of boreholes (Kambanellas *et al*, 2003: 8-11).

THE SECOND WATER MANAGEMENT PARADIGM

The Second Water Paradigm refers to communities that have entered the phase of industrial modernity, in which Enlightenment ideas, engineering capacity, science and large-scale investments were applied in the water sector. Modernity, as the term denoting modern society or industrial civilisation, is associated with "*i) a certain set of attitudes towards the world, the idea of the world as open to transformation by human intervention, ii) a complex of economic institutions, especially industrial production, a market economy and a capitalist economic order and, iii) a certain range of political institutions, including the nation-state and mass democracy*" (Giddens and Pierson, 1998: 94). These characteristics attribute modernity with dynamism and make it fundamentally different from previous forms of social order (Giddens, 1990).

Through the evolution of the project of Modernity, modernisation became the main developmental model for less developed parts of the globe through the diffusion and

[7] Prior to the Ottoman Domination, Cyprus went through the Hellenistic Period (310-30 BC), Roman Period (30 BC – 330 AD), Byzantine Period (330 – 1191 AD), Richard the Lionheart and the Knights Templar (1191-1192 AD), Frankish Period (1192-1489), Venetian Period (1489-1571). For further information see Kambanellas *et al*, 2003; Frangoulidou, 2004

[8] Information collected during the respective interview

adoption of "*the characteristics of expansive and apparently more advance societies in societies, which are apparently less advanced*" (Johnston *et al*, 1991: 392). The main assumption of modernisation is that its subject societies "*have no history, culture or developed set of social or environmental relations, [a] fact that puts forward a profoundly racist view of the world*" (Preston, 1997: 178). This represents one strand of the fierce critiques of the Modernity project, with which the thesis aligns, and has paved the way in the search for what might lie beyond it.

In the water field, industrial modernity is often referred to as the 'Hydraulic Mission' (Reisner, 1990; Swyngedouw, 1998) of the mid-twentieth century. The term denotes the vision and political ecology to which industrialised economies were dedicated from the end of the 19th century until the 1960-70s. The mission was first and most fully pursued and implemented in the US and emulated in the Soviet Union and other European countries such as Spain (Allan, 2001; 2003a). However, its objectives—broadly shared with the overall Modernity project—were questioned with the emergence of the environmental movement and a growing concern with principles of sustainability, which signalled a shift in the water sector in the North (i.e. Northern Europe and the U.S.) in the mid-1970s.

CYPRUS & INDUSTRIAL MODERNITY

For Cyprus, the break with modernity can be perhaps detected within the First Water Paradigm (and the infrastructure development), more intensively during the British Colonial Administration (1878-1960) and continued through the island's independence era (1960) and beyond the events of 1974. However, it should be noted that –in essence and in terms of political self-determination - the starting point of the second paradigm in Cyprus was somehow delayed until the 1960, when the newly-established state was able to decide independently for its future socio-economic and water trajectory. The subsequent course of the two *de facto* divided sides differs. In the South, in can be argued that the second paradigm halted in the late 1980s, when the largest dam in Cyprus, the Kouris dam, was completed and alternative modes of water management emerged (informed by environmental concerns). For the North the Modernity project (or more accurately the modernisation process) seems to be continuing, although in a way that bears the distinct marks of elements of the third, fourth and fifth paradigms.

Although Cyprus does not fit precisely into the chronological orientation of the second water paradigm, its context seems applicable to the island, as both a single entity and

as two *de facto* divided sides. Cyprus actively embarked onto its 'hydraulic mission' immediately after independence (1960) and the slogan "not a drop of water to the sea" has defined the water policy of each government since. The period lasting until 1974 saw the construction of several dams and the completion of the preparatory techno-economic work for short and long-term water development. It was also during this period that drinking water was distributed at household level (Kambanellas *et al*, 2003: 14).

After 1974, both sides continued in their efforts to maximise the water storage capacity and the use of groundwater. However 1974 left open wounds to both sides that were not only psychological as, with respect to water, resources and agricultural lands were arbitrarily segregated. In order to respond to the need for food and water security the South initiated a colossal process of dam (and other waterworks) construction that continues to this day. As a result, Cyprus has the highest number of dams per square kilometre in Europe, including the former Soviet Union (World Commission on Dams, 2000). The majority of dams and water infrastructure were completed by the late 1980s and early 1990s and the authorities shifted towards alternative water resources in order to bridge the fast-growing supply-demand gap. The North, due to its non-recognised status and international isolation did not have the necessary access to financial and human resources. As a consequence it focused its water supply efforts on groundwater exploitation and the construction of a few small-scale dams and reservoirs. A detailed presentation of the water situation (supply and demand) in the South and the North is provided in Chapter V. Typical of the overall industrial modernity paradigm, environmental concerns and ideas on the environmental, economic and institutional aspects prompted debates within the two sides—although with some delay—as to the future direction of water management.

REFLEXIVE MODERNITY: 3RD, 4TH & 5TH WATER PARADIGMS

The recognition of the 'dark' face of Modernity, after the Second World War was fought at the heart of neo-liberal Europe, and the questioning of the overall Modernity project, led to new intellectual efforts to examine the potential transition to an era post, after, or beyond Modernity. A heated debate ensued, as to whether there was (i) a linear continuation between the two paradigms, (ii) a distinct cut but with longstanding engagements, or (iii) a radical rupture with the past (see Smart, 1993).

Providing the title to Allan's (2003a) latter part in the Modernity continuum, Giddens (1990) and Beck (1992) favour a view of an incomplete Modernity project and a focus

on the element of reflexivity; modern societies have reached a stage of radicalised Modernity of which the dominant characteristic is a high degree of reflexivity. "*Reflexive modernisation means not less but more modernity; a modernity radicalised against the paths and categories of the classical industrial setting*" (Beck, 1992: 14). Moreover, "*only societies reflexively capable of modifying their institutions in the face of accelerated social change will be able to confront the future with any confidence*...*the developments considered to be an embodiment of post-modernity are symptoms of the global extension and diffusion of modernity and the associated disintegration or dissolution of the traditional world*…" (Giddens, 1990: 21 & 26-29).

The reflexive component may be conceived of as being both reflex and reflection. The reflex, or structural, part questions the central institutions of society (science, the legal system, parliamentary democracy, the market economy). It therefore prompts a questioning of the centrality of the state as the only legitimate level of analysis. The reflection, or actor-centred, component involves the freeing of actors from social and other social-structural categorisations/classifications, the concomitant construction of new identities and roles, and the formation of new social movements around these new identities and concerns about risks (Beck *et al*, 1994). This reflects a call for wider stakeholder engagement and the active involvement of civil society in all aspects of social life. The reflex-reflection distinction echoes the overarching structure-agent dichotomy of the social sciences, a stance which the thesis questions[9]. Here, the focus of the research question—alternative forms of governance (policy networks) resulting from regular interaction among actors and the social construction of policy—is restated.

Regarding water, the hydraulic mission became a casualty of the environmental movement (Allan, 2001a: 28) once environmental and sustainability principles began to influence water policies in the North (Northern Europe and US) in the mid-1970s. Indeed, neo-Marxist critiques of neo-liberal capitalism have claimed that perhaps the most significant structural problem of the system has concerned the ecological crunch of the final decades of the 20th century. It has demonstrated the constraints that are inevitably imposed upon any aspiration for a universal control of nature, the essence of the so-called 'second failure of capitalism' (Wallerstein, 1974; 1995).

The reflexive response to the questioning of the hydraulic mission is encapsulated in three water management paradigms, grouped under the Reflexive Modernity Paradigm (Allan, 2001; 2003a):

[9] Further analysis on this is provided in Chapter II

- The Green (Third) Paradigm was inspired by the green movement's environmental awareness and signalled a change in water allocation and management priorities. The environment itself was recognised as a water user; its water allocation increased while the allocation to agriculture, traditionally the largest user, was reconsidered.
- The Economic (Fourth) Paradigm was inspired by economists who highlighted the economic value of water and its importance as a scarce economic input. This developed during the early 1990s, a period in which efforts were made by International Financing Institutions (IFIs) and development agencies to promote the paradigm in the (global) South. Attention to the economic aspect of water continues, as demonstrated by the emphasis placed on tariffs, cost recovery, regulation and private sector participation by countries, IFIs and regional organisations alike (OECD, 2003, 2009a, 2009b; EIB, 2010).
- The Last (Fifth) Paradigm is based on the notion that water allocation and management are political processes and therefore require holistic and integrated approaches. This Paradigm coincides chronologically with the emergence of the IWRM (Integrated Water Resources Management) framework in the early 1990s. The importance of IWRM is in its grounding of issues including participation, consultation and inclusive political institutions to enable the mediation of conflicting interests among water planners, managers and users. This inclusive political process needs to involve the parallel consideration of the differing inputs of government (hierarchy), civil society at large, and the private sector (market forces) (Thompson *et al*, 1990).

CYPRUS IN REFLEXIVE MODERNITY

As previously indicated, Cyprus' entry to the phase of reflexive modernity was subject to some delay. Acute water scarcity due to years of recurrent drought and security concerns due to the political question have dictated the continued priority of water development within both sides' policy agenda. Therefore, the construction of dams and storage infrastructure and the focus on water supply measures continued well into the reflexive paradigm.

For the South, the construction of major waterworks came to a halt in 1988, with the completion of the largest dam in the island: the Kouris dam. However, the prolonged drought period that followed immediately (1988-1991) prompted concerns over the choice of dams/reservoirs as a reliable means for water provision given the particularity of Cyprus' climate. The response of the authorities to the hydraulic mission's perceived

impasse was to shift towards non-conventional water resources in order to mitigate the deficiencies of the water budget. Desalination formed the first and most prominent option for securing the drinking water supply. Environmental awareness and an active green movement in Cyprus have resulted in a fierce debate over desalination, which represents an intriguing example for policy analysis (and for reflexive modernity), where active stakeholder involvement alters hierarchical policy options. The analysis of the desalination discourse falls within the objectives of the thesis and will be therefore examined in detail in Chapter VI. In addition to desalination, the South has promoted the reuse of recycled wastewater. Although largely dictated by the harmonisation requirements entailed by EU accession requirements, this is also linked to an increased water consciousness and environmental awareness. This theme, again due to its discursive nature, also addresses the thesis' research question and will be comprehensively analysed in Chapters VI and VII.

Economic considerations have been reflected in the South's water tariff system, which has also stemmed from compliance with the EU Water Framework Directive. Moreover, the private sector has already become active in water infrastructure with contracts for the construction of desalination and wastewater treatment plants. Further, the South claims to be aligned with the last water paradigm (IWRM), and this is also related to harmonisation with the European *acquis*. However, water demand measures have been difficult to implement, especially given the central role of agriculture in the island's social perception. The process of curving water demand is on-going. Nonetheless, the contentious water discourse that began with the desalination debate has firmly placed the issues of consultation, inclusiveness and participation within water management and the South within the reflexive modernity paradigm.

The North, on the other hand, seems to be largely within the industrial modernity paradigm, given the perseverance of efforts that aim at additional water supply. Due to the limited investment capacity for water infrastructure (dams, reservoirs, desalination and wastewater treatment plants), the North has systematically considered the water transfer option. This possibility was made feasible due to steady Turkish political backing and the availability of water at close geographical proximity (in Turkey's Manavgat region). As this aspect represents a part of a deeply political discourse in the North, a detailed analysis of its different parameters will be carried out in Chapter VI, along with analyses of desalination and recycled water (themselves contentious issues in the making). A Northern environmental movement is also present and active and this alters the "official" hydraulic mission. Economic considerations are taken into account, but the long-standing and deep dependency on Turkey for financial support, renders

the topic slightly irrelevant. As for the last water paradigm, it is the deep-rooted desire of the people in the North for a European path that may signal a shift towards more integrated and holistic water management approaches coupled with the more active involvement of citizens and civil society at large.

However, the last water paradigm (IWRM) would require cross-'border' management of water resources in order to be implemented effectively. The hydrological structure of the island is such that it cannot be divided arbitrarily; rather, it requires island-wide action for the efficient utilisation, management and preservation of this scarce and important resource. To this end, the thesis aims to highlight examples of South-North cooperation on water and demonstrate the benefits of such an approach.

WATER PARADIGMS RECONSIDERED

The presentation of the five water management paradigms shows that they do not function in isolation; rather they seem to be growing out of one another based on new knowledge and contemporary water resource management approaches. By showing the different trajectories of change, the paradigms can be adaptable to specific country contexts, as Cyprus demonstrates. As stated at the beginning, the use of the paradigms is done for practical reasons when presenting Cyprus' water trajectory. Notwithstanding are voices questioning the paradigm scheme, with some of which the thesis agrees. A cursory reference to selected items of this discussion is provided below.

For example, the paradigms' orientation appears rather teleological and suggests that the only way forward is through the different phases of Modernity with the modernisation process as the vehicle. Developing countries tend to consider the hydraulic mission (i.e. storage capacity maximisation and focus on supply measures) as a reliable path towards economic development and appear reluctant to recognise associated risks (environmental impacts, economic restrictions, rights and social equity). At the same time, the persistent export of environmental considerations from the developed to the developing countries (usually in the form of prerequisites for funding disbursement) has been often referred to as "*environmental imperialism or neo-colonialism*" (Litfin, 1998: 336).

Moreover, there is a significant overlook of the emergence of regional modernities that incorporate the state and other sub-national and supranational social and political formations that are more or less salient depending on the social networks and

development projects under consideration. In particular, the concept of region may be valuable in assessing large-scale ethnic, religious, social, and geo-political formations as they mediate oversimplified binary oppositions of colonial or postcolonial power and local incorporation or resistance (Sivaramakrishnan & Agrawal, 2003[10]).

Directly linked to the paradigms' teleological nature is a focus upon IWRM as the end point of the water management journey. Although this paradigm incorporates elements of the other paradigms and would therefore appear well-equipped with prior knowledge, the IWRM discourse—at scholarly and management levels—may suggest otherwise. Opinions are divided on the suitability of the IWRM as the leading framework for water resources management. Experience relating to its on-the-ground implementation appears contracted; space is left, therefore, for competing voices to grow louder (e.g. ecosystem-based or sector-wide approaches, to name a few). Nonetheless, the thesis maintains a positive, if sceptical, stance towards IWRM and briefly elaborates upon it in Chapter III.

Another point of concern is that the narrative of the five paradigms depends upon a predominantly Eurocentric theoretical foundation. The Enlightenment project, its decline and the intellectual efforts to determine what may lie beyond Modernity, have been primarily the concerns of the North (i.e. the western European and the Anglo-Saxon world). The Paradigms' narrative—drawn from Modernity's discriminatory conception of modernised countries—does not reflect the variety and diversity of existing societies and cultures and therefore leaves little space for the contribution of local knowledge. For water this could prove to be a significant oversight, as locally-practiced water management methods, and for dealing with water scarcity, would have much to contribute[11]. Further on that, the paradigm scheme does not account for the emergence of "multiple modernities" (Eisenstadt, 2000), which distinguish various cultural traditions of modernity and call for models of a globalised world society that are not based on nation-state formulations, but on ethnic, local, regional and transnational identities.

On this point, and with reference to the philosophical grounding of the five paradigms, the thesis maintains a preference towards post-modern theoretical deliberations. In other words it supports schools of thought that favour the engagement of Modernity with whatever lies beyond, but it does not consider the Modernity project incomplete or

[10] This book contains a series of contributions coming from India and explores the emergence of "regional modernities" in ways that are distinct from a so-called global modernity and its local variations.

[11] For example, a compilation of such methods and approaches for the Mediterranean Region was conducted in the framework of the HYDRIA Project. Cyprus was one of the case studies. More information on the techniques according to place, time and type is available at http://www.hydriaproject.net/

ongoing. In that context, the thesis stands, critically, against the centrality of the state as the maker/carrier/implementer of water policy and favours, instead, the multi-centrality of alternative governing forms that necessitate active stakeholder engagement. This is the focus of the thesis, as the following chapters will bear out.

7. NICOSIA: THE LAST DIVIDED CAPITAL

This section is dedicated to a historical overview of Nicosia since its foundation. The aim is to highlight the individuality of the city and shed light on the conditions that have made it distinct compared to other cities in the island. It is claimed that the historical trajectory of Nicosia, rich in influences from various rulers, has rendered the city reflexive and adaptable to changing conditions and thus, able to cope with the consequences of the 1974 *de facto* division. Moreover, the different fortification efforts of the city along with the function of Nicosia as the island's capital since the 11th century have shaped the population's identity with strong bi-communal characteristics. The construction of walls within the city region has contributed to the creation of a perceived 'boundary' between the capital and the rest of the island[12].

The importance of Nicosia has been further amplified by the *de facto* division and also during the rapprochement efforts. It was in the capital that the first 'division line' (the Green Line) was marked in 1963 –and prior to 1974- cutting the city into two distinct parts. And it was again in Nicosia that the first rapprochement efforts were materialised with the joint sewage treatment plant and the Nicosia Master Plan for the rehabilitation of the within-the-walls city. The comprehensive presentation that follows, examines Nicosia's trajectory from antiquity up to the present day.

HISTORICAL OVERVIEW UP TO INDEPENDENCE

Nicosia (*Λευκωσία* in Greek, *Lefkoşa* in Turkish), located on the Pedieos River in the central plain of the island, is the capital city of Cyprus. It is a unique city, as after the fall of the Berlin Wall, Nicosia remains the only divided capital in the world (Wolf, 2009). The capital's southern (Greek Cypriot) and northern (Turkish Cypriot) segments are divided by a "Green Line"[13], a demilitarised buffer zone that runs in an east-west direction and is maintained by the United Nations. The city has a rich history, as it has

[12] As expressed by different interviewees, especially those born and raised in Nicosia
[13] The term Green Line is often used to refer to the line of demarcation that divides the Cypriot capital of Nicosia into the southern Greek Cypriot region and the northern Turkish Cypriot region. The barrier itself consists of concrete walls, barbed wire fencing, watchtowers, anti-tank ditches, and minefields

been continuously habited since the 3rd millennium BC, and it has formed the capital of the island since the 11th century. The city has known Greek, Roman, Byzantine, Frankish, Venetian, Ottoman and British rule prior to Cyprus's independence in 1960.

Nicosia emerged from the sea some 1.8-5 million years ago and along with the Troodos and Pentadaktulos mountain ranges formed the Mesaoria Plain, the centrepiece of the island of Cyprus[14]. Its location in the fertile plain with a rich river (the Pedieos River - Πεδιαίος/Πιδιάς in Greek, Canli Dere in Turkish) cutting across it, form the *raison d'être* for the constant presence and development of settlements in the area. The earliest human settlements found at the vicinity of the modern city of Nicosia (in the area of Choirokoitia) date back to the Neolithic Period (8200-3900 BC) (Press and Information Office, 2004b: 22).

Around 1200 BC mass waves of Achaean Greeks settled on the island, spreading the Greek language, religion and customs. However, during the Archaic, Hellenistic and Roman periods (750 BC – 330 AD), Nicosia remained a small town that did not enjoy the power or prosperity of other coastal cities[15]. And it was not until the 4th century AD that Nicosia was officially founded at the heart of the island by Lefkon, son of Ptolemaeus I of Egypt. The location of Nicosia was moved slightly northern from its initial site in order to provide better protection to its population from potential attacks (Klerides, 1959: 9). At first, the city was called Lefkon (as tribute to its founder) and was later renamed Lefkothea ("white goddess"), but was also sometimes referred to as Ledron or Ledri (from the City-Kingdom of Ledra that was founded in the area on the 7th century BC). Despite the presence of a perennial river (Pedieos), the city faced recurrent drought periods and as a result wells and sterns had been widely used since the Halcolithic era (2500-1600 BC) (Interviewees 12 and 22).

A more systematic method of water transfer to Nicosia was developed during the Byzantine rule (330AD-1191), as has been confirmed through the discovery of stone and clay pipelines dating back to that period (Interviewees 12 and 22; Kesisian, 1989). This system, however, was not developed further until the Venetian and the Ottoman periods. After the Byzantines, Nicosia was ruled for a short-term by Richard the Lionheart of England (1191-1192 AD) and by the Knights Templars[16] (1192 AD), who sold the island to Guy de Lusignan, following a revolt of the people of Nicosia against them (Hill, 1940; Press and Information Office, 2004b: 26).

[14] http://www.nicosia.org.cy/english/lefkosia_istoria_genesis.shtm and http://www.lefkosaturkbelediyesi.org/english/index_eng.html
[15] Wikipedia, http://en.wikipedia.org/wiki/History_of_Nicosia#The_Capital_of_the_Lusignan_Kingdom
[16] A Frankish military order

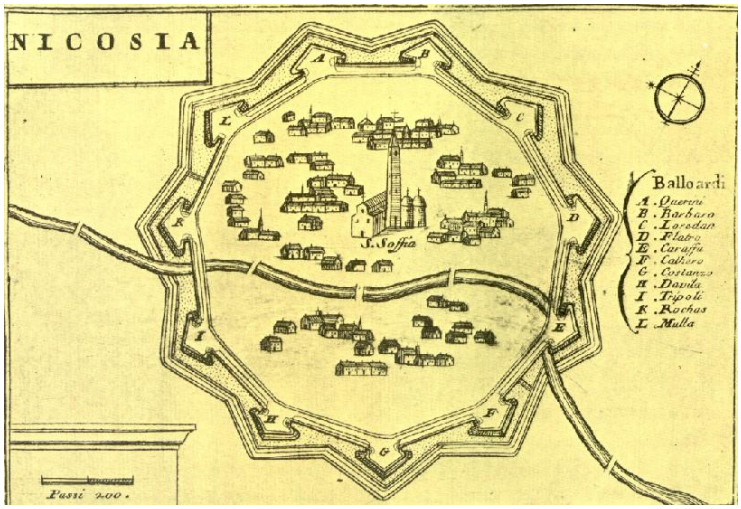
It was in the 11th century, and during the Lusignan Kingdom, that Nicosia was moved again to a slightly northern location and became the capital of Cyprus (Klerides, 1959: 13). It was the raiding of the coastal towns of Paphos, Salamis and Famagusta by the Saracens that forced the island's rulers to withdraw inland in order to protect themselves (Hill, 1940). And contrary to today's dried up stony riverbed, accounts for that period accentuated the city's richness in natural resources "*...Nicosia is...a very old city in the centre of the island's valley...in a very good climate...there is plenty of water and fertile land...*" (de Lusignan, 1573)[17]. Under the reign of the Frankish dynasty Nicosia was ruled under a feudal system and despite the occasional oppression, it was transformed into a cosmopolitan city, with an array of contemporary buildings, palaces, mansions, monasteries and churches. And it was during the Lusignan period that the first extensive fortifications of the city took place[18] and the name of the capital was changed into Nicosia (Klerides, 1959: 13).

The Frankish rule ended when the last Queen, Caterina Cornaro, was forced to cede Cyprus to Venice in 1489 (Hill, 1940). The Venetian rule lasted for about a century (1489-1571) and during that time Nicosia was the administrative centre and the seat of the Venetian Governor (Press and Information Office, 2000b: 15). The strategic importance of Cyprus was particularly emphasised during this period, as the Venetians considered the island the last bastion against the Ottomans in the East Mediterranean (Yorka, 1938). Despite initial proposals not to fortify Nicosia given that "*...this place does not lie on the sea nor in a situation in which it can be succoured...*"[19], a decision to proceed with its fortification according to contemporary defence methods was reached in 1567[20].

In order to construct the walls the capital was moved again further towards the north and the west (Klerides, 1959: 13). Moreover, the city was no longer cut into two equal parts by the Pedieos River, which was diverted to accommodate the construction of the walls (Yorka, 1938; Kesisian, 1989). In order to complement the water provision of the capital the Venetians initiated the system of 'chain wells' (λαγούμια in Greek, laum in Turkish) for the collection and transfer of water over long distances, which was developed further by the Ottomans (Interviewees 13 and 22).

[17] Book available in the Cyprus Library in Nicosia
[18] http://www.nicosia.org.cy/english/lefkosia_istoria_oxiroseis.shtm
[19] That was the conclusion reached by Ascanio Savorgnano, who was sent in 1592 to Cyprus to prepare a general description of the cities and their prospects for their fortifications (http://www.nicosia.org.cy/english/lefkosia_istoria_dikoisi_veneton.shtm)
[20] http://www.lefkosaturkbelediyesi.org/english/index_eng.html

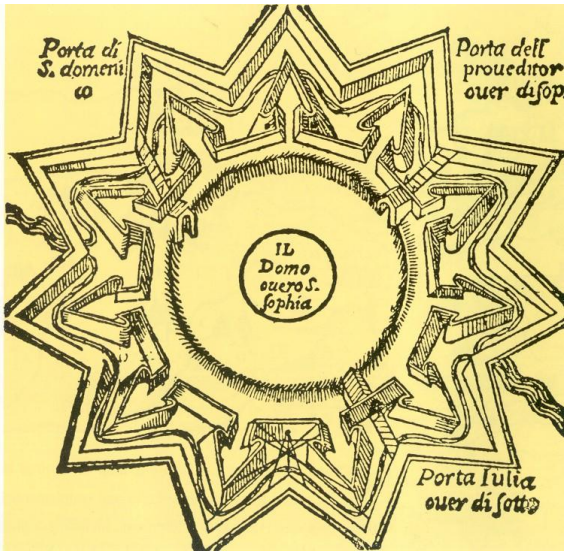
Photo 1: The star-shaped fortification of Nicosia with the 11 bastions



Courtesy of the Leventis Municipal Museum of Lefkosia

After the relocation of the capital and the diversion of the river, the new city walls were designed and constructed by Julio Savorgnano, in the shape of a star with eleven bastions, each named after an aristocratic family. The bastion's heart-shape design was considered more suitable for the latest contemporary artillery and providing better control to the defenders. The 4.5 km (2.7 miles)-long circular walls, which are considered the prototype of the renaissance military architecture, have three gates: Kyrenia Gate to the north, Paphos Gate to the west, and Famagusta Gate[21] to the east, which is also the largest of the three (Hill, 1940). Currently, and due to the 1974 events, Kyrenia Gate lies in the North, Famagusta Gate in the South and Paphos Gate within the Green Line.

Photo 2: The three gates of the Nicosia walls



Courtesy of the Leventis Municipal Museum of Lefkosia

[21] Also referred to as Porta Julia in honour of the architect

In September 1570, and after a nearly two-month siege, the Ottoman Turks, under the reign of Sultan Selim II, conquered Nicosia. Accounts of that period make reference to 'dark moments' that included the slaughter of a large part of the population, destruction of monuments and conversion of churches into mosques, among others (Contarini, 1572; Sereno, 1845)[22]. At the same time, the Ottomans built a number of mosques, inns (*han*), baths, libraries, Moslem theological schools (m*edrese*), fountains, shrines, tekkes and many other buildings in the city (Hill, 1952). With regard to the water provision, they perfected the 'chain wells' system by digging groundwater pipes linking the city with rivers at a distance of 10 and 20 kilometres. Also, by combining surface stone tracks and storage facilities they achieved reliable water provision to the capital for drinking and irrigation purposes (Interviewee 22).

During that era many inhabitants left the capital to reside in other coastal cities or to immigrate abroad, but Nicosia maintained its function as the seat of the Ottoman Pasha, the Greek Archbishop, the Dragoman and the Cadi and as the commercial centre of the island[23]. An earthquake in 1741 caused the destruction of many buildings in the city centre including the minarets of Selimiye Mosque (the converted St. Sophia Cathedral)[24]. With regard to bi-communal actions, it is interesting to note that towards the end of the Ottoman rule accounts refer to joint struggles of Greek and Turkish-Cypriots against the Ottoman oppression (Press and Information Office, 2000b: 17-18).

Under the 1878 Cyprus Convention, the Ottoman Turks handed over the administration of the island to Britain in exchange of protection guarantees against potential Russian aggression. The island remained part of the Ottoman Empire until the First World War, when Britain formally annexed it (Hill, 1952). The British also left their marks on the face of Nicosia as many of today's government buildings, including the Presidential Palace, ministries, the Supreme Court, police stations, the Archaeological Museum and schools date back to this era (Klerides, 1959; Kesisian, 1989).

Until this period, Nicosia was contained entirely within its Venetian walls. Increasing traffic and the growing importance of areas beyond the walls required that a series of openings were made. The first opening was cut in the Paphos Gate in 1879, while the most famous one –the Limassol or Hadjisavva opening- was a wooden bridge at the top of Ledra Street constructed in 1882 and linking the city to the government offices. In June of the same year, the municipal limits of Nicosia were extended to '*a circle*

[22] Both books are available in the Cypriot Library in Nicosia
[23] http://www.nicosia.org.cy/english/lefkosia_istoria_lefkosia_othomanika.shtm
[24] http://www.lefkosaturkbelediyesi.org/english/index_eng.html

drawn at a distance of five hundred yards beyond the salient angles of the bastions of the fortifications'[25].

Along with the gradual expansion of the city, the early 20th century saw a rapid urban development that culminated after the end of World War II causing the simultaneous expansion of the suburb areas. By the time of independence, Nicosia's population reached 100,000 inhabitants. The districts of Kaimakli and Pallouriotissa were accommodated within the city limits, while Strovolos, Aglandjia, Agios Dometios and Engomi were upgraded to municipalities (Maragkou, 1995). However, the old City started resembling an impoverished area, housing mainly pensioners, lower income workers and seasonal immigrants.

The individuality of Nicosia was eloquently depicted – though with a mild flavour of orientalism- in the accounts of Ludwig Salvator, Archduke of Austria (Salvator, 1881)[26]:

"*Lefkosia first bursts upon the sight, with her slender palms and minarets, seated in a desert plain, a chain of picturesque mountains as the background, it is like a dream of the Arabian nights realised – a bouquet of orange gardens and palm trees in a country without verdure, an oasis encircled with walls framed with human hands...*

Great is the contrast between the town and its surroundings, and greater still between the objects within the city. There are Venetian fortifications by the side of Gothic edifices surmounted by the Crescent, on antique Classic soils. Turks, Greeks and Armenians, dwell intermingled, bitter enemies at heart, and united solely by their love for the land of their birth..."

NICOSIA IN THE POST-INDEPENDENCE PERIOD

Independence came after five years (1955-1959) of armed struggle against the British rule, during which Nicosia functioned under emergency law with armed security forces patrolling the streets, curfew restrictions, barbwires and sabres surrounding the city (Maragkou, 1995; Press and Information Office, 2000b). The signing of the Zurich and London Agreements in February 1959 inaugurated a period of transition and Nicosia was at the heart of the administrative and constitutional preparations for independence. Cyprus became an independent state on 16th August 1960 and Nicosia was officially declared the capital of the Republic of Cyprus (Cyprus Encyclopaedia, 1990).

[25] http://www.nicosia.org.cy/english/lefkosia_istoria_astiki_anaptyksi.shtm
[26] Book available in the Cypriot Library in Nicosia

During the British rule there was no community-based municipality operating in any settlement area and the existing municipalities provided service to all the citizens of the island. Prior to independence (in mid-1958) first attempts were made to establish a separate Turkish Municipality in Nicosia, which gained legal status when the British Colonial Administration passed the 'Turkish Municipality Committees Law' in October 1959[27]. The right of the two Cypriot communities to establish their own municipalities in Nicosia was instituted with the 1960 Constitution of the Republic (Interviewees 5[28] and 39[29]). Therefore, two municipalities were set up and were represented by two majors. The Nicosia Municipality[30] is in charge of all the municipal duties and responsibilities on the southern (Greek Cypriot) part of the city, while the Nicosia Turkish Municipality[31] carries out the respective duties for the northern (Turkish Cypriot) section of the capital.

In December 1963, in the aftermath of a constitutional crisis, skirmishes broke out between Greek Cypriots and Turkish Cypriots in Nicosia. The intensity of the crisis led to the separation of the capital into Turkish and Greek quarters with a dividing line (the Green Line or Buffer Zone[32]) cutting across the city. The Line took its name from the green-coloured pen that the UN officer used when drawing the line on the city map (Lacarriére, 2003). This division was further solidified with the events of 1974 and since then forms a *de facto* border within the capital. The 180-kilometre (112 miles) Green Line, not only divides physically the city into two parts, but has also posed a number of problems to the two communities. Zampelas[33] (2003) listed the adverse impacts of the division and the key challenges it entails:

"*The adverse impact of the division was manifold. The fabric of the town was split in two parts. Great difficulties arose in relation to the provision of infrastructure and accessibility. The division undermined the centrality of Nicosia as a whole. Its development potential was restricted considerably. The centre was transformed into an "urban frontier". This posed serious barriers to balanced and sustainable development. It encouraged an extensive urban sprawl and scattered development. De-population and socio-economic decline hit previously central and vibrant areas. Investment and*

[27] http://www.lefkosaturkbelediyesi.org/english/index_eng.html
[28] The Greek-Cypriot Mayor of Nicosia when the informal bi-communal cooperation started in 1978
[29] The Turkish-Cypriot Mayor of Nicosia when the informal bi-communal cooperation started in 1978 and Leader of the Peace and Democracy Movement Party at the time of the interview
[30] The website of the Nicosia Municipality is available at: http://www.nicosia.org.cy/english/greekhome.shtm
[31] The website of the Nicosia Turkish Municipality is available at: http://www.lefkosaturkbelediyesi.org/english/index_eng.html
[32] http://www.unficyp.org/nqcontent.cfm?a_id=1592andtt=graphicandlang=l1
[33] An interview was conducted with Mr. Zampelas, under his capacity as Mayor of Nicosia at the time of the interview

activity were driven away from the centre to the suburbs. Rapid decay has been threatening the architectural heritage of the walled city.

Moreover, several challenges were created after 1974, the main of which was how to effectively address existing and new problems under the specific political circumstances. This required solutions that would improve the quality of life and promote a balanced development. Another aspect of this challenge was to preserve the prospect of the reunification of Nicosia. This prospect required functional solutions that would facilitate a potential reunification and would build bridges of collaboration between the two parts of the city."

According to Zampelas (2003) these challenges were successfully met through two significant initiatives for bi-communal cooperation that started soon after 1974 and have been on-going. The first initiative was the implementation of the Nicosia Sanitary Sewage System, which started in 1978. The second concerned the Nicosia Master Plan that was inaugurated a year later in 1979. Both initiatives will be analysed in detail in Chapter VI.

In addition to these impacts and challenges, the Green Line and the events of 1974 resulted in a complete geographical and administrative division of the two municipalities in Nicosia. The division of the capital city brought about major resource management and planning problems. The issues encountered in South Nicosia, which bear similarities with the situation in North Nicosia, may be summarised as follows[34]:

"*The buffer zone, which keeps the Greek Cypriot and Turkish Cypriot inhabitants of Nicosia apart, has split their town into two separate urban parts, which have been developing independently of each other. This has caused the transformation of the city's structure and the disintegration of its entity. Suburbanisation and the political circumstances, which caused the division of the town, have had unfortunate effects on economic and living conditions in Nicosia. The existence of the Buffer Zone, which runs through the middle of the city and the historic centre itself, has undermined its centrality and turned it into a "frontier" town. Under the impact of rapid growth, and the reality of its division into two separate parts, years of unplanned and uncontrolled development have created accumulated problems for contemporary Nicosia*."

Up until April 2003 there was only one South-North 'border' crossing in Nicosia (near the old Ledra Palace Hotel) and only diplomatic personnel of foreign missions, tourists

[34] Information compiled from the website of the Nicosia Municipality

visiting the South and, in exceptional cases, a few civilians were allowed to cross. Nowadays, there are six pedestrian and vehicle crossings (two of them in Nicosia) and talks are still in progress about opening more[35]. As a sign of good will, the Ledra Street footbridge crossing was dismantled on the Turkish Cypriot side in December 2006 and a few months later (in March 2007) the barrier was completely demolished by the Greek Cypriot Government. On April 3rd 2008, in an effort to promote the unification of the island, the Ledra Street pedestrian crossing was officially re-opened in the presence of Greek and Turkish Cypriot officials (New York Times, 3 April 2008).

Photo 3: 'Border' Pedestrian Crossing at Ledra Street after April 2008[36]

Although the *de facto* political division of the capital city has gradually "softened" since April 2003, the physical and administrative division remains intact. Moreover, infrastructure investments such as water treatment, garbage collection, water distribution systems, public transportation etc. have become more costly to implement since in some cases investments have been duplicated due to the *de facto* division. The United Nation Development Program (UNDP), through the Nicosia Master Plan (NMP), has been assisting the two communities to develop and implement mutually beneficial bi-communal projects. Despite the various efforts, the city's expansion on both sides, as a consequence of the influx of refugees but also as a result of the island's socio-economic development, was done at different paces for the two sides and not always in line with the calls for sustainable urban development.

[35] One is in Lokmaci area and another in the Yesilirmak village
[36] Wikipedia http://en.wikipedia.org/wiki/File:Nicosia_Ledra_street_border.jpg#file

The table below shows the distribution of population in the Greek and Turkish sectors of the Nicosia district:

Table 1: Distribution of Urban and Rural Population in South and North Nicosia[37]

	South Nicosia	% of Total Population	North Nicosia	% of Total Population
Urban Population	213,500	69.3	36,834	43.2
Rural Population	75,600	30.7	48,456	56.8
Total Population	289,100		85,290	

According to the above figures, the population distribution in the Turkish sector appears balanced between urban and rural areas. In contrast population in the Greek sector is mostly located at the urban part of the district. This has been largely the end-result of the influx of refugees from the northern part of the island after the events of 1974. The Government implemented a housing policy for the refugees in purpose-built organised settlements (large housing estates) in the suburbs and particularly on the southern fringes of the Nicosia Urban Area (Demetriou, 2004).

Nowadays, the city not only accommodates major government offices on both sides, but is also home to many business enterprises and foreign embassies (though there are no foreign embassies based in the North besides the Turkish Embassy). Nicosia also has an International Airport about 8 kilometres (5 miles) west of the city centre, which has remained closed since 1974 as it lies within the UN-controlled Buffer Zone. Although the 'crossing' conditions between the two sides have eased significantly since 2003, Nicosia is still far from resembling a unified capital of a unified state.

As eloquently pointed out by Wolf (2009) "*...shoppers in the capital sometimes have to take along an extra item with their credit cards and mobile phones – their passports...*"

This historical review reveals the particularity and individuality of Nicosia. Based on the capital's key role in the pre- and particularly in the post-1974 developments the thesis claims that Nicosia represents a promising setting for evaluating the applicability of Chapter III's analytical frameworks (communities of practice and policy networks). The old Nicosia district in particular, already demonstrates forms of bi-communal co-operation in three areas: the sewage collection and treatment system, the drinking

[37] Data for the South Nicosia was obtained from Demographic Report of Republic of Cyprus (2003); data for the North Nicosia was obtained from Census of Population (1996)

water distribution system and the Nicosia Master Plan (NMP) for the rehabilitation of the within-the-walls city; these three areas will be analysed in detail in Chapter VI.

8. THESIS STRUCTURE

Chapter I provided a snapshot of the thesis, explained its objectives and outlined its significance and originality. Moreover, it rationalised the choice of the case study and provided some necessary clarifications relating to the terminology employed. Further, it introduced Cyprus with reference to water resources management by using the framework of the Five Water Management Paradigms, covering the period from the 19th century until 2008 (the latter part of the thesis' chronological scope). Finally, it provided a historical overview for the capital, Nicosia, the cornerstone of bi-communal interaction.

Chapter II presents and analyses the theoretical framework of policy analysis employed in the thesis. It discusses the characteristics, potentials and limitations of the theoretical lens and draws direct linkages with the case study.

Chapter III discusses the analytical frameworks that the thesis uses in its empirical analysis. These frameworks are: policy networks, enhanced with elements of (water) governance, and communities of practice through the regular use know-how as the glue for creating a common construction of reality. The Chapter presents their characteristics, qualities and shortcomings also in relation to the case study. The potential contribution of the thesis to the furthering of the analytical frameworks is also sketched.

Chapter IV discusses the thesis' methodology. It presents the orientation of the research, as well as the core and complementary research methods. It particularly accentuates the role of interviews for collecting information that is not available through secondary sources in the case of Cyprus. It also includes an anecdotal component, of selected incidents and/or experiences during the field-trips that enhanced the author's understanding of the on-the-ground situation.

Chapter V addresses the first objective of the thesis and presents conventional water resources management in a comparative manner across the *de facto* border. It provides information on previous studies, a presentation of the geographical and

climatological conditions in Cyprus along with an overview of water supply and demand in the South and the North.

Chapter VI tackles the second objective of the thesis and analyses three highly political water discourses—desalination, water transfer and recycled water—using the theoretical lens of policy analysis. Following the overall methodology of the thesis, it juxtaposes information on both sides while also highlighting points of convergence and divergence, both between the two sides and among the three themes. It aims to highlight the centrality of politics within water management and the shift made towards inclusive and socially constructed water policy processes.

Chapter VII elaborates on the third objective of the thesis and examines the issue of policy networks in Nicosia using the lenses provided by the analytical frameworks. It covers the analysis of three examples of bi-communal engagement in the capital (on wastewater treatment, on drinking water and on the rehabilitation of the old part of the city). Throughout, linkages with the thesis' research question are made.

Finally, the Closing Chapter provides a summary of the thesis' key findings while assessing them against its three objectives. It then considers whether the research question has been answered, acknowledges shortcomings, reflects on the contribution of the study and identifies potential directions of future research.

CHAPTER II
On Theoretical Narratives

1. INTRODUCTION

Chapter II discusses the theoretical framework employed in the thesis (i.e. policy analysis) and explains the rationale for this choice with reference to the key research question. This literature review will determine the disciplinary framework within which the Cyprus case study will be examined and, in doing so, the potential contribution of the thesis to further scholarly work will be also identified.

In disciplinary terms the thesis is located within political geography; it examines the reciprocal inter-relationship between political processes and spatial structures. In particular, the thesis is concerned with the issue of geopolitics[38] in relation to water resources management. Traditionally, geopolitics has been applied primarily to the impact of geography on politics, although its usage has evolved to encompass wider connotations (O'Tuathail, 1998). The case study of Cyprus is well placed within these disciplinary boundaries, as geography has determined political processes and choices throughout the island's history and perhaps never more so than after its *de facto* division into two quasi-separate political entities in 1974. Ever since, Cyprus' historical trajectory has involved constant efforts to either legitimise or reverse this reality.

Moreover, geography (and spatial structures) has also determined water policy choices given that the island faces severe water scarcity conditions with recurrent drought periods. The allocation and management of water resources are complex and highly political procedures requiring reflexive approaches and adaptability. The spatial reality of the post-1974 *de facto* division has attached an additional element of complexity in water management and has therefore tightly bound politics, boundaries and water together. It is almost impossible to remove the *de facto* boundaries from the island's politics or politics from the management of Cyprus' water resources. Stakeholders on either side of the 'border' consider water management to be the second most important issue after the political question.

[38] Academically, the study of geopolitics is multidisciplinary in its scope, and includes all aspects of social sciences with particular emphasis on political geography, international relations, political science and international law (O'Tuathail, 1998; Criekemans, 2009). The multidisciplinary aspect is considered particularly important for the analysis of water resource management and is embraced in the thesis.

Box 1: Discussing 'boundaries' and frontiers in Cyprus[39]

The events of 1974 resulted in the delineation of a *de facto* border that cuts across the island of Cyprus and has created a frontier - the Buffer/Dead Zone - between the two segregated communities. This demarcation occurred overnight, was largely the result of a complex set of external interventions in the island's internal affairs and turbulent internal socio-political conditions, and has been sustained ever since by military presence (on 37% of the island by Turkish troops, an action condemned in numerous UN Security Council Resolutions[40]). Since 1974, this 'border' has marked and determined the island's subsequent historical trajectory with attempts to either legitimise or deconstruct it. Given also the compact nature of the island's territory, undertaking any kind of research in and on Cyprus cannot bypass this reality.

According to the literature, boundaries can be considered as both symbols and manifestations of power relations and social institutions and form part of divergent and day-to-day institutional practices (Newman and Paasi, 1998). Boundaries create identities and are created through identity; they create practices and forms, which may then become the basis of separate meaning and interpretation (Tester, 1993); finally boundaries not only separate groups and communities from each other but also mediate contacts between them (Minghi, 1991; Newman, 1998). Taking it a step further, Wallerstein (1974) claims that greater integration of world markets and increasing concentration of capital in the core capitalist societies has formed part of an inexorable process; one that will abolish the significance of geographical distance and will make all frontiers permeable.

In Cyprus, the artificial frontier of the Buffer Zone was created to keep the two sides apart; however, as it cuts through the island's capital it therefore incorporates the city firmly into the frontier zone. The frontier, although denoting separateness, also signals a meeting point for the two communities because Nicosia is at the heart of Cyprus' administrative, political and socio-economic activity. It is one of the few examples of what Minghi (1991) calls "frontiers/boundaries of contact", in which the actual existence of the frontier constitutes the reason for the two sides' rapprochement.

The operation of both the sewage treatment plant and the drinking water distribution system in Nicosia has managed to disregard the division of the city and treat the two parts of the capital as a single unit. This is seemingly a unique example within the context of post-1974 Cyprus, one where a frontier has emerged as a point of regular contact and cooperation.

The frontier as an identity marker may signify either the diversity or the commonality of frontier populations. Lamb (1968: 32) refers to frontiers as "*a cell wall of the basic unit of national identity, marking an emotional and psychological divide as well as a political geographical line*". Interestingly enough, in Nicosia, the frontier has not altered the perception of its inhabitants as 'Cypriots' over Greeks or Turks. Indeed, it has enhanced a sense of shared identity and has strengthened a common desire to unite around a common vision on how to

[39] A discussion on the context of boundaries and frontiers as well as different analysis frameworks with relevance to the Cyprus case study is included in Annex 7

[40] A list of all UN Security Council Resolutions on Cyprus is available at http://www.un.int/cyprus/resolut.htm and condemnation of the military activities forms part of Resolutions 353 onwards

develop their city (materialised in the Nicosia Master Plan for the rehabilitation of the within-the-walls city). More importantly, this engagement has brought the two sides together within a framework that is beyond political connotations and party interests.

In that sense, the rigidity of the Dead Zone has been questioned as it increasingly resembles a frontier of contact rather than one of conflict, despite a "*pervasive, often almost superstitious, fear characterising closed frontiers as lines of transition between two worlds*" (Anderson M., 1996:6) when crossing the 'border' checkpoints between the two sides.

When considering the overall water management in Cyprus, this frontier of contact is both an outcome and a prerequisite. An effective water management would require cross-'boundary' cooperation, as water ignores the presence of the Dead Zone and cuts from one side of the *de facto* division to the other. Moreover, the sewage treatment system and, to a lesser extent the drinking water distribution system, in Nicosia are interlinked. This reality essentially compels the two communities to work together and forms a stepping stone towards a water management framework closer to holistic and integrated models.

It is said that good fences make good neighbours only when they are not made from sabres (Boulding, 1989). Becoming good neighbours however, cannot occur overnight; a certain level of trust and overall stability are among the prerequisites. Since April 2003 and the opening of crossing, Cyprus has entered a substantial phase of reconciliation and rapprochement at which point the presence of a fence of sabres no longer automatically causes the alienation of the two sides. Although this 'border' cannot be yet caricatured as a wooden garden fence between two good neighbours, important steps towards rapprochement have been firmly taken by the South and the North in Cyprus.

"Frontiers are indeed the razor's edge on which hang suspended the modern issues of war and peace" Lord Curzon of Kedleston (1907: 7, quoted in Prescott, 1987: 5)

In order to shed light on the complexity of the water-politics nexus in the case of Cyprus, the thesis has employed the theoretical framework of policy analysis. This choice has been made in order to primarily comprehend the complexity of governing; its interdisciplinarity is considered appropriate for water analysis. For example, the three discursive themes analysed in Chapter VI (desalination, water transfer, water recycling), aptly demonstrate the role of politics in water policy issues. Moreover, the key theme of the thesis - policy networks - falls within the boundaries of policy studies. The subsequent literature review emphasises the policy elements that point towards forms of governance that are de-touched from statism or the market. Such forms are favoured due to the flexibility and adaptability they entail, qualities needed in conditions of political separation/segregation and *de facto* territorial division that characterise the case of Cyprus. In addition, these elements complement the thesis' orientation towards critical geopolitics, in which the state is exceeded as the sole legitimate unit of analysis and the focus shifts positively towards geopolitical discourses involving a multiplicity of actors. Furthermore, this approach tallies with the philosophical orientation of the thesis

towards post-modernism and post-structuralism (as presented in the previous chapter). In this scheme, reality (and thus, policies, issues, etc) are, primarily, socially constructed through the active engagement of actors and less determined by a structure or system.

This is an important consideration for the research at hand: in Cyprus, while there is no (structural) contact between the two sides, there is - within an alternative management paradigm - evidence of informal, actor-led, bi-communal engagement over water. It should be highlighted at this point that the encounter with the different elements of policy analysis and the inclusion of some social theory considerations (as presented in the sections below) is done in an effort to identify applicable concepts for the Cyprus case study. Regretfully, the island's political deadlock rules out several options and renders the strive for solid theoretical grounding for analysis somewhat challenging.

Throughout this chapter, the theoretical discussion is linked to the research question and the case study so as to enhance the analysis' coherence. The chapter is brought to a close by a summary and some conclusions.

2. ON POLICY ANALYSIS

Policy is a difficult concept to capture and demarcate. Nonetheless, it appears regularly in disciplinary and inter-disciplinary scholarly work[41]. The water sector is no exception and 'water policy' is a frequently encountered term[42]. A plausible explanation lies in policy analysis' potential to explore different forms of governance, informed by the post-modern and post-structural questioning of statism and the market as non-reflexive and inadequately adaptable governing structures. The main research question of the thesis is situated in this search for alternative forms of water sector governance; framing water policy analysis in Cyprus as webs of informal networks[43] may be one way of exploring possible ways out of the island's political impasse. Additionally, policy analysis is relevant to the thesis because water resources management represents an important aspect of public policy. Despite the various trends of privatisation, regulation and de-regulation, water management remains largely in the hands of governments. In

[41] For example, social policy, environmental policy, agricultural policy, industrial policy, European policy, defence policy, foreign relations policy...the list seems endless.
[42] As seen by the existence of a plethora of national and regional water policies. Most water-related projects aim to reform/review/enhance/update/streamline water policies. Most water-related events (including the World Water Forums that constitute a reference point for water professionals and related stakeholders) include separate sessions on water policy/ies, while the examination of water policy usually lies at the heart of the various debates.
[43] As analysed later in the empirical sections of the study.

Cyprus especially, water is constitutionally grounded to the authority of the state and is primarily considered as a common pool resource.

This section presents the policy analysis framework; it explains its relevance to public policy, considers the elements that may be used in its study and how the thesis' research question may contribute to a critical review of policy research. The section also examines the concept of social construction of policy that is relevant for the thesis. The chapter concludes with a summary of the main points.

THE RIDDLE OF POLICY

"*Policy analysis is like a hot dog;*
Its contents are both variable and suspect"
Stewart (1991:167)

Policy's nascence seems bound to the rise of Modernity and the Enlightenment's belief in human reason and the power of knowledge as the means out of the world's impasses; the latter forms the philosophical underpinning to the development of policy science. This may be understood "*in terms of the desire for knowledgeable governance, that is, the acquisition of facts and knowledge about problems so as to formulate better solutions*" (Parsons, 1995: 17). Indicative of the term's proliferation *on pair* with the spread of modern liberal democratic ideas, is the identification of ten different uses of the term policy[44] (Hogwood and Gunn, 1984). In the socio-political realm in particular, the concept of policy is encountered regularly[45] and the term "*is used to indicate the need for clarifying the social ends to be served by a given allocation of scientific energy*" (Lasswell, 1948: 122 cited in Parsons, 1995: 18). One explanation for this pervasiveness lies with the concept's function as a way of "*making sense of the complexity of governing*" (Colebatch, 2002: 1).

Policy "*is a way of labelling thoughts about the way the world is and the way it might be and of justifying practices and organisational arrangements*" (Colebatch, 2002: 8). At the same time "*there can be no one definition of policy analysis*" (Wildavsky, 1979: 15); practising policy is more important than trying to define it. "*Policy is not…a self-evident term…a policy may usefully be considered as a course of action or inaction rather than specific decisions of actions*" (Heclo, 1972: 84-85), while "*a policy…consists of a web*

[44] As a label for a field of activity; an expression of general purpose or desired state of affairs; specific proposals; decisions of government; formal authorization; a programme; output; a theory or a model; a process (Hogwood and Gunn, 1984: 13-19).
[45] Foreign Policy, Economic Policy, Educational Policy, Race and Equality Policy, Water Policy, just to mention a few.

of decisions and actions that allocate…values" (Easton, 1953: 130 cited in Ham and Hill, 1993: 11). These attempts for definition demonstrate the difficulty in boxing policy[46], which seems better characterised in terms of fluidity and adaptability.

In establishing the field of policy science, Lasswell (1951: 5 cited in Parsons, 1995: 16) asserts that the word policy "*is commonly used to designate the most important choices made either in organised or in private life…policy is free of many of the undesirable connotations clustered about the word political, which is often believed to imply partisanship or corruption*". At the same time, when policy-making and implementation go unrecognised as political processes, then the policy recommendations that are produced are often ill-adapted for application in the real world. In other words, "*the greatest problem for most policy analysts is their inability to cope with politics*" (Minogue, 1997: 12).

The thesis takes a firm stand towards water resources management as an inherently political process (Allan, 2001; 2003a; Mollinga, 2008a; 2008b) and embraces the expanding area of scholarly and project-based approaches affirming the concept of "water politics" [47]. This will be manifested also in the next chapter that touches upon water governance, whilst reaffirming that the global water crisis is structured around governance issues. The centrality of politics is also favoured as part of the reflexive water management paradigm that places politics at the core of integrated approaches (see Chapter I). As mentioned, the Cypriot context cannot afford an overlook of the water-politics nexus, if realistic and applicable policy options are to be sought.

An intriguing concept is that of a 'political sociology of water resources management'[48], coined by Mollinga (2008) that is under further scholarly exploration. Although reflecting immensely on the political nature of water in Cyprus, there is an inherent difficulty in applying three out of the four different domains of the concept's kaleidoscope: they necessitate the existence of formal structures and sovereign entities that can discourse with one another. In Cyprus such setting doesn't exist; the state-political deadlock between the Greek-Cypriot and the Turkish-Cypriot sides render the use of hydro-politics, national policy or global politics inapplicable. Of interest and potential

[46] Etymologies of policy comprise 'political sagacity; statecraft; prudent conduct; craftiness; course of action adopted by government, party, etc.' (Oxford English Dictionary) while its synonyms include 'statesmanship, administration, wisdom, plan, role, action, tactics, strategy, sagacity' (Collins College Thesaurus, 1995: 474).

[47] And contrary to scholarly work questioning the essential political character of water (as in Warner & Wegerich, 2010)

[48] In his analysis, Mollinga (2008b) asserts that "*the notion of a 'political sociology of water resources management' can bring under one roof a vast kaleidoscope of context specific analyses. In this section the colours of that kaleidoscope are first briefly sketched by mapping out four domains of water politics investigation (everyday politics, politics of state policy, hydropolitics and global water politics), and their interlinkages as a fifth domain – a topology of water politics*" (ibid: 11).

applicability is the domain of *everyday politics* (Kerkvliet, 1990) that refers to the disputes over day-to-day water use and management; however, the thesis claims to essentially utilise this aspect through the framework of communities of practice and policy networks that however, do not attribute obvious focus on the heavy-loaded word 'politics'. Furthermore, it should be clarified that the thesis wishes to explore ways of addressing water cooperation across the 'border' outside the conventional analysis that water governance and IWRM often imply; hence the selection of policy analysis (and policy networks) as the method of enquiry.

In sum, the development of theories of policy analysis "*…requires an integration of both political scientists' knowledge of specific institutions and behaviour, and policy scholars' attention to policy communities and substantive policy information*" (Sabatier, 1991b: 147). Thus, politics and political science need to form substantial elements in policy analysis, a position supported by the thesis, particularly concerning the centrality of politics to water policy (demonstrated particularly in the empirical analysis of Chapters VI and VII). The following sub-section aims to shed additional light on the concept of policy through the examination of its dual understanding.

ANALYSIS OF AND ANALYSIS FOR POLICY

In discussions of policy, two distinct approaches are normally put forward: the 'analysis of' policy and the 'analysis for' policy (Gordon *et al*, 1977; Ham and Hill, 1993; Parsons, 1995; Jenkins, 1997; Colebatch, 2002). The former refers to the policy process, the latter to the policy content (Gordon *et al*, 1977; Jenkins, 1997: 30). Lasswell's (1970) alternative designation is of 'knowledge in (and for)' the policy process and 'knowledge of' the policy process. The 'analysis of' policy developed, deriving its tenets primarily from political science (Sabatier, 1991a: 144), as an "*alternative focus to the study of constitutions, legislatures, interest groups and public administration*" (Parsons, 1995: 21).

The two policy approaches may also be viewed to represent the division of labour between theory and practice. As an academic activity, policy analysis focuses on advancing understanding whereas, as an applied activity, it emerges as problem-solving and providing solutions to specific social problems (Ham and Hill, 1993: 4). This prescriptive orientation of policy analysis makes it a "*problem-centred activity*" (Wildavsky, 1979: 17), concerned, therefore, with both planning and politics. On this view, "*the highest form of analysis is using intellect to aid interaction between people*" (ibid). So, negotiating a course between theoretical understanding and practical

implementation represents a prime source of tension within policy analysis. The thesis aspires to link these two angles: the research question emerged from the theoretical exploration of communities of practice and policy networks, while the empirical analysis focuses on their practical implementation with regard to water management and bi-communal engagement in Cyprus.

Another approach aiming to clarify the policy process derives from Easton's (1965) work on a system of stages: the policy process is conceived of as an adapted input-output model of the political system and policy is seen as a "*logical succession of steps*" (Parsons, 1995: 77), within which each step is followed by the next one in a simple and rational mode. The stagist approach has been criticised for the little attention it pays to the so-called 'black box of decision-making' (Dror, 1983) and the simplistic assumptions on the progression of the stages that rarely occur in the practical world of policy-making (Sabatier and Jenkins-Smith, 1993; Ham and Hill, 1993: 15). Policy analysis may be better understood through the notion of incrementalism, where "*…deliberate, orderly steps…are not an accurate portrayal of how the policy process actually works. Policy-making is, instead, a complexly inter-active process without beginning or end...*" (Lindblom & Woodhouse, 1993: 11). The thesis favours this perspective, recognising the open-endedness and incrementalism of policy practice and action in the case of Nicosia; particularly in the way that the collaboration over the bi-communal Mia Milia wastewater treatment plant and the consequent rehabilitation of the capital took place.

In water policy analysis the demarcation of inputs and outputs becomes increasingly blurred. Water resources are often considered to represent either, and particular stages tend to be non-linear and to blend into one another. Monitoring and evaluation, for example, are present throughout the process rather than simply at the end, while decision-making may take place on more than one occasion during the process. Nonetheless, the stagist model is important in that it draws attention to the relationship between political and other systems (Ham and Hill, 1993: 17). In addition - and given the complexity of the policy concept - the stagist model offers a rational and easy-to-handle way of ordering/organising policy issues and initiating the policy analysis process (Quade, 1989; Mazmanian and Sabatier, 1980) and it is still in use (Parsons, 1995; Jenkins, 1997). Any apprehension felt towards the stagist approach seems to not lie with the policy cycle *per se*, but with the need to incorporate different models and approaches into the policy analysis (Parsons, 1995: 81). So the thesis aligns with a critical strand of the stagist approach and hopes to contribute to it by using a combination of different models in exploring water policy processes in Cyprus.

Although useful as initial points of enquiry, adopting either the systemic/stagist approach or the 'of/for' analysis of policy activity, leads to fragmentation. For a comprehensive view and appreciation of policy, a combination of the various approaches may be more appropriate (Ham and Hill, 1993; Jenkins, 1997; Colebatch, 2002). The benefits lie in the dynamism it affords policy analysis; indeed, the nature of a policy problem would benefit from "*a variety of approaches...to deal with the complexity of the process*" (Jenkins, 1997: 34). Each of the approaches bestows attention to different aspects of policy and policy-making and may be more appropriate for some purposes or in some cases than others are.

However, "*one should not be bound too rigidly or too dogmatically to a particular model…the explanation of political behaviour, rather than the validation of a given theoretical approach, should be the main purpose of political enquiry and analysis*" (Anderson, 1975: 25). Given the purpose of the research, this point is central to the thesis. The validation – or, indeed, invalidation - of a theoretical approach is an intended outcome of the empirical analysis although not an end goal in itself. Moreover, the dynamism implied by the use of multiple policy approaches can prove beneficial for water policy because of water management's intricacy and need for innovative and reflexive methods when tackling problems (Chapter III will consider these methods further). In the meantime, a more careful scrutiny of public policy would be constructive for the analysis given that the key policy theme of the thesis – water- falls predominantly within the public policy realm.

POLICY AND PUBLIC POLICY

Policy may be seen as "*whatever governments choose to do or not to do*" (Dye, 1998: 1) or "*how, why and to what effect governments pursue particular courses of action and inaction*" (Heidenheimer *et al*, 1983: 3). On another account, policy is seen as "*a course of action by governments designed to achieve certain results*" (Bridgman and Davis, 2000: 6). Therefore, an enduring association of policy with governmental conduct seems to be in place. However, the concept has been held hostage to the volatility of public politics and has often become interchangeable with public policy and the focus on the "*public and its problems*" (Parsons, 1995: xv). Public policy examines the procedure an issue follows from its construction as a problem through to its incorporation within a political agenda from where it may be dealt with. One definition of public policy describes it as "*a set of interrelated decisions taken by a political actor or group of actors concerning the selection of goals and the means of achieving them*

within a specified situation where these decisions should, in principle, be within the power of these actors to achieve" (Jenkins, 1997:30). Thus, public policy accounts for the eventuality of either action or inaction, meaning that policy is more than mere decision-making. Both qualities are important to the thesis, given that they enjoy a good fit with the Cyprus case study where examples of both action and inaction (or even lack of action) have influenced public policy making.

The growth of public policy as a distinct field of academic activity dates back to the late 1960s (Sabatier, 1991a: 144; Parsons, 1995: 27). It is founded upon a belief in the state apparatus as the primary solution-provider for modern society's problems. Public policy may refer to issues as diverse as foreign relations, transport, housing, health, education, economics, race, urban planning, the environment and utilities, meaning that its scope seems blurred by default. This makes any attempt to accurately demarcate public policy science in a disciplinary sense tricky. For this reason, public policy analysis emerged in the 1970s as an approach that offered the possibility of a unified or integrated social science that could bridge the boundaries of academic disciplines (Parsons, 1995: 28). In the 1970s and 1980s American scholarship paved the way for public policy analysis (Anderson, 1975; Dye, 1976) and, of special importance to the emerging body of work was Allison's (1971) study on the Cuban missile crisis, which became a principal text on public policy decision-making[49]. The 1980s and 1990s witnessed a shift away from the American scholarship as Europeans began to contribute the majority of new policy approaches (Kooiman, 1993; Lane, 1993; Hogwood and Gunn, 1984; Richardson and Jordan, 1985). More recent efforts have focused on explaining the diffusion of public policies across countries and on making their content more accessible to the public (Compston, 2004; Birkland, 2005; Dobbin *et al*, 2007).

Public policy's evolution in academic terms and the various influences it has received, have endowed it with the quality of inter-disciplinarity; "*both the interest and the complexity of the study of public policy lie in its propensity to disrupt disciplinary boundaries and to call for examination of the social, economic and political environment in which the state operates*" (Minogue, 1997: 10). Similarly, "...*policy analysis is an applied sub-field whose content cannot be determined by disciplinary boundaries but by whatever appears appropriate to the circumstances of the time and nature of the problem*" (Wildavsky, 1979: 15). This temporality, along with the

[49] This refers to the situation in 1962, when the USSR made efforts to deploy missiles with the potential to carry nuclear weapons on Cuba, which is considered as the USA's 'backyard'. Though not formally established as such, Cuba constituted a critical frontier for the USA and so the consecutive actions and reactions of the superpowers brought them to the brink of nuclear war, which was avoided at the last minute (Allison, 1971).

multiplicity of aspects, actors and their interaction, make public policy complex. Public policy "*is almost never a single, discrete, unitary phenomenon*" (Greenberg *et al*, 1977: 1533) and indeed this insight pertains, especially, to water policy given the inherent complications of water resources management. The prevailing consideration of water as a social good (Rogers *et al*, 1998; Hansson, 2004) places it firmly within the realm of public policy. Moreover, the cross-disciplinary approach of public policy responds well to the holistic and integrated water management frameworks that are also favoured in this study (i.e. calling for cross-sectoral approaches that account for economic, social, environmental and political considerations).

There has been, however, a systematic confusion between public policy and government conduct. It has been possible to circumvent this supposed link through the development of an understanding of policy as the vehicle for the control and contestation of the existing order, and which simultaneously asserts a right to participate (Colebatch, 2002: 2). This is facilitated by conscious collective action, by wider participation in governance frameworks and by the increased availability of information for the (re)construction of knowledge[50]. In Cyprus, with water as an issue of public policy, it was specialised knowledge (regarding wastewater treatment and urban planning) and actor involvement (through joint practice) that signalled a move away from a disaggregated official policy line and towards task-specific, goal-oriented and alternative water management modalities. In that sense, the case study offers some empirical evidence of how the public policy - government conduct link has been transcended. It may also strengthen the further development of public policy's theoretical framework (i.e. the action-inaction account as well as viewing the overall process and not only the decision-making part). Given the importance of these elements for understanding the particularities of the case study, delving further into the policy concept and its various characteristics has an added value for the analysis. .

THE TWO DIMENSIONS OF POLICY

The policy activity is said to consist of two dimensions: a vertical and a horizontal (Colebatch, 2002). In the vertical dimension, policy is understood as rule and is "*concerned with the top-down transmission of authorised decisions*" (Colebatch, 2002: 23). This dimension is primarily concerned with the implementation of policies and emphasises the value of instrumental action, rational choice and the force of legitimate authority. It is important because of the way in which it structures action and facilitates the acceptance of outcomes rather than providing any description of the process. The

[50] A separate analysis of these three elements follows in the next chapter.

second dimension, the horizontal, conceives of policy as structured interaction and accentuates the relationships among the various policy participants outside the line of hierarchical authority, irrespective of whether they come from the same or different organisations (ibid).

The horizontal dimension has gained particular attention in recent years[51], due also to a receding belief in the ability of state structures to cope with upcoming challenges (including those related to the environment) and a growing presence of alternative forms of governance (notwithstanding civil society and grassroot movements). As a result, examples of '*governance without government*'[52] (Rosenau and Czempiel, 1992; Rhodes, 1997) have emerged, which are particularly important for the thesis that argues for such structures to be present in the case of Cyprus. Policy's horizontal dimension indicates the necessity of wider and more active stakeholder participation since the resources needed for tackling a specific policy issue do not necessarily rest in government hands. This has been a constant topic within water debates, where participatory approaches and wide stakeholder involvement are called for in order to enhance a sense of ownership and legitimacy of action (Hemmati *et al*, 2002; Mitchell *et al*, 1997). It is understood that mobilising authority and resources from beyond government, requires action, interaction and a level of negotiation. Such a process however, is likely to give rise to "*policy collectivities*" (Colebatch, 2002: 33), formed as one of the active responses to the needs of policy's horizontal dimension.

A central argument of the thesis calls for the fortification of the horizontal policy dimension by highlighting the engagement (and the types of engagement) of actors in the policy process. It is argued that governance structures –that move away from formal configurations- enhance the plausibility and practicality of solutions to contested issues (such as the management of scarce water resources) in politically challenged settings (like that of Cyprus). Given the focus of the thesis on actors' interaction on policy matters, a brief encounter with policy collectivities/sub-systems is provided below in order to examine their potential relevance to the case study.

[51] Also due to the work of social movements and increased public participation that have given stronger voice to various policy collectivities
[52] Emphasis added

POLICY COLLECTIVITIES & POLICY SUB-SYSTEMS

'Policy collectivities' may be based around different formations: (a) the power relations described by Lukes (2005), such as iron triangles (Cerny, 2001) or hydro-hegemony constructions[53] (Lustick, 2002); (b) linkages, as is the case for networks (Borzel, 1998; Marsh and Smith, 2000); or (c) shared knowledge and expertise as is the case for epistemic communities (Haas, 1992) and advocacy coalitions (Sabatier, 1991a, 1991b, Sabatier and Jenkins-Smith, 1993). These categorisations are not mutually exclusive; they may co-exist, as parallels between networks and communities or coalitions exemplify (Sabatier, 1991b) for example. The important function of policy collectivities is that they strengthen the horizontal policy dimension and enhance wider actor participation and public involvement.

When talking about collectivities in the policy process, the discussion may also include the operation of policy sub-systems. The latter consist of those institutions and actors that are directly involved in the policy making process in a specialised policy area. It has been argued that the policy process does in fact operate through such partially segmented policy sub-systems (Kingdon, 1984; Sabatier, 1986; Jenkins-Smith *et al*, 1991). Empirical work has described how the development and execution of domestic policy in the United States and Western Europe involves numerous agencies and interest groups operating at all levels of government (Wildavsky, 1979; Mazmanian and Sabatier, 1989), so understanding the policy process requires the examination of these inter-governmental policy communities and sub-systems as well as the public-private partnerships, as relevant.

In sum, the importance of policy communities, networks and sub-systems rests with (i) the involvement of actors from numerous public and private institutions and from multiple levels of government and (ii) the substantive policy information that functions both tacitly and explicitly as knowledge within those structures. These characteristics are important for the thesis, the cornerstone of which concerns the role and value of policy networks in the case of Nicosia. Whilst keeping in mind the brief account on policy collectivities and policy sub-systems, an elaborate discussion on policy networks is provided in Chapter III along with the applicability in the Cypriot water sector.

The various forms of stakeholder activity, with and without the government, is inevitably facilitated and restrained by existing social structures. This duality of structure-agency entails linkages with the two dimensions of policy and the operation of policy

[53] For an examination of Cyprus using the lens of hydro-hegemony theory see Brouma, 2007

collectivities/networks, since the majority of policy activity - and water activity in particular - is placed within the social realm; thus, it will be briefly examined in order to shed further light on the policy networks' discussion of the following chapter.

STRUCTURE-AGENT DUALITY & STRUCTURATION

With a social science flavour, the interaction and contestation within the social realm can be further explored through the agent-structure conceptualisation. This topic is concerned with the interaction between individuals and society and the way the two may influence and determine each other. Giddens (1984) called for more emphasis to be placed on the active flow of social life: "*We should see social life not just as 'society' out there or just the product of 'the individual' here, but as a series of ongoing activities and practices that people carry on, which at the same time reproduce larger institutions*" (Giddens and Pierson, 1998: 76).

He further on elaborated this theoretical positioning through the concept of 'structuration', which he argues "*offers a conceptual framework scheme that allows one to understand both how actors are at the same time creators of social systems yet created by them*" (Giddens, 1979: 213). In other words, structuration may be understood as "*an ontological*[54] *framework... a conceptual investigation of the nature of human action, social institutions and the interrelations between action and institutions*" (Giddens, 1979: 201). The core of Giddens' theory concerns the rejection of the dualism between human action and the structure of society and instead, considers that structure is implicated in action "*as nothing more than the continuous series of actions through which it is both reproduced and transformed*" (Giddens, 1984: 297-304). Thus, human agency and structure form a duality – and not a dualism – and represent the two sides of a coin.

For the thesis, the value of structuration theory is in its recognition of the potential role of actors in (re)producing (and thus altering) social life through interaction among them and with the structure. In Cyprus, actors beyond the boundaries of legitimate authority have been the creators of a social reality – i.e. the bi-communal engagement on specific policy issues - that has contradicted the existing structure of political separation. And it has been sustained practice/action that has endowed this social reality with a semi-institutional status, one that could not be questioned or jeopardised by the structure (as seen by the endurance of this engagement for over 30 years).

[54] Ontology is a branch of philosophy concerned with the nature of being (Longman, 1984: 474)

For all the support that it has been afforded by scholars, structuration theory has also been the focus for critical voices (Hay, 1995; McAnulla, 2001; Archer, 1995 and 2003). The Cyprus case study points to the validity of several of these arguments. For example, the emphasis on "*conscious series of actions*" leaves little conceptual space for post-structuralist concerns with passion or desire as a driving force for action; on this point, Thrift (1996: 54-5) highlights the "*anaemic version of structure*" that characterises those instances in which networked action is not considered. This is manifested in the Cyprus case study where the initiation of bi-communal engagement sprang from a *desire*[55] for a joint and sustainable future development of the capital, while the initial individual activity was then largely supported by a *network of people*[56] who became progressively involved with the process. Another criticism of structuration concerns its weak, almost non-existent, understanding of culture that impoverishes post-modern considerations of structure-agent interaction (Gregory, 1994; Thrift, 1996; Mestrovic, 1998). As Chapters IV, VI and VII will imply, the cultural element appears often in policy developments and bi-communal interaction in Cyprus[57].

A line of criticism that questions structuration on analytical (and not on philosophical) grounds, and that is of relevance to the thesis, has been provided by Archer (1995; 2003). She argues critically about the *central conflation* where structure and agency are seen as being co-constitutive: i.e. structure is reproduced through agency which is simultaneously constrained and enabled by structure. Such situation precludes the possibility of sociological exploration of the relative influence of each aspect. Instead Archer (2003) puts forward analytical dualism leading to a *morphogenetic process*. While the interdependence of structure and agency is left intact (i.e. without people there would be no structures), the two are considered as operating on different timescales and can be therefore unpicked analytically. By isolating structural factors, it is possible to investigate how they shape the subsequent interactions of agents and how those interactions in turn reproduce or transform the initial context. Social processes consist of a series of such processes and as such, their separate investigation is possible. It is argued that through such process it is possible to give empirical accounts of how structural and agential phenomena interlink over time rather than merely stating their theoretical interdependence. The Cyprus case study could contribute empirically to this; agency (bi-communal interaction) has been functioning largely outside (and in opposition to) the structure. By isolating the action of the agency

[55] Emphasis added
[56] Emphasis added
[57] Further engagement with cultural and ideological parameters determining the success of a policy model (e.g. as seen in the case of irrigation management transfer in Mexico, Rap, 2006) might have been fruitful in the case of Cyprus; however, this would have diverted substantially the focus away from the core of the thesis' objectives and research question. Therefore, these elements are not elaborated upon further.

and understanding its context, the interplay with the structure can be then assessed *vis-a-vis* the selected policies (e.g. upgrading the joint wastewater treatment plant or advancing with the capital's rehabilitation).

Despite the critiques (some of which mentioned above), structuration seems to be a "*...pervasive and compelling attempt to move 'beyond' traditional dualistic thinking...and is expressed in a form which allows it to be open to a number of empirical applications*" (Layder, 1994: 9). If structuration is assumed for most social systems, then it could be safely claimed that structure frames action and action recreates structure (or in the context of *central conflation, as* in Archer's analysis). A serious question arises then on how far structure determines action and how 'free' action is, whether individual or collective. Are choices involved in this kind of action, or do the various alternatives solely derive from the established order of things? Within such a social frame what are the roles and potential of alternative modes of governance, such as networks or communities, and what difference can their enactment engender? Chapter VI addresses some of these questions through the empirical examination of specific policy themes. For example the structure's opting for desalination or water transfer will be recounted *vis-a-vis* social actors' opposing interventions. The role of networks in particular, will be examined in Chapter VII through the empirical analysis of forms of bi-communal engagement in Nicosia where the disregard of the structure's dictations will become more prominent.

A recurrent theme in the previous discussion, as well as in the examination of the two dimensions of public policy and policy communities, is the role of action, inaction and interaction with regard to the policy process. Given that the policy network's core is about action, a brief discussion on the issue of policy as action and the potential of collective action in the policy process follows next.

POLICY AS (COLLECTIVE) ACTION

As previously mentioned, public policy has two dimensions: the vertical, largely depending on the choices and actions of the decision-making authorities and the horizontal, which points more to the (inter)actions of participants who are external to the hierarchical governing authority. When putting the two dimensions together, public policy is about formal and informal choices, organised and unstructured actions, and rigid and flexible structures. It is conceived of as a continuing process of social action and interaction among a wide range of participants, with particular attention attributed to the way in which this (inter)action is patterned. This is linked to the discussion on

structuration where "*action involves intervention in events in the world, thus producing definite outcomes, with intended action being one category of an agent's doing or his refraining. Power as transformative capacity can then be taken to refer to agents' capabilities of reaching such outcomes*" (Giddens, 1979: 88).

Power (for action) is a central theme in the study of policy discourses, as it determines the way a problem - a discourse - is framed since "*policy arguments are framed by power relations*" (Parsons, 1995: 153). In the case of Cyprus, the applicability of the concept of power in bi-communal relations is obvious; the political and economic settings equip the South with comparative power *vis-à-vis* the North due to its international isolation and external financial dependence. However, in the thesis, power relations will not be examined as in conventional assessments of policy discourses in Cyprus, which always confront the impasse of the *de facto* separation and yet remain devoid of the potential for practical application. The thesis claims that task-specific and informal interaction –less loaded, both politically and in terms of power- seems, in this case, to offer practical solutions to problems of collective action.

Further, in terms of action and the capacity for action, the policy process involves the "*difficult task of constructing a basis for collective action among the participants who may have quite diverse views on the nature of the task*" (Colebatch, 2002: 4). This is, perhaps, one of the most challenging aspects of policy analysis as "*what is common to the greatest number has the least case bestowed upon it. Everyone thinks chiefly of his own, hardly at all of the common interest*" (Aristotle, 1995). Further on that, "*rational, self-interested individuals will not act to achieve their common or group interests*" (Olson, 1965: 2) because "*when a number of individuals have a common or a collective interest –when they share a single purpose or objective- individual unorganised action will not be able to advance that common interest at all…or adequately*" (ibid: 7).

A comprehensive analysis on issues of collective action over common pool resources (including water resources) is offered by Ostrom (1987; 1990; 1998; 1999). The main cases of collective action analysed concern cases of the 'tragedy of the commons', where traditional political theory seeks solutions either through the state (and increased centralised and/or bureaucratic control) or the market (through privatisation and forms of private sector participation) (Ostrom, 1990). In Cyprus neither state nor market intervention is operable because of the two communities' mutual political non-recognition. Therefore, there is a need to approach the issue of cross-'border' (collective) action differently in order to deal with the 'tragedy of the commons' (water

resources and wastewater treatment in this case). Policy networks and communities of practice may offer this potential, which will itself be analysed in detail in Chapter III.

In the thesis, action is primarily understood as bi-communal engagement rather than as the scholarly definitions' collective action. This is because collective action requires both some form of an institutional setting and the existence of some enforcement mechanism that may facilitate legal intervention. This is simply not possible in Cyprus due to the post-1974 political circumstances and the consequential deadlock. This reality regretfully also restrains the applicability of Ostrom's (1990) alternative institutional approach to governing the commons, where Cyprus could have offered a useful empirical case. Furthermore for Cyprus, it is the desire of individuals to sustain the island's development (rather than the power relations between the two sides) that seems to represent the driving force behind bi-communal action.

Moreover, action is important to this study because of the effect it has on the policy process. Bi-communal action and regular joint practice have not only led to alternative forms of water sector governance, but also to the social construction of policy as determined through the active involvement of actors and contrary to the dictations of the official structure. The social policy construction is briefly touched upon in the following sub-section.

SOCIAL CONSTRUCTIONISM (OF POLICY)

As previously discussed, policy does not exist in a vacuum; it is not formulated, decided upon and consequently implemented in isolation. Rather it falls within a multi-stakeholder governing social system. "*The concept of social system…refers to reproduced interdependence of action…*" (Giddens, 1979: 88) and society may be understood as "*a complex of recurrent practices which form institutions. Those practices depend upon the habits and forms of life which individuals adopt. Individuals don't just 'use' these in their activity but these life practices constitute what that activity is*" (Giddens and Pierson, 1998: 76-77).

So, further attention is needed towards the different aspects of individual actions as determinants of (and upon) the social system. To that end, the role of social practices and social interactions becomes profound. This aligns with one of the thesis' key hypotheses, according to which joint individual practices on issues of common interest have led, over time, to a shift in the system towards solid bi-communal forms of engagement. The post-modern and post-positivist conception of reality (and also

policy) as socially constructed, forms a central tenet of the thesis: "*the conception of knowledge as a mirror of reality is replaced by a conception of the 'social construction of reality', where the focus is on the interpretation and negotiation of the meaning of the social world...the multiplicity of meanings in local contexts; knowledge is perspectival, dependent on the viewpoint and values of the investigator*" (Kvale, 1996: 41). Rather than being objective, reality exists as a mental construct relative to those who hold it (Guba, 1990). It is important to note that given the social construction of policy, it cannot be value-free and because of the inclusion of the human element, "*policy analysis requires both art and craft. Analysis is imagination involving experiments in thought and creativity*" (Wildansky, 1979: 16-17). In retrospect, understanding policy becomes imperative if the 'art of governing' is to be mastered.

Following the same line of reasoning, policy is constructed and sustained by the participants within conditions of discursive interaction where different options and alternatives are available. The role of language, discourse and argument in the policy process, as expressed through practice and action, are therefore of particular interest. "*Cognitive and normative elements play an important role in how actors understand and explain the world...the goal [is one] of establishing the importance of the dynamics of the social construction of reality in the shaping of historically-specific and socially-legitimate frames and practices*" (Surel, 1998: 1). Such an understanding signals an argumentative turn in the study of policy analysis, which is in part derived from the broadly critical and mutually distinctive work of theorists such as Foucault and Habermas (Fischer and Forester, 1993).

Though of interest to the thesis, further elaboration will not be made upon the argumentative turn in policy analysis, other than to describe the implications it has on bi-communal interaction in Cyprus. Language plays an important but delicate role in any bi-communal activity, as demonstrated by the concerns that pertain to how representatives should address one another and how the affiliations should be carried by joint documents. Words carry political weight that may prove explosive if handled insensitively. This is especially true in Cyprus. Moreover, the language chosen for use in bi-communal communication (whether English, Greek or Turkish) is another significant topic. Older generations seem more willing to shift from one language to the other, as the interaction of the two Directors of the respective Sewage Boards demonstrated. By comparison, their younger peers tend to opt for the use of English as a 'neutral' means of communication.

The social constructivist understanding of policy is important in the Cyprus case study for two reasons. Firstly, the international isolation of the North and the consequential lack of bi-communal interaction since 1974 have blocked the common social construction of a (shared) reality for the South and the North. Therefore, any joint policy activity is based on obsolete perceptions that only succeed in maintaining the two sides' alienation. So, there is a need for the (re)construction of shared perceptions of reality. Secondly, and in parallel, the context in which the bi-communal engagement has occurred and continued has been socially constructed, in the face of political obstacles. Social constructivism intertwines with the horizontal dimension of policy and may strengthen the potential of alternative governing forms for the issues entailing collective action. The empirical evidence of the Cyprus case study firmly supports this idea.

3. CHAPTER EPILOGUE

Chapter II examined the policy analysis theoretical framework that the thesis employs in order to shed light on Cyprus' complex water-politics nexus. The scope has been binary: on the one hand to draw out of the theoretical lens some elements that are applicable for the examination of the case study; on the other, to highlight the difficulty in approaching through one single framework the research question on forms of bi-communal engagement on water in the case of Cyprus.

Policy is largely concerned with making organised activity stable and predictable, reducing the complexity of governing and the uncertainty of an increasingly risky world. Creating this predictability becomes even more challenging when considering the multi-layered and multi-faced interaction of the various participants in any policy activity. Tackling this challenge seems to be dependent upon negotiation rather than the provision of a simple decision. These negotiations tend to focus less on alternative choices than they do on the common ground on which parties may converge and act. The literature on the topic covers conceptual frameworks including networks, power alliances or communities; each attempts to provide an answer to the question: What makes for collective action and how can it be initiated and reinforced? Besides setting the objectives for an activity, policy may simply designate the standardisation of practice and this captures well the argument of the thesis. Indeed, it is claimed here that communities of practice have given rise to policy networks in Nicosia, which over time have spilled over beyond the water services to cover urban planning issues.

Water analysis stands to benefit greatly from policy analysis because of its inclination to disrupt disciplinary boundaries and seek dynamic and reflexive approaches when tackling complex policy issues. Water management is precisely such an issue and this basis in policy analysis offers flexibility and adaptability at both theoretical and practical levels and responds to the post-positivism's interrogation of conventional disciplinary frameworks. Concurrently, alternative governing structures (e.g. policy networks) may foster the potency of policy analysis in areas that have not been fully scrutinised, for example policy sub-systems/policy collectivities. Such models denote a challenge to the rigidity of hierarchical structures and the ambivalent social responsiveness of the market; the thesis aspires to develop further enquiry in this area through its empirical component (the case study).

With particular reference to water resources management, elements of policy analysis (viewed through the post-positivist and social constructivist understanding of water policy networks) offer an additional benefit: they reinstate the centrality of politics in the water discourse through enhanced actor interaction. By acknowledging social action (and re-action or non-action, including through informal models) and politics as facets that must not be avoided at all costs– and that do indeed represent an inherent part of the actual activity - policy networks support a notion of dynamic interaction that thus far appears limited or inadequately elaborated in policy studies literature. To this direction, the case study aims to provide favourable arguments through empirical evidence.

The main research question of the thesis, on the existence and operation of bi-communal water policy networks in Nicosia, has much to benefit from the selected theoretical elements discussed above. At the same time, empirical evidence from the case study may assist in furthering some aspects of policy analysis, for example through the strengthened role and involvement of multiple actors or the emergence and functioning of alternative governing forms for water. The table below summarises the key points from each policy element employed for the purposes of the thesis, along with an epigrammatic reference to their value for the thesis.

Table 2: Key elements of policy analysis & relevance to the thesis

Element of Policy Analysis	Key features	Value for thesis
Analysis of/for policy	- Policy process *versus* policy content - theory *versus* practice	- Research question stemmed from policy process/theory – empirical analysis focuses on policy content/practice
	- Policy process as a stagist model	- Rational, easy-to-handle, useful as entry point
	- Incremental aspect of policy process	- Flexible and responsive to complex political situations (i.e. Cyprus)
	- Use of multiple models/approaches	- Reflexive and dynamic, the thesis employs different approaches that serve concrete needs
Policy and public policy	- Water policy within public policy (water as a social good)	- Water in Cyprus is constitutionally placed in the hands of the Government, hence, water is a public policy issue
	- Public policy accounts for both action and inaction	- Useful for explaining the situation in Cyprus
	- Inter/cross-disciplinarity	- Fundamental for water analysis, especially for holistic and integrated approaches
	- Association of public policy and governmental conducts: policy as vehicle for control and vehicle for contesting the existing order	- Cyprus offers an example for both through government policy and through conscious and aware collective action
Two dimensions of policy	- Vertical dimension: hierarchical	- Structures action; facilitates the acceptance of outcomes; useful for framing the official policy stand in Cyprus
	- Horizontal dimension: structured interaction among multiplicity of actors outside hierarchy; stakeholder involvement	- Frames structured interaction among multiple actors; ensures stakeholder involvement; flexible for politically contested settings (i.e. Cyprus); offers flexibility in politically contested settings; responds to the empirical findings on bi-communal engagement on water The thesis emphasises/focuses on actor interaction outside the structure through its empirical analysis
Policy collectivities/ sub-systems	- Collectivities: strengthen the horizontal dimension – actor participation and public	- Useful for viewing stakeholder engagement around the water policy-making process in Cyprus

	involvement - Sub-systems: strengthen the involvement of actors already in the policy-making process	 - Offers insights on the involvement of actors within the water policy-making process in Cyprus Both strengthen the role of actor action and interaction that is central to the thesis
Structure-agent duality / structuration	- How individuals and society influence and determine each other - How actors are creators of social systems and at the same time are created by them - Recognises the potential role of knowledgeable actors in (re)producing social life	- This is at the core of the research question – to what extent structure determines action and *vice versa* - Valuable for the empirical analysis and particularly of the situation in Nicosia - This is the core of the research question on bi-communal engagement in the island These aspects again strengthen the role of actor engagement and interaction
Policy as (collective) action	- A continuing process of social action and interaction among a wide range of participants	- The issue is at the core of the research question, although some adaptation is needed for Cyprus due to the lack of formal institutional structure at cross-communal level; empirical evidence stresses the existence of collective action despite the *de facto* division
Social constructionism of policy	- Policy as part of a social system of multi-stakeholder governing - Role of social practices/interactions as determinants of the social system - Argumentative turn in policy analysis	- This is at the core of the research question - Again this is at the core of the thesis' research question - The role of language (as means of communication and also as entailing political connotations) Again this strengthens the role of actor interaction and the emergence of alternative governance structures

As seen, policy analysis is a multi-faced task when striving to illustrate the complexity of governing. Adding further to this challenge, the application of this theoretical model on Cyprus faces the geopolitical particularities of the island. The post-1974 *de facto* division has become the centrepiece of Cypriot life and efforts have been directed, relentlessly, towards either its legitimisation or deconstruction (with some examples also pointing towards the two directions at the same time). Separating research on Cyprus from its political question would produce poorly grounded results, de-touched from the island's context and so, working within this reality seems both necessary and constructive.

As mentioned, the strive for applicable theoretical foundation has been most challenging due to these particularities; a jigsaw-like approach comprising different elements (consisting primarily of policy analysis enhanced with selected social theory considerations) has been opted for instead and is complemented by a set of additional approaches in the form of analytical frameworks. These frameworks are analysed separately in the following chapter.

CHAPTER III
On Analytical Frameworks

1. INTRODUCTION

This chapter discusses the analytical frameworks used in the examination of the Cyprus case study. An analytical framework does not constitute a theory *per se*, although it may still involve conceptual elements to an extent that means it may resemble a theory. Its main purpose is to seek ways in which theories can be utilised in relation to specific case studies and ways to respond to specific research questions. In other words, an analytical framework provides the context within which the analysis of a case study may take place. In the thesis two analytical frameworks have been selected for this purpose: policy networks (as a manifestation of informal governance) and communities of practice (as a regular operationalisation of tacit knowledge and know-how).

It is reminded that the thesis' research question examines whether bi-communal cooperation exists over water in Cyprus and, if so, what form it takes. The thesis' starting point, based on informed evidence, is that joint practice in the sewage treatment sector has led to relatively stable and regular interaction between the two communities. The thesis claims that this form of engagement has led to the formulation of dynamic and enduring cooperation clusters. Depending on their focus and policy impact, these clusters may be viewed either as communities of practice or as policy networks.

This in mind, Chapter III is structured in three parts. First, an analysis of the policy network framework is carried out explaining also why they fall within the domain of policy activity. Given that their understanding can be enhanced by elements of the governance framework, the second section makes reference to this latter concept, special attention attributed to water governance and its ramifications. Before a summary and some conclusions, communities of practice (with selected references to the concept of knowledge and knowledge management) are discussed.

2. ON POLICY NETWORKS[58]

This section considers the policy networks' analytical framework (as a particular form of policy activity) and argues that they represent an alternative/unconventional form of governance, applicable to the study of the water sector. Initially, the development and relevance of policy networks to policy analysis is provided. The section then considers definitions and provides conceptual explanations in order to develop the understanding of the framework. The similarities and points of difference between policy networks and other types of policy collectivities are presented next, while seeking to justify the decision not to consider these forms further in the thesis. An examination of the two main schools of thought on policy networks follows, after which the particular advantages and shortcomings of policy network analysis are elaborated. The section closes with a summary and a few conclusions.

HOW HAVE POLICY NETWORKS EMERGED

Over the last thirty years a significant body of literature has come forward refining network-based models of policy making and implementation. The term, 'policy networks' emerged in the social sciences in the 1940s and 1950s in order to analyse and map personal relationships, inter-connectedness and dependencies (Parsons, 1995: 184). Its qualities of fluidity and realistic analysis of multi-level human interaction triggered interest in political science and out of theoretical debates in the 1970s and 1980s, network constructions on the nature of governance and the properties of state-civil society relations developed (Rhodes, 1990). Since the early 1990s, the network debate has come to revolve around the governing system of the European Union and the consequences for member states' sense of sovereignty (Jordan A., 2001; Jordan A. *et al*, 2004; Kassim, 1994; Bulmer, 1994; Kohler-Koch, 1996; Grande, 1996; Falkner *et al*, 1999; Aspinwall and Schneider, 2000).

Indeed, policy networks have become "*an appropriate metaphor for responding to a number of empirical observations with respect to critical changes in the political governance of modern democracies*" (Kenis and Schneider, 1991: 34). More specifically, the ongoing discussion on networks seems to have sprung from two debates: (a) the welfare state crisis, the main policy direction appearing to dictate more market involvement and less government participation, and (b) the discourse on

[58] Parts of this section, along with selected parts of the empirical analysis of Chapter VII, have been published in Brouma and Ezel (2011).

environmental challenges that has prescribed wider and more inclusive social participation.

Both have encouraged social openness and increased interaction between sets of well-established and newer actors. This is also visible through the appearance and (inter-) activity of various policy collectivities[59]. At the same time a shift has taken place according to which public administration is increasingly viewed as a form of public management (Parsons, 1995). One of the approaches to policy-making in the 1980s and 1990s included attempts to break away from the Eastonian black box[60] and the iron triangle[61] (Parsons, 1995; Cerny, 2001) and formulate models dependent on the new metaphors of policy 'networks' and 'communities' (Sabatier 1991; Marin and Mayntz 1991; Bressers *et al* 1994). Moreover, a renewed focus on institutions[62] (Aspinwall and Schneider, 2000), principally through the use of neo-institutional theory (March and Olsen, 1984), has fostered an interest in the linkage between network analysis and institutions (Falkner *et al*, 1999; Standifird, 2001).

The welfare state crisis has also opened up the discussion for enhanced private sector involvement with a range of in-between models of public-private-partnerships (Hoering, 2002; OECD, 2003; OECD 2009a; OECD 2009b; EIB, 2010). This is of particular relevance to the water sector. The environmental movement has offered a 'window of opportunity'[63] for water-related issues to come to the foreground and an opportunity for them to acquire a prominent position within the global agenda. Both debates are relevant to Cyprus because its Constitution (1960) places water resource management into state hands, which makes the involvement of other actors—particularly civil society and environmental organisations—challenging. Nonetheless, private sector involvement has increased since the mid 1990s, a consequence of the official policy towards desalination and the re-use of treated wastewater. Through these issues the environmental discourse has steadily gained ground in the Cypriot policy arena[64].

[59] For example the formalisation of theme-specific civil forums (especially within the EU framework), active intervention of civil groups in public debates, establishment of numerous consultation platforms, universities' networks on specific topics, etc.
[60] See Chapter II.
[61] Here, emphasis is placed on the interaction among interest groups, bureaucracies and elected politicians.
[62] Institutions are defined as 'a set of working rules that are used to determine who is eligible to make decisions in some arena, what actions are allowed or constrained, what aggregation rules will be used, what procedures must be followed, what information must or must not be provided, and what payoffs will be assigned to individuals dependent on their actions' (Ostrom, 1998: 51).
[63] The concept was introduced by Kingdon (1984)
[64] As discussed in in Chapter VI.

WHAT IS A POLICY NETWORK?

"*…the development of horizontal, co-ordinating governance is not an isolated phenomenon, but a central expression of social modernisation where functional sub-systems become highly differentiated…this is why the notion of policy networks signals a real change in the structure of the polity*…"

Mayntz (quoted in Coleman and Perl, 1999: 693)

In complex socio-political environments the strength of policy network analysis is said to be in its provision of a metaphor, which "*fits with the technological and sociological changes of [post][65] modern society*" (Parsons, 1995: 185). At the same time, the nature of the network structure defuses the problems of coordination that are typical of (post-) modern societies. Due to the frequent use of the concept, the term network seems to have become "*the new paradigm for the architecture of complexity*" (Kenis and Schneider, 1991: 25).

Most network analyses revolve around the idea that a policy is framed within a context of relationships and interdependencies, the latter having been identified in the 1970s as a key dynamic of international economic and political relationships (Coleman and Perl, 1999: 692). A policy network can be understood as "*a cluster or a complex of organisations connected to each other by resource dependencies and distinguished from other clusters or complexes by breaks in the structure of resource dependencies*" (Benson, 1982; also in Parsons, 1995: 186, 484). It includes identifiable and policy-concerned actors, both public and private, who depend on one another for resources such as information, expertise, access and legitimacy; "m*ost networks, form around functions (implementation, regulation) and/or specific policy sectors (agriculture, environment)*" (Bomberg, 1998: 167).

The resource dependency argument is valid for Cyprus; both the South and the North depend on the island's scarce water resources and are therefore locked together in an interdependency cluster, their fervent denials notwithstanding. Both sides' attempts to become water secure through, for example, the construction of desalination plants, does not fundamentally alter this interdependency because there still exists a thorough reliance on groundwater and non-perennial surface water. Moreover, the two sides' interdependence with respect to wastewater treatment in the capital is most tangible.

[65] Prefix added to reflect the thesis' line of argument.

Another attempt to define policy networks, with an emphasis placed on the actors' interaction, points to:

"*a set of relatively stable relationships which are of non-hierarchical and interdependent nature linking a variety of actors, who share common interests with regard to a policy and who exchange resources to pursue these shared interests acknowledging that co-operation is the best way to achieve common goals*" (Borzel, 1998: 254).

This understanding seems to describe the situation in Cyprus well, and is therefore one privileged in the thesis.

In their analysis of sectoral policy networks in advanced capitalist economies, Atkinson and Coleman (1989) afford greater attention to specific bureaucratic arrangements in addition to the relationships that officials maintain with key societal actors. Indeed, these "*actors, in company with bureaucratic agencies, form the core of policy networks at the sectoral level*" (ibid: 50).

Additionally, in a special edition of *Environmental Politics* (1994) dedicated to water policy networks, these are described as: "*the large class of multi-actor arrangements of interdependence in these varied phases of the policy process*" (Bressers *et al*, 1994: 5).

With this in mind, the policy network concept is used "*in a generic sense to encompass the variety of structures of interdependence, sometimes only vaguely, in the burgeoning scholarship*" (ibid). This understanding of policy network seems also to fit nicely in the context of Cyprus, and is thus, used as a key reference point.

In their work on the causes and effects of globalisation and the functioning of internationalised policy domains, Coleman and Perl (1999: 695) use "*policy community when referring to the participants in the governance structure and the degree and patterns of integration among them*", while "*policy network . . . serve[s] to characterise differences in the manner in which public power is shared by members of the policy community*". In a similar context, regarding the actor power-sharing element, van Waarden (1992) argues that policy networks are better understood as the different patterns of public-private relationships that are the result of the sharing and distribution of the state's decision enforcement authority among community members. These relationships provide the context for policy deliberations; further work elaborates on this

and similar understandings of policy networks (Coleman and Skogstad, 1990; Atkinson and Coleman, 1992).

Coleman and Perl's (1999) conception of policy networks is of particular interest for work on Cyprus because the island's water domain represents one aspect of an internationalised polity. Since independence in 1960 the island has embarked upon a trajectory of economic and social modernisation that is firmly entrenched within the overarching dynamics of globalisation. This has come about due to the internationalisation of Cyprus' post-1974 political question through United Nations resolutions as well as efforts of individual states. Additionally, Cyprus' EU accession (in May 2004) has placed its water domain within the wider umbrella of EU Water Policy, particularly with respect to the requirements of the Water Framework Directive.

Drawing again upon Coleman and Perl's (1999) analysis, it could be argued that policy networks embody the globalisation trend in policy analysis. For Cyprus in particular, that would also include the island's Europeanisation trajectory, both before and after the EU accession; there is an expanding body of scholarly work that considers the influence of the EU upon national policy activity (Richardson, 1994; Borzel, 1997; Conzelmann, 1998; Falkner *et al*, 1999; Richardson, 2000; Hooghe and Marks, 2001; Jordan A., 2001). However, the policy community-policy network distinction that Coleman and Perl (1999) favour, appears too definite on differentiating the interaction among actors from the various types of power sharing patterns. For the thesis, policy networks are favoured because they may soften this determinism, and defuse potential frictions by facilitating interaction between actors and the power sharing structure.

Besides, this is the context within which the policy networks concept—as an alternative expression of governance—is being developed. According to this approach:

> "*policy networks are webs of relatively stable and ongoing relationships which mobilise and pool dispersed resources so that collective (or parallel) action can be orchestrated towards the solution of a common policy*" (Kenis and Scheider, 1991: 36).

Furthermore, these networks:

> "*…are characterised by predominantly informal interactions between public and private actors with distinctive but interdependent interests, who strive to solve problems of collective action on a central, non-hierarchical level*" (ibid).

Before delving into the discussion on policy networks as forms of governance, the different formation types that the term 'network' encompasses, and how networks may be applied in Cyprus are considered.

FROM ISSUE NETWORKS TO POLICY COMMUNITIES

Policy networks are often treated in a generic sense, the term taken to incorporate various policy sub-system formations that exhibit different levels of coherence and integration. Marsh and Rhodes' (1992) illustrate the continuum of network types through a typology based on four dimensions: membership, integration, resources and power. Issue networks exist at one end of the continuum; at the other are policy communities, with professional networks, inter-governmental networks and producer networks between them (also Rhodes, 1990). Issue networks are looser and semi-stable configurations, their non-exclusive membership policies demonstrating low levels of integration. They are comprised of a large number of participants who constantly move in and out of such networks, making it "*almost impossible to say where a network leaves off and its environment begins*" (Heclo, 1978: 102 cited in Falkner *et al*, 1999: 497). Issue networks are characterised by fluctuating patterns of actor interaction, inequalities of resources and power, the absence of consensus and the logic of a zero-sum game (Marsh, 1998: 14-16).

Policy communities, on the other hand, refer to highly integrated formations that display membership exclusivity and the tight coherence of members' interests. They involve a limited number of actors who, among them, develop stable and close relationships. Actors share values and broad policy preferences and are linked through resource interdependency and exchange (Falkner *et al*, 1999). The power distribution is balanced, although it is "*not necessarily one in which all members equally benefit but one in which all members see themselves involved in a positive-sum game*" (Marsh, 1998: 14).

In the Cypriot context, the different types along the continuum are not so easily distinguished. Although the existing networks began as issue networks, based primarily on practice and interdependence (on the theme of wastewater treatment in the capital), over time they have evolved into more integrated constructions. However, this has occurred without observing the policy community classification.

With respect to tight policy communities that influence policy, the advocacy coalition model has been developed. An epigrammatic presentation of the model follows, along with the reasons for not applying it to Cyprus.

ADVOCACY COALITIONS: WHY NOT A MODEL FOR CYPRUS

Advocacy coalitions feature prominently among policy sub-systems (see Sabatier 1986, 1988, 1991, 1998; Sabatier and Jenkins-Smith, 1993). The model offers an alternative to the stagist approach to policy by "*bringing together a number of approaches and frameworks into a 'better' theory, which may serve to predict policy change*" (Parsons, 1995: 195). Advocacy coalitions are made up of individuals from different private or public organisations or institutions that share a particular belief system and who, through their coordinated action, seek to actively influence policy decisions and implementation (Sabatier, 1998).

The actors in an advocacy coalition share "*a set of basic values, causal assumptions and problem perceptions and show a non-trivial degree of co-ordinated activity over time*" (Sabatier, 1988: 139). "*Beliefs are the 'glue' that hold coalitions together*" (Lopez-Gunn, 2003: 34). Therefore, advocacy coalitions create "*spaces of meaning within the policy community that provide a framework for political action*" (Sabatier, 1993: 25). Sabatier asserts that "*the impact of public opinion is, at best, modest*" (1991b: 148) and that understanding policy change requires a focus on elite opinion and the factors that induce its shifts over a relatively long period of time (7 to 10 years) (Sabatier, 1993: 19-20).

Despite the use of the advocacy coalition framework in empirical water-related analyses (Munro, 1993; Sabatier and Zafonte, 1995; Ellison, 1998; Lopez-Gunn, 2003; Bukowski, 2005) it is not considered appropriate for the examination of the Cyprus case study for the following reasons[66]:

- In Cyprus, the existing policy formations more closely resemble networks because of their loose integration and volatility (as a result of the political question).
- These formations do not interact with one another; rather, the interaction takes place within each individual structure due to the special socio-political situation of the island[67].

[66] Further, evidence-based justification is provided though the empirical analysis.
[67] Interaction takes place within the wastewater policy network or the old city rehabilitation policy network.

- In Cyprus, policy brokers—who in Sabatier's analysis play an important role—are external, rather than internal, to the sub-systems (in this case they mostly concern super-structures like the UN and the EU).
- Belief is not the only element that holds the Cyprus sub-systems together. The thesis claims that practice and knowledge (primarily about interpersonal relations), held tacitly, gave rise to policy networks and that they have been sustained over time by resource interdependency, common practice and force of habit. Given the island's complex politico-security situation, any further evolution in the direction of policy communities would appear to be a remote likelihood.
- In advocacy coalitions collective action is based on ideas rather than interests. In Cyprus sub-systems collective action is largely based on common interests. The segregation of the two island communities inhibits the further development of common ideas and their translation into policies, even where and when they do exist.
- Public opinion in Cyprus influences policies due, particularly, to its limited geographical scale. Elite opinion, although respected, is frequently overshadowed and usually sidelined as a result of the island's political question.
- Finally, given the number of actors involved in Cyprus' policy sub-systems, their diversity and varied modes of interaction, it seems that the situation would be better examined through the policy networks lens. This permits flexibility: between issue networks and policy communities there are a host of available forms.

Therefore, the thesis focuses on policy networks and the role that they play in policy activity. This may take two forms: considered narrowly as a model of state-society relations (in a given issue area) or, more widely, as forms of governance. It is this distinction that is discussed next.

POLICY NETWORKS' RATIONALE: TWO SCHOOLS OF THOUGHT

While there has been "*no agreement on whether policy networks constitute a mere metaphor, a method, an analytical tool or a proper theory*" (Borzel, 1998: 253) there are two schools of thought that have explicitly considered policy networks in the scholarly literature: the Anglo-Saxon and the German-Dutch.

To the Anglo-Saxon School, also referred to as the interest intermediation school, policy networks are perceived as a model of state-society relations around a specific

policy issue area. This understanding developed after the conceptual impasse encountered with the pluralism-corporatism dichotomy of the 1970s (Jordan and Schubert, 1992). Policy networks are thus, seen as power (inter)dependency relationships between government and interest groups, in which resources are exchanged (Jordan G., 1990; van Waarden, 1992; Marsh and Rhodes, 1992; Marsh and Smith, 2000). This approach has been applied to the study of sectoral policy-making in various cases[68].

It is viewed, mainly, as an analytical tool, or as a model for examining institutionalised exchange relations between the state and civil society organisations and/or the private sector. The basic assumption of the Anglo-Saxon school is that the existence of policy networks (a) reflects the relative status or power of particular interests in a policy area and (b) influences, although does not determine, policy outcomes (Borzel, 1998: 258). Similarly, it is argued (Bressers & O'Toole, 1994) that no systematic hypotheses exist to link the nature of a policy network with the character and outcome of the policy process. By contrast, the argument for a 'dialectical approach' in the study of policy networks is put forward (Marsh & Smith, 2000), illustrating the interactive relationship between networks and policy outcomes while exhibiting some theory-producing attributes[69].

Much of the policy network literature is aligned with the interest intermediation school. Its focus is a narrow one, generating a fragmented study of the policy activity, coupled with a generic use for any interest group relations. This understanding of policy networks responds to the conditions that characterise Cyprus' environmental policy and, in particular, the relationship between the government and the environmental movement (whether as a political party or as a civil society manifestation). But interest intermediation, which captures the main elements of environmental policy in Cyprus (power dependency, resource exchange, the primary role of interests) does not account for the governance-related elements and actor interaction that characterise the Cypriot water policy-making. This is particularly true for Nicosia because it overlooks the potential of networks to mould policies. It is argued that this aspect is better explained through analysis of policy networks as alternative forms of governance.

For the German-Dutch School policy networks reflect the changed relationship of state and society. Policy-making now involves both public and private actors, a development

[68] For examples on environmental policy see Falkner *et al* (1999) and Jordan A. *et al* (2004), for industrial pollution policy see Smith (2000), for government-industry relations see Wilks and Wright (1987), for industrial policy see Atkinson and Coleman (1989) and for agricultural policy (in Britain) see Marsh and Smith (2000).

[69] A brief analysis of this point is included in the network theory debate in the next sub-section.

that has "*signall[ed] a real change in the structure of the polity*" (Mayntz, cited in Borzel, 1998: 260). According to the Max-Planck-School[70], modern societies are characterised by functional differentiation and partly autonomous societal subsystems. In complex (post-)modern political economies no single actor possesses all the necessary resources to effectively deal with the rapidly-growing number of policy issues that lead to political overload and 'governance under pressure' (Jordan and Richardson, 1983). Hierarchical coordination and the de-regulatory problems of market failures are also relevant in this sense (Kooiman, 1993).

According to this second school, policy networks, with their ongoing evolutionary character and ability to incorporate diverse actors into stable webs, offer a plausible solution to the coordination problems typical of modern societies. They represent an alternative[71] to hierarchy or the market and a promising arena for the efficient horizontal coordination of the interests and actions of public and private actors who are mutually dependent upon each other's resources (Kenis and Schneider, 1991). In addition, policy networks can overcome the bargaining dilemma of hierarchy or the market; within them negotiations are based on actors' communication and trust, the aim being to achieve joint outcomes (Borzel, 1998) rather than the maintenance or reshaping of power constellations. Furthermore, through their semi-informal structure policy networks are able to encourage additional informal linkages among actors.

In sum, policy networks are considered to represent a particular and steadily growing form of governance in modern political systems (Kenis and Schneider, 1991; Kooiman, 1993; Rhodes, 1996; Rhodes, 1997). In the thesis it is argued that the Cyprus case study fits this governance-related understanding of policy networks because of the disposition and functioning of bi-communal engagement in Nicosia. The next sub-section outlines both the particular qualities of policy network analysis along with criticisms that have been levelled at it.

TOOL, MODEL OR THEORY? QUALITIES & SHORTCOMINGS

What makes networks different from other concepts of actor interaction is that, in order that they may function, they are based heavily on communication and trust. This means that measure of shared views, values and beliefs—or at least a common ground for understanding—must be presupposed. "...*in this language the policy network is a*

[70] This name was selected because most of the scholars are, or were, affiliated to the Max-Planck-Institut für Gesellschaftsforschung (MPIGF) in Cologne, Germany (Borzel, 1998: 260).
[71] The term 'alternative' is used to indicate that networks are alternative forms of state-society relations, distinct from both pluralism and corporatism (Jordan and Schubert, 1992; Marsh and Rhodes, 1992).

statement of shared interests in a policy problem: a policy community exists where there are effective shared community views on the problem. ***Where there are no such shared views no community exists***" (Jordan G. 1990: 327, emphasis in original). Therefore it is surprising that, in the literature (Richardson, 2000; Dowding 1995), the concept is often critiqued for its supposedly inadequate reference to the role of shared knowledge, ideas, beliefs and values. The network idea is often juxtaposed with the advocacy coalition framework (Sabatier, 1991a; 1991b; 1998). Enabling action based on communication and mutual trust within a structure is what distinguishes policy networks from other forms of non-hierarchical coordination and, moreover, makes them more efficient. The network concept would perhaps benefit significantly from the actor-oriented, value-centred, policy-shaping approach that advocacy coalitions employ, but so far, a joint analysis of the concepts has not been adequately made. The thesis draws substantially on the role of knowledge, ideas and values in the case study analysis and will therefore work towards redressing this shortcoming through the provision of empirical evidence.

Another network characteristic is the non-obligatory nature of actors' participation; networks are informal institutional constructions, based on voluntary and intentional involvement. The underlying purpose of a network is to minimise transaction costs, ensure information sharing/exchange and as such facilitate policy-making and implementation. The boundary rules of network formations is a point that needs special attention: overly restrictive membership may turn networks into tighter structures like policy communities or advocacy coalitions; looser boundary rules may result in the transformation of a network toward looser structures such as issue networks.

The risk of a network acquiring a semi-institutional status and thus, becoming rigid and inflexible is real enough (Richardson, 2000) and may reduce its flexibility for action if specific rules and norms need to be applied. A response to the risk of institutionalisation may be provided from the non-hierarchical nature of the network: "*it is the absence of hierarchy which gives networks their flexibility, their capacity to expand and contract in response to changing environments and the potential to adapt*" (Stein *et al*, 2001: 5).

Although policy networks may, at times, resist change (Lehmbruch, 1991)—and especially in situations in which vested interests are influential—knowledge is a powerful agent for change because it is "*an independent and highly significant variable in the investigation of the policy process*" (Radaelli, 1995: 161). New technologies, and particularly the transfer of knowledge and policy experience, offer the means by which

change may be promoted in otherwise resistant environments. The EU WFD may also be considered as a change agent since its requirements are binding upon member states and therefore compulsory and non-negotiable[72]. For Cyprus particularly, the EU directives represent the most efficient way of enforcing change in the water sector and current developments bear this out[73].

Another strand of the critique focuses on the limited potential of policy networks to develop or evolve into a theoretical framework. Dowding (1995) claims that the concept represents a mere metaphor, has reached the limits of its usefulness and is likely to inhibit theory development. On this view, actors themselves have been afforded too little attention although they constitute more important analytical targets (ibid). Another element of the critique (Parsons, 1995: 185) also understands a weakness of the metaphor itself, and argues that networks are highly diverse in their use and interpretation.

Coleman and Perl (1999) disagree with Dowding's (1995) critique. They argue that the frequent use of the policy network model, its openness to several explanatory theories and the encouraging results in advancing explanations for policy outcomes and policy change, are elements that "*should cause us to remain aware of its potential*" (Coleman and Perl 1999: 694). Indeed, it has been argued in defence of policy networks that "*they have permitted political scientists to move beyond considering state-society relations through the prism of pluralism or corporatism*" (van Waarden, 1992: 30). From this perspective it is possible to agree with Coleman and Perl (1999) that the theoretical differences among policy network types have been shown to explain variations in policy processes and outcomes[74]. Indeed, it may be argued from here that "*network analysis is no theory in stricto sensu, but rather a toolbox for describing and measuring regional configurations and their structural characteristics*" (Kenis and Schneider, 1991: 44).

In order to equip policy networks with the qualities of a theoretical framework, Marsh and Smith (2000; 2001) developed a 'dialectical approach' to network analysis[75]. Although placed firmly within the Anglo-Saxon tradition, Marsh and Smith (2000) move beyond its analytical borders to argue that there is a dialectical relationship between

[72] For information on the Water Framework Directive and the harmonisation process for the member states see: http://forum.europa.eu.int/Public/irc/env/wfd/library
[73] See Chapter V
[74] This is the case because policy networks are better understood as different patterns of public-private relationships that result from the sharing and distribution of the state's decision enforcement authority among community members. These relationships provide the context for policy deliberations (van Waarden, 1992).
[75] Dialectic is understood as "*development through the stages of thesis, antithesis and synthesis*" or as a "*systematic reasoning, exposition or argument that juxtaposes opposed or contradictory ideas and usually seeks to resolve their conflict*" or as "*the dialectical tension or opposition between two interacting forces or elements*" (Longman Dictionary, 1984: 188).

policy networks and policy outcomes that may assist networks to evolve beyond their interest intermediation function. Their analysis focuses on the interactive relationship between structure and agency with the aim of developing a theory that will provide an explanation of policy continuity and change within policy networks (ibid). For these authors, networks reflect "*the structuration of past power distributions and conflicts and present organisational power and political outcomes. By examining networks we are looking at the institutionalisation of power relations both within the network and within the broader socio-economic and political context...*" (Marsh and Smith, 2000: 6). This network approach, also embraced by the thesis, softens the structure-agent tension as it offers an alternative to the duality's impasse by focusing on both actor-actor and actor-structure interaction.

However, Marsh and Smith's dialectical approach to policy networks has received intense criticism of its own (Dowding, 2001; Evans, 2001; Raab, 2001). Nonetheless one critic (Evans, 2001) works to further develop the dialectical framework by drawing upon different dimensions of dialectical analysis (see Benson, 1977, 1982, cited in Evans, 2001: 544). Evans (2001: 546) stresses the vital need to incorporate the concept of governance into network analysis:

> "*governance must be conceptualised as a concrete total phenomenon that exists beyond the state and attention paid to the intricate ways in which its components are tied together through the intricate interplay between form and content, between structure and process, and the like*".

This point is adopted as part of the thesis' core argument and it is to this that the next chapter section turns.

Possibly the most important shortcoming of policy networks is a lack of democratic control, a consequence of their nature as a set of informal interactions at a non-hierarchical level (Borzel, 1998; Richardson, 2000). This lack has highlighted a purported deficiency of legitimacy and the answer to this question is still being debated. A potential solution may be derived through the use of policy network analysis in combination with institutional theory, in which institutions are conceived of as regulatory structures that provide opportunities and impose constraints upon rational actors that seek to maximise their preferences (March and Olsen, 1984; Ostrom, 1987, 1998). The use of institutional theory may appear as bringing back the discussion to the semi-institutionalisation of networks (as discussed above); this is not the case, as the added value lies with options for addressing collective action. One major function of

institutions is to overcome collective action problems by constraining egoistic and opportunistic behaviour (Ostrom, 1999).

Networks may be conceptualised as informal institutions; as non-formally organised, reciprocal, relatively permanent relations and forms of interaction between actors who strive to realise common gains. In this sense networks are based on agreed rules for the production of common outcomes and this means that the legitimacy deficiency gap may be bridged. Respect for the rules is ensured through the long-term functioning of the network, as actors learn to observe them. But moreover, and as the thesis argues, the democratic deficiency of the policy network may be surpassed through the concept of *'legitimacy through action'*[76]. Indeed, the functionality and sustainability of a framework may be established through assessments of its practice and this is the case with bi-communal interaction in Nicosia: the actors have continued to function within the framework that was agreed and initially set up in 1978 (and so for more than 30 years).

SECTION SUMMARY

The foregoing analysis has illustrated a variety of existing and still-developing policy network conceptualisations. All of the definitions, and attempts at definition, have added something novel to the understanding of the term and so perhaps a better and more comprehensive insight may be provided if elements of the various approaches are combined. Therefore, for the thesis, policy networks constitute metaphors that fit the needs of (post-) modern societies; they encompass resource interdependencies among multi-actor arrangements; they comprise the interaction of actors that share common interests and common goals; they represent expressions of an internationalised (and europeanised) policy domain; and they demonstrate the sharing patterns of public power and authority.

In conjunction with the understandings of networks, two schools of thought have developed around the concept: the Anglo-Saxon considers policy networks as interest intermediation structures; the German-Dutch school perceives them as an alternative form of governance. With their non-hierarchical structure and the emphasis on horizontal actor interaction, networks enhance the horizontal dimension of policy and present themselves as a less conventional governing system for reflexive political

[76] The concept of 'legitimacy through action' is gratefully borrowed from a conference speech given by Javier Solana, EU High Representative for the Common Foreign and Security Policy (Solana, 2006).

economies (and beyond pluralism and corporatism). The thesis argues that policy networks in Nicosia have developed in this context.

The strength of the network approach is that it provides an adaptive metaphor for the complexity of policy-making and modern governance. This fits with the technological and socio-political changes of (post-) modern political economies. Analysing the context of relations and the structures within a policy network provides a "*powerful brush for painting a systematic picture of global social structures and their components*" (Thompson *et al*, 1991: 173). Coupled with the theoretical potential of a dialectical approach and the concept of legitimacy through action, policy networks seem to constitute a dynamic and powerful framework for policy activity and analysis.

As stated, the thesis embraces an understanding of policy networks as governance forms, based on the context of the German-Dutch school of thought. The concept of governance can be tricky though, given its wide use and applicability in policy analysis; even more so for the water sector, where governance represents a core issue in the global water debate. Aiming to highlight these linkages (as the thesis is concerned with water policy networks), the following sub-section discusses some key ideas on governance/water governance and their connection to the case study.

3. ON (WATER) GOVERNANCE[77]

The post-modern questioning of the neo-liberal world order has instigated a surge in the terminology that relates to functions of the state and, in particular, of government. In view of the inability of the state apparatus to respond to the increasing and changing needs of society, new ideas have been formulated to tackle the problem. As considered in Chapter II, public policy frameworks have appeared, claiming that application of private sector ideas and tools hold the key to better public sector operation. Under the umbrella of public policy a number of concepts were introduced including governance.

Governance is a term used frequently to capture a wide range of meanings. It has become a catchword for a diverse array of functions[78], including autonomous and self-

[77] Selected parts of this section with reference to public involvement in the Mediterranean region have been published in Brouma and Scoullos, 2008

[78] Such as facilitating development; enhancing economic growth; monitoring the execution of western type socio-economic requirements in less developed countries (the so-called 'good governance'); implementing corporate management; introducing managerial tools and methods in the public sector; or manifesting the socio-cybernetic system of a centre-less society just to name a few

organising networks. 'Water governance' has become especially prominent—particularly since the UN Millennium Summit (2000)[79] and the Johannesburg Summit (2002)[80]—and its proponents claim that it holds the key to the better management of the vital resource. Amidst a plethora of governance approaches, the thesis will concentrate on its network aspect as well as on its implications for water resource management; this is relevant and applicable to the Cyprus case study. Emphasis is placed on the understanding of policy networks as forms of governance, following the previous section's discussion on the German-Dutch School of network analysis.

This section begins by defining the governance concept before presenting a discursive analysis of governance and its manifestations as self-organising networks. The final part of the section touches, briefly, on the IWRM framework because of its inherent linkages with governance and the relevance to Cyprus. The section closes with a summary.

WHAT IS GOVERNANCE?

In considering 'governance', it is inevitable that a supposed correlation with 'government' springs to mind, and it is common for the two words to be used interchangeably to describe government-related activities. Although the terms may seem to converge etymologically, the difference between them is more than mere semantics. Governance signifies the "*action, manner or system of governing*" (Longman Dictionary, 1984: 301) and is therefore a broader term that refers to a wide policy activity agenda and, more importantly, implies the inclusion of a wide number of stakeholders[81].

According to the UNDP (2003), "*governance is the exercise of economic, political and administrative authority to manage a country's affairs at all levels. It comprises the mechanisms, processes and institutions, through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations and mediate their differences*". In this understanding, governance is related to issues of power and the way in which power and authority are exercised and distributed in society. It also refers to a manner and degree of citizen involvement in the policy-making and decision-making processes. The power and participation elements signify the distinction points

[79] http://www.un.org/millennium/summit.htm
[80] http://www.earthsummit2002.org/
[81] Stakeholders are sometimes defined as individuals or groups who have a legal responsibility or mandate relative to a decision and who will be directly or indirectly affected by a decision. The concept of stakeholders has increasingly been used to highlight that while it is not reasonable to involve everyone in every decision, it is important to ensure that those who have legal responsibilities or could be directly or indirectly affected by decisions are represented when decisions are taken (UN WWDR, 2003: 373)

between the narrow and the wider concept of governance. Whilst the former refers exclusively to the actions (and inactions) of the government as the central political entity, the latter embraces a broader sense of governing that incorporates the entire social system. This understanding echoes the two dimensions of policy analysis—vertical and horizontal—and the discussion on public policy that are central to the thesis.

Similarly, it is argued that "*governance refers to relationships that can be manifested in various types of partnerships and networks. A number of different actors with different objectives are involved, such as government and civil society institutions and trans-national and national private sector interests. An important shift in governance thinking is that development is now increasingly seen as a task that involves society as a whole and not the exclusive domain of government*" (Pierre, 2000: 32).

Therefore, governance is about enabling the participation of all stakeholders, public or private, in dealing with issues of common interest, including the distribution and allocation of water resources. Such participation requires inclusive and integrative legislative and institutional arrangements; as the 2002 Johannesburg World Summit concluded, governance encompasses "*democratic institutions responsive to the needs of the people and to the rule of law*" (Report of the World Summit, 2002). Such rules may be both formal (codified and legally adopted and binding) and informal (non-codified, traditionally and locally agreed). As informal interactions involve less political frictions and are thus, less likely to break down or lead to a policy impasse, the value of policy networks as an informal type of stakeholder interaction is strengthened further.

Actor involvement and interaction are further stressed when defining governance as "*the pattern or structure that emerges in a socio-political system as common result or outcome of the interacting intervention efforts of all involved actors. This pattern cannot be reduced to one actor or group of actors in particular*" (Kooiman, 1993: 258). Therefore, one of the key elements of governance is the creation of a framework—institutional, legal and administrative—within which actors, and their diverse interests and distinct priorities, may interact in a composed manner so that they may better coordinate their activities.

The inception of governance as expressing the legitimacy of structured stakeholder interaction is embraced by the thesis when analysing bi-communal cooperation in Cyprus. Further, it is claimed that policy networks represent apposite frameworks for the exercise of governance because they tend to even out disparities in terms of

members' respective power. Although one group may seem to form the dominant actor, the power outcome tends to be positive-sum as the focus is not on political prevalence but on the attainment of common goals through voluntary joint action; political benefits do not figure as expected outcomes given the semi-institutional and informal context of policy networks. As the previous section explained, policy networks promote and facilitate positive-sum interactions through horizontal, informal settings that place the emphasis on the issue at stake.

GOVERNANCE AS SELF-ORGANISING NETWORKS

When left to their own devices, hierarchies and markets seem ineffective and unreliable as governing structures, demonstrably inadequate as exclusive governing alternatives (Rogers, 1992; Lindblom, 1977). Especially for market-led governance, and as the first failure of capitalism has indicated, it is too simplistic a model with little consideration for wider societal values (Rogers, 1992: 6-7). Rather, the concept of socio-political governance has been advocated (Kooiman, 1993), which refers to the marriage of hierarchical political governing with structures of social self-organisation. Networks represent just such structures and incorporate the several interdependent actors involved in governing a society that is centre-less and highly differentiated (Luhmann, 1982). Given that networks span the boundaries of the public, private and voluntary sectors they should not be regarded as hybrids of hierarchies and markets but, rather, as alternatives to them (Thompson *et al*, 1991).

Simultaneously, an integrated governing system requires the presence of all three structures as they supplement and complement one another. In most occasions, no single actor possesses all the necessary knowledge and resources to effectively deal with a specific policy area and, therefore, governance is the result of interactive socio-political forms of governing (Rhodes, 1996). Socio-political governance can be regarded as the flipside of distributed governance; *"the empirical manifestation of State adaptation to its external environment*" (Rogers and Hall, 2003: 13) where formal authority is supplemented by an increasing reliance on informal authority. Both terms refer to governance as a more encompassing phenomenon that embraces not only governmental organisations, but also informal non-governmental structures.

> Since networks represent such structures, and ones that can interact with hierarchies and markets, it might feasibly be claimed that, essentially, "*governance is about managing networks*" (Rhodes, 1996: 658).

Given that networks represent a widespread form of social coordination, with trust and cooperation at their root (Thompson *et al*, 1991), perhaps it is reasonable to claim that they are self-organising structures, accountable to themselves alone. Self-organisation implies, further, that they are also autonomous and self-governing, and this has led to claims that:

> governance as self-organising networks forms an example of "*governing without government*" (Rhodes, 1996: 667).

In a similar vein Rosenau (1992: 291) argues that citizens engage in collective action within "*a world where governance is increasingly operative without government, where lines of authority are increasingly more informal than formal, where legitimacy is increasingly marked by ambiguity*". Forming policy networks is one form of collective action, characterised by awareness, voluntary involvement and self-organisation. In that sense governance, and therefore policy network operation, refers to "*activities backed by shared goals*" (Rosenau, 1992: 3).This is at the heart of policy networks, where actors with shared views and interests pursue common goals.

Governance, whether as self-organising networks or in its distributed or socio-political form, is associated with slow procedures that require flexible time-spans. Focusing on theme-specific applications of governance (e.g. for water), may offer insights on "*more practical and manageable solutions"* (Rogers and Hall, 2003: 15). Given that the thesis' examination of the Cyprus case study centres on the concept of water governance, a brief discussion on the latter is provided below.

THE EMERGENCE OF WATER GOVERNANCE

It was not until the 1990s that the concept of water governance gained ground in the international arena. Even though the Green Movement of the 1970s and 1980s identified human actions as the main force behind environmental degradation, recognition of water scarcity as a mainly human-induced condition was not widespread. But a noticeable shift occurred in 2000 when the Second World Water Forum concluded that, "*the world water crisis is a crisis of governance not one of scarcity, and good water governance is one of the main challenges facing governments in attaining water security*" (Ministerial Declaration, 2000). In the following year, the Bonn Conference on International Freshwater identified governance as one of the three areas requiring priority action (Bonn Recommendations, 2001), while the 2002 Johannesburg World Summit on Sustainable Development declared that "*good*

governance is essential for sustainable development" (Report of the World Summit, 2002).

Strengthening further the new focus on water governance, GWP (2002: 2) affirmed that "*the water crisis is a crisis of governance and that it is increasingly about how we, as individuals, and as parts of a collective society, govern the access to and control over water resources and their benefits*". Similarly, the UNDP contends that water crises are directly linked to issues of governance and that resolving the challenges in this respect represents the key to the development and management of integrated and sustainable water resources (UNDP, 2006).

Besides the plethora of local, national and regional meetings focusing on water governance, a good indicator of the concept's prominence at the global level has been the organisation of governance-specific and governance-related sessions at the World Water Forums[82], the largest triennial international gathering of water experts, policy-makers, managers and end users. The same practice has been adopted at World Water Weeks[83], another prominent gathering of water people, organised annually in Sweden, by the Stockholm International Water Institute. The importance of these meetings lies with the opportunities they offer for exchanging knowledge and good practices and showcasing success stories. More importantly, these meetings provide an informal and open way of reviewing countries' efforts in meeting internationally-set goals (such as the Millennium Development Goals or the Johannesburg targets[84]). Importantly, for the thesis, Cyprus has agreed to align with these processes and meet the related targets.

For the Mediterranean region—Cyprus' own immediate neighbourhood—perhaps the most politically significant sign of water governance's prominence has been the inclusion of Efficient Water Governance as one of the four chapters in the Strategy for Water in the Mediterranean, elaborated within the framework of the Union for the Mediterranean (UfM)[85]. Once adopted, the Strategy[86] will stand as a guiding document

[82] Detailed information on the forums is available at the website of the World Water Council that organises them, http://www.worldwatercouncil.org
[83] http://www.worldwaterweek.org/
[84] See the governance section.
[85] Information on Cooperation in the Water Sector within the Union for the Mediterranean, as well as access to all documents is available at http://www.ufm-water.net/
[86] The elaboration of the Strategy was mandated during the UfM Ministerial Conference on Water in 2008 (Dead Sea, Jordan, 22 December). Following an intensive preparatory process, the final document was presented in 2010 to the UfM Ministerial Conference on Water (Barcelona, 13 April). However, and although the text has been agreed at 99% by all countries, two points of political discord meant that the Strategy was not adopted in Barcelona: one surrounded the reference to occupied territories, the other to the 1997 UN Convention on the Law of the Non-Navigational Uses of International Watercourses . As of late 2010, the adoption of the Strategy is still pending.

for the proposed orientations and objectives on water resource management and protection. All countries in the UfM have assented to the document, while input has been also provided by stakeholder groups including civil society. As a UfM country, the implications for Cyprus are obvious and will translate into concrete water policy decisions, given that the Strategy envisages the fulfilment of a series of short, medium and long-term objectives.

In addition to meetings relating to the water governance theme, a wide range of initiatives and processes have been launched to support the countries' reform efforts directed towards good and efficient water governance. For example, in 2000, in collaboration with the International Council for Local Environment Initiatives, GWP launched a scheme on 'Dialogue on Effective Water Governance'[87]. The initiative considered the enabling environment and institutional arrangements required in order to achieve good water governance (GWP, 2002: 3). Experience sharing and exchange of good practices provided main vehicles to this end. Another international initiative supporting the exchange of experiences and best practice through multi-stakeholder dialogues has been the establishment of the UNDP Water Governance Facility at the Stockholm International Water Institute[88]. At EU level, the adoption of the Water Framework Directive (2000, Directive 2000/60/EC)[89] signals an aspiration towards good water governance with an emphasis on basin management through an integrative water resource management (IWRM)[90] approach. The EU Water Initiative (EUWI)[91], launched in 2002 at the Johannesburg Summit, aims to assist countries in the sustainable management of their water resources[92] within an IWRM framework. The

[87] Some forty Dialogues have been held in more than thirty countries at the local, national and regional levels. Participation in each Dialogue has been substantial, the average group consisting of a hundred and thirty people who hold a variety of positions in the water sector and come from a range of diverse backgrounds. The Dialogues have made it possible to share current experiences on effective water governance (UNDP, 2004: 15).

[88] For more information on the Facility visit www.watergovernance.org. The Facility works on the governance aspects of water challenges and promotes improved water governance reform and implementation. The Facility benefits the work of government agencies, civil society organisations and other involved stakeholders and supports the exchange of experience and best practices through multi-stakeholder dialogues.

[89] For more information on the Water Framework Directive visit http://www.europa.eu.int/comm/environment/water/water-framework/index_en.html and http://forum.europa.eu.int/Public/irc/env/wfd/library?l=/andvm=detailedandsb=Title

[90] IWRM is understood as "*a process, which promotes the coordinated development and management of water, land and related resources in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems*" (GWP, 2000: 22). A thorough analysis of IWRM is offered through GWP's publications (http://www.gwptoolbox.org), as GWP has been since 1996 the leading international organisation promoting the IWRM framework. As with most frameworks, IWRM has faced severe criticisms focusing on its ambiguity and lack of clarity on what practically constitutes integrated management (Allan 2003; Allan, 2005; Gyawali and Allan, 2006: 14) and the limited experience with its on-the-ground implementation (Matondo, 2002; Biswas, 2004).

[91] www.euwi.net

[92] Of particular interest is a EUWI Report (Gyawali and Allan, 2006) reviewing 67 projects, funded by EU Framework Programmes between 1994 and 2006, with reference to integrated water resources management. Cyprus, as part of the Mediterranean region, has formed partner in a number of those projects.

Mediterranean component of EUWI [93] in particular, constitutes both a strategic partnership between the various actors, involved in the water sector, and an open forum for consultation with relevant stakeholders in the EU and in the region.

This discussion of the different meetings and initiatives relating to water governance is by no means exhaustive and its scope has been merely to demonstrate the prominence to which water governance has risen since 2000 and been adopted as a route towards sustainable water management and water security. Cyprus has been present and active in most of these processes (particularly the European ones) and has closely aligned its own water policy with the decisions made at the Euro-Mediterranean level. Moreover, the government of Cyprus has, on several occasions, stated its commitment towards achieving efficient water governance within the IWRM framework. Analysing the thesis' case study without reference to these components would be partial and incomplete.

What is important about these initiatives is that they point towards more inclusive, participatory approaches that actively involve actors from within and beyond the state. At the same time they stress the importance of dialogue and consultation processes. These are elements embraced by the thesis, where policy networks are understood as governing frames that accentuate the role of actor interaction and thus may effectively serve the objective of good water governance.

DECIPHERING WATER GOVERNANCE

Water governance refers to "*the range and various levels of political, social, economic and administrative systems and/or mechanisms that are in place to develop and manage water resources and the delivery of water services, at different levels of society. It comprises the mechanisms, processes and institutions through which all involved stakeholders, including citizens and interest groups, articulate their priorities, exercise their legal rights, meet their obligations and mediate their differences*" (GWP, 2000; Rogers and Hall, 2003:16; GWP, 2004: 12).

In a similar sense, the term "water governance" is said to "*encompass the political, economic and social processes and institutions by which governments, civil society and the private sector make decisions about how best to use, develop and manage water resources*" (UNDP, 2004:17) and "*their relationships insofar as these are related to water development and management*" (UN-WWDR, 2003: 372). This is so, since "*all*

[93] http://www.minenv.gr/medeuwi/

are instrumental in different ways in the successful implementation of institutional reforms" (GWP, 2004: 21).

As such, water governance depends not only on specific institutions, mandated to govern water, but also on the overall context of a country's governance within which water issues are placed. Therefore, the development of appropriate legal, regulatory, institutional and technical frameworks is essential in the promotion of water governance (Water – A G8 Action Plan). Efficient water governance must avoid, on the one hand, a persistent disparity between central government policies and priorities, and, on the other, people's concerns and aspirations. To this end, greater transparency and accountability, public participation, access to information and better social, environmental and economic links are all necessary (GWP-Med Workshop, 2001).

As indicated by the different definitions, water governance is comprised of four dimensions reflecting the components of the sustainable development concept (WCED, 1987) and the key ingredients of the integrated water management approach (GWP, 2000).

Box 2: Why is water governance important?

Why is Water Governance important?
Four inter-related and poverty-centred dimensions point to the importance of addressing governance issues:

The social dimension **points to** ***equitable use*** **of water resources.** Apart from being unevenly distributed in time and space, water is also unevenly distributed among various socio-economic strata of society in both rural and urban settlements. How water resources and related services are allocated and distributed have direct impacts on people's health as well as their livelihood opportunities.

The economic dimension **draws attention to the** ***efficient use*** **of water resources and the role of water in overall economic growth.** Aggressive poverty reduction and economic growth depend highly on water and other natural resources. Studies show that better governance can exert a powerful and positive effect on per capita incomes in many countries.

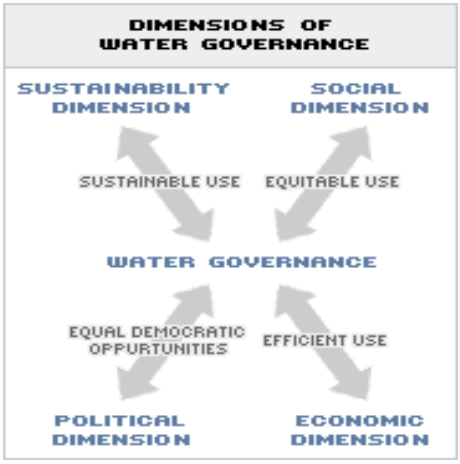
The political empowerment dimension **points at granting water stakeholders and citizens at large** ***equal democratic opportunities*** **to influence and monitor political processes and outcomes.** At both the national and international levels, marginalised citizens, such as indigenous people, women, slum dwellers, etc., are rarely recognised as legitimate stakeholders in water-related decision making, and typically lack voices, institutions and capacities for promoting their water interests.

The environmental sustainability dimension ***shows that improved governance allows for enhanced*** **sustainable use of water resources** ***and ecosystem integrity.*** The sufficient flow of water of appropriate quality is critical to maintaining ecosystem functions and services. Unfortunately, water quality appears to have declined worldwide in most regions with intensive agriculture and large urban and industrial areas. Poor people's livelihood opportunities in particular depend directly upon sustained access to natural resources, including water - especially since they tend to live in marginalised areas that are prone to pollution, droughts and floods.

Source: UNDP, 2006

A schematic illustration of the four dimensions has been provided by the UNDP Water Governance Facility:

Figure 2: The four dimensions of water governance



Source: http://www.watergovernance.org/aboutwatergovernance/whyisgovernanceimportant.html

In most conceptions of water governance, the four dimensions are considered to be equal components. However, it is an initial contention of the thesis that the political dimension occupies a primary position in the water discourse, one that often determines the trajectory towards water governance. Water management is a highly political process (Allan, 2003a) with water decisions anchored in multi-centred governance systems. This is particularly evident in Cyprus, where the political question not only influences but determines all policy sectors (including the water sector). The thesis advocates the creation of an enabling environment for dynamic actor interactions, in order to counterbalance the impasses that stem from any potential politicisation of water issues. It is argued that this is possible through the formation of policy networks; actor interaction and the focus on specific issues of common interest exceed the mismatch between government policies, market interests and people's concerns by locking them together into an interdependent, practice-centred cluster: the network itself.

Moreover, the definitions of water governance imply that governmental structures have been assumed, to a certain degree, to have been transcended. This in mind, it could be argued that the type of governance analysis that endorses wide actor participation also has applicability for the water sector. Therefore, and as previously analysed, if governance is about managing self-organising networks then water governance may be understood as a form of managing self-organising water networks. The notions of interactive socio-political and distributed governance also have relevance for the water sector. An endorsement of distributed water governance is first found in the Dublin

Principles (1992), a key reference document on water resource management that fully embraced wide stakeholder participation in water development and management[94].

The Dublin Principles was the first official document to highlight both the complexity of water resource management and the need for a holistic, multi-stakeholder and cross-sectoral approach. It placed IWRM at the heart of water management. Since 1992, the IWRM framework has gradually become a reference point for water resource management and this has been reflected in various internationally- and regionally-established processes, documents and milestones (e.g. MDGs, EU WFD, Johannesburg Implementation Plan, EUWI, UN World Water Reports, African Water Vision 2025, etc). Particularly, in their response to the Johannesburg Implementation Plan's IWRM Target (which called for the development of IWRM and water efficiency plans at national level by 2005 as means towards MDGs achievement) all countries are at different stages in conducting water sector reforms. In Cyprus, both the South and the North are committed to this process, although a genuinely integrated approach would require water management at cross-'border' and bi-communal levels.

The IWRM framework falls beyond the scope of the thesis and will not be examined in depth. However, its close interrelation with water governance cannot be overlooked: on one hand IWRM provides a framework of principles and good practices for water governance; on the other, water governance is crucial for the implementation of IWRM (GWP, 2000; Rogers and Hall, 2003; GWP, 2004; Biswas, 2004; UN WWDR-II, 2006; UN-Water and GWP, 2007). Both aspects are important to policy networks given the priority afforded to actor involvement, knowledge sharing and a multi-disciplinary approach. Following the argument in which water policy networks are viewed as alternative forms of water governance, the linkage between policy networks and IWRM becomes apparent. The thesis claims that the operation of water policy networks could contribute towards IWRM and better water governance, by strengthening the components of stakeholder interaction on theme-specific, action-centred and outcome-oriented practices.

Another point of convergence and potential contribution is represented by the issue of constructive inclusiveness. For it to be operational and effective IWRM has to be "*constructively engaged*" (Gyawali and Allan, 2006: 17); IWRM practice must involve the parallel consideration of inputs, from government (hierarchy), civil society at large, and the private sector (market forces) (Thompson *et al*, 1990). Such an understanding

[94] The relevant clause of the 1992 Dublin Principles states that 'water development and management should be based on a participatory approach involving users, planners and policy-makers at all levels (The Dublin Statement) http://www.wmo.ch/web/homs/documents/english/icwedece.html

is fully aligned with the context of policy networks that aim to do precisely that: bring together the various stakeholders in order to accommodate various interests through regular joint action. Like IWRM, this process is "*an intensively political process that requires an unprecedented level of political co-operation; integration is political and so is management*" (Allan, 2003a: 1).

SUMMARY: AND (WATER) GOVERNANCE IS?

"*Governance is about effectively implementing socially acceptable allocation and regulation and is thus, intensely political. Governance is a more inclusive concept than government per se; it embraces the relationship between a society and its government. Governance generally involves mediating behaviour via values, norms and where possible through laws. The concept of governance of course encompasses laws, regulations and institutions but it also relates to government policies and actions, to domestic activities and to networks of influence including international market forces, the private sector and civil society. These are in turn affected by the political systems within which they function*" (Rogers and Hall, 2003: 4).

However, the term 'governance' is "*popular but imprecise*" (Rhodes, 1996: 652); and arguably the same applies to the term 'water governance'. It may be misleading, due to an elusive content, and it is definitely confusing when it appears as an all-encompassing framework. Nevertheless, it involves the act of governing a shared resource in a holistic manner that is informed by principles of environmental sustainability, social equity and economic efficiency. Achieving effective water governance cannot be undertaken in haste using externally-imported blueprints as examples of IWRM implementation have demonstrated (Scoullos *et al*, 2002; Wegerich, 2003; Biswas *et al*, 2005; Moreyna and Wegerich, 2005; World Bank, 2006). It needs to be developed in such a manner so as "*to suit local conditions with the benefit of lessons from all over the world*" (Rogers and Hall, 2003: 38).

An important aspect of water governance is its requirement for wide stakeholder participation. It involves governments, the private sector and civil society alike, and policy network formations seem like an appropriate model for this interaction among stakeholders. In extending the analysis of governance, water governance could be understood as a form of managing self-organising water networks. It might be considered the post-modern response to the problems of modern water management;

If modernity was about the government offering solutions to problems of water supply, water governance may be considered to represent the post-modern approach towards the management of water demand (including non-conventional resources).

By inviting the participation of all concerned stakeholders, water governance (and the IWRM framework) appears to be more democratic than government-led processes and more aware of the central role of politics in the overall process. The thesis argues that the dynamic interaction promoted by policy networks is a fertile ground in which the search for better water governance might take place. Moreover, networks tackle the water problem at its root by addressing the users (and abusers) of water resources directly, i.e. the people. Bringing people together so that they may learn to think together is one aspiration of the framework, and one that represents a challenge for the *de facto* divided communities in Cyprus.

One aspect of the thesis' argument considers that the objectives of efficient water governance, as well as the operation of policy networks—both generally and with specific regard to Cyprus—may greatly benefit from increased knowledge and knowledge management. Moreover, the thesis claims that policy networks in Cyprus are manifested along with communities of practice; the latter are based on the sharing and exchange of (primarily tacit) knowledge and so the final section of this chapter is devoted to the analysis of the knowledge management analytical framework.

4. ON KNOWLEDGE AND KNOWLEDGE MANAGEMENT

The previous section frequently described the value of knowledge in the water governance framework; its role in triggering changes in water management was graphically presented in the paradigm shift representation (see Chapter I). However, the general theoretical debate on knowledge and knowledge management falls beyond the scope of the thesis. Selective references to the knowledge literature are made in this chapter insofar as they may offer an insight on the epistemology[95] of knowledge and on its role in network formation through the operation of communities of practice. Knowledge is viewed as a medium/tool that brings people together and promotes a common basis for understanding and communication. The people-centred approach to knowledge that is possible through a social constructivist perspective is endorsed (as in the policy analysis of Chapter II), and the value of tacit knowledge for social interaction

[95] Epistemology is the theory of knowledge. The discipline examines what is knowable, what should count as knowledge and whether knowledge is certain in fields including science (Horrocks and Jevtic, 1997: 18).

is stressed. It is argued that this approach best serves the research components of the thesis and the Cyprus case study.

The section begins with a brief discussion on the concept of knowledge and the different forms it may take. Special reference is made to tacit knowledge and the social construction of knowledge. The analysis is then rounded up in the context of knowledge management, which underpins the formation and development of communities of practice. The subsequent section explores the latter before briefly outlining the reasons that suggest its applicability to Cyprus. The section closes with a summary and a few conclusions.

UNRAVELLING KNOWLEDGE

Knowledge is considered as the principal characteristic of the post-industrial society; everything can be defined in terms of acquiring, processing and distributing information (Bell, 1973). While information consists of "*facts and data that are organised to describe a particular situation or condition*", knowledge is distinguished from information by the addition of "*truths, beliefs, perspectives and concepts, judgements and expectations, methodologies and know-how*" (Wiig and Ofstad, 1993: xvi).

Knowledge is -in essence- fundamentally subjective (Leonard and Senisper, 1998) because it depends on who has it, how it is acquired and how it is passed on. It is a person that must "*identify, interpret and internalise knowledge*" (Myers, 1996: 2) and thus, knowledge originates from and exists in the mind of individuals (Alavi and Leidner, 2001; Davenport and Prusak, 1998). Another characteristic of knowledge is its fluidity: "*it is always recreated in the present moment. Most of us cannot articulate what we know. It is largely invisible and often comes to mind when we need it to answer a question or solve a problem*" (McDermott, 1999 cited in Alvesson and Karreman, 2001: 996).

The latter echoes the central distinction in the knowledge discourse between its tacit and explicit forms[96]. Explicit knowledge is the articulated and communicated knowledge that is externalised in symbolic form and/or natural language; tacit knowledge is rooted

[96] The basis for understanding the tacit-explicit knowledge distinction comes from the work of Michael Polanyi (1983) and his example of riding a bicycle. "*Many people who say they can ride a bicycle will claim, when asked, that they do not know which way to turn the handlebars to prevent a fall to the left or right. However, since staying upright is part of knowing how to ride a bicycle, anyone who can ride must, by definition, know which way to turn the handlebars to avoid a fall. What they can't do it say which way to turn. So there's something known by everybody who can ride that most cannot say. What they can say is an example of what Polanyi called the explicit dimension of knowledge, while what is known by everyone who can keep upright on a bike is what he called the tacit dimension of knowledge"* (Cook and Brown, 1999: 384)

in action, experience and involvement in a specific context and may entail cognitive as well as technical elements (Nonaka, 1994; Alavi and Leidner, 2001). Explicit knowledge may be codified; this is less straightforward for tacit knowledge because it is embedded in people. Therefore, the communication of tacit knowledge—besides being elusive and questionable—is more complicated as it is based on human interaction and social relations. Since it is attached to the knower, it "*seems entirely natural and cannot be expressed*" (Ambrosini and Bowman, 2001: 813), nor can it be effectively communicated through words of other symbols (Badaracco, 1991: 82).

The value of tacit knowledge lies primarily with the abilities and skills that are developed whilst acquiring it and thus, it is "*sedimented into work practices*" (Spender, 1994). The practical side of tacit knowledge is emphasised and the concept is associated more with 'how to do something' rather than 'knowing what to do' (Kogut and Zander, 1992). This is also the reason why the term 'know-how' is used with reference to tacit knowledge and is considered "*unique, imperfectly mobile, imperfectly imitable and non-substitutable*"[97] (Ambrosini and Bowman, 2001: 813).

On the precedence of scientific over tacit knowledge, Gelwick (1977: 85) asserts that "*it is one of the paradoxes of our knowledge that we accept science because we think it gives a truer account of reality, yet this account could be false since reality in not explicitly definable*". However, the two kinds of knowledge do not need to form a dichotomy. Rather, "*they are mutually dependent and reinforcing qualities*" (Alavi and Leidner, 2001: 112). It could be argued that this dual typology of knowledge is a remnant of the Modernity discourse that promoted, through positivism, the distinction of scientific processes from what the average person knows (Lyotard, 1984). In Cyprus, the implementation of joint activities seems to be based on explicit/scientific knowledge, but the bi-communal *modus operandi* largely demonstrates qualities associated with tacit knowledge (know-how).

More importantly, the tacit-explicit duality suggests that in order for people to exchange knowledge, they need a common knowledge base, or shared knowledge space, so that shared information can be processed and endorsed. Therefore, a link exists here with the distinction of knowledge as individual (possessed by a single person) and collective (embedded in a group, organisation or institution, etc). The Modernity discourse and Cartesian cosmo-theory[98] have disproportionately focused on the individual thinker as

[97] These characteristics suggested the applicability of the concept because of their potential role in establishing a firm's competitive advantage or area of expertise (Grant, 1991).
[98] This echoes Descartes' (1994) 'cogito ergo sum' (I think therefore I am) that has become the nucleus of modern philosophy and the basis for the framework of individualism

the primary force in the search for knowledge and truth. But the philosophical move beyond Modernity has come to stress collective knowledge as an amalgam of possession and practice through social interaction and the social construction of meaning. In the thesis, the Cyprus case study and the consideration of the operation of communities of practice makes a contribution to this prioritisation of collective knowledge.

KNOWLEDGE, KNOWING & THE SOCIAL CONSTRUCTION OF MEANING[99]

Referring to the forms of knowledge, Cook and Brown (1999) argue for two kinds of epistemologies, one of possession and one of practice. They equate the former with "*the possession of knowledge*" and the latter with "*the act of knowing*" (Cook and Brown, 1999: 382). On this view, whether tacit, explicit, individual or collective, knowledge may be possessed but it can only remain incomplete if there is no account for the actual experience that is involved in the process of knowledge possession. Most importantly, they claim that knowledge and knowing are complementary and, together, enable an "*understanding of what and how people know, as that relates to the epistemological dimension of organised human activity*" (Cook and Brown, 1999: 398). This call for a holistic view of knowledge is particularly relevant for Cyprus because the sole possession of knowledge cannot account for the actual operation of bi-communal activities. More importantly, understanding the overall knowledge process may provide valuable insights on what has worked on the ground and how it can be replicated for issues other than water alone.

Supporting the knowledge-knowing distinction, it is suggested that knowledge is a matter of competence; the human ability to experience the world and achieve a meaningful engagement with it constitutes the core of meaning, and meaning is what ultimately learning aims to produce (Wenger, 1998). However, learning is not simply the acquisition of facts; rather it refers to the acquisition of an ability to act in the world in a socially recognised way (Brown and Duguid, 2001). Favouring the social aspect of learning, Daft and Weick (1984) argue that "*all but the most simplistic learning involves*

[99] Other knowledge concepts of interest—that cannot be analysed in detail for the purposes of the thesis—include the 'knowledge alliances' that aim at balancing knowledge deficiencies, obtaining the necessary competencies or creating new knowledge (Baskerville, unpublished: 7; Conner and Prahalad, 1996). If applied to the water sector, knowledge alliances, based on resources and resource-deficiencies, could be useful for strategic water management. Its main weakness is the measurement problem it entails. Another viewpoint of knowledge with applicability in the water sector refers to consultancy firms that realise the value of the knowledge business and seek to commodify their knowledge as a product (Quintas, 2002: 9). Another interesting framework includes the promotion of a knowledge culture where reducing harsh bureaucratic structures and increasing informal communication will improve creativity and innovation by promoting spontaneity and freedom of expression (Graham and Pizzo, 1996). This stance develops along the arguments in favour of policy networks as informal structures of interaction. Lastly, interest entails the concept of knowledge networks aiming at the creation and dissemination of knowledge (Stein *et al*, 2001)

a complex social process. Such social interaction shapes how individuals interpret the world and learn from it". Wenger (1998) considers whether learning is a fundamentally social phenomenon which reflects the people's deeply social nature. Stressing the priority of the social, Cook and Brown (1999) argue that meaning is created through action within a specific social context, while Wenger (1998) argues that meaning exists in neither people nor in the world, but in the dynamic relation of living in the world. The thesis, informed by its basis in social constructivism, is fully aligned with the social aspects of knowledge[100]. Indeed, it argues that a socially constructed practice primarily on wastewater treatment, achieved through informal interaction among knowledgeable actors, is at the root of bi-communal cooperation in Cyprus.

Central to the thesis' argument is the non-divisibility of practice and knowledge; "*human knowledge is a product of experience, achieved through experience and inherently indeterminate*" (Tsoukas, 1996: 37). Similarly, Orlikowski (2002) contends that knowledge is, at any given time, what practice has made it. Therefore, knowledge is enacted every day and over time in people's practices (Lave and Wenger, 1991). But practice does not exist in abstract terms alone; it engages diversity, relationships, social complexity and community maintenance (Venters, 2006) and therefore practice is linked to the formation and operation of a community. The thesis argues that through the operation of communities of practice, on-the-ground knowledgeable practices have been the catalyst for overcoming Cyprus' *de facto* political division. In this respect the management of knowledge is a central theme and is therefore briefly discussed below.

FRAMING KNOWLEDGE MANAGEMENT

Knowledge management[101] is not simply about managing computer or other technical infrastructures, or building a large electronic library (Davenport and Prusak, 1998; Coleman S., 1998; Liebowitz, 1999). Rather, it is about "*blending…internal and external information and turning it into actionable knowledge*" and "*discovering and developing (new) organising processes that value and cultivate a dynamic process of learning that is collectively shared and irreducible to information*" (Willmott, 2000: 218).

Most importantly knowledge management is about "*connecting people so they can think together*" (McDermott, 1999: 104). As previously mentioned, creating a common

[100] See Chapter II.
[101] The mid-1990s saw a revived interest in knowledge and the way it may be managed, initially within organisation analysis but then increasingly within other disciplinary fields too (Prichard *et al*, 2000; Quintas, 2002). Indicative of this increased attention was the publication of two special journal issues on knowledge management (Strategic Management Journal, Volume 17, Winter 1996; Organisational Science, Volume 7, No. 5, 1996)

knowledge base is necessary if people are to process information in compatible ways and pursue common goals. Knowledge management may provide the apparatus with which the creation of such common knowledge space may be facilitated. For Cyprus in particular, enabling dynamic and collective learning may provide sustainable water practices in spite of the *de facto* division. Indeed, knowledge management is "*the dynamic process of turning an unreflective practice into a reflective one by elucidating the rules guiding the activities of the practice, by helping give a particular shape to collective understandings and by facilitating the emergence of heuristic knowledge*" (Tsoukas, 2005: 303).

Therefore, knowledge management may assist the transition towards reflexive water management; it encourages people to think together through communities of practice (tacit knowledge) and creates the necessary common knowledge space through policy recommendation and other information-related documents (explicit knowledge). More importantly, knowledge management is not seen as "*something valuable in and of itself, but as fragile, politicised and dialectical*" (Swan and Scarbrough, 2001: 921), a description that clearly characterises the management of water resources in Cyprus.

For all its valuable contributions, knowledge management has been criticised for its "*vague context that can be all-encompassing and empty...popularised and polarised...contradictory and trivial...and most of its uses tension-ridden*" (Alvesson and Karreman, 2001: 997-1000). This kind of critique echoes that directed at water governance and is one that has been levelled frequently at integrative and cross-disciplinary frameworks that, by definition, must be flexible enough to respond to differing challenges. Following the modernity continuum with reference to both water and knowledge, it seems that the sectoral reflexive responses to the impasses of Modernity tend to produce generalised suggestions that can easily adapt to various circumstances. Criticising this tendency, Knights (2002: 576) writes that "*post-modern...studies demand a radical epistemological break with modernism and not a fudge that seeks to reconcile modernist demands for generality within the context of localised circumstances*". Difficulties in quality and capability measurement schemes (Baskerville, unpublished: 3), common in social sciences, add to the inherent vagueness of the frameworks.

Perhaps the most intense critique focuses on the potentially negative dimensions of knowledge when associated with power. Foucault (1980, 1991) argues that knowledge and power are intrinsically related, since knowledge creates a space for the exercise of power while the exercise of power, in return, makes knowledge possible. "*Power and*

knowledge directly imply one another...there is no power relation without the correlative constitution of a field of knowledge, nor any knowledge that does not presuppose and constitute at the same time power relations…" (Foucault, 1980: 27) Interesting, for the thesis, is the centrality of the individual in this discourse. "*Power is thus, exercised by binding the subject to a particular identity or form...all we can study are the discourses*[102] *and practices which shape the individual...as an object of knowledge and influence. The individual is the effect of power*" (Foucault, 1980: 98) Therefore, knowledge is not "*an innocent or neutral tool for accomplishing something socially valuable; it creates rather than reveals truths; it imprints standards for being that disciplines and subordinates the individual*" (Alvesson and Karreman, 2001: 1000). The thesis argues that it was knowledgeable individual endeavours that made the bi-communal rapprochement possible. It will examine empirically how jointly-practiced knowledge has altered the governing scenery in the *de facto* divided Cyprus.

Supporting this relation between power and knowledge, Blackler *et al* (1998) argue that the inter-linkages of culture, knowledge and power are impossible to disentangle. Davenport and Prusak (1998: 29) refer to "*the reality of knowledge politics'* explaining that *'if knowledge is power, then the owners of knowledge have the power that may dissipate if other people come to know what they know*". The thesis supports this contention, arguing that through communities of practice knowledge is transferred to all members and therefore loses the connotations of power-relatedness. At the same time, it seems that the power element in Cyprus is utilised beyond communities of practice in order to sustain the actors' joint practice.

Although the association with power attributes negativity to the concepts of knowledge and knowledge management, the thesis recognises the positive elements of knowledge to be of greater importance. In particular, the formation of communities of practice and the contribution of getting people to think together are among its major virtues. Although the case of Cyprus demonstrates how it is susceptible to politicisation, knowledge may also operate silently through social interaction and daily practice (tacit knowledge). The research question of the thesis aims to examine whether knowledge has made the formation of communities of practice in Cyprus possible and, if so, how they have developed and what has been their role in the two communities' rapprochement.

[102] A discourse may be understood as a theoretically based line of thought, regulated and inspired by power relations and social practices, but also constituting and regulating those practices; it is thus, both socially and economically determined and determining. It provides frames for thinking and is associated with the development of knowledge during a particular period, and contributed to the determination of practices (Alvesson, 1996).

COMMUNITIES[103] OF PRACTICE

"*Communities of practice (CoP) are groups of people who share a concern, a set of problems, or a passion about a topic and who deepen their knowledge and expertise in this area by interacting on an ongoing basis*" (Wenger, 2000). "*They develop their own practices, routines, rituals, artefacts, symbols, conventions, stories and histories*" (Wenger, 1998: 72). According to Brown and Duguid (1998, 2001, 2002) "*the group of people that shares the know-how and sense-making is called a community of practice. It is the group that needs to work together for its dispositional know-how to be put into practice. In the course of their on-going practice, the members of such a group will develop into a de facto community*" (Brown and Duguid, 2002: 25).

A community of practice, therefore, may be understood as a group of individuals that collectively create and share knowledge through shared practice. The key dynamics involve learning situated in practice and, through the engagement in this practice, the shaping of identity. Indeed, on this point Davenport and Prusak (1998: 5) assert that knowledge "*often becomes embedded not only in documents or repositories but also in organisational routines, processes, practices and norms*". These practices are "*normally unique to or characteristic of that group*" (Cook and Brown, 1999: 386), while the knowledge the group possesses is "*epistemically distinct*" from the knowledge held by the individuals within the group (ibid).

Therefore, the two types of knowledge (individual and collective) have different (and not superior/inferior) values and perform distinct functions, of equivalent importance, in the work of the community. Each participant in the community becomes irreplaceable and, simultaneously, dependent on each other participant in the community and upon the community itself as a distinct entity. This creates an inter-reliant and interdependent net, the goal being the harmonious and unobstructed operation of the community of practice. The actors of the community form a web consisting of core and periphery players, differentiated by the intensity level of the link between experience and competence (Wenger, 1998; 2000). "*Each player may know his or her part, but on its own that part doesn't make much sense. Alone it is significantly incomplete: it requires the ensemble to make sense of it*" (Brown and Duguid, 2002: 25). This is a point of particular importance for communities of practice in contested situations, as in the case of Cyprus, in which the willingness to abscond (from the community) may be stronger

[103] The concept of community includes at least two elements: 1) individuals belonging to a community have ends that are in a robust sense common, not merely congruent private ends, and that are conceived of and values as common ends by the members of the group; and 2) for the individuals involved, their awareness of themselves as belonging to the group is a significant constituent of their identity, their sense of who they are (Routledge Encyclopedia of Philosophy, 2000)

than the desire to stay and this mutual engagement/dependency may form the glue which keeps the actors together.

On the operational side, communities of practice form the key to the "*effective application of knowledge*" (Little, 2002: 369) because they directly link knowledge to practice. And the value of knowledge is enhanced when it "*is viewed as a means to increase the capacity for effective action*" (Nonaka, 1994). Such knowledge is passed on to new members through "*a 'craft-like' learning process*" (Rydin *et al*, 2006: 9), in which more established members initiate newcomers. This element implies the identity-shaping quality of communities; it transforms learning into a personal development experience that binds members. The thesis' research question considers whether this process has taken place in Cyprus and, if so, whether it has assisted in transcending the political question at interpersonal level within the communities of practice.

Furthermore, communities of practice may be thought of as 'shared histories of learning' (Wenger, 1998). This is, perhaps, one of the strongest points of the framework—one valuable for the thesis—as it considers learning and the engagement with knowledge as an ongoing cultural process embedded in everyday practice. Although the development of practice requires time, it is not the temporal dimension that defines a community of practice but, rather, the sustained mutual engagement in jointly pursuing an activity and sharing some significant learning (ibid). The importance of the concept lies on the regularity of engagement and the 'authentic experience of their daily work' (Brown and Duguid, 1998), which promotes coherence within the community. The thesis argues that engagement requires interaction; interaction facilitates capacity building within the communities of practice; and the latter supports the formation of more solid structures such as policy networks.

As with most such frameworks, communities of practice have been regarded with some scepticism. One line of critique argues that the framework addresses the learning process among the homogenous members of a community but does not extend to heterogeneous members (Wenger, 2000). This perhaps limits how far the framework may be applied and would therefore be a serious limitation for the Cyprus case study. However, initial evidence points to the heterogeneity of the group involved (i.e.in terms of language, discipline, and perceived statehood) in the empirical content of the thesis therefore making this line of critique inapplicable.

Another strand of criticism argues that by encouraging the reproduction of practice and learning, communities of practice inhibit change. As Wenger (2000: 230) asserts, "*they*

are the cradles of the human spirit but they can also be its cages". Building on this Thompson (2005) claims that communities of practice demonstrate only a limited engagement with issues of power. This may encourage an undue emphasis on consensus, rather than conflict (Contu and Willmott, 2003), which would appear incongruous with the association between knowledge and power (discussed above). Although potentially restrictive in the case of Cyprus, in which practice revolves around issues of conflict over those of consent, the evidence initially suggests that bi-communal engagement—which is centred on joint practice—downplays the role and influence of politics. This will be explored further in the empirical chapters.

CoP FOR CYPRUS

Although the thesis uses communities of practice as an analytical framework, that of policy networks is still considered preferable. The main reason for this inclination centres on the political interaction that policy networks steer and their dynamic composure with reference to actors' relations and the actor-network interface. The policy network framework seems better equipped to deal with the shortcomings of communities of practice: it permits consideration of the issues surrounding the management of power among heterogeneous members within circumstances of conflict.

Nonetheless, this does not mean that the value of communities of practice is diminished and they remain important insofar as they promote engagement and learning through practice. One significant function is their effective application of knowledge which has led scholars to reconsider communities of practice as networks through which knowledge and policy interact (Rydin *et al*, 2006). Particularly for Cyprus this interaction is of paramount importance because of the political circumstances. There is a need to alter the two communities' knowledge bases in order to create a common knowledge space and thereby make bi-communal cooperation feasible.

Additionally, it is likely that the construction of this common space would assist in the de-construction of an image of the 'other' as an enemy. The role of tacit knowledge within the communities of practice seems to have been central to the *modus operandi* of bi-communal engagement, since political inertia has prohibited the codification of processes, routines, information, (etc). However, on both sides, water sector personnel have been in office since 1974 meaning that changes are happening (or are expected) simultaneously in the South and the North. A gap, in terms of expertise and tacit knowledge, will emerge that cannot be bridged unless a common knowledge base has

been established. Perhaps this knowledge base can be established through training and capacity building on explicit knowledge, which is more tangible and much needed (especially in the North). Finally, strengthening the knowledge base (tacit and explicit) for both the South and the North is necessary in order that they may comply with European (WFD, Groundwater Directive, Costal Zone Protocol, etc) and international (MDGs, Johannesburg Plan of Implementation, etc) obligations. This is especially important in view of the potential for the island's re-unification.

SECTION SUMMARY

The thesis employs the knowledge management framework for the case of Cyprus in order to explore the role of knowledge in social interactions and therefore consider the ways in which the island's *de facto* divided communities may potentially be brought together. Knowledge is an elusive and adaptable notion that resides primarily in the minds of people. Indeed, in the words of Little (2002: 370): "*People are the locus of knowledge"*. Effective and coordinated joint action requires that people are able to process information in similar—or at least compatible—ways and this makes a common knowledge base a prerequisite.

Knowledge is multi-faceted: it may be tacit, explicit, individual, collective or an amalgam of some or all. Therefore an epistemology of knowledge is necessary for a solid and rigorous comprehension of the concept, especially with regard to its social meaning. *Tacit knowledge is considered central to the thesis because of its politically silent nature; it rests with the human mind and develops through daily practice. It is un-codified and therefore requires no formal institutional involvement*[104]*.* A group that shares tacit knowledge, the know-how, through regular interaction forms a community of practice. Also important in communities of practice is the creation of knowledge through shared practice; they constitute shared histories of learning. In this sense "*it is the learning and not knowledge that is the primary source of value. As the life of an item of knowledge approaches zero, knowledge ceases to be power; the ability to change knowledge—to learn—becomes the source of power*" (Willmott, 2000: 218). Moreover, stakeholder engagement facilitates the development of interdependencies through daily (or regular) interaction which, in its own turn, eases capacity building and cooperation. For cases such as Cyprus, this possibility is of utmost importance since formal bi-communal interaction is not possible.

[104] Emphasis added

The formation of communities of practice is facilitated through knowledge management; one of the latter's purposes is to connect people in order that they may think together. Although knowledge management has been critiqued broadly—and mainly with reference to its vague context, problems with quantification and association with the concept of power—the thesis argues that employing the framework may prove beneficial for the potential rapprochement of the two Cypriot communities.

It is a task of the thesis to examine whether communities of practice exist in Cyprus and, if so, what form they have acquired and how they have evolved over time. Based on existing evidence, it seems that communities of practice do exist and operate in Nicosia. However, a large number of the personnel involved, drawn from the two communities, are on the verge of their retirement. This reality raises queries as to potential risks on the acquired tacit knowledge. There seems to be an urgent need to ensure that the common practices and the common knowledge space are passed on to the next generation of actors because "*[k]nowledge grows when shared and grows when used; unused knowledge deteriorates*" (Chumer *et al*, 2000: xvi). If a person can learn, grow and adapt so can an organisation, network, or whole society, even if one that is *de facto* divided.

5. CHAPTER EPILOGUE

The Chapter discussed the analytical frameworks employed in the thesis. Policy networks and communities of practice, through respectively the prisms of governance and knowledge management, will be used in the case of Cyprus to operationalise the thesis' theoretical framework (see Chapter II).

The post-1974 political circumstances in Cyprus, and its *de facto* division, have created a separate and distinct social reality for the two communities. The perceptions of 'self' and 'other' are based mainly on pre-1974 information and on the distorted image that is inherent in *quasi*-conflictual conditions. The thesis claims that the two sides' rapprochement largely depends on how they view each other and how they perceive their current and future coexistence. The social construction of reality changes with perceptions and so deconstructing the dividing acuities may be one key to the island's unified future. Knowledge management has a lot to offer to this end; indeed, one of its primary functions is to connect people so they may think together and the creation of a common knowledge base is necessary for true and shared understanding. Besides, knowledge can be an agent for change, as presented in the paradigm shift of the

Modernity continuum. Knowledge management makes unreflective modes of action reflective by linking knowledge with practice, by transforming people (the knowers) into participants of social reality (the materialisation of knowledge through practice). Therefore the active engagement of actors through a common venture may assist with overcoming the fragmentation of approaches towards more holistic and integrated practices (including the water-related ones). It is a contention of the thesis that knowledge management, along with the operation of communities of practice and policy networks, may work towards this goal.

Communities of practice constitute networks within which knowledge and policy interact and are created over time by the sustained pursuit of a shared venture. As a shared history of learning, this is an ongoing cultural process embedded in everyday practice. In such a process, mutual engagement is of utmost importance as it produces coherence and continuity. Every participant of a community of practice, while sharing know-how and sense-making with others, is unique and irreplaceable for the knowledge he/she possesses and forms an essential part of the ensemble. At the same time the engagement within the community shapes and influences the individual identity; it is a two-way process.

Therefore, communities of practice, if present in Cyprus, may contribute to bi-communal rapprochement in that they may alter the fundamental basis of the island's social reality. By promoting interaction through practice within an interdependent cluster, they lay the foundations for capacity building, communication and trust that can only come through regular and reliable contact. The thesis argues that these clusters have come to exist in Cyprus and that they have evolved over time into more solid structures in the form of policy networks. Indeed, it is the policy networks framework that better corresponds to the reality of Cyprus; they lend the tools with which the power relations of heterogeneous actors within situations of semi-conflict may be analysed. For this reason they effectively address one of the main critiques levelled against the communities of practice framework.

Policy networks have evolved as a reflexive response to the needs of post-modern political economies. The relevant literature has refined network-based models of policy activity, due to the strengths that the framework entails. Policy networks are horizontal, semi-informal interactions among resource-interdependent actors that strive to solve problems of common interest. They are based on communication and trust because choice and voluntarism underpins their formation. Their semi-institutional status allows them to adapt and respond to the needs of their environment. This flexibility represents

one of their important potential contributions. These formations may prove immensely beneficial in and for Cyprus given the specificities of the island's situation. Perhaps, their most important quality rests with the dynamic (and usually silent) political interaction that they facilitate among the involved actors. In turn, this has provided a link with the notion of governance. Indeed, the rationale of policy networks, with which the thesis is aligned, is found in their potential as alternative forms of governance.

Within the scholarly literature, and especially in that on European integration, governance figures prominently due to the increasing awareness of the shortcomings of hierarchical and market structures and the growing reliance on informal authority in tackling social issues. The strongest aspect of governance is in its fostering of participation and the way in which it may include different parts of the social system in the governing activity. In that sense, governance supports and promotes the horizontal dimension of policy through wide stakeholder involvement and interaction. It offers a transcendence of governing activity (away from the prescribed boundaries of the government) thereby making it more flexible and adaptable and, in this sense, it is considered to represent a post-modern and reflexive response to the problems of modern government. Indeed, as a method of governing without the government, governance is conceptualised as the management of self-organising networks, bringing governance closer to politics. Rather than reinforcing a distinction between government and governance, the thesis makes the coexistence of governance and politics the real challenge (and this follows the thesis' theoretical disposition towards political science).

There is a similar discourse on water governance and the IWRM frameworks. Not until the 1990s did it became apparent that the water crisis is essentially one of governance. The two concepts are popular but at the same time problematic and imprecise, as they strive to reflect socio-political particularities and produce generalisable prescriptions rather than address the centrality of politics in water affairs. The thesis claims that the understanding of governance as self-organising networks can be expanded to water governance. In this way water governance can address politics in a more dynamic way through the operation of water policy networks.

Through the focus on enhanced participation, the thesis claims that water governance constitutes the post-modern response towards water demand management and seeks to verify community and network formations in Cyprus and Nicosia in particular. Chapters V, VI and VII are dedicated to this quest. Before commencing the empirical analysis, the following chapter will explain the methodology employed in the thesis.

CHAPTER IV
On Methodological considerations

1. INTRODUCTION

Chapter IV outlines the methodology used in the thesis and the way in which the various methods selected have complemented one another during the research process. The selection and applicability of these methods will be explained and their effectiveness in addressing the thesis' key research question examined.

The Chapter comprises four sections. Firstly, the research approach is outlined, and its situation within a qualitative, interpretivist and constructivist field justified. Secondly, an examination is carried out of the different research methods employed in the thesis and their role in the research process. Particular emphasis is placed on the use of semi-structured interviews as the study's key research method. Thirdly, the integrated research process is presented schematically. This section links together the steps involved in the research, outlines the methodological choices that were made and describes their connection with the analytical and theoretical frameworks employed in the thesis. Fourth, anecdotal material is provided in order to highlight the specificity of the case studies' cultural context and how this has affected the research process. The Chapter is brought to a close with a brief summary.

2. THE RESEARCH APPROACH: WHY QUALITATIVE, INTERPRETIVIST & CONSTRUCTIVIST

"Everywhere, our knowledge is incomplete and problems are waiting to be solved. We address the void in our knowledge and those unresolved problems by asking relevant questions and seeking answers to them. The role of research is to provide a method for obtaining those answers by inquiringly studying the evidence within the parameters of the scientific method" (Leedy, 1997: 3)

Responding to the key elements that constitute a formal research, as defined by Leedy (1997), the thesis:

- originated with a question (does bi-communal interaction exist in Cyprus despite the *de facto* division and in what forms?),

- involved the clear articulation of a goal (to prove that this interaction does exist and responds to the profile of policy networks and communities of practice),
- entailed a specific procedure (the collection of information/data, conducting interviews and the triangulation of findings)
- divided the main research question into smaller, more manageable tasks (the presentation of cross-'border' water management, analysis of three specific discursive water themes, and the assessment of three sets of bi-communal engagement in the capital)
- has been guided by a specific research problem or hypothesis (that bi-communal engagement is present in Cyprus and was initiated in the water sector)
- accepted certain critical assumptions (the *de facto* division along with its implications and at the same time the necessity for cross-'border' cooperation on vital issues like that of sewage treatment)
- required the collection, interpretation and triangulation of data in order to respond to the original question
- was a dynamic cyclical process[105].

The thesis' main research question informs the decision to opt for a qualitative research perspective over a quantitative strategy. The question focuses (i) on perceptions, opinions, meanings and understandings of individuals and groups in relation to particular policy lines, (ii) the impacts of the political situation on the water sector and (iii) the individual and collective action on specific water policy themes. These elements cannot be verified through quantitative techniques or tested through (quasi-)experiments. Although some quantitative analysis is used in Chapter V, where a comparative presentation of conventional water resources across the de *facto division* takes place, the focus of the thesis is on inter-personal interaction and its policy implications. The thesis, therefore, follows Creswell's (1998: 15) understanding of qualitative research as "*an enquiry process of understanding based on distinct methodological traditions of enquiry that explore a social or human problem. The researcher builds a complex, holistic picture, analyses words, reports, detailed views of informants, and conducts the study in a natural setting*".

A qualitative research methodology has been chosen because it delves into complexities and processes in depth, by exploring where and why policy and local knowledge may be at odds (Marshall and Rossman, 1999). Additionally, in the case of Cyprus, this complexity is heightened by a *de facto* physical border and a quasi-

[105] An schematic analysis of the research process as an integrated cycle is presented in Section 4 of the Chapter

conflictive political scenery. Both factors are inconsistent with the informal practices of cooperation that characterise relations between the two sides in the capital.

Moreover, a qualitative framework appears the most appropriate methodological approach when the object of study is analysed in the context of its natural setting. As Creswell (1998: 20) explained "*we let the voices of our informants speak and carry the story through dialogue*..." As such, the thesis adopts an interpretivist line that seeks to understand the situation from the participants' viewpoints by focusing on their perspectives and their way of understanding issues (in this case water resource management and bi-communal engagement). In such cases – and this study is one – interviews, as well as the observation and analysis of documentary materials, are the methods primarily employed. Observation was not selected because it entails the researcher's involvement in the interpretive process, and the author felt that her nationality and educational background would jeopardise the objectivity in the research findings[106].

As mentioned, a key contribution of the thesis' methodology is in its use of interviews across the *de facto* division and therefore, compares and contrasts opinions coming from both sides of the 'border'. Furthermore, and based on the interpretivist approach, "*...the conception of knowledge as a mirror of reality is replaced by a conception of the 'social construction of reality', where the focus is on the interpretation and negotiation of the meaning of the social world...the multiplicity of meanings in local contexts; knowledge is perspectival, dependent on the viewpoint and values of the investigator...*" (Kvale, 1996: 41). Such outputs also converge with the philosophical inclination of the thesis towards post-modern approaches to knowledge that questions the belief in one true and objective reality and instead opts for a plural, socially constructed approach, as "...*the most that can be achieved is a plausible interpretation*" (Ham and Hill, 1993: xi).

In this sense, an interpretivist understanding of qualitative research is linked to an approach based in constructivism, according to which perspective humans generate knowledge and meaning from their experiences through processes of accommodation

[106] The method of observation was aborted as the author was concerned about preconceptions and biases that could have altered the foundations of the analysis. History (as perceived and presented) surrounding the relations among Greece, Turkey and Cyprus and particularly with regard to the 1974 events, underpins strongly the educational systems in all three countries. The author's educational background (in the political science department of the National University of Athens) is well grounded on specific assumptions about the context of the countries' relationship. Therefore, the author preferred to eliminate any possibility of personal standpoints being externalised in the thesis and thus, potentially affecting the objectivity of the findings. Perhaps an understanding of these particularities is difficult for an external observer however, the author is determined to avoid any unconscious/unintended mingling of personal biases with the context of the thesis.

and assimilation (Liben, 1983). On this view problem-solving is at the heart of learning, thinking and development. As people solve problems and discover the consequences of their actions – through their reflection on past and immediate experiences - they construct their own understandings. This line of thought corresponds to the analytical frameworks of knowledge management employed in the thesis (relating to communities of practice). These frameworks refer to the groups of individuals that collectively create and share knowledge through shared practice which, in turn, shapes their identity (Davenport and Prusak, 1998; Brown and Duguid, 2002). The case study's empirical findings (with regard to finding practical solutions to problems of wastewater treatment and water supply) support this position. Moreover, the analysis confirmed the argument that meaning is created through action within a specific social context (Cook and Brown, 1999) and therefore calls into question any purported rigidity of the structure-agent duality. The case study demonstrated that it is not only the structure (the political scenery of separation) that affects individuals' behaviour and level of interaction, but also that those individuals influence the way the structure is formed through policy interventions (bi-communal joint action has defied and questioned the political separation).

In brief, the thesis follows a qualitative research perspective, aligning itself with interpretivist and constructivist approaches, due to the context of the case study under exploration and the nature of the selected theoretical/analytical frameworks. In the next section this trajectory is further justified through the presentation of the chosen research methods.

3. RESEARCH METHODS

Methods refer to the different strategies of inquiry used to collect and analyse information. The thesis employs a combination of different methods in order to enable the collection of information from a number of different sources and so opts for an approach based in "*a critical methodological pluralism"* (Danermark *et al*, 2002: 50). The main methods used include document analysis and interviews, the latter being the core method of enquiry. Additional methods have proved complementary to the enquiry, including case studies or focus themes, the deployment of grounded theory, narrative presentation and cognitive mapping. Given the qualitative approach of the thesis and the inherent difficulties in depicting policy processes based primarily on inter-personal interaction, the use of multiple methods aims to enhance a process of triangulation, i.e. the process of using multiple data collection methods, data sources

and theories to check the validity of the findings and provide multiple insights (Leedy, 1997).

3.1 MAIN RESEARCH METHODS

DOCUMENT ANALYSIS

In line with best practice in qualitative research, multiple document forms were collected. An initial desk study included the compilation of secondary sources available in library collections and online. Primarily, this facilitated the composition of the literature review and the compilation of the background information for the Cyprus case study. However, it should be noted that a large number of secondary sources on Cyprus (particularly Annual Reports, official studies and quantitative data on water resources) were made available during fieldwork; in some cases access to them was restricted to reference-only use on the premises of particular organisations. Moreover, the author used a small number of non-disclosed documents from the Greek Ministry of Foreign Affairs (mainly used in the analysis of the discursive water themes of Chapter VI) that cannot be referenced in the bibliography.

As secondary sources proved inadequate for a solid assessment of on-the-ground bi-communal interaction, the thesis found a substantial basis in its use of primary sources, including: 55 interviews (conducted with stakeholders across the *de facto* 'border'), newspaper articles, official letters, unpublished papers/presentations of key stakeholders and selected historical maps. Particularly for the North, where there is only a limited amount of literature available, and even less in English, a large part of the information presented in the thesis is based on interviews, unpublished papers and unofficial documents with which the author was provided during fieldwork.

The combination of primary and secondary sources provided a rich set of documentary material upon which the empirical analysis of the thesis was grounded. Through these various sources it was possible to conduct an "*analysis of the actual discourses – that is, the examination of argumentative structure in documents and other written or spoken statements – which provides insight into this interplay*" (Hajer, 1997). Without undermining the value of the secondary sources, however, semi-structured interviews formed the most substantial data collection method of this research process.

INTERVIEWS

Interviews represent the main method employed in the present research process. They followed the basic model that "*locates valued information inside the respondent and assigns the interviewer the task of somehow extracting it*" (Gubrium and Holstein, 2002: 13). The interviews have facilitated the collection and documentation of information relating to both the historical and contemporary aspects of water resource management in the South and the North. More importantly, they have facilitated the documentation of personal perspectives and opinions on aspects of bi-communal engagement that cannot be provided by the secondary sources. The key contribution of the interviews (and therefore an innovation of the research process) was the manner in which they assisted with recording the informal bi-communal interaction taking place in Nicosia. Due to the non-recognition issue this is not registered or documented elsewhere.

TYPE OF INTERVIEWS

The interviews conducted fell within the semi-structured category (Gall *et al*, 1996). No questionnaires were used, neither was any rigid set of questions; rather, a set of both open and closed questions was considered more appropriate in the context of Cyprus because the precarious political scenery and the *de facto* separation of the two communities made a more informal approach necessary. This allowed interviewees to speak freely and on their own terms, in order to express personal perspectives, doing so only so far as they felt comfortable with the process. It was felt that this was particularly important given the politically sensitive nature of the issues at stake including, specifically, bi-communal interaction.

In environments, such as in Cyprus, where every word may be politically-loaded, structuring the interviews around a series of firmly-stated questions that require clear-cut answers may not be effective. If interviewees feel pressurised with potentially sensitive questions they tend to dismiss them and bring an abrupt end to the overall exercise. The many interviews conducted in the South in which reference was made to other researchers caused the author to recognise this; as respondents explained, they felt that other researchers '*did not comprehend adequately the Cypriot context*'. As Silverman (1997: 249) put it, "*no method of research can stand outside the cultural and material world*" and so the author tried to avoid replicating the negative experiences of previous researchers and followed a more localised way of carrying out discussions (informally, covering a wide range of issues over a cup of coffee).

This approach was intended to align with the people-centred cultural tradition of Cyprus which is based on personal contacts and so requires a 'looser', more accommodating and flexible approach to personal interaction. Indicative of the role of personal contacts in Cypriot affairs is the fact that the majority of the interviewees provided their mobile phone numbers in addition to those for their homes' landlines as the preferred contact numbers and, indeed, most of the stakeholders' business cards, in both the North and South, include both home landline and office telephone numbers. As Section 5 of this Chapter will demonstrate, the research process was –to a considerable extent – determined by the cultural context and so it was fortunate that the author's cultural background proved conducive to successful interviews.

PLACE, TIME & RECORDING OF INTERVIEWS

The interviews were conducted during a series of four field trips to Cyprus in April-May 2004, January-February 2005, May 2005 and October 2008. A total of 55 in-person interviews were conducted on both sides of Nicosia, a process which involved daily crossing of the Dead Zone[107]. In order to facilitate the smooth flow of the discussions (and avoiding the interruptions of note-taking) and build good interpersonal relations between author and interviewees, most interviews were recorded. The interviews conducted in the South were done in Greek; those in the North primarily in English with some rare use of Turkish. All of the interviews have been translated into English and, for those carried out in the South, every effort was made to maintain accuracy in the intended meaning of the replies and opinions, even at the occasional expense of a felicitous translation.

SELECTION OF INTERVIEWEES

The choice of the interviewees was made following an initial cursory 'stakeholder mapping'[108] (Mitchell *et al*, 1997; Hemmati *et al*, 2002), a useful tool for identifying key actors and other interest groups, be they organisations and/or individuals with a role in the water management of the case study area. The small-scale of the island, the concentration of water-related responsibilities into a few departments and the key role

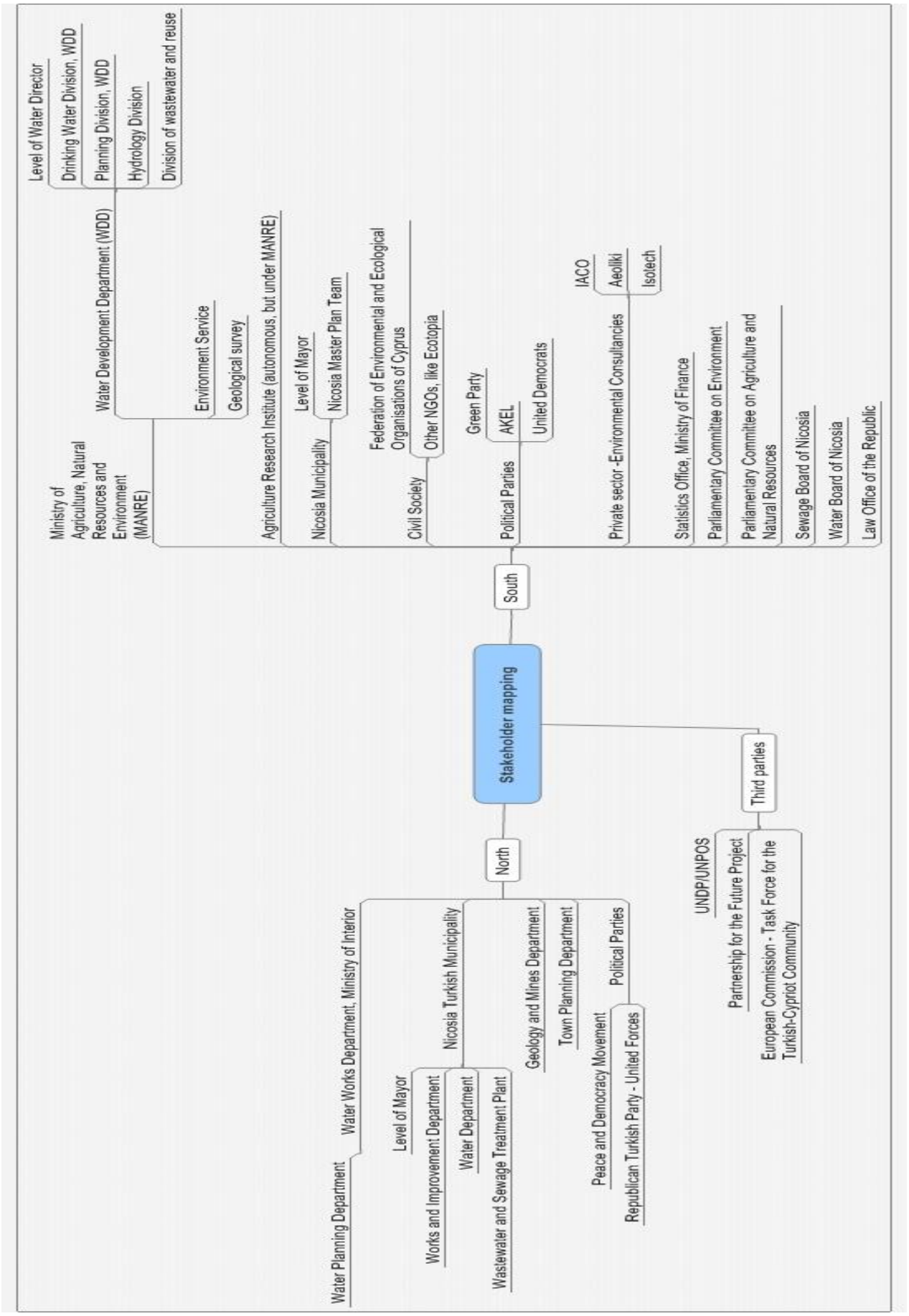
[107] Crossing the checkpoints in Nicosia was not as easy and smooth as might have been expected when moving within the space of a (small scale as well) city. It involved long waiting time and strict checking of papers (passport or othed ID) from officials on both sides of the checkpoint. On occasion more detailed explanations were needed (when having meetings with high level people in the North), even phone calls to the interviewees to confirm that interviews had indeed been scheduled. A recurrent reception of the author with suspicion, unfortunately accompanied the majority of the checkpoint crossings.

[108] Some generic information on how to structure stakeholder mapping is provided at http://www.slideshare.net/martin1959/Stakeholder-mapping

of individuals in the process made further classification of stakeholders into key, primary and secondary[109] groupings, a task of limited scope. Therefore, it was decided that the research process would not involve any extensive stakeholder analysis. Below is a schematic representation of the mapping exercise as it evolved and was enriched during the research process, and which depicts the organisations with which interviews were finally held:

[109] Primary stakeholders are the general public and the end-users who are usually the intended beneficiaries of the foreseen activities. Secondary stakeholders are made up of people or groups that have a role in the decision-making process, but are not necessarily directly affected by the outcomes. Secondary stakeholders are also referred to as intermediates and are comprised of donors, implementing agencies, civil society and NGOs. Key stakeholders are made up of both formal and informal institutions, groups and associations that either have an interest in or can influence the outcome of the implemented policies. The latter category includes government institutions, councils, departments and administrations involved in policy formation, planning and development, other public sector bodies, local administrations, at times the private sector and in those countries that are heavily dependent on foreign assistance for development, then potentially key donors as well (Hemmati *et al*, 2002).

Figure 3: Stakeholder mapping



ANALYSIS OF STAKEHOLDER MAPPING

Based on the mapping exercise, the cornerstone of the South's water management and administration was identified as the Water Development Department (WDD) in the Ministry of Agriculture, Natural Resources and Environment (MANRE). Therefore, a large number of interviews were conducted with people from WDD and an emphasis was placed on collecting information across its different divisions. Of paramount importance were the interviews with the WDD's Directors (both former and current) as they made possible an adequate comprehension of the official direction of the implemented water policy. In the North the equivalent entity is the "Water Works Department" in the "Ministry of Agriculture and Natural Resources". The interview with its Director (and other key people in the Department) provided valuable insights on the water policy that has been employed in the North.

For the South, a more complete picture of water management and policy was sought through interviews with the Environment Service – especially with respect to compliance with EU aquis directives and internationally-set carbon emission restrictions affecting the use of desalination – and, given the central role that agriculture plays in water affairs, with officials of the Agriculture Research Institute. In both the South and the North, important quantitative information was provided by people in the respective Geological Surveys/Departments.

With reference to the thesis' key research question on Nicosia, it proved possible to conduct interviews with the two Mayors that initiated the bi-communal engagement in 1977. Also interviewed were the two Mayors incumbent during the field trips, and a comparative analysis of the situations was carried out. Interviews with the Directors of the two sides' respective Sewage Boards provided the information necessary for an assessment of practices of bi-communal engagement in the particular area of sewage treatment that addresses the research question of the thesis (bi-communal interaction). The same applied to the drinking water system and interviews were held with the South's Water Board of Nicosia and the North's Water Department.

Finally, with reference to the Nicosia Master Plan, interviews were held with the key organisation in the South – i.e. the Nicosia Municipality – and a number of different administrative bodies in the North, as responsibilities are shared between various departments of the Turkish Municipality of Nicosia, the Town Planning Department, etc. At this point it is noted that interviews with water users (i.e. farmers or farmer organisations) were not scheduled, given the focus of the thesis on water services.

Nonetheless, interviews with selected people directly or indirectly dealing with agricultural issues (e.g. the President of the Parliamentary Committee for Agriculture and Natural Resources or employees –including the Director- from the Agriculture Research Centre) provided valuable insights about the agricultural sector and the interplay among users in the Cypriot water sector.

The research process was complemented with interviews with other stakeholders who were external to the official authorities. In that respect the interviews with the representatives of the Federation of Environmental and Ecological Organisations of Cyprus (the most prominent civil society actor) were central in understanding opposition to the Government's water policy line in the South. For the same reason interviews were held with the South's Green Party and the Parliamentary Committees concerned with water resources. Interestingly enough, insights into and examples of bi-communal engagement were offered by the Federation and also by consultancies. Finally, it should be noted that the small scale of the island results in people often holding dual affiliations and at times representing conflicting policy positions: WDD officers are members of the FEEOC, Ministry officials have worked to establish NGOs, and political figures who have worked to further (official) policy may be affiliated to opposition formations (etc.).

INTERVIEWS AT A GLANCE

During the four field trips a total of 55 people were interviewed in person: 38 in the South, 12 in the North and five belonging to third parties (UNDP/UNOPS, Partnership for the Future Management Unit and the European Commission-Task Force for the Turkish-Cypriot Community). Although the majority of the interviews were conducted with Greek-Cypriot actors, the number of meetings with their Turkish-Cypriot counterparts may be considered to be proportional given the respective sizes of the two communities' populations and human resources available to them. Moreover, the Turkish-Cypriot stakeholders that were chosen represent key actors because policy is highly centralised and actor-oriented in the North. For example, as they pertain to sewage treatment and drinking water in Nicosia, the respective portfolios are managed by individuals. Efforts to locate more people involved in these areas of administration and policy proved fruitless and, repeatedly, the author was directed towards the two actors identified initially.

Overall, effort was made to hold interviews at the highest possible level in the selected organisations (mayors, directors, heads of departments, presidents of parliamentary

committees, leaders of political parties, founding members of civil society organisations, senior officers, etc.) as these actors most closely follow official policy lines and are better placed to access information. These actors were also able, on many occasions through personal ties, to make the contacts that rendered additional interviews possible. Mirroring Herod *et al*'s (1997: 216) experience, "*I have often found that being able to use someone's name or having a letter of introduction and/or business card has given me access to high level official in other organisations who might otherwise have ignored my request for help*".

A full list of the interviewees and their affiliations is provided in Annex 1. The data collected during the interviews proved invaluable to the research process and it remains undocumented elsewhere. And, most importantly, the interviews captured personal perspectives on a wide range of issues based around the enquiry into the types and effectiveness of bi-communal engagement in, particularly, the Nicosia area. It is noted that aligning with confidentiality closures and in order to maintain the anonymity of the interviewees, reference to information gathered is cited in the thesis using a numbering approach (Interviewee 1, Interviewee 2, etc). The same applies to opinions and views expressed directly by the interviewees. The full list of interviewees with their names, affiliations and the corresponding number used inside the thesis is provided in Annex 1.

3.2 COMPLEMENTARY RESEARCH METHODS

CASE STUDY & FOCUS THEMES

A case study methodology has been selected because of its power to verify or reject hypotheses. The case study method is a type of qualitative research in which the researcher "*explores a single entity or phenomenon (the case) bounded by time and activity (a programme, event, process, institution or social group) and collects detailed information by using a variety of data collection procedures during a sustained period of time*" (Creswell, 1994: 12). Case studies are employed in order to shed light on a phenomenon, be it a process, event, group or object of interest (Yin, 1994) and, despite some divergence regarding the use of case studies in empirical research (Verschuren, 2003), this method has been selected in order to test the chosen theoretical and analytical frameworks through empirical examples. Moreover, through the use of sub-case studies/focus themes, it has been possible to break down the overall research task into smaller, more manageable units. The case study retains "*the holistic and meaningful characteristics of real life events*" (Yin, 1994: 8), and is often of

value when "...*a 'how' or 'why' question is being asked about a contemporary set of events over which the investigator has little or no control*" (ibid: 9).

Overall, the thesis has focused on the case study of the island of Cyprus with the aims of: (i) evaluating the usefulness of viewing water management under conditions of administrative and political separation and quasi-conflict through the lens of policy analysis; and (ii) assessing the applicability and value of alternative forms of governance (e.g. policy networks and communities of practice) in water management under conditions of *de facto* division.

In order to pursue the thesis' objectives a further set of sub-case studies, in the form of focus themes, has also been developed. More specifically, three discursive water themes/technologies (desalination, water transfer, water recycling) were selected for analysis; their potential impact and the ways in which they might be adopted were evaluated in order to demonstrate the value of viewing water in Cyprus through the lens of policy analysis. These three themes were suitable for examination through case studies: analysis was to be issue-specific and time-bound and, furthermore, could be orientated towards presenting each theme as a cross-'border' manner while making the linkages with the theoretical frameworks clear. Moreover, three areas of bi-communal engagement (sewage treatment, the drinking water system and urban planning in the old part of the capital) were chosen in order to test the applicability of the thesis' two analytical frameworks (policy networks and communities of practice). As for the three discursive themes, the three areas of engagement were issue-specific, time-bound and focused on the area of the capital, Nicosia. The use of these six focus themes (or sub-case studies) assisted in addressing the thesis' key research question and objectives.

NARRATIVE PRESENTATION

Another complementary research method employed in the thesis was its presentation of the collected information through narratives. The narrative method is understood as "*a communication medium that reflects a structured approach to reasoning*" (Tomai and Forbus, 2007:1) and it is considered an effective and reliable – though not necessarily subjective – way of conveying information. As "*the presentation of a sequence of observed events...[a narrative] will always involve a subset of partial representations of the source events combined with additional assertions*" (ibid). One significance of a narrative presentation is that it entails interpretivist elements and may simultaneously address a wide array of issues during the course of a story. Therefore it may be considered as a boundary condition highlighting the course of events, past and

present, and as one that includes some predictions for the future. Due to its informal nature, narrative presentation serves to constrain complexity by fostering an account of events as seen by the presenter. Especially when it comes to social interaction, narrative permits the expression of emotions, value systems and personality tendencies that may be inferred from externalities (Kelley, 1973; Gratch *et al*, 2006).

The elements described above proved important in this study, and the narrative presentation was very helpful in the research process given that it facilitated the collection of sensitive information during interviews. Several of the interviewees opted for this approach when responding to questions; they considered story-telling a less politically-loaded approach that allowed them to present information in a structured manner, perceived as relatively 'subjective'. Moreover, it allowed the insertion – sometimes in an anecdotal manner – of personal perspectives without labelling them explicitly as such and thus, widened the interviewee's comfort levels when elaborating on discursive themes. Moreover, given that the majority of the interviewees were people with many years' experience, a narrative method provided ample space for references to their knowledge and expertise. Finally, this method was used as a medium of improving the author's interaction with the interviewees as it meant that they were able to speak freely, recollect information and provide a complete picture of the situation as the story developed.

In the thesis the narrative presentation was used in two ways. Firstly, to recount information provided by interviewees, for example in the section on the Nicosia Sewage Plant (Chapter VII). For triangulation purposes, such information was cross-checked through secondary sources and other narrative presentations. Secondly, it was employed in the analysis/review of the discursive water themes (Chapter VI). These themes are presented, chronologically, in a narrative manner and this facilitated the structuring and communication of their complex context. Moreover, the narrative presentation served to extract and highlight the events, outcomes, correlations and conclusions that the author considered relevant in answering the thesis' research question.

GROUNDED THEORY

Grounded theory is a "*general research methodology, a way of thinking about and conceptualising data*" (Strauss and Corbin, 1994: 275) which emerged through two sociologists' (Glaser and Strauss, 1967) efforts to close the "*embarrassing gap*

between theory and empirical research" (Leedy, 1997: 163). Subsequently, the use of grounded theory has not remained discipline-bound or restricted to use in sociology.

Grounded theorists begin with a broad research question that provides the freedom and flexibility to explore a phenomenon in depth. The research question identifies the general focus of the study and tends to be action- and process-oriented. Depending on the focus of the question, the researcher gathers various data and covers various aspects during the course of the analysis. Grounded theory is an "*iterative process by which the analyst becomes more and more grounded in the data and develops increasingly richer concepts and models of how the phenomenon being studied really works*" (Denzin and Lincoln, 2003: 279).

In grounded theory, the research "*attempts to derive a theory by using multiple stages of data collection and the refinement and interrelationships of categories of information*" (Creswell, 1994: 12). The theory is 'grounded' in the sense that, rather than being suggested by a basis developed from the literature, it is developed from the data. Therefore theory is an expected outcome – rather than starting point – of a study. By linking descriptions of participants' perceptions to more general social science theories, grounded theorists aim to contribute to the development of theory. An important assumption underlying this approach is that "*all the concepts pertaining to a given phenomenon have not yet been identified, at least not in this population or place; or if so, then the relationships between the concepts are poorly understood or conceptually underdeveloped"* (Strauss and Corbin, 1990: 37).

As it pertains to the present study, the grounded theory method is not used in development of a new theory. Rather, it is employed with the aim of further strengthening the policy network analytical framework, the intention being that it may subsequently evolve into a theoretical model. As explained above (see Chapter III), the policy network approach is considered primarily as a tool for understanding informal, but stable, non-hierarchical relationships among actors on specific policy issues. One of the main criticisms of the approach concerns its arguably limited potential for evolving into a theoretical framework. On this view grounded theory is considered to represent a mere metaphor, highly diverse in its use and interpretation. But, based on its proponents' arguments, the viewpoint adopted by the thesis is one favourable of grounded theory's potential as a theoretical framework. This view is taken on the proviso that further study is carried out on the actors, a dialectical approach is assumed, and that the concept of governance is better grounded within it.

Thus, the thesis aims to contribute in this way through the empirical analysis of a specific case study, where the actors' engagement seems to fit well into the policy networks framework. More specifically, the thesis aims to reinforce these aspects by (i) shedding light on the actors and their interaction within the context of specific focus themes, (ii) fortifying the interactive nature of agent and structure by demonstrating the manner by which policy is socially constructed, and (iii) demonstrating that the existing policy networks form an alternative form of governance, removed from hierarchy and official politics, on the basis that the prevailing political circumstances in Cyprus do not allow for the implementation of a formal policy process.

In order to respond to these objectives, the empirical analysis will be primarily based on the interview material. This is in line with the methodology of grounded theory where "*the grounded theorist collects verbatim transcripts of interviews...as coding categories emerge, the investigator links them together...one technique is to compare and contrast themes and concepts*" (Denzin and Lincoln, 2003: 279). The data collection process of grounded theory varies depending on "*the specificities of the area under study, the purpose and focus of the research, the contingencies faced during the project, and perhaps also the temperament and particular gifts or weaknesses of the researcher*" (Strauss and Corbin, 1994: 276). This seems to mirror the data collection process employed in this study. In both cases data collection is flexible and characterised by openness to changing conditions, while data is gathered from more than one unit (i.e. participant) in order to maximise the triangulation of the obtained information. But the main correlation between the thesis' approach and grounded theory remains in its attempt to record relationships and link together descriptions of participants' perceptions.

COGNITIVE MAPPING/MIND MAPS

Cognitive maps, mental maps, mind maps, cognitive models or mental models are types of mental processing composed of a series of psychological transformations. By these transformations individuals may acquire, code, store, recall and decode information about the relative location and attributes of phenomena in his/her everyday or metaphorical spatial environment (Downs and Stea, 1973; Buzan and Buzan, 1995; Buzan 2006). Cognitive maps are graphical representations of the frames and arrangements of perceptions and knowledge by which individuals or groups perceive a phenomenon or event (Kitchin and Freundschuh, 2000). A cognitive map analysis combines the "*intuition of human coders with the quantitative methods of network*

analysis", with the latter examining the "*properties that emerge from relations among things*" (Denzin and Lincoln, 2003: 270-272).

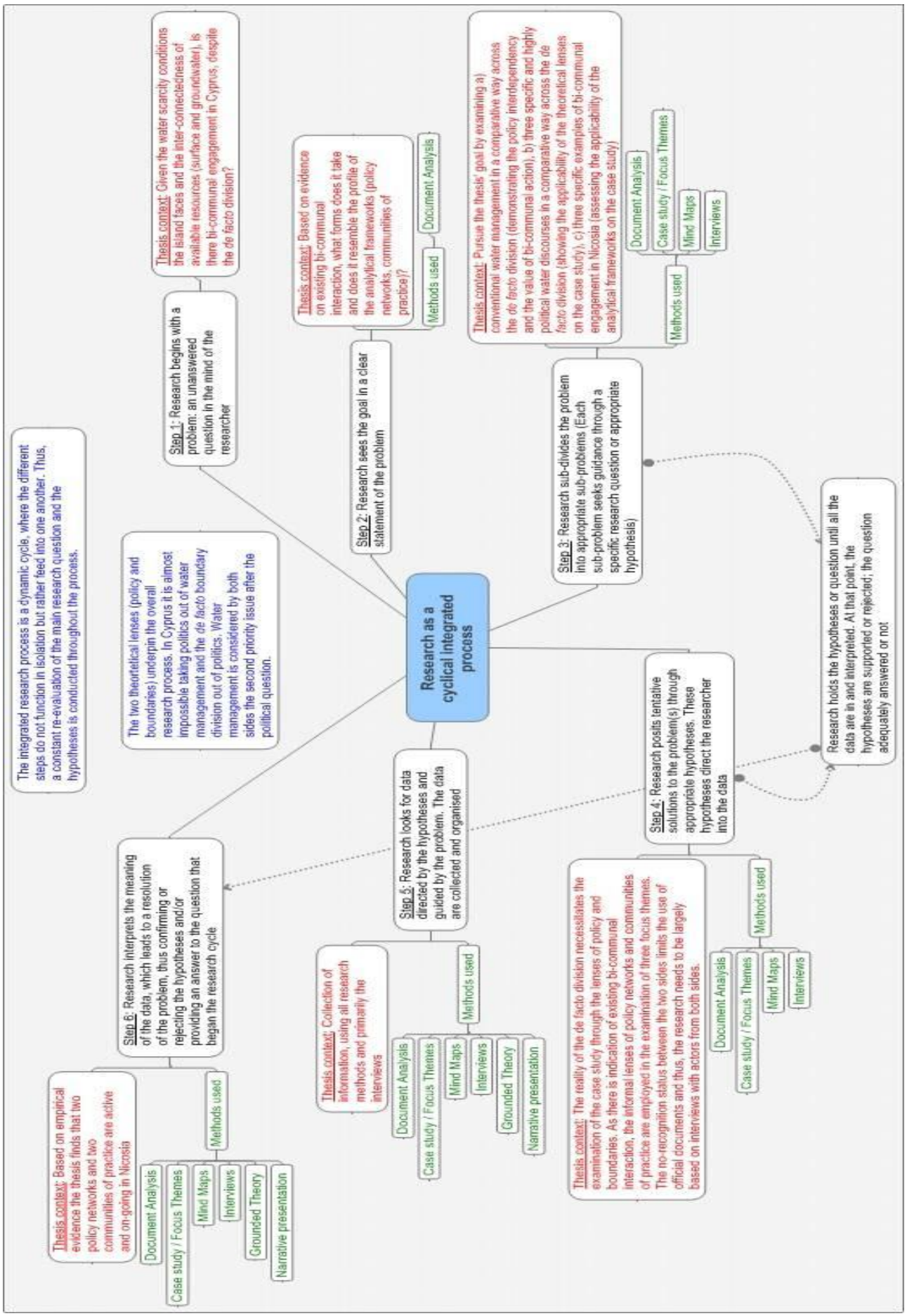
In particular, mind maps are methods used to construct and accumulate spatial knowledge, allowing the mind's eye to visualise images in order to reduce the cognitive load and enhance recall and learning of information. It is a "*powerful graphic technique which provides a universal key to unlocking the potential of the brain...towards multi-dimensional thinking*" (Buzan and Buzan, 1995: 59-61).

In the present research, extensive use has been made of the mind map technique: from note-taking, to synthesising theoretical concepts, to elucidating discursive themes or structuring collected information (two examples are included in this Chapter). This methodological technique enabled the establishment of different mind maps by area (South, North) and theme (desalination, water transfer, sewage treatment, etc). It was particularly useful in compiling and juxtaposing the perceptions of different stakeholders on the same themes. More importantly, it provided a way of examining bi-communal interaction on specific themes by juxtaposing a diversity of opinions on a single graph. This technique allowed the multi-dimensional evaluation of themes, including spatial and temporal parameters.

4. THE INTEGRATED RESEARCH PROCESS AND METHODOLOGICAL LIMITATIONS

In the thesis, the research process is understood as a dynamic cycle where the different steps do not function in isolation but, rather, complement each other in an integrated manner. Therefore, the research question, analytical tools and research methods work in parallel. A schematic representation of this cyclical process is provided below. It is based on Leedy's (1997: 10) six steps of the research cycle (sections marked in black), but has been adapted to a mind map format and in order to address the specific context of the thesis.

Figure 4: Research as a cyclical integrated process



The overall methodology and the specific research methods were selected after careful consideration of the thesis' research question and the specificities of the case study. Every effort has been made to minimise the potential for error however, certain problems and limitations must be acknowledged.

Access to resources and data validity:

The availability of resources on the theoretical elements of the thesis was comprehensive. However, one constraint that the author faced concerned access to German and Dutch material on policy networks because of language restrictions. For this reason, again, the case study suffered limitations given its dependence on Turkish-language material. However, it should be noted that most of the body of resources on the North – although of a limited volume – are usually available in English. Moreover, third party assessments on conventional water resources, for example those composed by the various UN bodies, Aquastat and the World Bank, were largely based on data compiled in the 1990s and, above all, covered only the area of the South. Thus, the quantitative information relating to the North was primarily based on resources accessed during field work and on the reports/studies compiled by Turkish-Cypriots which have not been widely published.

Triangulation has been extensively used in order to confirm the validity of the collected material. However, as the thesis was substantially based on information derived from interviews, the issue of subjectivity necessarily implies an important margin for error. This is an expected consequence of research conducted in highly politicised and securitised contexts; as the thesis readily acknowledges, the cross-'border' analysis of water management in Cyprus can only be such an example . However, that so many interviews were carried out underpinned the intention to minimise this risk (insofar as that is possible) through the juxtaposition and cross-checking of the compiled information.

The issue of subjectivity:

As is the case for policy issues in the broadest sense, complex policy issues such as water management involve a predicament of defining - in an objective or subjective manner - the reality within which they are constructed. Reality, in the mind of the researcher, is usually perceived through a theory or a framework and the chosen theory largely determines the issues at stake; in the case of the thesis, this is done through the lens of policy analysis. But policy issues involve perceptions, perceptions involve constructions, and usually a definition of an issue becomes part of the matter at

stake. "*In defining a problem, analysts and policy-makers jump into the problem...analysis is participation, not simply observing a problem*" (Parsons, 1995: 88). In an attempt to tackle this problem, the thesis includes a set of analytical frameworks to enhance the lenses through which the policy discourse is analysed. The success of such an endeavour may be determined through the thesis' findings and the on-the-ground future trajectory of the policy issues at stake. A related risk arises also from using interviews as the key research method which, in addition to an issue of validity, raises a risk of subjectivity with regard to the information that is provided. As mentioned, triangulation and, simply, the conduct of a large number of interviews represent the efforts made to respond to this challenge.

Subjectivity has been widely acknowledged as a risk in qualitative research and as a potential problem when grounded theory is used as a research method (Leedy, 1997; Denzin and Lincoln, 2003; Bryant, 2003). "*One major worry in qualitative research concerns the different predilections of interviewer and interviewee...interview data yields the construction of data that represents the mutual interpretation of the interviewer and of the interviewee as the interview proceeds...this constructivist orientation is that data is constructed with interacting interpretations*" (Glaser, 2002: 1).

However, and as stated at the beginning of the Chapter, the thesis embraces the constructivist and interpretivist approach to qualitative research. These are suitable methods given the context of the Cypriot case study, and that may be used in the assessment of the chosen theoretical and analytical frameworks. On this view, the thesis aligns with Charmaz's (2000: 510) assertion that "...*constructivism assumes the relativism of multiple social realities, recognises the mutual creation of knowledge by the viewer and the viewed and aims towards interpretive understanding of subjects' meanings*". As it is rarely possible to agree on one version of events "...*the most that can be achieved is a plausible interpretation*" (Ham and Hill, 1993: xi). Such an approach asserts the social construction of reality One of the intended contributions of the thesis is in strengthening the theoretical potential of policy networks by elaborating the role of agents (actors) who through regular (though informal) interaction may demonstrate the value of alternative forms of governance (i.e. policy networks).

<u>Selected scope of analysis</u>:

The subject of the thesis focuses on the examination of bi-communal forms of interaction in the area of Nicosia. This is coupled with a comparative presentation of conventional water resources management (Chapter V) and a critical presentation of three discursive water themes (Chapter VI). These three parallel processes aim to

elucidate the complex water paradigm of Cyprus and the necessity of bi-communal co-operation.

Other examples of bi-communal engagement that do not fall within the scope and objectives of the thesis concern the preservation of historical monuments, rehabilitation of old neighbourhoods, de-mining activities, cultural activities and civil society co-operation. Neither does any examination of Cyprus' political circumstances because (i) this issue has already received extensive coverage in existing literature and (ii) any attention afforded to the issue would divert the thesis' consideration of alternative forms of governance towards conventional political discourses.

5. EXTRACTS FROM THE FIELDWORK DIARY

As mentioned in the interview section, besides the multiple research methods the direction and extent of the research process was significantly affected by the local cultural context involved in the case study. The incidents and experiences of the field trips enhanced the author's understanding of the on-the-ground situation. These insights can only be extremely subjective and cannot be adequately documented as part of the research methodology in the strictest sense. However, the role and significance of anecdotal information should not be understated and so this section moves to consider a selection of these aspects.

THE INTERVIEWS

The way in which the interviews were set and conducted in both the South and North demonstrates the inherent cultural similarities of the two sides. All of the interviews were arranged over the phone or in person while the author was in Nicosia. Efforts to plan the interviews in advance through e-mail proved unsuccessful; most of the interviewees do not regularly use electronic communication and those that did respond to e-mails requested that the author travels to the island, and then calls them (preferably on their mobiles) in order to arrange a meeting for an interview. When the author arrived in Cyprus, most of the interviewees were eager to meet and willing to work to accommodate her schedule (which was rather fraught, given the large number of appointments).

A recurring pattern emerged in each of the interviews. Following the formal introductions, a significant amount of time was spent explaining the author's

background and relationships in Cyprus, outlining the occasions that she had visited the island (and the places she had visited), her previous studies, the aims of the current research and plans for the future. These introductions were carried out over coffee that – without exception – was offered by each of the interviewees. The introductions were two-sided; interviewees also provided information on their background and experience (etc.). Once a level of rapport had been established, the interview proceeded with an informal discussion on topics raised by the author and followed through by the interviewees. Time is a relative concept in Cyprus. On average the interviews lasted for about two hours, with some exceptions that lasted longer.

As the author is a Greek national (and given the cultural convergence of Greece and the South) a positive interpersonal relationship was relatively easy to establish with the Southern interviewees. However, it should be noted that reservation and mild disbelief were the initial reactions of the interviewees (on both sides) when informed about the research topic. It was only after effort that a more receptive interaction was possible with regard to bi-communal issues. What particularly struck the author was the eventual acceptance of her nationality by the Northern actors and the openness with which she was afforded. As Greece and Turkey are long-standing foes, it would perhaps be reasonable to assume and anticipate a certain level of suspicion and scepticism and yet, in this respect, any such expectation proved ill-founded in the end. It was pleasantly surprising that many Northern interviewees made their offer of coffee in the Greek language, to which the author considered it appropriate to respond in Turkish. After this brief crosstalk, the interaction usually became increasingly open and the discussion generally proceeded in the pattern mentioned above.

It should be noted that a significant number of interviews on both sides were arranged on the spot whilst interviewing. The author was provided with the contact details of other actors and encouraged to contact them (and at times to physically visit them when their offices were close by). On occasions, the interviewees would make calls in the author's presence in order to arrange for meetings with other actors. This proved valuable for witnessing, first-hand, the existence of good bi-communal interaction, as some of these calls were made directly from the South to the North.

Overall, the interviewing experience shed light on the local cultural context of Cyprus, which is people-centred and based, largely on interpersonal relationships. Having conducted the first few interviews it became easier for the author to gain access to more people and resources. It is also interesting to note that following a thorough explanation of the research topic, the majority of the interviewees were willing to share

information and data, despite knowing the scope of the author's research as a comparative cross-'border' analysis.

FACILITATED MEETINGS ACROSS THE DEAD ZONE

As indicated, a number of interviews were facilitated by the personal intervention of other interviewees. The few selected examples mentioned here aim to illustrate the good level of informal bi-communal interaction, which supports the thesis' research question on the existence and role of such communication.

Central to the research process, was the interview with the Head of the North's Wastewater Department, Interviewee 49. This was made possible with a personal call by the South's Head of the Sewage Board, Interviewee 20. The author was present during this call and so was surprised to realise that the discussion was conducted primarily in Greek. The level of trust between the two men seemed significant; Interviewee 49 immediately agreed to the interview and, moreover, waited to meet the author at the Ledra pedestrian crossing in order to facilitate the 'crossing' process and take her to his office.

The meeting with the –at the time- North's Mayor of Nicosia, Interviewee 43, was facilitated by Interviewee 34 (General Secretary of the United Democrats Party and former Minister of Agriculture, Natural Resources and Environment). He drove the author to the Nicosia Turkish Municipality premises and introduced her to the Mayor. So as not to prejudice its course, Interviewee 34 was absent during the interview with Interviewee 43, but whether the meeting would have been possible without his intervention is questionable.

In the same manner, the interview with Interviewee 39 (the North's Mayor of Nicosia when the bi-communal engagement commenced) was made possible through the intervention of Interviewee 5 (in the same period, the South's Mayor of Nicosia). Similarly, the interview with Interviewee 45 (the Head of the North's Water Department) was arranged over the phone by Interviewee 36 in the South's Water Board during his interview.

AND A SOCIAL INTERFACE

During the fieldtrips the author was also given the opportunity to experience bi-communal interaction during social gatherings. This provided informal evidence of the commonalities between the two sides and the unique identity they share, seemingly unaffected by more than 30 years of *de facto* political separation.

On one occasion during the second field trip to Cyprus (January-February 2005), the author was invited to an informal dinner in the North, organised between friends from both sides. The dinner took place in a small and picturesque – if slightly run down – tavern in the North next to the Dead Zone. The author crossed over by car with a few Greek Cypriots. The group consisted of Greek-Cypriot and Turkish-Cypriot researchers and academics, with a few Turkish-Cypriots working in Southern institutions. The discussions held were informal and general in their nature, people sharing different personal experiences as a tribute to the presence of the author. They talked, for example, on what the *de facto* division means to them, how it affects their daily lives and their wishes and predictions for the future. Besides the casual reaction of the tavern's regulars to the Greek-Cypriots' presence - only seven months after the island's EU accession had turned the crossing of people from one side to the other into a daily routine - another striking moment was that in which the tavern's owner began to play the guitar and its patrons started to sing. Although initially in Turkish, after a point the songs were sung, interchangeably, in Greek and Turkish and sometimes even in both at the same time. As it was explained to the author these were 'Cypriot songs'; even if the language differed, the context remains the same and the emotions that were triggered were shared.

6. CHAPTER EPILOGUE

Chapter IV discussed the research approach and methodology that is employed in the thesis. It began by identifying and justifying the selected research approach as qualitative, interpretivist and constructivist. It then proceeded with a detailed presentation of the main research methods (document analysis and interviews), the complementary ones (case study/focus theme, narrative presentation, grounded theory and mind mapping) and the role that each played in the research process. Particular emphasis was placed on interviews given their importance as the thesis' key research method. A total of 55 semi-structured interviews were conducted with key stakeholders in the South and the North during four sets of field trips to Cyprus (April-May 2004, January-February 2005, May 2005 and October 2008). In order to demonstrate the

linkages between the research methods and the thesis' context and theoretical/analytical frameworks, a schematic presentation of the integrated research process was provided using the mind map tool. An account was also provided of potential methodological limitations along with the ways in which they were overcome. Finally, the Chapter offered some anecdotal information on incidents and experiences during the field trips that enhanced the author's understanding of the local cultural context. These aspects of the research process significantly influenced the overall research process.

Chapter IV concludes the theoretical, analytical and methodological considerations of the thesis. The following chapters are dedicated to empirical analysis and it is Chapter V that turns to focus on a comparative presentation of conventional water resources management across the *de facto* division.

CHAPTER V

Deconstructing the division: conventional water resources management across the Dead Zone

1. INTRODUCTION

Chapter V is the first of the three chapters dedicated to the empirical analysis of the thesis. It responds to the thesis' first overall objective, which is to conduct an integrated review of conventional water resources management across the *de facto* division in Cyprus. Thus far, and to the best of the author's knowledge, such a juxtaposition of the South and the North has not been conducted in the frame of a single document. Although separate reports on the water situation in the South and the North exist, along with reports on (mainly UN-led) bi-communal projects, scholarly work has not taken the research further by combining a theme analysis for the two sides in one study. Part of the thesis' originality lies with its contribution to bridging this scholarly gap with regard to conventional water resources. There is no claim of originality regarding water resources assessment as the thesis will not produce new information nor exhaust existing one; instead it aims to direct attention to a cross-'border' review of available information.

To this end, a systematic presentation of conventional water resources management in Cyprus is attempted, aiming to accentuate the need for an integrated framework. This overview sheds light onto the geo-political particularities of the island's water resources and concretises the context within which the theoretical explorations of the thesis will take place (also with reference to the analytical frameworks). At the same time, the main water policy issues across the *de facto* boundary are highlighted, offering an insight to the reasons behind the prolonged complexity of the political debate. The identification of these concerns will also pave the ground for an analysis of selected discursive water issues in Chapter VI.

Although Chapter V concerns both sides of the island, it is noted that available data on the North is substantially less than that on the South. This is the case mainly for three reasons: i) the political and security situation on the island and the international isolation of the unrecognised North have rendered peer-reviewed academic sources scarce, a substantial proportion of which is available only in Turkish. Studies carried out by external actors are rather limited. ii) The organisation of water resources information in databases (and their digitisation) is at an elementary stage, as

experienced during fieldtrips. iii) Limited access to Turkish sources, due to language restrictions[110].

At this point an additional difficulty merits attention: the figures provided during several interviews were largely estimates of the interviewees and were not confirmed by secondary material. There was a widespread tendency in both South and North for approximations when discussing raw amounts/data, a reality that rendered the compilation of information (in a reliable scholarly manner) challenging. For these reasons, information presented in this chapter often utilises more than one reference (aiming at triangulation), while there is mentioning of all different provided figures. The references are principally based on primary and secondary sources in English and Greek, official reports of the South, documents about the North (primarily in English), EU and UN studies and documents, as well as on information collected during interviews.

This in mind, Chapter V commences with an epigrammatic reference to past studies on Cyprus' water resources, some of which on the entire island as they were conducted before 1974. Reference to the island's geo-climatological conditions comes next, followed by an analysis of water supply and demand on both sides of the island. Before closing, the chapter presents water-related initiatives led by the EU and UN; both are considered substantial change agents in the *de facto* divided island.

2. PREVIOUS STUDIES ON CYPRUS' WATER RESOURCES

A number of studies on Cyprus' water resources have been realised after the island's independence in 1960. Though detailed in their approach and data collection methodology, these studies seldom touch critically upon the institutional and socio-political aspects of water management. In addition, all post-1974 studies have been conducted separately for the two sides, thus providing a fragmented view of the island's resource situation. The thesis wishes to put together existing information on the South and the North and direct attention to the island as a single unit of analysis, also in accordance with the EU WFD that views the island as one single basin (MANRE WFD Report, 2005: 7).

The section makes reference to major studies that have been widely available to the public and/or frequently quoted. The aim is primarily to highlight the key water

[110] The author's command of the Turkish language is not adequate for in-depth document comprehension.

challenges, as identified by these studies. By default, an indication on the availability of water-related information is provided.

2.1 REPORTS ON THE ENTIRE ISLAND[111]

The first island-wide report was published by the United Nations in 1961, just after the island's independence. This report, also known as the Thorp Report (Thorp, 1961), was carried out to address the first signs of seawater intrusion into the coastal aquifers. It concluded that a long-term strategy for waterworks and wider infrastructure construction was urgently needed.

The Government of Cyprus carried out a second study between the years 1964-1969[112], with the financial and technical assistance of the United Nations Development Programme. This study estimated the total reserves of groundwater and the storage capacity of the aquifers; its most important finding was that the annual groundwater extraction exceeded the aquifers' safe yield by 43 million m^3 (Constantinou G., 2003).

In 1998, a study was initiated as a joint project financed by USAID between the South's Geological Survey and the United States' Geological Survey with the aim to design, construct and implement a computerised water resources database covering the whole island (Interviewee 13[113], Interviewee 48[114]). This study required the collaboration between the South and the North. Although concrete in its objectives, the project was not successful in bringing the two sides together (Interviewee 13). It terminated its first phase at the end of 2004 and until 2008 (the author's last fieldtrip) it was not known whether its continuation would be approved by the US partner (Interviewee 48).

2.2 REPORTS ON THE SOUTH

The first report on the South was published in 1998 by the South's Geological Survey[115] and detected the urgent need for a detailed study and re-assessment of the island's water supply and demand forces. This report formed part of the study funded by USAID with the collaboration of the US Geological Survey (see previous sub-section).

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[111] For a comprehensive historical presentation of water resources development since the ancient times and pre-1960 reports, see Great Cypriot Encyclopaedia, 1990: 204-207; Kambanellas *et al*, 2003.
[112] Also http://www.moa.gov.cy/moa/agriculture.nsf/All/A5270DB2D6FA3B21C225701400312A2C?OpenDocument
[113] Former Head of MANRE's Hydrology Division
[114] Senior Engineer in the North's Waterworks and Planning Department, 'Ministry of Interior'
[115] http://www.moa.gov.cy/moa/agriculture.nsf/All/A5270DB2D6FA3B21C225701400312A2C?OpenDocument

In response to the 1998 report's recommendations, a study was carried out between the years 2000-2002 by the Water Development Department in collaboration with the United Nations Food and Agriculture Organisation (hereinafter WDD-FAO Report). The findings of the WDD-FAO Report constitute a primary source of data reference for the South with regard to water resources. Although holistic in its proclamation, the Report has fallen short of suggesting demand management strategies and conducting an institutional analysis (Interviewee 31[116]).

Another study, in the framework of the MEDIS EU Programme (EVK1-CT-2001-00092), was conducted around the same time as the WDD-FAO Report and completed in 2003 (Constantinou G., 2003). This report, besides carrying out a water resources' assessment, it stressed the need to curtail water use in irrigation and to re-consider the structure and type of the agricultural sector so as to balance the supply-demand nexus. Moreover, the study pinpointed the importance of institutional reform to facilitate the EU WFD's implementation in Cyprus.

Due to Cyprus' EU accession process, a number of studies on specific water themes (irrigation, desalination using renewable energy, etc) have been conducted with EU funding (DG Research). However, their presentation goes beyond the scope of the thesis[117].

2.3 REPORTS ON THE NORTH

A study on water demand in the North was carried out by Numan and Agiralioglu in 1995. However, the accuracy of the findings has been questioned, as the authors seem to have overestimated the growth of the student population, the extent of irrigated land and also double-counted the students' visiting families (which were already included under the tourist sector) (Bicak *et al*, 1996).

A Technical Proposal was submitted in 1995 to the North's "Office of the Ministry of Finance", to examine a Master Plan for Water Resources Development and Management (Tahal Ltd, 1995). The study carried out an assessment of water supply and demand and provided a timeline for a Master Plan preparation along with an accompanying Action Plan for its implementation. The Master Plan would identify the actual water needs in line with the national economic development plan and define

[116] Retired Senior Engineer of WDD

[117] A list of research projects on water is available at http://ec.europa.eu/research/water-initiative/results_en.cfm?country=CY, while other projects on Cyprus can be found through the search engine of the Cordis website at http://cordis.europa.eu/home_en.html

ways to attain them (Ergil and Ateshin, 1999: 19). However, until the completion of the thesis, no further steps had been taken regarding the Master Plan's preparation.

A Report on water demand was presented to the "Council of Ministers" of the North (Technical Committee Report, 1996)[118]. Contrary to the Numan and Agiralioglu study, this report seems to have underestimated the population growth and did not consider the soldiers and workers from Turkey, or the overseas students in the five universities of the North (Bicak *et al*, 1996).

2.4 SOME KEY FEATURES OF THE STUDIES

One important feature of the above studies includes their quantitative focus, with little attention towards institutional, legal and socio-economic aspects. Another, concerns the tendency to follow the suggestions of external agents (UN, EU, USAID) concerning the island's water resources development. When it became apparent that after 1974 the recommendations of the 1961 and 1969 Reports could not be implemented on the whole island, the South proceeded separately with infrastructure constructions on the areas under its control. Responding to an increasing water demand and after having ceased control of the island's main agricultural parts, the South embarked on dam construction in order to re-build the agricultural character of the island in areas however, that were not as well endowed with water resources as the ones lost. Besides supporting agriculture, the South aimed to secure water provision for domestic and tourist uses through alterative water sources.

With the memories of the 1974 events still vivid, securitising water was one way of reassuring people that everything was under control; especially as water is considered the second most important issue after the political question. In the South, the axiom 'not a single drop of surface water to the sea'[119] (Kampanellas *et al*, 2003: 14) has encapsulated the cornerstone of its water policy ever since. The North aims at a similar trajectory –its own 'hydraulic mission'[120] (Allan, 2001) - however the lack of human resources, the international isolation and the acute financial dependence on Turkey have impeded a significant expansion of the water infrastructure.

[118] Reference to the Report was made during interviews; a copy was not provided
[119] Attributed to Archbishop Makarios, the first President of the Republic of Cyprus (1960-1974 and 1974-1977)
[120] See Chapter I

Before embarking on the discussion on water supply and demand, a brief presentation of the island's geographical-hydrological characteristics is made with emphasis placed on the conditions favouring the heavy investment on water storage infrastructure.

3. GEO-CLIMATIC CONDITIONS IN CYPRUS

3.1 GEOGRAPHY - TOPOGRAPHY

Cyprus is situated at the north-eastern corner of the Mediterranean Sea, at the crossroads of Europe, Asia and Africa[121]. It is the third largest island[122] in the Mediterranean Sea after Sicily and Sardinia and covers a total area of 9,251 km^2 (3,614 miles^2) (PIO, 2000: 50), of which 37 per cent is occupied by Turkish troops (after 1974) and 3 per cent constitutes the territory of the British Sovereign Base Areas[123]. Of the total area in the South, 19 per cent is forested, 47 per cent is arable and the remaining 34 per cent is cultivated land[124] (PIO, 2000: 56). In the North, about 187,000 ha is arable land (of which 116,400 ha is irrigable land), 64,300 ha is forest land, 16,300 ha is grassland, 26,500 ha is unused land and 35,000 ha is used for settlements (Tarimcioğlu, 1992; Korukcu *et al*, 2002)[125]. Other sources (Numan and Doratli, 1996: 11) calculated that in 1995 the irrigated land represented 8.3 per cent of the total agricultural land.

[121] The island lies 380 km (200 miles) north of Egypt, 97km (60 miles) west of Syria, 64km (40 miles) south of Turkey and 380km (200 miles) east of the Greek island of Rhodes (Frangoulidou, 2004: 10).
[122] Cyprus stretches 240km (145 miles) from the west coast to its eastern tip and 96km (60 miles) from north to south (PIO, 2000: 50).
[123] The Sovereign Base Areas (SBAs) are sovereign British territory and covers 98 miles^2 of the island of Cyprus. The SBAs are purely military in nature. They are run by the SBA Administration and have their own legislation, policy force and courts. They are very closely linked with the Republic of Cyprus with whom they are in a customs and currency union (British Foreign and Commonwealth Office www.fco.gov.uk
[124] Eurostat's 2005 Compedium for Mediterranean Countries divides the land use as 1, 992 km^2 of agricultural land, 3, 855 km^2 as forest and other wooded land and 205 km^2 as built up and related land. Of the total agricultural land 1, 014 km^2 is arable land, 418 km^2 has permanent crops, 11 km^2 has meadows and permanent pastures and 549 km^2 is classified as others (also at http://epp.eurostat.ec.europa.eu/guip/themeAction.do)
[125] With some mild differences observed between the two sources

Figure 5: Map of Cyprus (http://www.lib.utexas.edu/maps/atlas_middle_east/cyprus.jpg)

The topography of the island is dominated by two mountain ranges[126]. The Troodos Range[127] rises to 1,951 metres and covers about one third of the island's total surface area while the Kerynia Range is located in the island's north and rises to a height of 1,085 metres (PIO, 2000: 56; Frangoulidou, 2004: 10-11). Between the two ranges stretches the Mesaoria Plain that together with the coastal alluvial plains make up the bulk of the island's agricultural land (ibid). The 1974 *de facto* division cut through the Mesaoria Plain, thus dividing the main agricultural land. This reality forced the South to invest on the (until then) under-developed coastal plains and the North to re-operationalise the parts of the central plain that were under its *de facto* control. The *de facto* division bestowed both sides with a distressed agricultural sector.

There are fourteen main rivers in Cyprus - none of which perennial – that flow between the winter and spring months[128]. These rivers, originating mainly from the Troodos Mountain, can store substantial quantities of groundwater due to their deep alluvial riverbeds. This geographical peculiarity makes Cyprus highly dependent on direct rainfall and groundwater reserves. Moreover, it provides the rationale for considering the island as one single river basin under the EU WFD.

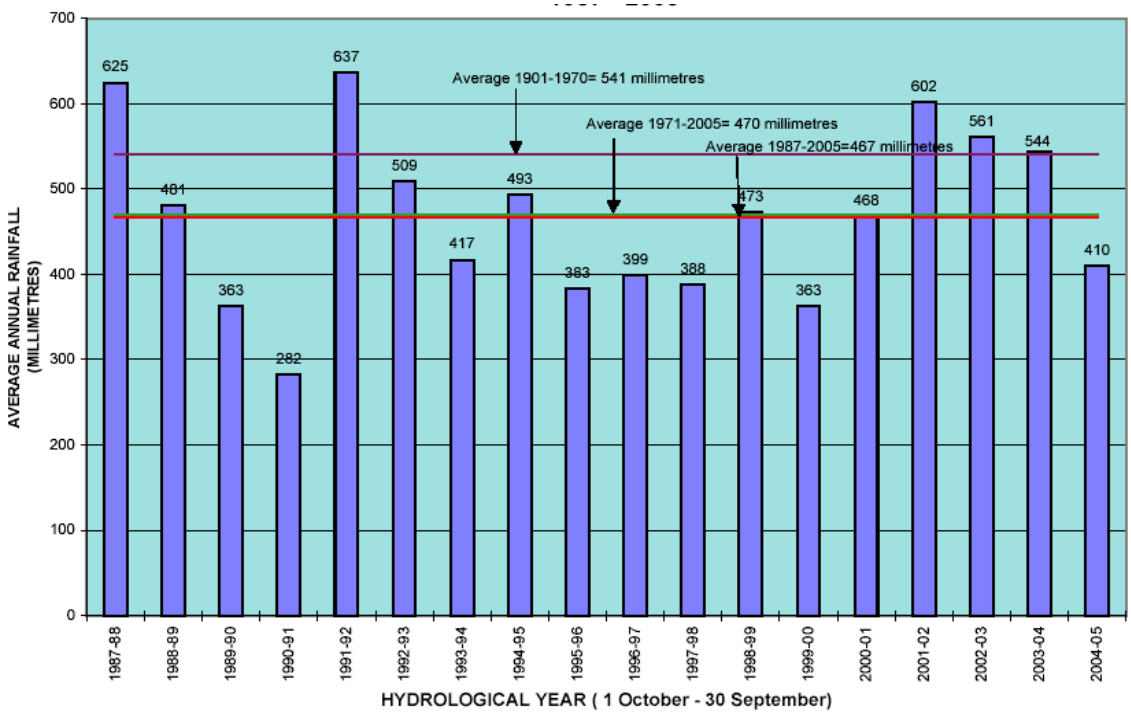
[126] The formation of Cyprus was the result of a series of complicated geo-tectonic events that made the island an international geological showcase. About 90 million years ago, Cyprus was part of the bottom of a deep ocean when tectonic movements at that time resulted in the collision of the African with the Eurasian plate ultimately giving birth to the island (Constantinou G., 2003: 7).
[127] The entire Troodos massif takes up approximately one half the area of the island and constitutes the largest volume of ophiolite rock in the world (Frangoulidou, 2004: 11).
[128] http://www.fao.org/nr/water/aquastat/countries/cyprus/index.stm

3.2 CLIMATE - PRECIPITATION

Cyprus has a typical semi-arid Mediterranean climate[129]. Precipitation is characterised by considerable inter-annual and inter-regional variations (Hadjioannou, 1987) with an annual average of 497mm (EU-Study 31, 2000: 72). Rainfall fluctuates between 300mm in the plains and 1000mm on the higher parts of the Troodos (Constantinou G., 2003: 10-13), with maximum rainfall received in the months of December-January (WDD-FAO, 2002: 2).

The average annual rainfall in the South for the years 1987-2005 is depicted below:

Figure 6: Average annual rainfall in the South (1987-2005)

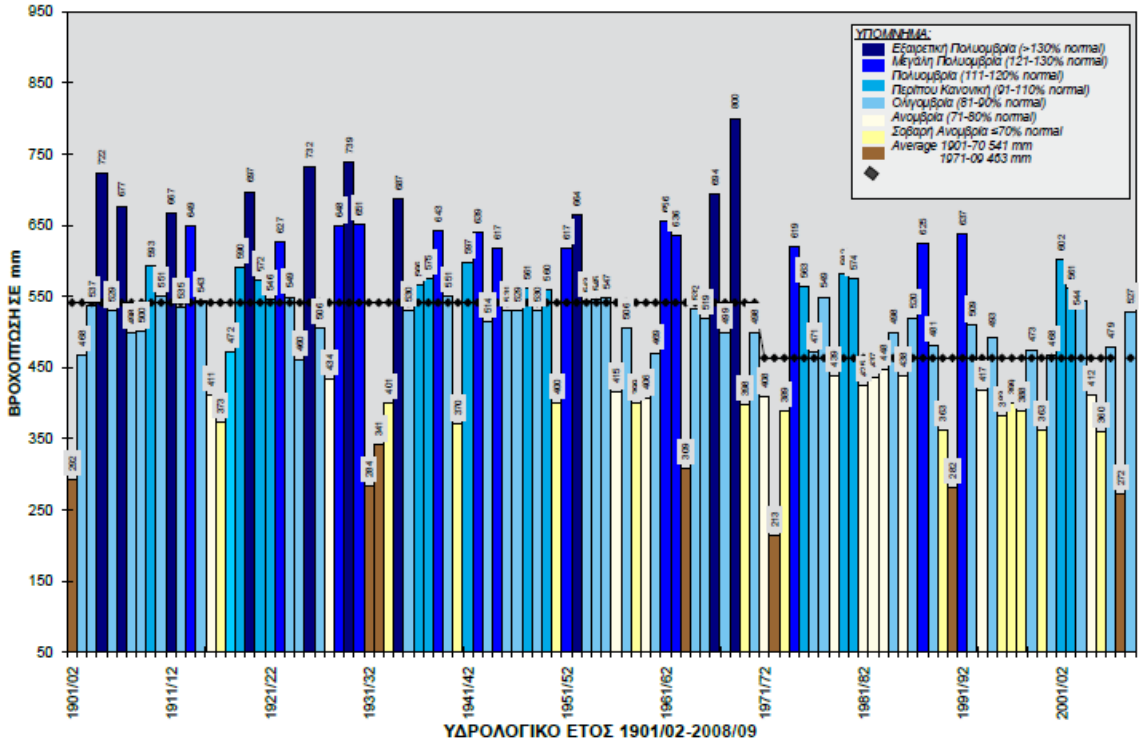


Source: www.moa.gov.cy/wdd

A better picture of the rainfall patterns for the extended 1901/2 – 2008/9 period is presented below. The vertical axis refers to the rainfall quantities (in mm), while the horizontal to the years. Brown colour marks the years with severe drought conditions (rainfall less that 70 per cent of the average). The same calculation method has been used for reporting on the entire period so as to allow for comparisons (confirmed during interviews with WDD).

[129] With hot summers from mid-May to mid-September, and winters with variable rainfall from November to March, separated with short autumn and spring seasons of rapid change. The temperature variation is 26 degrees Celsius with an average minimum of 9 degrees Celsius in December (being the coolest month) and an average maximum of 35 degrees Celsius in August (being the hottest month) (Constantinou G., 2003; Frangoulidou, 2004).

Figure 7: Annual rainfall (1901/2 – 2008/9)



Source:http://www.moa.gov.cy/moa/wdd/wdd.nsf/All/D618275164EF4DDEC2256E60003ADE14?OpenDocument

The WDD-FAO Report (2002) points that there has been a decrease of the mean annual precipitation in the post-1970 period (1971-2000) when compared to the 1917-1970 years. Based on these findings the Report claims that total runoff may be 20-60 per cent less than what was assumed based on the pre-1970 records (ibid: 3). According to the MEDIS Report (Constantinou G., 2003: 13), in the last 100 years the mean annual precipitation of the whole island has decreased by 14 per cent, reducing from 560mm to 480mm. Especially in the plains, for example in the Nicosia area, this decrease reached 20 per cent with the mean annual precipitation ranging between 300mm and 380mm (ibid). The implications are twofold: a) the overall water planning has been based on pre-1970 estimates and thus, there seems to be a gap between proclaimed and actual storage capacity of water infrastructures, and b) the plains, including Nicosia, face acute water challenges as 300mm of rainfall respond to desert climatic conditions[130].

Contradicting the findings of the above reports, Interviewee 4 stated that the precipitation patterns of the last 30 years have been normal and that the WDD-FAO Study (2002) did not include in its calculations the good water-crop years of 1968 and 1969, which would have altered the final figures. He also claimed that the data presentation was formulated to show that instead of 190 Mm^3 Cyprus received only 78-80 Mm^3 of river flow.

[130] Where precipitation equals or is less than evaporation.

Although the two reports use data gathered in the South, and given the island's small scale, it is likely that the conclusions on reduced rainfall patterns have applicability on the whole island. In the North, the annual average precipitation has been calculated at 406 mm (Tarimcioğlu, 1992: 5; Ergil and Atesin, 1999: 4), with Karpasia receiving 510mm, Kerynia/Girne 520mm and the Kerynia range receiving the highest rainfall at 530mm (Tarimcioğlu, 1992: 5). Different figures have been provided by Bicak and Jenkins (2000: 113), according to whom average annual rainfall ranges between 200-600 mm, but has reduced to 440-450 mm at the beginning of the 20th century and to 382.4 mm in the period 1975-1993. According to fieldwork interviews, the rainfall levels have decreased in the past 20 years (Interviewee 50[131]) and the annual average precipitation is currently at 380 mm in contrast to a previous average of 700 mm (Interviewees 40[132] and 47[133]).

The conditions in Cyprus seems to follow the wider climatological changes observed in the Eastern Mediterranean and which include a slight increase in the temperature and a considerable decrease in the annual precipitation (Bolle, 2003; Davit, 1997: 35; Giupponi and Shechter, 2003). However, it is difficult to show whether this is a climate change impact or how it might be halted (ibid).

Nonetheless, the average rainfall reduction has affected significantly Cyprus' renewable water resources in terms of river flow and dam inflow, and has resulted in cycles of three-year drought periods (Tsiourtis, 1995). In the South, the 1994 National Report on Drought (Lytras and Tsiourtis, 1994: 5-6), after examining the rainfall patterns in the period 1963-1993 concluded that Cyprus suffers from a recurrent drought phenomenon[134]. When analysing the effects of droughts, the Report stated that "*reduced rainfall causes reduction to the run-off, which results to reduced river flows and reservoirs inflows*" (ibid). Reduced river flow results in lower aquifer recharge, both upstream and downstream of a dam. Moreover, reduced rainfall and higher temperatures in the winter and spring months (rainy period) increase evaporation and evapotranspiration, which in turn increase reservoir losses.

The climatic particularities of Cyprus have conventionally formed the cause, reason and justification for the construction of waterworks. As stated by Tsiourtis (1994: 2),

[131] Director of the Waterworks Department in the North, at the time of the interview
[132] Director of the Geology and Mines Department in the North, at the time of the interview
[133] Senior Engineer in the North's Geology and Mines Department, at the time of the interview
[134] A drought year is considered the year during which the available water resources are not enough to cover the normal requirements and it is caused by a series of events, such as low rainfall, reduced river flows and inadequate volumes of water in storage in surface and underground reservoirs, all contributing towards insufficient volume of water for satisfying normal demands (Lytras and Tsiourtis, 1994: i)

'*the rainfall and evaporation pattern along with sunshine, humidity and wind, make necessary the supply of stored water both for domestic use and irrigation*'. Similar statements have formed the rationale for the incessant construction of big dams and other storage facilities, primarily in the South. Moreover, the island's climatic conditions led to statements (Stylianou, 1998: 3) that under such circumstances, it would be misleading to base the water availability estimates on the average rainfall data; instead, water management scenarios of low water supply lasting for two or even three consecutive years should be taken as the basis for water management planning. Similar positions have supported the official water policy towards alternative sources of supply in order to disconnect water planning from rainfall predictions.

With the geo-climatic particularities of Cyprus in mind, the following section reviews the water supply on both sides of the island and sheds light on the existing delicate water (im) balance.

4. WATER SUPPLY ACROSS THE DEAD ZONE

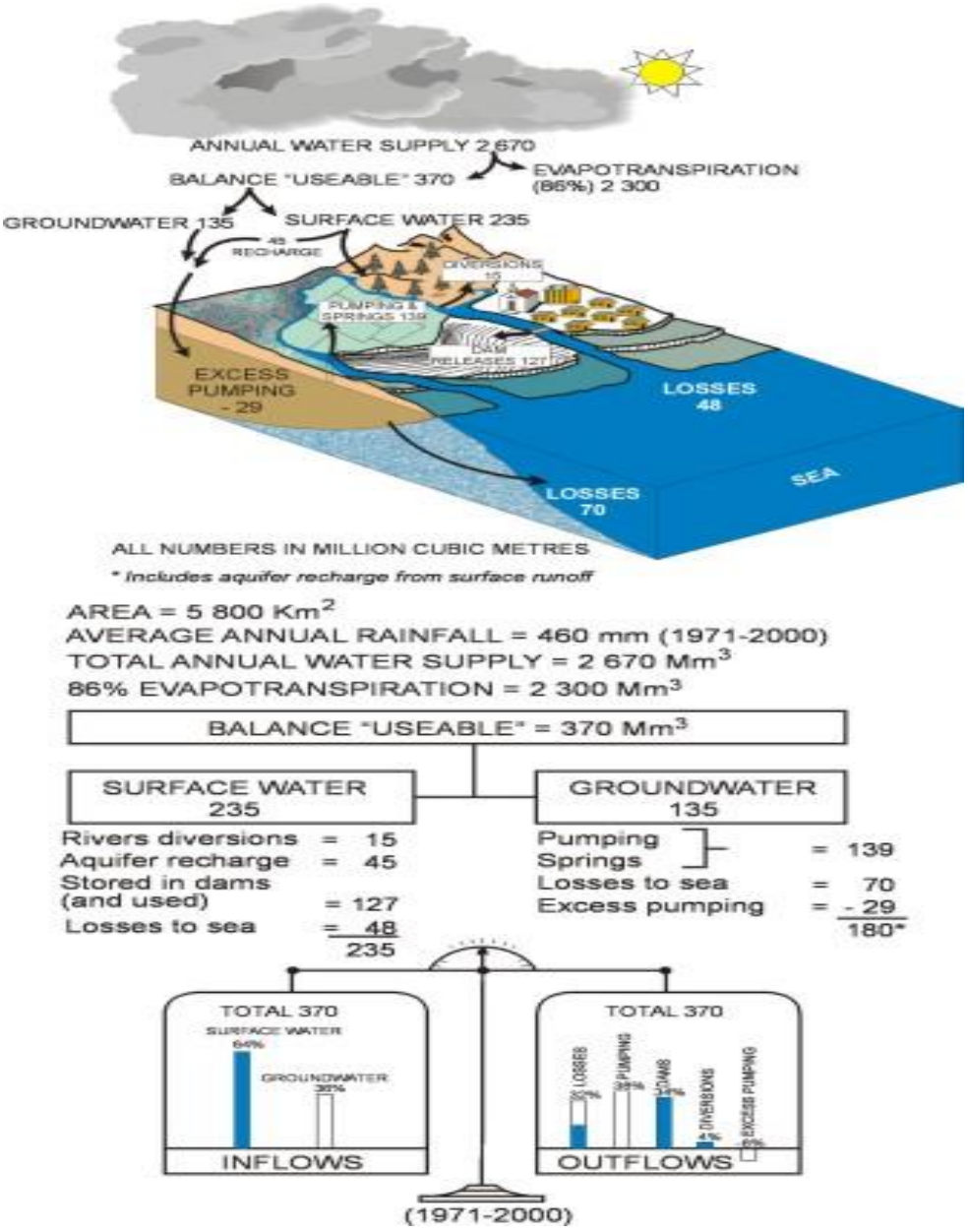
The link between Cyprus' history and the development of water resources has been prominent. A careful account of the available water quantities along with the methods used for their exploitation and development, demonstrate exactly how robust this connection is. Conventional resources – ground and surface water - proved inadequate in meeting the island's needs and despite the maximum use of both sources that has led the country to the limits of (if not to exceed) its water potential. The shift to non-conventional sources of water (desalination, recycling and water transfer) will be examined in Chapter VI, as they are considered topics of political friction and discourse.

The analysis of conventional water resources presents: a) the attempts to maximise water availability without a parallel consideration towards potential aquifer depletion until it was too late. b) The enthralment with dam construction as the most effective way of coping with water scarcity. The South in particular, while materialising the motto of 'not a water drop to the sea' was further encouraged by the international trend of the 1970-80s towards big dam construction. At present, the Republic of Cyprus (the South) figures first in Europe (including the former USSR) on number of dams per square kilometre (World Commission on Dams, 2000).

4.1 CONVENTIONAL RESOURCES IN THE SOUTH

The average annual amount of water from precipitation has been calculated at 4,600 Mm^3, but due to high evapotranspiration nearly 80 per cent returns to the atmosphere. The remaining 20 per cent, corresponding to 900 Mm^3, is the average annual quantity of water that is available for utilisation. From this amount, 600 Mm^3 is surface water and 300 Mm^3 replenish the aquifers (Stylianou, 1998: 1; Constantinou G., 2003: 15). The WDD provides a different water balance, as shown below:

Figure 8: Water Balance in the South



Source: www.moa.gov.cy/wdd

GROUNDWATER

Groundwater was the first resource to be exploited in Cyprus, as it is low-cost and simple to develop, especially when compared to the finance and technology-intensive construction of infrastructure. Another major attribute is that groundwater in the island is accessible throughout the year, while surface runoff is available only for a few months in winter and spring. The extensive groundwater exploitation by title holders in the last 40 years has been intensified by flourishing illegal boreholes, as people would often not follow the official procedures for obtaining drilling licenses (Interviewee 2). A counter-motive for acquiring a license, according to Interviewee 35[135], is that there is no metering of the water going from boreholes to agricultural fields.

A UNDP survey in the period 1964-69 (UNDP, 1970), estimated that the total water stored in the aquifers was 3,170 Mm^3 with the annual replenishment being 450 Mm^3 and the extra storage capacity reaching 850 Mm^3. The survey also found that the total annual use of groundwater through springs and boreholes exceeded the annual replenishment by 42 Mm^3 (ibid). Even in the unlikely event that the annual extraction and use of groundwater has not increased since the 1970s, the groundwater aquifers have been facing serious depletion and salinisation problems. It was estimated that a single generation, in a time span of about 30 years after independence, used more than 50 per cent of the water that was stored in deep aquifers since geological times (Constantinou G., 2003).

The calamity of the groundwater situation[136] may be further illustrated through an epigrammatic reference to the three main aquifers in the South. The most important aquifer (for both the South and the North) is in the Morfou area, with a potential for storage capacity of 1,660 Mm^3 (Constantinou G., 2003: 20). In 1969 it was estimated that 900 Mm^3 were stored in the aquifer, but only 20 per cent of that water has remained in the aquifer (ibid). Morfou's catchment area is about 460 km^2, but post-1974, 280 km^2 lie in the South and the remaining 180 km^2 in the North (Ergil, 2002), making the sustainable development of the aquifer politically –as well as practically-challenging. The second most important aquifer is the South-eastern Mesaoria, however it is severely mined and saline water has filled most part of it. The third most important aquifer in the South is the Akrotiri one, which although artificially re-charged, still suffers from saline water intrusion (Constantinou G., 2003: 21)[137].

[135] A founding member of FEEOC
[136] A table with the annual balance of the main aquifers in the South is available in Annex 2
[137] A map of all groundwater bodies in the South is available at www.moa.gov.cy/wdd

Another comprehensive analysis of the groundwater status for the period 1991-2000, included also in the WDD-FAO (2002) study, comes from Georgiou (2001)[138] and is presented in the table below:

Table 3: Annual groundwater balance in the South (averaged over the period 1991-2000)

Replenishment of the aquifers (in Mm^3):

Natural Recharge from:			
	Rainfall	205.1	
	River flows	44.8	
	Return from irrigation/domestic	22.1	
	Groundwater inflow	8.8	
	Dam losses	1.7	
	Natural Recharge	282.5	282.5
Artificial recharge			9.8
Sea intrusion			12.8
REPLENISHMENT (TOTAL RECHARGE)			**305.1** Mm^3

Outflow from the aquifers (in Mm^3):

Extraction	129.1
Groundwater Outflow	166.7
Sea Outflow	24.6
TOTAL OUTFLOW	**320.4** Mm^3

Total Water Balance = Replenishment - Outflow
= 305.1 – 320.4 = -15.3Mm^3

According to the table there is an overall negative annual extraction of –15.3 Mm^3 and this negative balance is reflected in an annual lowering of groundwater levels. Of a total of 66 aquifers examined in the WDD-FAO study (2002), 49 aquifers -including the major ones- are overexploited by an overall amount of 32.4 Mm^3 per year. The same source concluded that groundwater resources in Cyprus are overexploited by 40 per cent of their sustainable extraction. The recommended total extraction accounts for 81 Mm^3 per year (Georgiou, 2001) or 82 Mm^3 per year (Constantinou G., 2003). Aquifer overexploitation has led to the depletion of all inland aquifers and a deteriorating water quality in most of the important coastal aquifers due to seawater intrusion. Besides addressing the overexploitation and salinisation issues, immediate action was identified for tackling groundwater contamination problems caused by agricultural practices and direct disposal of domestic sewage and other pollutants into the aquifers (WDD-FAO, 2002; Constantinou G., 2003).

[138] Information collected during the interview. Georgiou's analysis is also referenced in Constantinou's G. (2003) study. Georgiou chooses the period 1991-2000 even though the average rainfall (435 Mm) over this period is 5 per cent lower than the average rainfall (460 Mm) of the period 1971-2000. He claims that a hypothetical restoration of rainfall patterns back to its 30-year average will not significantly affect the water balance of the aquifers and thus, it would be more appropriate to use the 1991-2000 average to estimate the aquifer water balances.

SURFACE WATER

Cyprus, in terms of surface water resources, is divided island-wide into nine hydrological regions (Papasolomontos, 1998: 2). As a result of the post-1974 trans-watershed investments, the South may be regarded as having three water supply systems or hydrological basins: the Khrysokhou System in the north-west, the Paphos system in the west, and the Southern Conveyor System covering the remaining area (Stylianou, 1998:4).

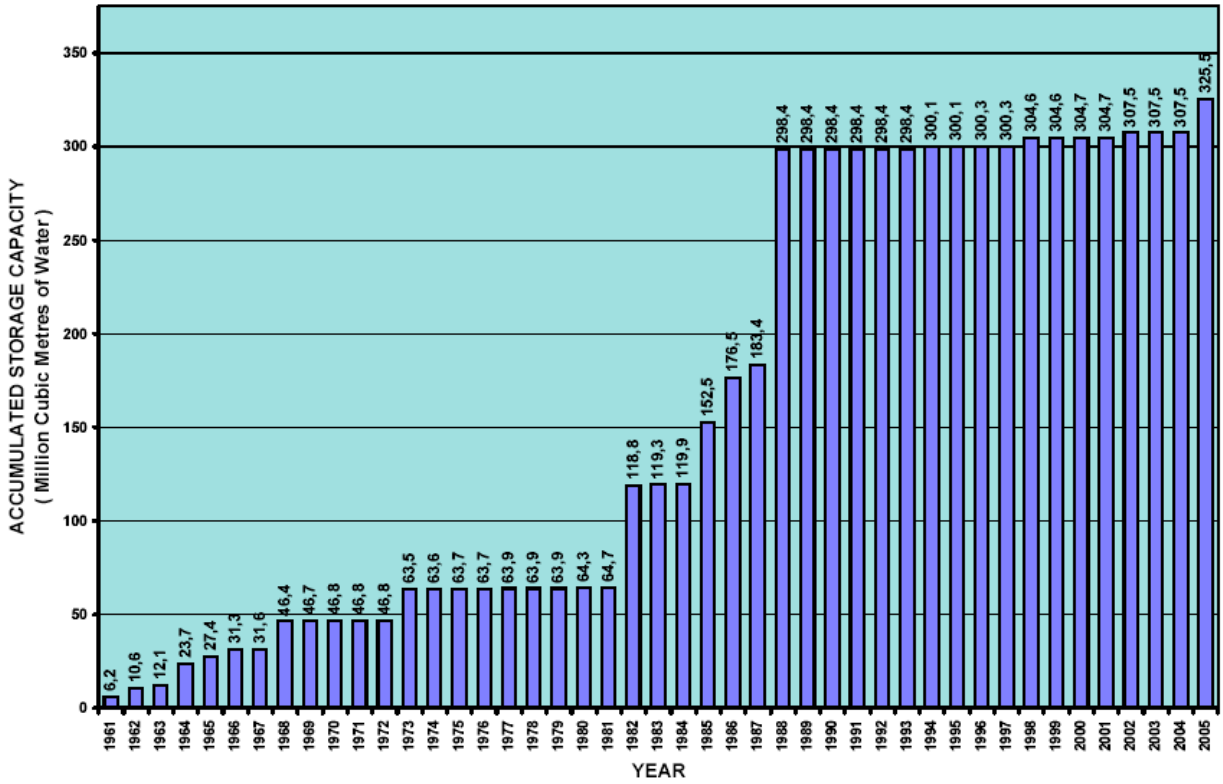
As mentioned already, the annual amount of surface water from precipitation is 600 Mm^3, with 80 per cent of the surface runoff generated in the Troodos Mountains (WDD-FAO, 2002) and the flow confined to a few months per year because of the island's rutted rainfall patterns. From the surface runoff about one seventh (2 per cent of the total water from the annual rainfall, i.e. 86 Mm^3) flows into dams, while about 150 Mm^3 are diverted from rivers and streams and are used by the farmers for spate irrigation in late winter and spring (Eliades *et al*, 1995). The rest of the surface runoff either evaporates during its flow or is lost to the sea through small streams (Constantinou G., 2003). According to the WDD-FAO Report (2002), 67 per cent of the mean annual surface runoff (127 Mm^3) flows into dams and irrigation systems, but human interventions reduce the actual figure substantially.

DAM CONSTRUCTION

In order to tackle the increasing water demand, the South embarked on an ambitious programme of water development works with the construction of dams, conveyors and irrigation networks, primarily funded through the government budget. The storage capacity increased from a mere 6 Mm^3 in 1960 to 304.7 Mm^3 in 2002 and 327.3 Mm^3 in 2006[139]. Cyprus has the highest concentration of dams per square kilometre in Europe, including the former USSR (World Commission on Dams, 2000). In 2001, Cyprus accounted for a total of 103 dams, 35 of which were large dams, 42 small dams and 26 were ponds (Socratous *et al*, 2001: 3). As in 2008, the South has 108 dams[140] with a total storage capacity of 325.5 Mm^3. Of these, 56 are considered large dams by the International Committee on Large Dams[141]. The figure below illustrates the dam construction with respect to water storage in the period 1961-2005:

[139] Figures available at www.moa.gov.cy/wdd
[140] A list of all the dams in the South is provided in Annex 3 and a map of their location in Annex 4
[141] http://www.icold-cigb.org/ and http://www.moa.gov.cy/moa/wdd/Wdd.nsf/all/B8D7262CBFCC9AF8C225711E00303F5A/$file/ICOLD_grk.pdf?openelement (in Greek)

Figure 9: Dam construction and water storage in the South (1961-2005)



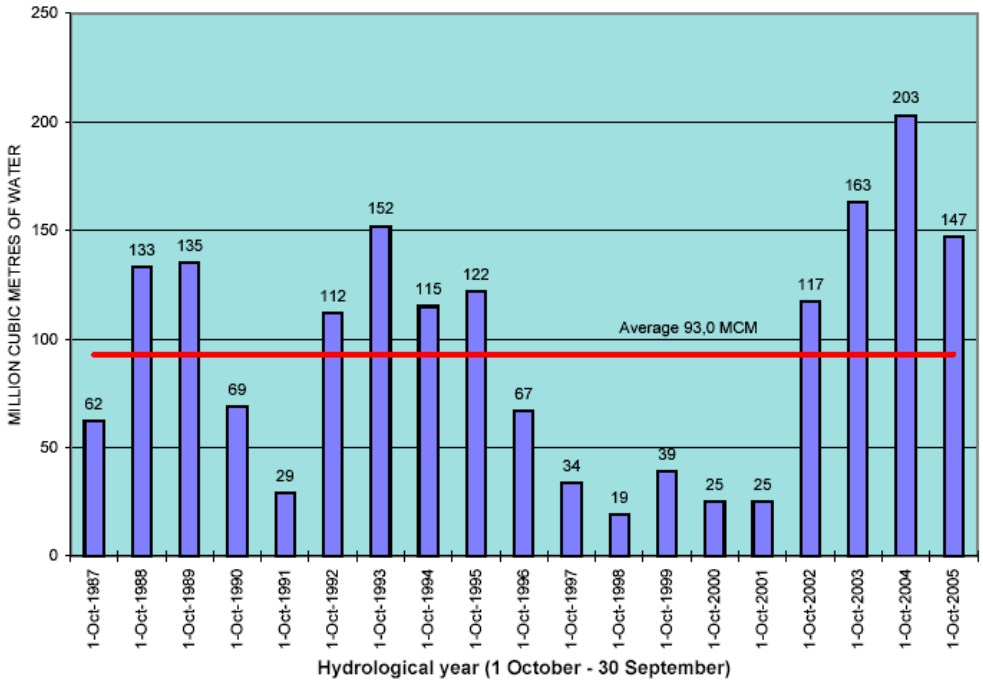
Source: www.moa.gov.cy/wdd

According to Interviewee 6, a senior hydro-geologist at MANRE [142], the dam construction was based on the pre-1970 precipitation calculations and due to the post-1970 decreased rainfall patterns the dams cover 40 per cent less needs than those for which they were initially constructed. Supporting this argument, Constantinou G. (2003: 16) stated that the estimated total annual yield in 1970 was 150-170 Mm^3, but due to the decrease in the annual precipitation after 1971, the dam annual yield has been estimated at 80 Mm^3.

A WDD diagram of water stored in dams in the years 1987-2005, although supporting the reduced yield statement, points to an average figure of 93 Mm^3.

[142] Who at the time of the interview was the Head of MANRE's Hydrology Section

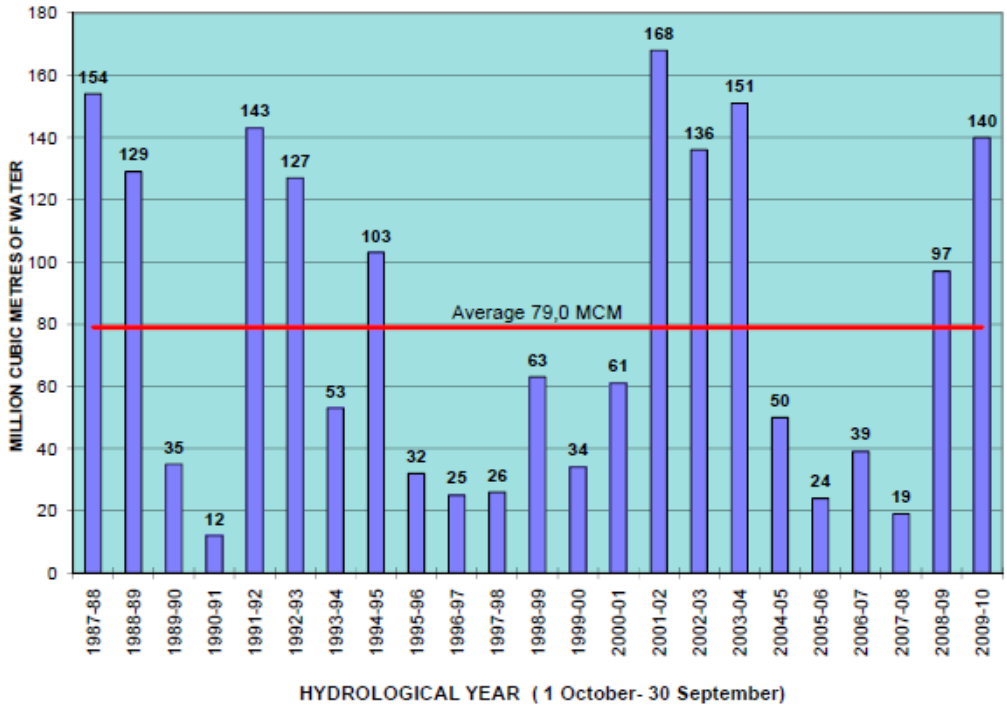
Figure 10: Water stored in dams in the South (1987-2005)



Source: www.moa.gov.cy/wdd

A more recent chart (as of January 2010) of water stored in dams shows a different picture along with a drop in the average quantity from 93 to 79 Mm^3.

Figure 11: Water stored in dams in the South (1987/8 – 2009/10)



Source: http://www.moa.gov.cy/moa/WDD/WDD.nsf/0/498453d183889e0ec2256e7e004c37a7/$FILE/20.pdf

The extensive rainfall variations are depicted even more eloquently when seen on a monthly basis. The inflow (in Mm^3) since 1994 is presented in the following table:

Table 4: Monthly dam inflow in Mm^3 (1994/5 – 2009/10) [143]

Month / Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug-Sep	Total
94/95	0.6	43.5	13.5	19.9	11.4	7.0	3.8	1.9	0.9	0.0	0.0	**102.7**
95/96	0.0	0.4	0.9	8.7	8.8	9.4	3.1	1.0	0.1	0.0	0.0	**32.4**
96/97	0.6	0.2	3.6	1.7	5.7	3.9	8.0	0.8	0.4	0.0	0.0	**24.9**
97/98	0.0	1.2	4.6	4.7	2.9	7.4	3.7	1.0	0.7	0.0	0.0	**26.5**
98/99	0.0	0.8	11.4	8.9	24.5	7.5	7.3	0.8	1.2	0.2	0.0	**62.6**
99/00	0.0	0.7	1.2	3.5	6.6	8.1	9.7	3.6	0.5	0.0	0.0	**34.1**
00/01	0.13	3.24	8.97	16.42	17.62	8.43	3.90	1.65	0.12	0.0	0.0	**60.48**
01/02	0.2	0.64	53.10	56.61	19.19	13.99	17.48	5.18	1.02	0.46	0.0	**167.87**
02/03	0.18	0.79	10.06	10.71	44.0	42.35	18.37	5.89	3.07	0.71	0.0	**136.13**
03/04	0.51	1.10	6.36	89.16	33.47	9.16	6.22	2.99	1.30	0.26	0.0	**150.53**
04/05	0.15	2.56	4.45	10.05	18.19	8.12	4.31	1.04	1.29	0.11	0.1	**50.37**
05/06	0.22	2.22	1.35	3.29	9.09	5.27	1.56	0.48	0.05	0.51	0.0	**24.04**
06/07	2.57	3.61	0.95	2.15	14.16	7.37	3.06	3.94	0.31	0.31	0.41	**38.84**
07/08	0.34	0.60	6.0	2.63	5.18	2.85	0.93	0.13	0.0	0.0	0.08	**18.74**
08/09	0.227	0.635	3.151	13.248	28.622	27.170	14.547	6.889	1.627	0.096	1.020	**97.232**
09/10	1.160	2.523	23.111	42.973	37.708	21.849	6.546	2.914	0.921	0.482	0.0	**140.187**

From the table it is evident that there are significant inflow variations, both within a single year and within the time-span of a decade. The inflow's erratic and unreliable pattern formed the key argument for the construction of desalination plants that the South hastily pushed forward in the mid-1990s.

The importance attributed to dam water inflow is reflected in the inclusion of the weekly figures in the daily weather broadcast of the South's media. In the months of February and March 2004, and after three consecutive good years of rainfall, the South's newspapers thrived with articles on dam filling levels and dam overflows (Phileleutheros-Φιλελεύθερος, 27/02/04; Alitheia-Αλήθεια, 19/02/04; Epikairotites-Επικαιρότητες, 19/02/04; Machi-Μάχη, 19/02/04). Of particular interest is the reference to the Kouris dam, the biggest in Cyprus with storage capacity of 115 Mm^3, which overflowed on the 4th March 2004. All major Greek-Cypriot newspapers (Charaugi-Χαραυγή, 05/03/04; Simerini-Σημερινή, 05/03/04; Lemesos-Λεμεσός, 12/03/04) were headed with titles like 'Historical Day for Kouris', 'Kouris overflowed', characterising the

[143] Figures obtained through interviews at the Water Board of Nicosia and from the WDD website

event as a divine blessing and a momentous point in the hydrological history of Cyprus. On a more sceptical tone, some articles pointed out that the water adequacy would have a lifespan of approximately three years (Machi-Μάχη, 03/02/04 and 05/03/04).

Regarding future dam construction, the South envisages building eight more dams with total capacity of 106 Mm^3 (Interviewee 2, Interviewee 31). Two of the planned dams (on the Karyotis and the Xeros River)[144] with total capacity of 74 Mm^3, will develop water that currently flows into the North (Socratous, unpublished: 9). Therefore, co-operation between the two sides is a prerequisite if the Karyotis/Camliköy dam especially, and as intended, is to provide potable water to both sides of Nicosia. Such co-ordination will be necessary especially as the North is also considering the construction of a dam on the same river. However, and as a previous futile attempt to build the Ayios Theodoros dam (on the Karyotis River) demonstrated, without bi-communal political will such endeavours are destined to fall short of results.

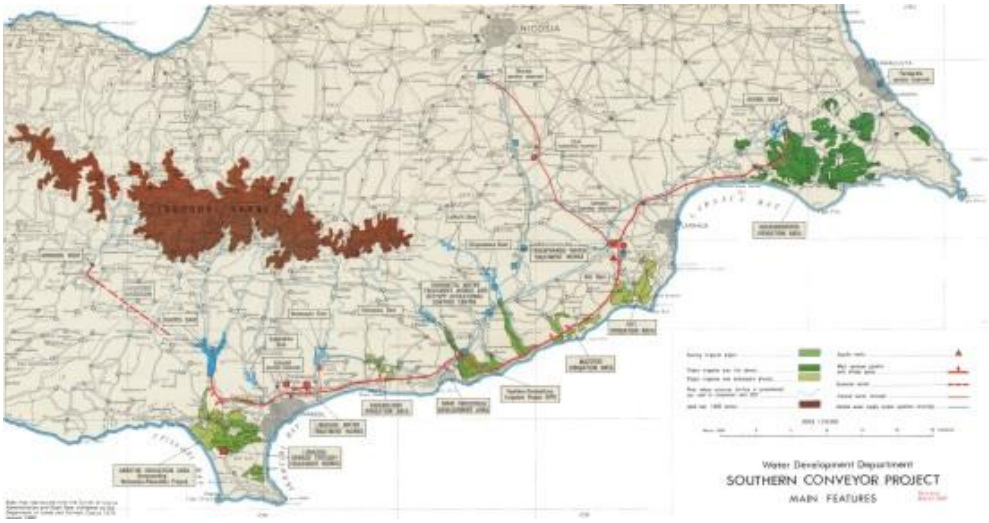
OTHER WATER DEVELOPMENT WORKS[145]

Besides the ambitious dam construction, additional water projects have been implemented in the South. The five major ones[146], addressing the congruent use of surface and ground water, are: the Paphos Irrigation Project, the Vasilikos-Pendaskinos Project, the Khrysolhou Irrigation Project, the Pitsilia Integrated Rural Development Project and the Southern Conveyor Project. The latter is the largest development project, thus far, undertaken in the South with an estimated cost of CYP 163m (GB £193m or €284m). The objective of the project is to collect and store surplus water and convey it for a) domestic water supply, b) irrigation in the coastal region between Limassol and Famagusta and c) additional water supply provision to the cities of Nicosia, Larnaca and Limassol (Omorphos and Ioannou, 2000). This project included the construction of the Kouris Dam, the largest in Cyprus, as well as the construction of a 110-kilometre-long (67-mile-long) conveyor[147] covering almost the entire southern part of the island[148] (PIO, 2000). For Interviewee 17, a former WDD

[144] The remaining dams that are planned or are under construction include Kannaviou, Episkopi, Souskiou, Arkhimandrita, Panayia Bridge and Malounda (Socratous, unpublished and also at www.moa.gov.cy/wdd)
[145] A map with the major waterworks in the South is available at www.moa.gov.cy/moa/wdd
[146] For more information on the individual projects, as well as their detailed description see Stylianou, 1998; PIO, 2000; Frangoulidou, 2004 and the website of the WDD at www.moa.gov.cy/moa/wdd
[147] Consisting of a 1400-1800mm diameter pipeline
[148] With the purpose to transfer water from the one side of the island to the other in order to facilitate the development of agriculture in the area of Kokkinohoria (on the south-eastern part of Cyprus) as well as to provide drinking water for all major cities of the South (apart from Paphos) (PIO, 2000). In view of the large investment and lengthy construction period involved, it was decided to implement the Southern Conveyor Project in two phases: Phase I started in 1984 and included the construction of Kouris dam on Kouris river, with a capacity of 115 MCM, the main conveyor, a 110 Km long pipeline, Achna terminal reservoir, with a capacity of 6,8 MCM, the telemetry system and Kokkinokhoria, Athienou, Troulloi and Avdellero irrigation

Director, the most important feature of the Southern Conveyor Project is the flexibility it attributes to water transfer from/to any part in the South.

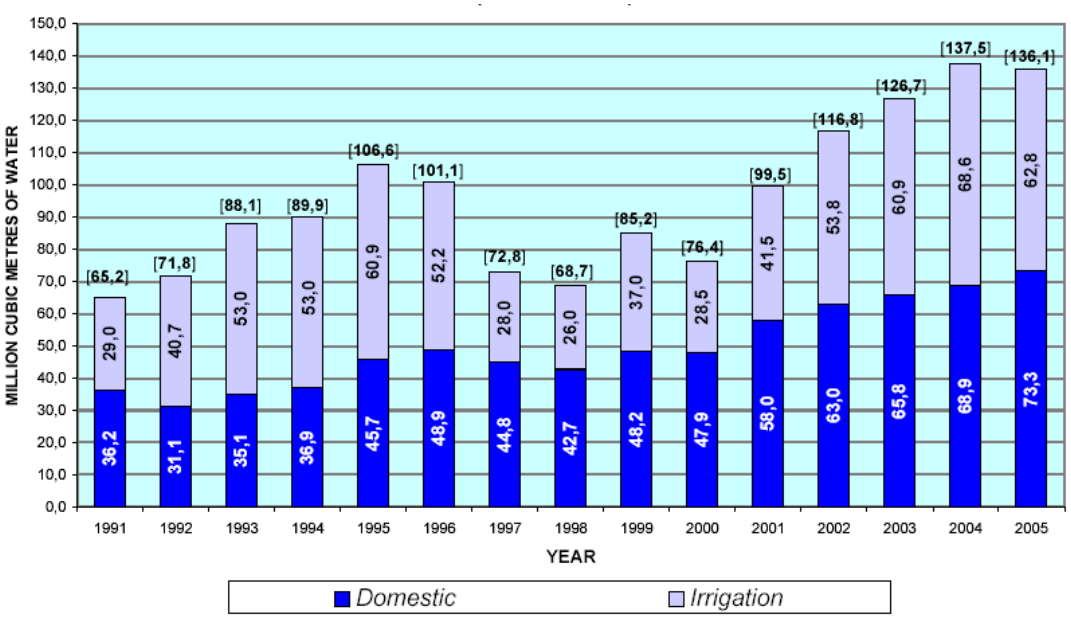
Figure 12: Map and main features of the Southern Conveyor Project



Source: http://www.moa.gov.cy/moa/wdd/

The figure below shows the total supply of water for domestic and irrigation use from waterworks in the period 1991-2005:

Figure 13: Total supply from waterworks and use in the South (1991-2005)



Source: www.moa.gov.cy/wdd

schemes on a total area of about 9 767 hectares. Phase I was completed in 1994 at a total cost of approximately C£97 million (about GB£140 million).
Phase II includes Diarizos diversion, conveying water from Diarizos river through a 14,5 Km long tunnel to Kouris dam, Chapotami scheme, Limassol and Tersefanou water treatment plants, Tersefanou-Nicosia conveyor, a 36,5 Km long pipeline, water supply to villages west of Limassol and the Akrotiri, Parekklisia, Mazotos, Kiti and Aradippou irrigation schemes on a total area of about 4159 hectares. The Limassol and Tersefanou water treatment plants, the water supply to villages west of Limassol, the Akrotiri, Parekklisia and Kiti irrigation networks, Diarizos diversion, Tersefanou-Nicosia conveyor and the Chapotami scheme have been completed. Phase II works are ongoing and are expected to cost approximately C£66 million (about GB£95 million) (info from interviews and WDD).

Although the provision of water in the South has increased steadily with the construction of dams and reservoirs, the gap between supply and demand has been growing as new water needs have developed alongside increased consumption patterns of traditional water users. The South's remedy for this gap has been additional dam construction and investment on alternative sources of water (predominantly desalination).

An a-typical opinion on the storage construction marathon was expressed by Interviewee 33[149] who claimed that water development is intimately linked with land development[150]. Water adds extra value to the land that it traverses, which may be even ten times more than the initial land value. Interviewee 33 posed the question whether water development happens for its own sake or in order to provide additional irrigation land for the farmers on the one hand and areas for summer country houses for the tourists on the other.

4.2 CONVENTIONAL RESOURCES IN THE NORTH

The water potential of the North relies substantially on data from the 1970s (UNDP, 1970; Konteatis, 1974), while there is a slight confusion as to what etymologically constitutes water supply (Bicak *et al*, 1996; Bicak and Jenkins, 2000). Among the various figures of water potential that have appeared, the 110 Mm^3 numeral quoted by the "Water Resources Department", is also cited in a number of studies (Tahal Ltd, 1995: 2; Bicak *et al*, 1996: 7; Bicak and Jenkins, 2000: 114).

The following table (Bicak *et al*, 1996: 6) presents the current and projected water supply in the North between the years 1995 and 2030.

[149] Civil Engineer in MANRE and member of FEEOC, both affiliations at the time of the interview
[150] He mentioned that in previous years the Water Development Department was anecdotally referred to as the Land Development Department

Table 5: Water potential in the North in Mm^3 (1995-2030)

Year	1995	1996	1997	1998	2000	2015	2030
Water Potential	110	110	110	110	110	110	110
New Dams	0	0	2	4	8	20	20
Water Cycle	0	3	6	6	6	6	6
Unsafely Drawn Water	29	29	29	29	29	29	29
Unaccounted Water	45.3	42.0	37.0	34.8	30.3	12.6	7.1
Total Water Supply	**184.3**	**184.0**	**184.0**	**183.8**	**183.3**	**177.6**	**172.0**

A few other sources quote water supply figures that lie on either side of the suggested 110 Mm^3. According to Bicak and Jenkins (2000: 114) the conventional water resources in the North account for a total of 94.1 Mm^3 with 74.1 Mm^3 being groundwater, 13 Mm^3 river flow and 7 Mm^3 stored in dams. Korukcu *et al* (2002) provide a higher figure, with the total annual potential reaching 117.5 Mm^3, 89.1 Mm^3 of which is supplied by aquifers, 27 Mm^3 from streams and 1.4 Mm^3 from springs. The Tahal Study (1995: 1) refers to 74 Mm^3 as the available groundwater and 110 Mm^3 as the total water potential (with 18 Mm^3 referring to planned dams). Information gathered whilst on fieldwork suggested that 16.5 Mm^3 of water were being stored in dams in 2005 thus, altering the total amount. As the exact total annual water supply in the North is difficult to calculate, the converged figure of 110 Mm^3 will be used instead, for the purposes of the thesis.

GROUNDWATER

The North, in terms of groundwater resources, is divided into five separate areas (Tarimcioğlu, 1992; Interviewee 40 and Interviewee 47): the Western Mesaoria aquifers that include the Morfou/Güzelyürt aquifer (the largest in Cyprus); the Central Mesaoria aquifer around the area of Nicosia; the Kerynia Coastline and Mountain Range aquifers in the north; some small aquifers in Karpasia in the north-east; and the Famagusta aquifer in the east.

According to older estimates (mentioned in Bicak and Jenkins, 2000: 114) about 74.1 Mm^3 can be extracted annually from the aquifers without jeopardising their sustainability. However, the estimated actual extraction was calculated to total 103

Mm^3 per year, resulting in an annual over-extraction of about 28.9 Mm^3 (ibid)[151]. The situation has further deteriorated by illegal boreholes making over-extraction one of the major issues of distress for the North (Interviewee 40 and Interviewee 47). Interviewee 40, the Director of the Geology and Mines Department, and Interviewee 47, also working in the same Department, claim that all aquifers in the North, apart from the Güzelyürt /Morfou aquifer, replenish every other year, while the Director of the Waterworks Department (Interviewee 50) maintains that due to reduced precipitation levels in the past 20 years, all the aquifers' levels lower annually by an average of two metres.

The Güzelyürt/Morfou aquifer, with a safe-yield capacity of 37 Mm^3 (Bozer and Topan, 1991) is overexploited by 50 per cent of its safe capacity that has led to a water deficit of 20 Mm^3 per year (Bicak and Jenkins, 2000: 114; Tahal, 1995: 3) and a fall of the water table to 45 m below sea level (Tarimcioğlu, 1992: 12; Ergil and Ateshin, 1999: 9). The inland seawater intrusion moves by 250 metres annually (Tarimcioğlu, 1992: 12) and has reached 6-7 kilometres (Interviewee 40, Interviewee 47, Interviewee 50) thus provoking high salinity levels that make water unsuitable for drinking purposes (Interviewee 48).

The Kerynia aquifers, demonstrate an approximate balance between safe extraction and replenishment, with moderate over-extraction amounts and no significant signs of salinisation, while the Central Mesaoria aquifer has some unexploited surplus part of which flows to the sea, but suffers from sewerage contamination (Ergil and Ateshin, 1999; Elkiran and Ergil, no date). The Karpasia region is characterised by small aquifer potential, serving the needs of local communities at sustainable extraction rates (ibid). In the Famagusta aquifer the water table has lowered to 22 metres below sea level, while the sea moves in annually by 100 metres causing significant water salinisation (Tarimcioğlu, 1992: 12; Ergil and Ateshin, 1999: 7). Overall, the issue of groundwater contamination has become an important problem for most aquifers in the North (Olgun 1991).

The limited financial investment capacity of the North has dictated the over-exploitation of groundwater resources. The Güzelyürt/Morfou and Famagusta aquifers have been sternly damaged, demonstrating aptly that heavy and uncontrolled reliance on groundwater is unsustainable.

[151] Bicak *et al* (1996: 7) also provide a figure of 29 Mm^3 as water drawn unsafely.

SURFACE WATER

As mentioned, the water potential of the North is difficult to determine with accuracy. Regarding dam construction, information is unclear as different scholars provide different figures. For example, Bicak and Jenkins (2000) refer to the existence of 7 Mm^3 of water stored in dams, while the five year older Tahal Study (1995) refers to 15 Mm^3 as total dam capacity. While the Tahal Study (1995) cites 18 dams as having been built, in 1999 Ergil and Ateshin quote only 12. The 18 dam figure, provided by the Tahal study (1995), was also confirmed in an article in the newspaper Kibris[152] of 3 February 2005, which published a list of the existing dams along with their storage capacity. A Senior Engineer in the Waterworks Department (Interviewee 48) provided the same information, with the inclusion of three more dams that are currently under construction[153]. In 1995 total dam capacity in the North was said to account for 15 Mm^3 (Tahal, 1995: 3) and to have increased to 16.5 Mm^3 in 2005 (Interviewee 48), while Interviewees 40 and 47 mentioned 20 Mm^3 as responding to the total water stored in dams in that year. The largest dam in the North is located on the Gemikonaği/Xeros River with storage capacity of 4 Mm^3. The majority of the existing dams are small, placed close to the Kerynia Range---so as to prevent the water from discharging into the sea---and mainly used for irrigation purposes (Interviewee 48).

All dams have been constructed with the financial and technical assistance of the State Hydraulic Works of Turkey and only their operation has been assigned to the North (Interviewee 48). Another 23 dams have been planned in order to increase the surface water storage capacity by an additional 20 Mm^3 (Tahal, 1995: 3; Interviewee 48). This will increase the total number of dams to 44, figure that is very close to Ergil and Ateshin's (1999: 11) allegation that 45 dams have been planned in total. The same source states that a 26-kilometre Derivation Channel has been constructed between Camlidere, passing through the town of Lefke, and the fields of Güzelyürt/Morfou in order to supply it with an additional 8 Mm^3 of water per year[154].

The exact location of the planned dams was not disclosed to the writer for the purposes of the thesis. However, a certain level of convergence seems to exist regarding some building sites. The most prominent refers to the Yeşilirmak/Limnitis River that discharges approximately 8-12 Mm^3 per year into the sea (Bicak and Jenkins, 2000: 115). Ergin and Ateshin (1999) refer to 7-8 Mm^3 as the river's annual discharge, while Interviewee 50 mentioned a total of 20 Mm^3 as being available from the rivers

[152] http://www.kibrisgazetesi.com/index.php/cat/2/news/18695/PageName/Ic_Haberler
[153] A list of dams and their storage capacity is provided in Annex 5
[154] Resembling the Southern Conveyor Project in the South

Yeşilirmak/Limnitis, Lefke and Camliköy/Karyotis. All three rivers originate in the Troodos range and flow along the *de facto* border between the South and the North. The best location for dams, especially for the Yeşilirmak/Limnitis River, would be at the *de facto* boundary (Interviewee 50). As expected, neither side has initiated any dam construction projects on the three rivers, out of wary of agitating the island's political question. An additional problem on the Yeşilirmak/Limnitis case concerns the conflict between the North's "government" and the local villagers that will be affected by the dam (Bicak and Jenkins, 2000: 116). Nonetheless, an investment appraisal for this dam is already in place (Özdemirag, 1996). Moreover, the North proclaimed that work on the Camliköy/Karyotis River would have started within 2006 (Interviewee 50).

Water supply corresponds to one dimension of water management. An integrated water resources assessment would not be complete without a consideration of water demand. Therefore, the following section is dedicated to the latter.

5. WATER DEMAND ACROSS THE DEAD ZONE

This section is dedicated to an assessment of water demand on the two sides of the *de facto* border. The section commences with an overview of the theme in the North and then extends to the South.

5.1 WATER DEMAND IN THE NORTH

The demand for water in the North faces similar problems of cross-reference as the discussion on water supply. According to the Master Plan Study conducted by Tahal Ltd (1995: 4) total water demand for the year 1995 was estimated at 120 Mm^3. In this study, agriculture –being the main water consumer- used 101 Mm^3, domestic consumption was at 12.9 Mm^3, tourist consumption at 0.6 Mm^3 and industry at 1.6 Mm^3.

Bicak and Jenkins (2000: 114) estimated the total water demand for the year 1996 at 106.6 Mm^3, with 87.5 Mm^3 given for agricultural use, 17.1 Mm^3 for domestic consumption (including the armed forces, seasonal workers from Turkey, students and tourists), 1.3 Mm^3 for livestock and the remaining 0.7 Mm^3 secured for commercial and industrial use.

A study by Bicak *et al* (1996: 6) presented the following current and projected figures regarding water demand up to the year 2030:

Table 6: Water demand in the North in Mm^3 (1995-2030)

Year	1995	1996	1997	1998	2000	2015	2030
Agriculture	162.2	163.6	163.4	162.8	161.8	153.8	145.8
People	18.7	19.0	19.2	19.5	20.0	22.1	24.7
Animals	1.4	1.4	1.4	1.5	1.5	1.7	1.7
Total Demand	**184.3**	**184.0**	**184.0**	**183.8**	**183.3**	**177.6**	**172.2**

With reference to the year 1996, Tarimçioglu (1992: 6) projected the water demand to be 20.1 Mm^3 for domestic use, 15 Mm^3 for the tourist sector and 44.9 Mm^3 for irrigation[155].

Bicak *et al* (1996) commented that previous studies on water demand either left out some water uses/users or made assumptions that did not appear realistic. For example the report presented to the "Council of Ministers" (Technical Committee Report, 1996) did not consider the soldiers and the workers from Turkey or the overseas students in the five universities of the North. Another study (Numan and Agiralioglu, 1995) made particularly optimistic assumptions about the growth of student population and the expansion of irrigated land, while double-counted the visiting families of the students who were already included in the tourist sector (Bicak *et al*, 1996: 6).

Numan and Doratli (1996: 2) stress the major role of international students for the North's socio-economic and cultural structure as they directly affect the total water consumption. They also state that it is difficult to calculate the exact number of immigrant workers and soldiers when estimating the total water demand. In their study they give the following figures for total water demand and for agriculture in particular:

Table 7: Agricultural and total water demand in the North (1995-2045)

	1995	2000	2025	2045
Agriculture use (average)	163	181	248	325
Total water demand in Mm^3				
Minimum	173.2	187.5	246.4	305.2
Maximum	-	261.8	371.3	473
Average	**197**	**227.8**	**295.6**	**378.8**

[155] For a study on the water use in citrus production in the North see Ezel, 1999

According to Interviewee 40 and Interviewee 47, total water demand (in 2005) consists of 45 Mm^3 used in agriculture and 7-8 Mm^3 used for drinking purposes for villages and cities, while a Senior Engineer in the Waterworks Department (Interviewee 48) said that 45 Mm^3 respond to potable water use. This person also provided a figure approximating to 150 Mm^3 for the North's total water demand when the Director of the Waterworks Department (Interviewee 50) indicated the same as being 120 Mm^3.

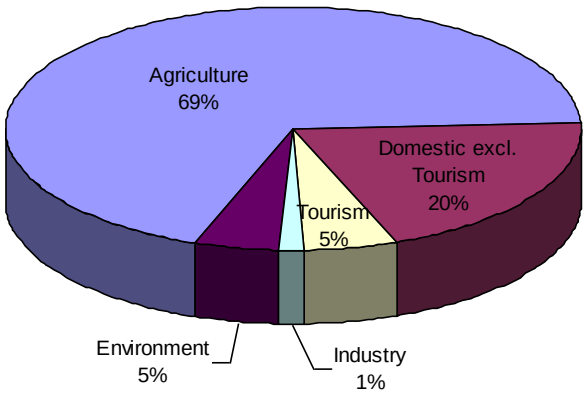
Settlements in the North have mainly developed around the cities of Nicosia[156], Famagusta and Kerynia (Numan and Doratli, 1996). As a result, municipal water demand has been a central point of attention and the reliable water distribution with system minimum losses has formed the long-lasting objective for the authorities in the North (Hamdy, 2002; Elkiran and Ergil, no date). This was also confirmed during the conducted interviews.

5.2 WATER DEMAND IN THE SOUTH

The total annual demand for water in the South was estimated by the MEDIS report to be 300 Mm^3 (Constantinou G., 2003), while the WDD-FAO Study (2002) found the figure to be 265.9 Mm^3. Both studies show that agriculture is -by far- the main user of water in Cyprus with total annual demand accounting for 182.4 Mm^3.

A sample of the composition of water demand by sector for the year 2000 is presented in the following figure (WDD-FAO Synthesis Report, 2002: 7):

Figure 14: Sectoral water demand in the South in 2000



[156] Nicosia is examined in detail in Chapter VII

The water demand per sector for the year 2000 along with the source of supply is presented below (WDD-FAO Synthesis Report, 2002: 9):

Table 8: Sectoral water demand and source of supply in the South in 2000

Source / Sector	Surface Water		Groundwater		Springs		Desalination		TOTAL	
	Mm^3	%	Mm^3	%	Mm^3	%	Mm^3	%	Mm^3	%
Agriculture	82	43	100.4	57	-	-	-	-	182.4	68.6
Domestic	14.5	21.6	16	23.1	3.5	5.2	33.5	50	67.5	25.4
Industry	-	-	3.5	100	-	-	-	-	3.5	1.3
Environment	5	42	7.5	58	-	-	-	-	12.5	4.7
TOTAL (Mm^3)	**101.5**		**127.4**		**3.5**		**33.5**		**265.9**	**100**
TOTAL (%)	**38.2**		**47.9**		**1.3**		**12.6**		**100.0**	

From the total water used in agriculture in 2000, only 8 Mm^3 was used for animal husbandry, while the rest was reserved for the irrigation of permanent and annual crops[157] (Constantinou G., 2003). From the permanent crops, citrus is the biggest water consumer (Hadjidemetriou, 1998). The significant expansion of the citrus plantations in the 1950s and 1960s and the prevailing high prices of the citrus fruits in Europe, contributed to an agricultural revolution and a socio-economic development that has been indissolubly associated with the citrus production. In the majority of the conducted interviews, the interviewees could recall vividly the vast citrus plantations in the Morfou area. However, the decline of the citrus prices in the 1970s along with a considerable increase of production costs (labour, fertilizers, machinery, fuel, etc) rendered the citrus production non-profitable. Despite these negative developments, the cultivation of citrus continued and still forms a significant part of Cyprus' irrigated land (Interviewee 24, Director of Agriculture Research Institute) and the total export commodities[158]. In 2003 agriculture constituted 3.5 per cent of the island's GDP, 15.4 per cent of the total domestic exports and offered employment to 8.2 per cent of the population (Constantinou G., 2003: 42). Interviewee 24 referred to a declining 7-8 per cent as the population involved in agriculture, while Interviewee 3 mentioned 5-6 per cent for the same and stated that agriculture contributes little or even negatively to the GDP if farmer compensations and foreign workers' salaries are included in the data calculations.

[157] Permanent crops include citrus, deciduous, olives, table grapes and bananas. Annual crops include green house products, open field vegetables, potatoes and fodder (Constantinou G., 2003).
[158] http://www.fao.org/es/ess/toptrade/trade.asp

The water demand for the domestic and tourist sectors was 67.5 Mm^3 for the year 2000 and has been following an incremental trajectory due to the island's socio-economic development and the investments in water infrastructure. The tourist industry has been growing steadily and in 2000 the number of tourists reached 2.7 million (Clerides and Pashourtidou, 2007: 53), figure that is almost 3.5 times more than the permanent population of the island.

The projected water demand for the main sectors for the period 2000-2020 is presented below. The agricultural demand is considered fixed, which reflects the official policy towards the sector:

Table 9: Water demand in the South 2000-2020

Year / Sector		2000	2005	2010	2020
Agriculture		182.4	182.4	182.4	182.4
Domestic					
	Inhabitants	53.4	58.4	63.2	73.5
	Tourism	14.1	18.0	22.9	30.8
	Total Domestic	67.5	76.4	86.1	104.3
Industry		3.5	5.0	6.0	7.0
Environment		12.5	14.0	16.0	20.0
TOTAL		**265.4**	**277.8**	**290.5**	**313.7**

Source: WDD-FAO Synthesis Report, 2002: 8

Maintaining the levels of agricultural water demand fixed---although significant as it concerns the main water user---is unlikely to achieve a positive balance in the supply-demand equilibrium. The South's continuous socio-economic development with an emphasis on tourism as the key economic activity can only suggest higher water demand, especially during the water scarce summer period. The situation is expected to further deteriorate given the suggested declining rainfall patterns, the recent 2007-8 drought and the prolonged water scarcity since then.

5.3 WATER SUPPLY-DEMAND DISEQUILIBRIUM ACROSS THE DEAD ZONE

The above parallel South-North discussion suggests a growing disequilibrium between water supply and demand on both sides of the 'border'. It is not possible to accurately calculate the scale of the gap, as the availability of water resources is significantly variable and fluctuating from year to year. For the North the difficulty is more pronounced, as the accuracy of the supply-demand calculations has been questionable. Nonetheless, the South and the North have recognised the magnitude of the problem and have been exploring alternative ways for complementing the water

supply while at the same time curving the water demand. As already mentioned, both sides have made a shift towards non-conventional water resources like desalination and wastewater treatment, or towards enhancing the water budget through water transfers. These options are often controversial and conflictual as they touch upon established practices, vested interests, rigid structures and socio-cultural beliefs. Given their political and discursive context, they will be examined separately in Chapter VI in conjunction with an analysis of the thesis' theoretical considerations.

As for water demand measures, efforts have been made to sensitise the people on the value of water and the dire status of water resources in the island. Extensive campaigns and awareness raising are in place on both sides, but further effort needs to be directed towards the agricultural sector –as the main water user- and tourism –as the emerging large water user. For example, plans for the construction of golf courses that both sides have been exploring, seem at odds with the ominous picture of future water availability. Moreover, further water sensitisation is much-needed to avert the danger of turning the construction of desalination plants into a 'new' hydraulic mission, one that promises seemingly endless additional quantities of water.

An approach favoured in many Mediterranean regional political processes (including the UfM that is of immediate interest to Cyprus), calls for the exhaustion of measures on water demand/efficiency before pursuing supplementary ways of water provision (like desalination or water transfer). In Cyprus, this would necessitate bi-communal cooperation, since the resources that have not been developed yet lie in parallel to or cut across the *de facto* 'border'.

The thesis supports the need for additional bi-communal contact and argues that the example of Nicosia (with regard to wastewater treatment, drinking water and the rehabilitation of the within-the-walls city), could serve as a good practice for replication. Efforts made by the EU and the UN, as positive change agents, aim towards the same objective. A brief overview of initiatives implemented within this context is presented in the following section.

6. EXTERNAL CHANGE AGENTS

Cyprus' long history is filled with examples of third parties' interventions in its internal affairs. The geo-strategic location of the island in the Eastern Mediterranean region and its small scale provide the main rationale for this reality. The list of actors with vested interests in the region is long, but it does not serve the purposes of the thesis to go into a detailed presentation of the individual actors and their motivations for getting involved.

On the contrary, the regional presence of non-state actors, like the EU and the UN, constitutes an area of interest for the thesis as their policy recommendations seem to be adhered to by the Cypriot authorities (South and North), while their involvement tends to occasionally balance out the island's conflictual politics. More importantly, initiatives undertaken by these actors provide the opportunity for bi-communal interaction that is free of political connotations and can transgress the impasse of formal interface as the focus is on specific project implementation. Such initiatives proclaim that they create opportunities for the two communities to work together on concrete projects that can benefit the whole island, while at the same time they promote tolerance and mutual understanding. This is particularly important for the thesis as it lies at the heart of the research question and its theoretical explorations. So prominent has the involvement of these third parties been over the years, that reframing perhaps the existing relationships from bi-communal to tri-communal would not be totally out of line.

Moreover, the role of non-state actors is further accentuated, as the EU and the UN seem to be the most active external players in the field of water resources management; the former because of Cyprus' 2004 EU accession that entails the obligation to transpose the water-related *acquis communautaire* into the Cypriot legal framework; and the latter because of the UN involvement in initiating and materialising water-related projects within each community separately as well as across the Dead Zone. As expected, reference will be made only to those projects/initiatives that are directly related to water resources management. It is noted that the initiatives/projects related to Nicosia and the sewage treatment plant will be mentioned in more detail in Chapter VII.

6.1 EUROPEAN UNION

The flirtation between Cyprus and the European Union started in the early 1960s and an Association Agreement with the –at the time- European Community entered into force in June 1973 (Hadjipaschalis and Lyssiotis, 2003: 16). Despite the impact of the 1974 events in delaying the accession process, the negotiations started in July 1990 and the entire island of Cyprus became a full member state of the EU on 1 May 2004[159]. However, due to the *de facto* division and the hitherto fruitless attempts to reach a solution to the political problem[160], the European acquis can be implemented only in the parts of the island that are under the control of the government of the Republic of Cyprus (the South). Nonetheless, the benefits of EU membership (for example freedom of movement) apply to all citizens of the Republic of Cyprus including Turkish Cypriots wherever resident[161].

The most significant implication of the EU accession with regard to water resources management is the obligation to harmonise the Cypriot legislation with the European legal framework. The transposition of the Water Framework Directive signifies the most prominent example. The Directive 2000/60/EC is a legislative framework that aims to protect and improve the quality of all water bodies (e.g. rivers, lakes, transitional, coastal waters and groundwater)[162] within the European Union. The Directive foresees that all water bodies are to meet 'good status', comprising good ecological and chemical water quality, by the year 2015 (WFD-Article 4). Following the WFD guidelines (CIS-Guidance Doc.2, 2003) for the identification of water bodies, the entire island of Cyprus is considered a single river basin (MANRE WFD Report, 2005: 7).

The WFD transposition was realised with the adoption of a Water Bill that entered into force on 20th February 2004 under Law N 13(1)/ 2004[163]. However, the transposition has largely been only that: the transposition of a legal document, with limited action

[159] http://www.delcyp.cec.eu.int/en/index.html

[160] The Annan Plan –seen in the next sub-section- is the most prominent example prior to the EU accession

[161] All citizens of the North (including those who were born after 1974) can claim the Republic of Cyprus passport. However, the settlers from Turkey and elsewhere, who moved to the North after 1974, are not regarded as Cypriots under Republic of Cyprus law and are, accordingly, not entitled to passports issued by its authorities.

[162] According to Articles 2 (1), (2) and (3) of the Water Framework Directive, the Directive covers all waters, including inland waters (surface water and groundwater) and transitional and coastal waters up to one sea mile from the territorial baseline of a Member State, independent of the size and the characteristics (CIS, Doc2, 2003: 2).

[163] Law N 13(1)/ 2004 entered into force with its publication in the Official Gazette No. 3812 on 20th February 2004. The full text is also available online at http://www.cyprus.gov.cy/moa/wdd/wdd.nsf/All/092CF489C17D5F43C2256E550026D211/$file/Low_Diaxirisi_Idaton.pdf?OpenElement

taken for the actual implementation of the WFD's provisions (Interviewee 30[164]). Given the amount of legal documents that Cyprus needed to transpose before the EU acceding date, it is not surprising that in most cases –as in the case of the WFD- the transposition process entailed predominantly the translation of the documents into the Greek language without any effort placed in attuning the context to the Cypriot social reality (ibid).

Nonetheless, steps have been taken to comply with the WFD and in 2004 a consortium[165] was selected to carry out a study on how to meet the requirements for the implementation of Articles 5 and 6 and the relevant Annexes of the Directive[166]. The project was completed a year later (MANRE, 2005) and the findings are accessible to the public[167], although during the project's execution period no information was made available[168]. A second project was allocated to the same consortium in April 2006 for the realisation of a study on the implementation of the Directive's Article 8[169]. The project, with a 20-month duration, aimed to establish integrated databases and a water-monitoring programme. It is important to stress that the allocation of the two projects to a consortium of non-Cypriot partners implies a shortage of human capital and non-engineering water expertise in Cyprus that although acknowledged by the authorities, it has not been sufficiently addressed or tackled[170]. During 2010 a public consultation has been in progress regarding the implementation of WFD's article 14[171]. Further intensification of the harmonisation process is anticipated also with regard to the transposition and implementation of additional water-related EU legislation (like the Groundwater Directive or the Coastal Zone Management Protocol).

[164] Senior Counsellor of the Republic, Law Office

[165] The consortium consists of WL Delft Hydraulics, ENVECO Argyropoulos, IACO Nicolaides and Ecologic, with the first partner leading the process. More information is available at http://www.wldelft.nl/issues/wfd/cyprus/index.html

[166] The objective of the project was to meet the articles' requirements in terms of working methods and expected deliverables, i.e. to characterise the river basin district in terms of pressures, impacts and economics of water uses, including a register of protected areas lying within the river basin district. Reference conditions for each water body type were determined and anthropogenic pressures such as pollution were identified (MANRE, 2005).

[167] http://www.cyprus.gov.cy/moa/wdd/wdd.nsf/All/ABA009EA9F54334FC225717600324B57?OpenDocument

[168] Difficulties in collecting any information relating to the project were encountered whilst on fieldwork. In the view of the writer, the project was treated with slightly exaggerated vigilance, especially as openness and public consultation are presupposed within the WFD context.

[169] The full title of the project is 'Development of Integrated Water Monitoring Programmes and Tools for Cost-Effective Monitoring and Assessment to Support Sustainability of Water Resources and the Implementation of the Water Framework Directive 2000/60/EC in Cyprus' http://www.wldelft.nl/issues/wfd/cyprus/index.html

[170] It is indicative that there are no provisions for the recruitment of new personnel –especially social scientists- in the Water Development Department or any other related governmental department in the South or the North (information from interviews). The topic of expertise shortage is discussed in more detail in Chapter VI.

[171] http://www.moa.gov.cy/moa/WDD/WDD.nsf/guide_gr/guide_gr?OpenDocument

The importance of the WFD implementation process lies with the ability to impel policies that would otherwise remain void of context, like measuring the social costs of water pricing or conducting public consultations on the Directive's components. It is revealing of the Cypriot political idiosyncrasy that changes in the water policy sector have been put forward mainly by external actors, and the EU in particular, and not by domestic stakeholders. The need for compliance with the European water (and wider environmental) *acquis* constitutes the main driving force behind the transition from water development to water management and from supply to demand methods of coping with water scarcity. The majority of the fieldwork interviewees were in accordance with this stance and the role of the EU in triggering water policy change. Given the discursive nature of water policy, introducing changes in the sector seems to entail too high a stake for the average domestic politician or planner, especially as the small geographical scale of the island can exacerbate further the political cost.

6.2 UNITED NATIONS

The second trigger for water policy change in Cyprus rests with UN activity. Although the post-1974 presence of UN forces[172] on the island has aimed primarily at preventing military escalation and ensuring conflict evasion, several bi-communal development initiatives have been launched, with the United Nations Development Programme (UNDP) playing a distinctive role in the process. The aim has been to contribute to the mutual understanding of the two communities and to facilitate the smooth transition to a functioning post-settlement structure in the island.

UNCHR & DAVIT REPORT

With this aim in mind, Alain Davit, a water sector consultant of the Programme and Technical Support Section of the United Nations High Commission for Refugees (UNHCR), carried out in the period May-August 1997 an assessment of water resources and use in Cyprus. The mission report concluded that the most pressing issue was "*…the necessity of the creation of an* ***effective bi-communal working team studying water resources and proposals***[173]" (Davit, 1997: 41). The report continued that the mission, through the organisation of one single bi-communal meeting on water resources, "*…gave a first input but* ***did not succeed in the efficient realisation of this team due to political reasons and a strong push would be necessary on***

[172] The initial employment of the United Nations Peacekeeping Force in Cyprus (UNFICYP) was realised in 1964 with the adoption of the Security Council Resolution 186 (1964) (http://www.unficyp.org/History/hist_establish.htm).
[173] Emphasis added

upper level[174] *in order to allow technicians and engineers from both sides to work together on this issue, particularly on the critical situation related to water supply and reserves*" (ibid: 42). The main difficulties for meeting the mission's objectives were identified by Davit (ibid: 4) as:

a) Reluctance of some departments to give information on water resources or to attend meetings especially when touching on the shared aquifers or the buffer zone. The case of the Greek-Cypriot Community's Atsas/Karyotis water project, with its impact study facing added intricacies, was characteristic.
b) Slowness in the procedures of visiting areas and projects with interlocutors (who need approval from their respective Ministries). In addition to the summer being a holiday period for most Cypriots, the summer time in Cyprus entails "touchy" commemoration dates[175].

The need to establish bi-communal teams on water resources and the difficulties encountered due to the political question reflect precisely the purpose and theoretical quintessence of the thesis. Given the rarity of insightful bi-communal reports, it is striking that Davit's report (1997) has been under-presented and well contained in UNOPS' archives. During fieldwork, the vast majority of the interviewees responded negatively, when asked whether bi-communal reports on water resources exist for Cyprus and referred instead to the pre-1974 Thorp Report.

BI-COMMUNAL DEVELOPMENT PLAN (BDP)

The identification of the need for joint work led to the initiation of a UN Bi-Communal Development Programme in 1998, which was dedicated to fostering peace building and co-operation in Cyprus through the implementation of common interest projects for Greek and Turkish Cypriots. Funding was provided mainly by the United States Agency for International Development (USAID) and the United Nations Development Programme (UNDP), while the United Nations Office for Project Services (UNOPS) carried out the Programme's administration. Although the Programme initially concentrated on three projects -the Nicosia Master Plan, the restoration of the Venetian walls of the old city of Nicosia and the upgrading and expansion of the Nicosia sanitary and sewage system- it quickly evolved into a fully-fledged multi-disciplinary, comprehensive initiative comprising of over 130 projects in a variety of sectors, with the environment receiving more than 25 per cent of the total budget[176]. As part of the environmental education programme, 'water testing kits' were distributed to schools so

[174] Emphasis added
[175] The events of 1974 took place in July-August
[176] www.unopspmu.org

that teachers could provide their students with a better understanding of island-wide water issues (ibid). The overall programme's time breadth was foreseen until the 1 October 2005[177], but given its successful trajectory a new initiative was launched in order to take over the activities.

ACTION FOR COOPERATION AND TRUST (ACT)

This new initiative is called Action for Co-operation and Trust (ACT) and aspires to build on the successes of the BDP and provide the two communities with the resources and opportunities to jointly build the foundations for a sustainable solution to the Cyprus Problem. The philosophy behind the ACT's approach is based on the understanding that 'any solution can only be implemented on the basis of solid networks of co-operation and the gradual normalisation of relations in a wide variety of fields'[178]. This statement aligns with the theoretical stance of the thesis on policy networks as clusters of co-operation that can assist in insulating potentially explosive political circumstances.

Although the Nicosia sewage system represents one of the pivotal projects in both UNDP initiatives (BDP and ACT), UN attention is not on water resources, which are considered part of the wider environment priority area and not a separate priority as such (Interviewee 52[179]). Nonetheless, the Nicosia sewage scheme's continuous presence in the UNDP agenda as one of the key action for the rapprochement of the two communities maintains the water theme prominent. This is particularly important because of the trend in UN projects to move away from infrastructure work and closer to civil society related initiatives that could erroneously marginalise water-related activities as strictly infrastructure-focused (Interviewee 52).

The UN initiatives are said to "*show on a day-to-day basis how practical results can be achieved irrespective of differences. It is important to respect each other's common heritage, culture and environment. The BDP is a perfect example of that happening*[180]" (UNOPS, no date). In the same context falls the statement by the former UN Secretary-General Kofi Annan that "*the Bi-communal Development Programme in Cyprus is an innovative use of conventional development tools to achieve co-operation and harmony*" (ibid). The focus on everyday issues of practical orientation in order to

[177] A complete list of the projects realised under the BDP can be found at http://mirror.undp.org/cyprus/projects/search.asp
[178] http://www.undp-act.org/
[179] Environmental Compliance Officer in the PFF at the time of the interview
[180] Stated by Kalman Mizsei, former Assistant Administrator and Regional Director for Europe and the Commonwealth of Independent States, United Nations Development Programme

overcome political impasses is perfectly aligned with the argumentation on communities of practice and policy networks, as analysed in Chapter III.

PARTNERSHIP FOR THE FUTURE - PFF

Since 2001, UNDP has been also responsible for the EU-funded programme Partnership for the Future (PFF), aiming initially at the rehabilitation of the old city of Nicosia in co-operation with the Nicosia Master Plan. PFF aims at contributing to the peace-building process in Cyprus through different levels of intervention, ranging from technical assistance for business communities to the de-mining of the Buffer Zone[181]. However, PFF's role in defusing bi-communal tensions may face difficulties due to the transferring in February 2007 of the project's premises to the northern part of Nicosia, an action that opposes the established international policy of non-recognition towards the North. The Greek-Cypriot and Greek authorities have already expressed their discontent and have condemned the action through correspondence to the UN Security Council. This represents an evocative example of an international development initiative getting caught up in the web of local politics. At the same time, it accentuates the role of knowledge and respect for local sensitivities that international initiatives need to incorporate in order to be successful. Another example, where local particularities and collective memory seem to have impeded the attempt for a resolution, is the UN-backed Annan Plan.

THE ANNAN PLAN

The most recent UN political initiative on Cyprus concerns what has become widely known as the Annan Plan (named after the – at the time - UN Secretary General). The Plan, which was first released in November 2002, constitutes a UN proposal to settle the dispute of the *de facto* divided island of Cyprus through the establishment of a United Cyprus Republic. After several re-drafts, the forth version of the Annan Plan was released on 31st March 2004[182] and proposed the creation of a Republic that would cover the island of Cyprus in its entirety –except for the British Sovereign Base Areas. This new state formation was to be a loose confederation of two component states, the Greek Cypriot State and the Turkish Cypriot State, joined together by a minimal federal government apparatus, vaguely resembling the Swiss confederal model.

[181] http://www.undp-pff.org/
[182] http://www.hri.org/docs/annan/

The Plan was placed before the two communities in a simultaneous referendum vote on 24th April 2004, was ratified by the Turkish Cypriot community (receiving a 64,9 per cent favourable vote) but was rejected by the Greek Cypriot community (receiving a 75,8 per cent negative vote)[183] (Frangoulidou, 2004: 31). Following the rejection of the Annan Plan, Cyprus joined the European Union on 1st May 2004, with the particularity that, due to the *de facto* division, the *acquis communautaire* cannot be enforced in the northern part of the island.

With regard to water resources, the relevant section of the Annan Plan was included in Annex III, Attachment 12[184] and was referred to as 'The Federal Law on Water Resources'. In article 3, paragraph 1, it is stated that "*the purpose of this Law is to establish a framework for the promotion of sustainable water use based on a long-term protection of available natural water resources and to ensure equitable sharing of these resources between the constituent states*". What is meant by equitable sharing is elaborated in paragraph 2 of the same article, which utters that "*…equitable sharing…means allotment to each of the constituent states of a percentage of the overall natural water income, after taking into account, in order of priority, the following factors…:*

a) *the natural water income of Cyprus and the natural water income of each of the constituent states*
b) *the number of Cypriot citizens enjoying permanent residence in each constituent state*
c) *the geographical distribution and availability of the natural water resources*
d) *the protection and conservation of the environment and the nature and extent of any adverse effects likely to arise as a result of the water abstraction*
e) *the cost of conveyance of natural water resources*"

Finally, paragraph 3 of the same article reads that "*at least thirty months after the date of entry into force of this Law, the Service shall estimate the overall natural water income of Cyprus and the water income of each of the constituent states and determine, in accordance with subsection (2), the percentage of the overall natural water income to be allotted to each of the constituent states*".

The Achilles' heel of the Annan Plan, with reference to water resources, seems to be located in more than one area. More specifically, the factors determining water allocation, as listed in paragraph 2 of the Article, refer to erratic parameters like

[183] For an analysis of the referendum see BCC http://news.bbc.co.uk/1/hi/world/europe/3656753.stm
[184] http://www.hri.org/docs/annan/Annan_Plan_Text.html

geographical and geo-morphological characteristics that fluctuate significantly in space and time (as analysed earlier in this chapter). Moreover, as the Greek-Cypriots have invested heavily on water infrastructure (dams, desalination and sewage treatment plants), sharing the yield of such investment without hesitation seems like a convoluted expectation. Another source of discontent rests with the Cypriot residents as a parameter determining water allocation, since the issue of the Anatolian Turkish settlers that have resided in the North after 1974, constitutes an issue of dissent between the two communities. Overall, the Plan's article denotes an understanding of water resources as negotiable and dividable on the basis of a post-settlement arrangement. It is unlikely that either community would impetuously embrace such stance, especially when Cypriots deem water as the second most important issue after the political question.

7. CHAPTER EPILOGUE

Chapter V reviewed conventional water resources in Cyprus across the *de facto* division with the aim to address the first overall objective of the thesis. To this end, overviews of water supply and water demand in the South and the North were carried out in parallel, complemented by a brief presentation on the geographical and climatological conditions prevailing in the island. Moreover, an outline was provided on already conducted studies with regard to water resources, both island-wide and specific for each side. The thesis claims that part of its originality and contribution lies with the integrated presentation of conventional water resources across the *de facto* border.

Cyprus is a semi-arid island, where the annual precipitation is distributed unevenly in space and time. Also, there is evidence on the potential impacts of climate change in the Mediterranean, manifested in Cyprus through reduced rainfall patterns in the past 30 years. A comparative estimate of water supply and water demand reveals significant deviation from a point-of-balance for both the South and the North. Increased demand for water by all users along with a commitment to the principle of food self-sufficiency and the aspirations of development, have resulted in over-extraction of groundwater within the time-span of a single generation. As a result, a significant number of aquifers have been depleted or are beyond safe use due to seawater intrusion. Regarding surface water, the South has developed its water capacity almost to its maximum potential through intensive dam construction. As stated, Cyprus is the state with the highest concentration of dams per square kilometre in Europe, including the former

USSR. Although there is still potential for water development in the North, the main candidate rivers cross the *de facto* boundary and therefore require delicate negotiation, which is not doable without political will. The unsuccessful experience on the river Karyotis/ Camliköy adequately demonstrated the difficulties of such endeavours and the urgent need for confidence and trust building.

To this end, encouragement has been offered by external agents, especially the EU and the UN, through bi-communal projects, which however have not succeeded in initiating a new phase in water resources co-operation. Nonetheless, the need to comply with the European environmental *acquis* (and the WFD in particular) seems to form the main driving force behind the transition from water development to water management and from supply to demand methods for coping with water scarcity. Moreover, the aspiration of the North towards the EU could function as an additional pressure point for more integrated and sustainable water resources management.

At the same time, UN-led bi-communal projects offer the opportunity for community interaction and gradual build-up of trust. This process of building blocks is in accordance with the theoretical stance of the thesis that considers communities of practice and policy networks as stepping stones for (eventually more political) bi-communal co-operation. The thesis suggests that through regular interaction on issues of common concern the political impasse may be overcome, as the sharing of benefits may prove more powerful than the matters of divergence between the two communities.

Chapter V's review of conventional water resources illustrated the island-wide need to explore alternative sources of water. Some of these options---desalination, wastewater treatment and water transfer---are considered discursive as they entail social interaction, touch upon vested interests and encounter complexities due to the political question. These three water discourses will be discussed in the following chapter, also using the lens of the thesis' theoretical framework.

CHAPTER VI

Contextualising policy in Cypriot water resources management: selected discursive themes

1. INTRODUCTION

Chapter VI represents the second part of the empirical analysis and addresses the second overall objective of the thesis: to demonstrate the relevance and applicability of the policy analysis theoretical framework to the Cyprus case study. It aims to do so through a comparative analysis of the South and the North with regard to three selected water policy discourses (i.e. desalination, water transfer, water recycling).

The discussion also aims to highlight the similar obstacles the two sides face when addressing the water challenge; thus, strengthening the role of water as a point of contact instead of a point of contention. Understanding the water reform trajectory of the South through an analysis of current debates may provide important insights for the future trajectory of the North. Following the logic of the paradigms shift[185], the inherent cultural similarities between the two sides, the common history (despite the effects of the 1974 events) and the expressed aspiration of the North towards the South's development paradigm, indicate that the two sides are following the same trajectory, though at different speeds. The North may be thus, considered as being one step (or paradigm in this case) behind and pre-viewing the benefits and shortcomings of specific policy options, may be useful in avoiding future political debates and social turbulence.

The methodology used in presenting empirical information is the same as in Chapters V and VII, i.e. juxtaposing the South and the North in a theme-focused analysis. The discussion is done in parallel, however more emphasis is given to the discourses taking place in the South (especially with respect to desalination and water recycling), due to better information availability. The analysis is unavoidably unbalanced as a result of the North's limited access to financial resources and investment in water infrastructure. Due to the different levels of economic development the South has enjoyed more flexibility, while the North is restricted in the range of realistic and sustainable policy alternatives. In addition to the use of semi-disclosed secondary sources accessed in the premises of national and local public authorities on the island, the Chapter's main

[185] As presented in Chapter I

contribution is the juxtaposition of opinions and views of interviewed key water stakeholders.

The Chapter starts with a discussion on desalination, followed by an analysis on water transfer and then by a discussion on the re-use of treated wastewater. Linkages of the case study with the theoretical deliberations of the thesis are made throughout the presentation of fieldwork material. The chapter is brought to a close with a brief summary and some conclusions.

2. DESALINATION

The section will discuss desalination in the South and the North within the context of policy analysis. Besides, providing detailed information on the context and the discourse, the section aims to highlight the policy aspect accompanying the desalination debate. The discussion is relevant to the overall research question because it supports the argument on multi-actor interaction affecting the social construction of the policy process. An integrated view of the theme (given the small scale of the island and the inherent interdependencies in terms of resources and environmental impacts), could also enhance bi-communal cooperation across the *de facto* division. The section looks first at the desalination debate in the South, moves into a similar analysis on the situation in the North and concludes with some issues relevant to both sides.

2.1 DESALINATION IN THE SOUTH

HISTORY OF THE DESALINATION UNITS

All non-conventional sources of water form prominent topics in the South, often generating intense political disputes. None has done so as much as the desalination debate. The deteriorating condition of groundwater aquifers, characterised by depletion and seawater intrusion, along with the post-1970s decline in rainfall levels and the drought of 1988-1991 (Lytras and Tsiourtis, 1994), provided the Government with the window of opportunity[186] to argue through and proceed with the construction of seawater desalination plants. The rationale behind this decision was to separate the demand for drinking water from the annual rainfall variations and the restrictions on water development imposed by the *de facto* division (i.e. resources lying across and

[186] For further analysis on the window of opportunity idea see Kingdon, 1984.

moving across 'boundaries'). With desalination, the South could secure a reliable and independent domestic water provision primarily for the large urban and tourist centres thus, ensuring security and further economic development.

The first desalination plant was built at Dhekelia and commenced its operation on 1st April 1997. Its initial nominal capacity was 20,000 m^3 per day (about 15 Mm^3 per year), but due to the prolonged drought of that period (1997-2001) its capacity was immediately expanded to 40,000 m^3 per day (Omorphos *et al*, 1999: 17; Tsiourtis, 2001; Tsiourtis, 2004: 3). The unfavourable rainfall conditions of 1999 imposed the production of an additional 5,000 m^3 per day that was possible through the continuous operation of the plant (as opposed to the two-hour daily interruption that the contract anticipated) (Interviewee 3). This plant provides water for the cities of Nicosia and Larnaca, as well as for the coastal tourist areas of Ayia Napa and Paralimni. The plant was commissioned on a build-operate-transfer contract (BOT) as a method of project financing on a ten-year basis and the produced desalinated water was sold to the Government at a fixed price that fluctuated depending on the price of oil. It is interesting, however, that although the expansion of the plant's capacity would suggest a lowering of the cost per cubic metre (as capital and operational costs would only rise slightly), the price remained fixed by the clauses of the initial agreement (54 CY cents[187] per m^3 according to the contract, but reached 66 CY cents per m^3 in 2005 due to the rising oil prices) (Interviewee 12[188]). The Dhekelia contract was bought out by the Government in 2005, and prior to its expiration, following the respective clauses of the contract. Immediately afterwards, the Government conducted a tendering for the rehabilitation, operation and maintenance of the plant and the retail of water for a period of 20 years (May 2007-May 2027). The contract was won by the same company that managed the construction contract[189].

The continuing unfavourable rainfall conditions offered another window of opportunity for the construction of the second desalination plant in the South. The agreement for this plant, which is situated near the airport of Larnaca, was again a build-own-operate-transfer contract on a ten-year basis. It was signed in March 1999 and the unit

[187] At that time 1 CY£ was approximately 1.4 GB£ - Cyprus is a member of the Economic and Monetary Union of the EU and adopted the euro as its official currency on Jan 1 2008.
[188] Retired Senior Engineer in the Drinking Water Division of MANRE
[189] http://www.moa.gov.cy/moa/wdd/Wdd.nsf/All/2ACB760DDE60ED1CC2256E3F0048E3FA?OpenDocument – information available only in Greek

commenced operation in April 2001[190] with a nominal capacity of 52,000 m^3 (Tsiourtis, 2004: 3) at a cost[191] of 39.9 CY cents per m^3.

Photo 4: The commemorate plate for launching the Larnaca Desalination Plant

Source: http://www.moa.gov.cy/moa/wdd/Wdd.nsf/All/30002753372BBD59C2256DF0003D51A2/$file/phote20.jpg?OpenElement

The two desalination plants together provide 33 Mm^3 of water per year (daily capacity of 92,000 m^3) (Interviewee 34). Perhaps the most concerning point in the construction of the two plants would be the execution of the environmental impact assessment studies by the same companies that were carrying out the feasibility studies or/and the design of the plants thus, jeopardising the reliability and impartiality of the findings (Interviewee 33[192]).

Nonetheless, the provision of desalinated water for potable use, led to the lifting of the water rationing measures and after January 2001 every household in the South had continuous provision of piped water (Interviewee 2). The magnitude of the achievement becomes apparent when considering that before 2001, household water provision was restricted to 30 hours per week (Interviewee 34) or 8 hours every two days (Interviewee 36). In 2000 for example, drinking water was available in Nicosia only for three nights a week. The political importance of this achievement is also evident in the ceremonial statement by the then President of the Republic of Cyprus, Mr Glafkos Clerides, on 22nd January 2001 where he stated that "…*it is with special satisfaction that the government announces today the solution of a problem that has troubled our country*

[190] www.moi.gov.cy/moi/pio/pio.nsf/All/554188F648662A72C2256DC90034B99A?Open; more information on the technical specificities of the plant is available at http://www.water-technology.net/projects/larnaca/

[191] http://www.moa.gov.cy/moa/wdd/Wdd.nsf/All/D9DD3467701044CDC2256E44003D7207?OpenDocument

[192] Civil Engineer in WDD and also member of FEEOC

for decades. From today the regime of water cuts is finally terminated…every part of free Cyprus will have continuous supply of drinking water on a 24-hour basis…"[193]

With a view to strengthening even further the potable water security, the government looked into the construction of a third desalination unit in the area near the city of Lemesos (Επισκοπή – Ακρωτήρι Λεμεσού) and a fourth one in the area of Paphos. The projected daily capacity of the two plants would be 40,000 m^3 and 20,000 m^3 respectively. However, the construction of the two plants was put on hold due to increased rainfall in the period 2001-2004 and the political pressure exercised by the Green Party and the main Cypriot environmental NGO. The idea was, however, not removed from the South's policy agenda and reached the headlines again during the drought years after 2006. Besides exploring the option of building the two additional desalination plants in Paphos and Lemesos, the authorities looked also into the possibility of expanding the existing Larnaca plant (WDD website). Moreover, and following the persisting post-2006 drought years, the option of additional desalination plants has been considered, only that on this occasion the decision took into account the construction of mobile/floating desalination plants under shorter-term contracts[194].

THE DESALINATION DEBATE

Different and often conflicting opinions have been expressed on the issue of desalination. The debate is driven by the competition between the traditional water user (agriculture) and new water needs and environmental concerns. Additionally, it reflects the conflict between the South's hydraulic mission and the necessity to comply with obligations stemming from the EU *acquis* and international agreements. Interviewee 34, a former MANRE Minister, is a firm believer in the necessity of desalination and was in office during the contracting and construction of the Larnaca plant. He claimed that there is an urgent need to unravel the drinking water provision from the climatic and weather fluctuations. He asserted that Cyprus has a booming tourist industry that requires reliability in the provision of adequate and good-quality water. Though ideas of eco-tourism may have some impact, the average tourist does not expect to face water-rationing measures whilst on holiday. Such a situation, he stated, proved rather

[193] Aquamedia, http://www.aquamedia.at/templates/index.cfm/id/1275

[194] Under these modalities, and with contracts ranging between 2-5 years, 3 more floating plants constitute, as of 2010, part of the South's sources of non-conventional water (in Moni in Limassol, in the Kouklia area of Paphos and off the Germasogia coast at Limassol). The Government plans to go ahead with the construction of the two additional permanent plants in Paphos and Limassol so as to cover all water needs through desalination by the year 2011,
http://www.cyprus-mail.com/cyprus/desalination-cover-all-our-water-needs-2011/20100302,
http://www.moa.gov.cy/moa/wdd/Wdd.nsf/All/2ACB760DDE60ED1CC2256E3F0048E3FA?OpenDocument (in Greek)

embarrassing in previous years, when "*Cyprus was advertised as a tourist destination with water supply being a non-stipulated service"* (Interviewee 34[195]).

In accordance with this water policy is the former WDD Director, Interviewee 2, while another former WDD Director, Interviewee 17, pointed that the choice of desalination was a matter of life over death back in 1997 when water restrictions reached 80 per cent of the total drinking water provision. The importance placed by urban centres, and Nicosia in particular, on desalinated water for securing drinking water provision was also stressed by Interviewee 36, the Technical Services Director in the Nicosia Water Board, and Interviewee 12, a senior engineer in MANRE's Drinking Water Division. Interestingly enough, it was the same government front that called for caution and step-by-step approach towards desalination, when in 2000 – and faced with severe water cuts due to persistent drought - the mayors of Nicosia and the suburbs pushed fiercely for a policy of hiring mobile desalination units to provide emergency supplies[196].

From a different viewpoint, Interviewee 33[197] claimed that the water allocation achieved through the operation of the desalination plants defies any sense of social justice. The waterworks (i.e. dams and other storage infrastructure) in the South were constructed with money coming from the whole population through taxes. The government, he stressed, "*is now basically telling people they cannot have access to the water stored in the constructions they financed and instead, they have to pay for another –more expensive- source of drinking water*". The consumers are expected to pay for the cost of desalination through high water bills and through general taxes that cover the energy cost of desalination in the form of state subsidies (Interviewee 37[198]). At the same time, the water stored in dams is given to activities of low revenue return, like agriculture that extracts additional state subsides due to its low economic performance (Interviewees 3, 33 and 37). Stylianos (1998: 7) asserted that Cyprus moved to the expensive option of desalinated water before making a real effort to save water from increasing irrigation efficiencies. He uttered that the decision to extend the capacity of the 1997 plant and the construction of the second unit became a necessity in view of the three-year drought period of that time and the complications that irrigation policy changes normally imply (ibid). Stylianos (1998) concluded that perhaps delaying the use of desalination water would have been preferable, until exploring adequately the possibilities from reducing irrigation water demand and the improvements in desalination technology. Desalination as the last resort was among the conclusions of a specialised study

[195] A former MANRE Minister, General Secretary of the United Democrats Party at the time of the interview
[196] http://www.cyprus-mail.com/costas-themistocleous/water-crisis-nicosia-mayors-threaten-take-matters-their-own-hands
[197] Civil Engineer in MANRE and member of FEEOC, both affiliations at the time of the itnerview
[198] Founding member of FEEOC and member of the Green Party

(Batho, 1999), while according to the Green Party resolving to this non-conventional resource was not recommended prior to 2005 (Interviewee 28[199]). However, the desalination measures preceded this suggestion by almost a decade.

The Green Party of Cyprus and the Federation of Ecological and Environmental Organisations of Cyprus (FEEOC) have led the opposition to the construction of desalination plants. The argumentation of the Green Party, verbalised mostly through its member of parliament[200], is plentiful and includes several areas of concern. The main issue regards the environmental cost of the activity. On the one hand is the issue of sea pollution, including the extra salt deposited into the sea, as well as the impacts on coastal ecosystems from the local temperature increase. On the other hand, and most importantly in the Green Party's view, there is the issue of energy needs and the increased levels of air pollution that will place Cyprus outside the requirements of European environmental legislation as well as the Kyoto Agreement and post-Kyoto arrangements.

The same views are supported by the FEEOC. Additionally, Interviewee 35[201] made the link between desalination and tourism arguing that the desalination policy was put in place in order to facilitate the construction of golf courses, as the initiation of the two policies (desalination and golf courses construction) coincided chronologically. She claimed that there has been a trend to move tourism from the beaches inland to golf courses and key actors of the Cypriot private sector[202] have been paving the way by influencing water policy. Stephanou (1995: 212) claimed that the creation of golf courses irrigated with water from dam schemes when decisions are made to proceed with desalination plants cannot be regarded as sound water resource policy. In the same line of thought, Interviewee 16[203], when commenting on the planned floating desalination plant in Paphos, stated that '*people with no vested interests could actually end up subsidising the building of golf courses'*, since the expected EU fines for non-compliance with the obligation to limit CO_2 emissions will be particularly high (Leonidou, 2007; Howarth, 2009).

Interviewee 3 stressed that there is a straightforward equation between water and energy costs, thus rendering Cyprus vulnerable to international commodity price instability and especially oil price fluctuations. Moreover, such dependency translates into the export of currency (in order to import energy) that will restrain the economy

[199] President of the Green Party and Member of Parliament at the time of the interview
[200] With whom an interview was held – Interviewee 28
[201] A founding member of FEEOC
[202] Like the businessman Lanitis who is well-known/well-established in the South
[203] The Director of one of the main environmental consultancies in the South

since a significant part of the GDP needs to be retained for this purpose. It is interesting that officials in the South consider the use of virtual water (Allan, 2003b) as a distressing external dependency (Interviewee 6[204]), but "*do not view the energy reliance in a similar way*" (Interviewee 28[205]).

Scepticism on the desalination plants was also expressed by Interviewee 18[206], a keen supporter of agriculture's primacy in water supply, who asserted that this solution is at the same time indispensable and adverse. In his view, the construction of desalination plants took place in a hurry and without adequate studies. He believes that desalination ought to be an option only when all other alternatives have been exhausted. On this point, Interviewee 4, a former Director of the Geological Survey, stated that desalination was pushed forward because the management of water was and remained in the hands of politicians who place disproportionate value on agriculture. He asserted that amidst the water scarce year of 1996, the citrus production received water that could cover the drinking needs of 1.7 million people and the government still proceeded with desalination a year later (i.e. in 1997).

P. Hardisty, a chief consultant and environmental engineer of Comex Environmental Ltd[207], when asked his view on desalination, stated that as an environmental scientist he does not find it rational to produce water while burning oil. Such activity generates and reiterates a vicious circle; burning oil induces the greenhouse effect that leads to reduced rainfall and thus, leads to increased dependency on desalination for water provision. In his opinion there is enough water in Cyprus to cover all the competing needs. '*What is not in place is a rational, holistic and long-term water planning*[208]' (Phileleutheros-Φιλελεύθερος, 26th Oct. 2003).

PLACING DESALINATION WITHIN POLICY ANALYSIS

The desalination debate leaves a strong policy-centred aftertaste. It represents an interesting mixture of official government decisions and fierce questioning from within the government apparatus as well as beyond it (including from the Green Party, environmental NGOs or private sector representatives). Below, linkages are provided with the key policy-related elements (as analysed in Chapter II).

[204] Senior hydro-geologist who headed MANRE's Hydrology Division at the time of the interview
[205] President of the Green Party and Member of the Parliament at the time of the interview
[206] The President of the Parliamentary Committee on Agriculture and Natural Resources at the time of the interview
[207] Comex Environmental Ltd. is an international company, based in Cyprus, dealing with environmental and water issues in Europe, Middle East and Africa.
[208] Emphasis added

In theory, and as acknowledged by different actors, desalination should have formed the last policy resort and required extensive background study prior to endorsing it as an option; in practice, it was introduced hastily as an aversion measure in a crisis situation (the prolonged drought). This presents a good example for the differentiated application of the policy process and the policy content (the distinction between analysis of and for policy). However, an incremental approach has been followed in the official policy line, and the seemingly one-stop solution (the first desalination plant) paved the way for the construction of more plants and eventually led to the formal linkage of safe urban drinking water provision to the existence of desalination plants (whether fixed infrastructure or mobile/floating ones).

There can be little doubt as to desalination being a manifestation of public policy and its recurrent association with government conducts. The government (and MANRE/WDD in this case) has been the driving force in this process primarily as the legitimate carrier and implementer of decisions; these are examples of action. It is a pity that accounts of inaction cannot be assessed, for example the non-pursue of immediate reforms in the agricultural sector or the extensive introduction of water demand measures, all of which might have modified the water budget gap and perhaps have put the desalination policy option on hold.

At the same time, the desalination debate appears consistent with the discussion on the two dimensions of public policy (vertical-horizontal) and the disentanglement of policy analysis from the exclusive realm of the government through the involvement of different stakeholders and the emphasis on the social construction of policy. As mentioned above, the vertical dimension (concerning the implementation of policies using the force of legitimate authority) is most pronounced through the role of the Ministry and the WDD. These actors have been traditionally in favour of the desalination option because it secures the drinking water provision (and thus, respects social issues and the right to water) whilst not competing with the water allocated to irrigated agriculture the role of which has been pivotal in the island's socio-political affairs.

Agriculture forms the basis of the social structure and represents the "*backbone of the economy"* (Interviewee 18[209]) because it sustained and nurtured the state in the difficult post-1974 years when tourism did not exist. Despite contributing only 3.5 per cent in the South's GDP and offering employment to 8.2 per cent of the gainfully employed

[209] President of the Parliamentary Committee for Agriculture and Natural Resources at the time of the interview

population (MEDIS, 2003: 42), agriculture claims 69 per cent of the total freshwater (blue) water demand (WDD-FAO, 2002: 7; WDD, 2007: 54). More importantly, and although rationing measures are in place for dry years, water allocation to the farmers is usually carried out as promised by the government at the beginning of the hydrological year, irrespective of the annual rainfall fluctuations[210]. Besides the socially constructed role of agriculture, there are also strong political implications. The farmers' unions are affiliated to the major political parties in the South (Interviewee 6[211]) and the farmers' lobby is particularly influential in water affairs (Stephanou, 1995: 210). Agriculture's political role becomes more perceptible by the fact that the Ministry in charge of water resources and the environment is also responsible for the agricultural policy.

Therefore, the vertical dimension of the desalination policy seems strongly connected to the official agricultural (and water) policy and vested interests determining how public policy is processed and implemented in the South. Interestingly, a similar discourse is in the making with regard to water provision for tourism, since its role as a key economic activity has been steadily gaining ground (Interviewees 28, 37 and 35).

Concerning the horizontal dimension of policy (the structured interaction among stakeholders outside the line of hierarchical authority), this has been rather profound in the desalination debate through the involvement of civil society representatives, the Green Party, other social and environmental activists and also private sector representatives. In the case of the South, this enhanced stakeholder participation – despite the questionable outcomes given the government's firm stand for desalination - has been also triggered by the EU accession process and the need to comply with related procedures such as public consultation on the implementation of the respective WFD articles. Especially, since 2004 (when Cyprus joined the EU as a full member state) the social construction of water policy has become more prominent. This outcome may also be the result of the sense of political security that the EU accession entails, thus allowing for a temporary passing by of the political question. It could also be claimed that desalination has offered an additional layer of security, with regard to water provision. These new circumstances have allowed the South to enter a policy-making paradigm that is less determined by fear and apprehension towards the perceived other/enemy (i.e. the North and Turkey).

[210] As the decision to proceed with the construction of the second desalination plant indicated
[211] Senior Hydro-geologist, Head of MANRE's Hydrology Section at the time of the interview

With regard to the role of knowledge in the desalination debate, it is the explicit and collective form that dramatised the key role through the well-informed members of the Green Party and FEEOC. This was facilitated by the codification of explicit knowledge within scholarly work (on the technical aspects of desalination, the environmental impacts, etc) and the existence of the WFD. Interestingly, personnel from MANRE have been also active in the transmission of explicit knowledge through related publications, although their FEEOC membership may better account for their critical stance towards the desalination policy option. Moreover, similar knowledge is possessed by representatives of environmental consultancies who bring into the debate also the voice of the private sector.

Further insights on the linkages between desalination and policy analysis are offered through the examination of the more recent phase of the desalination debate, presented below.

THE MORE RECENT (POLITICAL) PHASE OF THE DEBATE

The recent phase of the desalination debate was fuelled when three years of favourable rainfall (2001-2004) resulted in several dams being filled to their maximum capacity and as a result water was discharged into the sea. Discussions thrived on the possibilities of either temporarily suspending the operation, or buying out the Dhekelia desalination unit before the end of its contract in April 2007. The discussion started with a newspaper article titled 'Rain saturates desalination' (Politis-Πολίτης, 19/01/04). The increased rainfall led to the consequent overflow of some dams (Phileleutheros-Φιλελεύθερος, 27/02/04; Alitheia-Αλήθεια, 19/02/04; Epikairotites-Επικαιρότητες, 19/02/04; Machi-Μάχη, 19/02/04) with the Kouris dam (the largest in the South) being the most prominent example (Charaugi-Χαραυγή, 05/03/04; Simerini-Σημερινή, 05/03/04; Lemesos-Λεμεσός, 12/03/04). As a result, the Minister of Agriculture requested from the WDD a report with a cost-benefit analysis of a potential buy-out of the Dhekelia desalination unit. The report calculated the various costs and concluded that this option would not be financially beneficial.

However, the report was followed by enquiries on behalf of the Green Party's MP, questioning the continuation of the desalination plant's operation. After directing the relevant question to the Minister of Agriculture (13th February 2004), the Minister replied (19th March 2004) that the topic is complex with multi-faced consequences (legal, economic, technical, environmental and those of overall water policy). He stated that the favourable rainfall of the past two years constitutes a new reality that is slowly

incorporated in the water policy-making of the government, while stressing the unpredictable nature of rainfall patterns.

In the meantime, the same MP directed a similar letter (ΧΚ/ΓΠ/044/04 dated 06/02/2004) to the State's General Inspector. After carrying out the relevant research, the General Inspector found that the savings from buying out the Dhekelia unit are higher than the continuation of the unit's current operation and concluded that the State would be saving more from avoiding the high-cost production of desalinated water with the overall savings amounting to CYP 12 million (about £15 million) (Letter dated 9th March 2004). Thus, it seemed that the data provided previously by the WDD were incorrect and misleading in order to maintain the desalination's operational *status quo*[212].

More importantly, the General Inspector concluded that the desalination unit's operation is not an exclusively economic issue and water policy aspects need to be co-calculated. The General Inspector couldn't provide an explicit recommendation regarding the buying out of the Dhekelia plant, as such an evaluation *would contain reflections of clear political beliefs and convictions*[213]. The State's General Accountant expressed similar reluctance on the same topic during a meeting of the Parliamentary Committee for Project Inspection and Public Spending Control on the 20th October 2004. He claimed that his department could not comment at all as the issue *clearly involves a political decision*[214]. It seems that the only clear position on the matter was expressed by the Greek-Cypriot press: one leading newspaper[215] backed the rationale of the WDD report, while another leading newspaper[216] after initially adopting 'the buying out' stance, positioned itself in favour of this option and presented in detail the contested aspects of the WDD report.

The General Inspector's Report caused the President of the Republic to request from the Minister of Agriculture (letter dated 15th March 2004) a thorough examination of the potential of 'buying out' the Dhekelia desalination unit. In the meeting of the Parliamentary Committee for Project Inspection and Public Spending Control of 23rd June 2004, the same request was put forward. Thus, the WDD Planning Department was asked to carry out a cross cost-benefit study, which was issued on 30th September

[212] Detailed information on the costs and the contested governmental information is provided by the General Inspector's Report and by an article of the Politis newspaper dated 15th March 2004.
[213] Emphasis added
[214] Emphasis added
[215] The Fileleutheros newspaper issued an article on the 4th February 2004 where it explained the rationale behind the Government persistence in maintaining the desalination units in operation.
[216] The Politis newspaper issued an article on the 15th March 2004 titled 'Water technically salted', where it analysed the different aspects of the misleading WDD report.

2004 and reached the same conclusions as the General Inspector's Report (i.e. showing the benefits of the 'buying out' option). Furthermore, the study concluded that the construction of another desalination unit in the Southern Conveyor System in the area of Lemesos is not necessary, as the needs could be covered through the use of recycled water and through reduced water consumption from both domestic and irrigation use. The exploration of the necessity for a third desalination unit formed part of an earlier study (in 2001) also carried out by the WDD[217], the findings of which were not disclosed to the author during fieldworks.

According to the 2004 WDD study, domestic water use reduction is linked to the establishment of stricter tariff and revenue collection systems, while agricultural demand is likely to decrease due to the compliance of Cyprus with the EU Common Agricultural Policy[218] (that foresees restrictions on state subsidies and encourage the rationalisation of crop selection). Moreover, this cross-reference study, through the use of alternative models and scenarios and taking as reference points rainfall-scarce years, concluded that an interruption of the Dhelekia desalination unit for one year is not likely to affect the overall Southern Conveyor System (which is the heart of the South's water storage and distribution system).

The above information became available to the author through interviews with Green Party members and members of the FEEOC. The cross-reference study was sent to the Green Party, but it was made available to the FEEOC only because the MANRE engineer responsible for the study is also a member of the FEEOC. The political nature of the debate is demonstrated by the inaccessibility to this study and its classification as confidential. A copy of the study was not available to the author, but a hasty read through it was allowed. The first page of the study mentioned that "*politically sensitive information is included"*[219] in it, which would *"weaken the Government's bargaining position in a future negotiation with the private sector, should the study be publicised partially or in full*".

The viability of the water system without the operation of both desalination units was proven possible two years later, in 2006, when the Dhekelia plant was kept shut for maintenance purposes from the end of October 2006 and until the end of that year (WDD-Annual Report, 2006). Following the intense drought years after 2006, the debate reached a higher level of intensity, with the Green Party and the FEEOC

[217] Information deducted from a letter, dated 9th May 2003, addressed to the President of the Republic on behalf of the FEEOC.
[218] http://europa.eu/pol/agr/index_en.htm
[219] Emphasis added

maintaining their stand against desalination while the opposition party criticising the government for not pushing the pro-desalination policy more actively (Leonidou, 2007).

THE RECENT DEBATE AND POLICY ANALYSIS

During this latest debate, the vertical dimension of the desalination policy and the Finterlinked consideration of water as a solely public policy issue vested in the hands of the official authorities were largely questioned. Especially with reference to public policy, the desalination discourse appeared as a vehicle for control (the government's stance) and as a vehicle for contesting the existing order (the involvement of others), while asserting at the same time the right of a range of actors to participate. Thus, it was rendered possible for policy collectivities (i.e. civil society, individuals, private sector, the press) to engage more actively in the desalination policy process and through this practice to alter the water policy-making landscape.

Furthermore, the desalination debate offered the opportunity for policy sub-systems to materialise and thus, strengthen the involvement of actors already within the policy-making process (e.g. the Green Party, the Parliamentary Committees, the State Inspector, the General Accountant and notwithstanding the President of the Republic). At the same time, this signalled a significant enlargement of the spectrum of stakeholders involved in the debate. It would be unfair not to acknowledge these policy changes, despite the fact that politics remained prominent and largely impervious to these developments, as seen in the Parliamentary Committee's reply (October 2004) and the non-accessibility to the WDD 2004 cross-reference study.

Nonetheless, the examination of the desalination debate in the South highlights that water policy exists within a social system of multi-stakeholder governance that is characterised by interdependence of actions amidst a multiplicity of options and alternatives. In that sense, the example of desalination in the South[220] may offer additional empirical evidence on the value of the horizontal – plural - dimension of policy making and the accompanying social constructivist understanding of water policy. All these elements are useful when considering the emergence of governance forms beyond statism or the market. In this case, the enduring practice of questioning and scrutinising the favourable orientation towards desalination provided by MANRE resulted in widening the discourse, enlarging the range of involved stakeholders and

[220] The value of confirming the horizontal dimension of policy in the South will be coupled with the analysis on water policy networks in Nicosia in Chapter VII

firmly placing the debate within a social constructivist framework with regard to the policy process.

Moreover, it is important to stress the role of these practice(s) on the policy process and the effects it has on action (i.e. reconsideration of desalination as a policy option or the buy-out of the Dhekelia contract prior to its expiration as a result also of stakeholder pressures). This discussion also highlights the linkages between knowledge and practice (knowledge enacted over time in people's practices) and the role of such (explicit) knowledge for engaging diversity (the enlargement of involved stakeholders), relationships (within and outside the government apparatus) and the maintenance of a policy community/sub-network that is firmly engaged in the desalination debate.

DESALINATION IN THE SOUTH REVIEWED

The contribution and value of desalination in reliable drinking water supply is difficult to question. The desalination units offered a sense of security for potable water that was not in place before 1997. Such security is of particular importance to a modern country under a *de facto* division living with the phobia of further offensive military operations from its neighbour state. This is especially the case as the North has been contemplating water transfer from Turkey by sea and pipeline to cover its water needs. The linkage between desalination and the island's wider political concerns becomes apparent. In that sense, the value of desalination cannot be measured by simple cost-benefit economic analysis as it also involves strong qualitative elements that are socially constructed. Ironically for a country like Cyprus that seems rather sensitive to issues of security and self-reliance, encouraging desalination means substantial dependency on oil imports and hence on well known international politico-economic fluctuations. Although the South has been promoting the use of alternative energy sources, it cannot be expected that such sources can counterbalance, at least in the foreseeable future, the demand for oil.

On another front, linking domestic and tourist water demand to desalination also facilitates and eases the allotment of water stored in dams and aquifers to agriculture. Such allocation offers limited incentive to use recycled water in agriculture and less inducement to rationalise the crop production towards those that are less water demanding and financially more profitable. Additionally, it offers limited motivation for implementing water demand measures. Finally, it constitutes a form of social injustice, as the consumers have to pay for expensive desalinated drinking water on top of having paid for the waterworks' construction from which they do not benefit.

Touching upon the politics of water allocation, several interviewees made reference to a Northern Conveyor scheme (in replication of the Southern Conveyor Project) that included structures on the 'cross-border' Karkotis River. Such infrastructure could provide potable water to Nicosia, thus rendering the operation of one or both desalination plants unnecessary. The operation of this Conveyor would, however, not allow the flow of the exploited water to the North and therefore could potentially invoke political tension. The fact that the scheme has not yet taken the form of a concrete policy suggestion was explained in two ways by the interviewees: either the South does not wish to provoke further political instability in the South-North relations, or the power of the private sector in the South is well-established and determines significantly the policy options that get on to the water agenda.

Coming back to the desalination option, the 1994 National Report on the South (Lytras and Tsiourtis, 1994: 2) stated that desalination formed an expensive option and thus, was not included in the immediate programme of the government. This was stated only three years before the first desalination plant started operating. Therefore, it may either be that the decision to use desalinated water was an act of desperation in a crisis management situation, or that the policy was already in place waiting for the appropriate window of opportunity to open. The latter was facilitated by the reduction in the cost of desalination in the late 1990s as a result of technological advances and the use of innovative financing mechanisms (Henthore, 2009).

The recent debate on desalination reveals further the highly political nature of the discourse. Desalination is placed high on the policy agenda of the Southern authorities and the construction of additional plants seems more of a plausible scenario than an emergency option in case of acute drought conditions. Especially given that the year 2007 and the beginning of 2008 were characterised by very dry conditions (WDD website; Leonidou, 2007; Joshi, 2008; Kalatzis, 2008), the political leadership clearly favours desalination and has proceeded with the construction of floating plants and the planning of two additional permanent plants in Paphos and Lemesos. To this end will contribute, on the one hand the expected revision of the South's water tariffication policy (through the WFD implementation) (Omorphos, 2002) and on the other the shift towards services as the focus of economic activity [221] that favours an active engagement of the private sector. Cyprus has already accumulated experience on private sector participation in water infrastructure through the BOT contracts for the desalination plants.

[221] https://www.cia.gov/library/publications/the-world-factbook/geos/cy.html#Econ

Summarising the relevance of policy analysis for the desalination discourse in the South, it appears that several policy elements are applicable and can benefit from the empirical discussion (analysis of/for policy; public policy; two dimensions of policy; policy collectivities and subsystems; social construction of policy). Of particular importance is the fact that desalination has questioned the traditional hierarchical structure of water policy-making through the involvement of additional policy communities/collectivities outside the government apparatus (especially the Green Party and the federation of environmental NGOs) as well as within the structure (General Inspector, Parliamentary Committees, etc). This reality has signalled a shift away from hierarchy as the determining factor of water policy towards a more socially constructed and value-centred policy formulation.

2.2 DESALINATION IN THE NORTH

THE STATUS OF DESALINATION IN THE NORTH

The North places desalination third when it comes to options for water provision (Interviewee 40 and Interviewee 47), as the use of desalinated water is still very limited. The plants under operation include a small one in Bafra, with nominal capacity of 2,000 m^3 per day and a privately-owned (by Tahal company) plant in Kerynia that is used for golf courses (Interviewee 48[222]). Elkiran and Turkman (2007) report two additional operating plants along the coastline with annual capacity of 0.4 Mm^3 at a cost of 0.7 Euro/m^3. The intention is to expand the desalination unit in Bafra to a capacity of 10,000 m^3 per day, where the produced water will be mainly used in the tourist sector and the involved actors will be primarily private companies and not the "government" (Interviewee 50). If, however, the prices are reasonable the "government" would be willing to buy 2,000 m^3 per day (ibid). As for the location of the desalination plants, Interviewee 45, Head of the Water Department in the Turkish Municipality of Nicosia, said that instead of having units scattered in the North, it would be better to have one plant in the Morfou area or in Kerynia and pump the produced water from there as needed. Future plans include building a moderate scale desalination plant in the Karpaz region to serve the needs of an expanding tourist sector in the area. This plant, that will follow BOT contract modalities, is envisaged to have a daily capacity of 2000 m^3 at a cost of 0.95 USD/m^3 (Elkiran and Turkman, 2007).

[222] Senior Engineer in the Waterworks Department, Ministry of Interior, at the time of the interview

AN EARLY DESALINATION DEBATE

On the desalination topic, Interviewee 48 argued that it would provide a good answer to the North's water problem, but that it is not considered an option for the time being. The desalination alternative is cited by Numan and Dolatli (1996: 13) and is connected to solar energy utilisation, but is considered an expensive solution in need of additional techno-economic feasibility studies. The Tahal Study (1995: 5) made reference to desalination of brackish water that could be used for urban consumption and the tourist sector. In January 2005 there was discussion on a law regarding the financing of desalination plants (Interviewee 41[223]). The law foresaw that the cost of the unit would be covered 20 per cent by the actor wanting to build it, 20 per cent by "government" subsidy and the remaining 60 per cent would be available with a 1 per cent interest in long-term credit (ibid). Up until the end of 2008, there was no further development regarding this law.

The use of desalinated water in the South for Nicosia's domestic needs has signalled a shift in bi-communal cooperation. Given that water has become more expensive, the South has significantly reduced the amounts of water going through the joint drinking water supply system, as such transfer was no longer considered financially viable. On this issue, Interviewee 43, the Turkish-Cypriot Mayor of Nicosia, commented that receiving such water (desalinated) from the South "*would have been simply unfair*".

Although future plans for the construction of desalinated units exist in the North, the overall capacity up to 2008 remained largely unchanged. This situation is mainly due to the weak economy and the international isolation of the North. These circumstances limit the existing financing alternatives and render the construction of plants complex and problematic. The desalination topic is also politically charged in the North, but from a particular viewpoint; it is the technical and financial dependency on Turkey that impedes the process and not necessarily the reaction from within the Turkish-Cypriot community (views expressed during interviews). Moreover, the relative standstill in the construction of desalination plants may also be explained by the progressively greater prominence and political priority attributed to the water transfer option from Turkey (through an under-sea pipeline). Additional important externalities to the desalination discourse include the dynamic technological progress and the unpredictable energy prices that add another layer of complexity.

[223] Deputy Mayor of the Turkish Municipality of Nicosia at the time of the interview

RELATING THE NORTH'S DESALINATION DEBATE TO POLICY ANALYSIS

In the North, the policy analysis is structured in a different way than in the South. Given the financial dependency on Turkey and the fact that the majority of high-level decisions need to go through Ankara first before being debated in the North, it seems that the vertical policy dimension may apply more to the guidance provided by Turkey, while the horizontal dimension may be more linked to the discussions held within the North. At the same time, the two dimensions of policy have applicability also within the North. It is civil society, and environmental NGOs in particular, that lead the front against desalination measures by raising the issue of environmental impacts. It is important to note that some NGOs work closely with respective bodies in the South and at times present joint views on specific policy issues such as the development of the bi-communal village of Pyla or the exploitation of the cross-cutting Karyotis River proposal. Moreover, there are three NGOs that work across the Dead Zone on a regular basis (Interviewee 16)[224]. Through mostly environment-related examples, the island is treated as a single entity, with bi-communal interaction supporting the structured interface of policy's horizontal dimension. This point is of particular interest for the thesis as it touches upon the main research question and enhances the potential of (water) policy networks.

2.3 DESALINATION ACROSS THE DE FACTO DIVISION: SOME HIGHLIGHTS

From the above discussion it has become evident that desalination constitutes a (public) policy issue for both the South and the North. Therefore, the theoretical lens of policy analysis contains suitable explanatory qualities for a comparative discourse analysis. Both sides examine desalination within the confines of their respective communities, with emphasis placed on the policy continuum and the elements of public policy. Both sides have questioned the hierarchical dimension of water public policy and are amidst transcending towards more socially constructed forms of governance and thus, policy making. This shift, coupled with indications of civil society clusters working across the *de facto* border (through environmental NGO work), are particularly important in answering the research question of the thesis that examines the forms and the potential of bi-communal cooperation in the water sector.

However, it is important to stress that most discourses in the North (including desalination) extend beyond the borders of the island, with Turkey playing a key role in

[224] The NGO names were not provided at the time of the interview, however through informal discussions with interviewees it was possible to cross-check that the NGO AKTI is one of them and working intensively at bi-communal level.

most policy-making processes. This reality places an additional layer of complication in the analysis of discursive water issues. With the latter in mind, the empirical analysis of this chapter continues with the theme of water transfer.

3. WATER TRANSFER

Water transfer to Cyprus has constituted a policy option of extensive study but of limited implementation. At different chronological points, both sides have made use of this water provision alternative, but neither has considered it as a regular input to their respective water budgets. The section commences with an examination of the water transfer debate in the North, followed by a similar one for the South and concludes with some highlights of the analysis that link to the theoretical deliberations of the thesis and support the key research question.

3.1 WATER TRANSFER TO THE NORTH

THE THREE WATER TRANSFER OPTIONS

Water transfer from Turkey constitutes a politically and technically feasible option for the North and has –to some extent- been implemented in order to tackle water scarcity. Since 1974, various projects have considered the import of water from Turkey by large water-bags, by tankers or through an under-sea pipeline. The proposed intake points include the Manavgat or the Göksü Rivers in south-west Turkey that discharge into the sea over 100 m^3 per second (more than 3 Bm^3 per year) (Numan and Doratli, 1996: 13). Moreover, the necessary infrastructure seems to be already in place on the Manavgat River rendering 180 Mm^3 per year (or 500,000 m^3 per day) available for immediate use (ibid; Rende, 2007:11). With this in mind, a rather wide-ranging Protocol was signed in 1997 between the Ministry of State responsible for Cyprus Affairs, the Ministry of Energy and Natural Resources of Turkey and the "Ministry of Interior and Rural Affairs" of the North regarding the provision of fresh-water resources to the North (Rende, 2007: 14).

The *water-bag*[225] option for the provision of drinking water was considered a practical solution (ibid), was successfully put forward, and was implemented for nearly four

[225] Earlier Turkish initiative (1990) to provide water from the Manavgat region not only to the North, but also to Israel, considered the use of bags created by the Canadian company Medusa Corporation Inc (Cran, 1990)

years between 1998 and 2002 (Interviewee 50[226]). It was estimated that water bags with a 10,000 m^3 capacity could bring a total of 3 Mm^3 annually (Bicak and Jenkins, 2000: 114). In 1998, three such bags were scheduled to make the sea journey each week (Theodoulou, 1998). The water would come from the Soguksu River in Anamur, Turkey (Nachmani, 2000: 84). An increase in the capacity of the water-bags to 30,000 m^3 would enable 7 Mm^3 of water to be imported annually, which responds to the maximum amount that the system in the North can allow to be pumped in (ibid). This water would be then pumped from Kumkoy to Serhatkoy, and then on to Dikmen, where the main reservoirs are situated, and from there to the cities of Nicosia and Famagusta.

The first such contract was signed in 1997 between Nordic Water Supply Company (based in Oslo, Norway) and Turkey and constitutes the first international export of water with plastic navigable water bags. The contract was originally signed for 10 years and determined the water price at 55 USD cents per m^3 (Rende, 2007:14), but in the end it lasted for 4 years and transported a total of 4 Mm^3 (ibid). According to other sources (Gleick, 1998: 203; Gökçekuş, 2001:12), the contract foresaw the delivery of more than 7 Mm^3 to the North within two years at an annual cost of 4.1 million USD. According to Elkiran and Turkman (2007) the water bags transferred a total of about 41 Mm^3 in five years from the Aydikcik region in Turkey to the Kumkoy reservoir in the North. However, after the last water-bag broke before reaching its destination in 2000, this transfer option was reconsidered and finally abandoned in 2002 as unsatisfactory (DSI[227]) and due to technical deficiencies under rough sea conditions (Elkiran and Turkman, 2007). Until 2008 the abandoned plastic bag was still visible outside the port of Famagusta (from the side of the North)[228]. It is important to stress that the transfer was realised despite the strong protests from the South against it due to the political dangers of quasi-recognising in such manner the illegal status of the North.

The transfer of water by *tanker* constitutes the second alternative and again involves water coming from the Manavgat region in Turkey. An investment appraisal by Bicak *et al* (1996) considered the transfer of 30 Mm^3 of water annually with the scope to provide 20-25 Mm^3 for the replenishment of the Guzelyurt/Morfou aquifer and 5 Mm^3 for domestic use. The final cost per m^3 was calculated as 0.1357USD and 1.588USD for the two uses respectively. Bicak and Jenkins (2000: 113-135) carried out an economic

[226] Director of Waterworks Department, 'Ministry of Interior', at the time of the interview
[227] http://www.dsi.gov.tr/english/service/icmekulsue.htm
[228] According to Rende (2007) another opportunity for using water bags was put forward in 2003 through an agreement with the Israeli 'Inbar Water Distribution Company' at a cost of 60 USD cents per m^3. However, further information on this agreement/deal has not been made available –and despite the claims of the Turkish State Hydraulic Works Department that it has been completed (ibid).

analysis for this type of water transfer using another set of variables/parameters. The tanker capacity would be 40,000 m^3 and the cost per unit would reach 1.095-1.150 USD depending on the payment method[229]. In their study, Bicak and Jenkins (2000) concluded that the most important variable determining the real price of water would be the amount of leakage in the system[230] that could further increase the final water price by an additional 0.5-0.6USD per m^3. The tanker option, despite the several studies, has not been -thus far- put into practice.

The most substantial (in terms of water quantities), but politically loaded option for water transfer concerns the construction of an underwater *pipeline* from the Anamur or Manavgat region in Turkey to Kumkoy or Kormacit in the North. The political weight of this project is demonstrated by the fact that it was approved by the Turkish Government Decree No. 98/11202 of 27th May 1998 (Rende, 2007: 15). One of the main preconditions of the Decree foresaw the construction of facilities for extraction, transportation and storage of water by a consortium comprised of domestic and foreign companies under the leadership of Alşim-ALARKO A.Ş. (ibid; Nachmani, 2000: 85). The pipeline project has been steadily included in the investment programme of the Turkish DSI since 2002 (DSI[231]).

An investment appraisal carried out by Bical *et al* (1996) foresaw the transfer of 82 Mm^3 of water annually, 7.5 Mm^3 of which would be used for domestic consumption and 29 Mm^3 would be used for aquifer replenishment thus, leaving a significant amount available to be sold to the South. The project was envisaged to be a build-operate-transfer contract with a guaranteed life period of 30 years that would be transferred to the ownership of the North after 15 years (ibid). The importance of this project, in terms of policy implications, rests with the inclusion of the South in the project planning. An initial contract with the Turkish firm ALARKO Holding Company in 1996 (ALARKO, 1996) was found financially non-profitable for Turkey unless water was definitely sold to the South (Bicak and Jenkins, 2000: 115). However, this was a politically unfeasible option at that time (Nachmani, 2000: 85). Nonetheless, a Memorandum of Understanding was signed between DSI and ALARKO on the 7th October 2005 in a

[229] The transportation cost of water, including the infrastructure and operating costs in the North as well as the port handling charges in Turkey, was calculated to be about US $ 0.79 per m^3 but this price did not include any payment to Turkey for the raw water. Hence, the above mentioned final price (Bicak and Jenkins, 2000).
[230] This variable is directly linked to the management and maintenance practices of the local water authorities in the North. The model they elaborated allowed them to calculate the price of water when given different leakage estimates. When water leakage is at 30 per cent, the break-even price of water increases to US$ 1.565 for Famagusta and US$ 1.643 for Nicosia. A 20 per cent leakage would reduce the price to US$ 1.369 and US$ 1.438 respectively for the two cities (Bicak and Jenkins, 2000).
[231] http://www.dsi.gov.tr/english/service/icmekulsue.htm

ceremony that was held in the Turkish Ministry of Energy and Natural Resources and during which, the project modalities were specified[232].

The pipeline alternative has been re-incarnated following the post-2006 drought period, as Interviewee 50, Director of the Waterworks Department, mentioned. Should it be implemented, it will have the potential of providing 75 Mm^3 per year and it would require ten years for its completion (Interviewees 40, 47 and 50; Rende, 2007:15). However, Interviewee 40 and Interviewee 47 commented that this project faces additional technical difficulties as it requires the use of one single pipe since it won't be possible to have joints in an undersea pipeline. Moreover, they identified the financing of the project as the most important obstacle to its realisation. The same line of thought is further supported (Elkiran and Turkman, 2007) with a claim that the completion of the project would involve a total cost of 400-600 million USD and needs to be therefore treated with utmost care (also on Gökçekuş, 2001: 14). Until late 2007, the feasibility study of the project was still pending (Interviewee 48[233]), while discussions on starting the construction and completing the work on the land facilities were envisaged to be completed by the end of October 2008 (ALARKO[234]).

However, according to undisclosed sources in the Greek Ministry of Foreign Affairs (Feb 2007, Apr-Aug 2008), the project's technical study was concluded in February 2007 and although completion of the pipeline is foreseen in 2012, it is said that the transfer of water for use in irrigation could start as early as 2010. The same document states that besides the ALARKO Company, other foreign companies (Norwegian, Danish and American; further details were not provided) also have shares in the project. The document finally mentions that ALARKO representatives are said to consider the transfer and selling of water to the South, as well as to Greek islands, through respective waterworks and depending on their implementation feasibility. The same information is confirmed by an article published in the Greek-Cypriot newspaper Philelefthеros (Φιλελεύθερος) on May 30th 2007, in which the names of the foreign companies are disclosed[235]. The pipeline project has since been in the news and in the policy spotlight and it seems that it will go ahead[236] and possibly be operational by 2012 (Cartwright, 2008).

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[232] http://www.hri.org/news/cyprus/tcpr/2005/05-10-10.tcpr.html

[233] Senior Engineer in the Waterworks Department, Ministry of Interior, at the time of the interview

[234] http://www.alarko.com.tr/faaliyet_gruplari_eng.asp?id=50

[235] According to the article, ALARKO Contracting Group signed a Memorandum of Understanding with the Turkish State Hydraulic Works, while for the conduct of the needed studies it cooperates with the Turkish company ARTI PROJE Ltd, the Danish Hydraulic Institute for Water and Environment, and the British companies NEPTUNE Oceanographics Ltd, AQUATEC Group Ltd and Trevor Jee Associates of the UK, www.philelefthеros.com/main/showarticle_prt.asp?id=488077

[236] On April 4th 2010 the Turkish Minister for Environment and Forestry, Mr. Veysel Eroğlu, announced that due to the technical difficulties of placing the pipeline on the sea-bed, a floating pipeline will be used

Opinions in the North are divided on the water import topic. Interviewee 41 [237] expressed the opinion that water coming from the southern part of Turkey with undersea pipes will bring peace to the whole island. The Tahal Proposal (1995), Tarimcioğlu (1992) as well as Ergil and Ateshin (1999) are all in favour of the water transfer, whether by pipe or tanker. Ergil and Ateshin (1999: 14) especially, claimed that such a move would be necessary for political reasons as well as for environmental needs (aquifer recharge).

On the opposite stand, Interviewee 48, from the Waterworks Department, commented that a water pipe from Turkey is not necessarily a desirable solution. The reason for her position is based on the quasi-entire exclusion of the North from the relevant policy discussions. The project preparation (including the feasibility studies) was carried out by Turkey. The financing would be provided by Turkey through Turkish private companies (as foreseen in the 1998 Decree that ensured a leading role for the Turkish ALARKO company in the project). Furthermore, the realisation of the project would constitute a clear political decision aimed primarily at unsettling the South (Interviewee 48). It is indicative that even people working in the North's Waterworks Department do not have access to information relating to the water pipe[238]. Interviewee 49[239] who was against the idea of water importation argued that water transfers are not only expensive, but also bring dependence on other countries. On a similar tone, Interviewee 39[240] is opposed to the intense presence of Turkey in the affairs of the North whether related to water or to any other issue. He claims that in the same way that the North does not like to be dominated by the South, it does not want to be dominated by Turkish civilian or military bureaucracy either. This desire for self-determination was particularly palpable during fieldwork interviews with stakeholders in the North. The assertion by Intervewee 49 that "*…we have to find solutions to our problems on our own…"* captures the essence of this desire.

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instead at a depth of 250m. The project, he continued, will be the first of its kind, using patent Turkish know-how and will be completed in four years. Moreover, on July 16th 2010, Turkish PM Mr. Erdoğan announced that the agreement over the construction of the pipeline would be signed during the visit of the deputy, Mr. Çiçek, to the North for the celebrations to commemorate the 1974 events (Hürriyet Daily News, 16 July 2010)
http://www.radikal.com.tr/Radikal.aspx?aType=RadikalHaberDetayandDate=andArticleID=989480andCategoryID=97

[237] Deputy Mayor of the Turkish Municipality of Nicosia at the time of the interview

[238] As became apparent through interviews with different representatives of the Department

[239] Head of Wastewater and Sewage Treatment in the Turkish Municipality of Nicosia

[240] The Turkish-Cypriot Mayor of Nicosia when the informal bi-communal cooperation started in 1978 and Leader of the Peace and Democracy Movement Party at the time of the interview

The unwillingness of the North to rely on external sources of water –and despite the serious water predicament it faces- signals a clear shift away from functioning as a Turkish semi-enclave and moving closer to a self-governing entity. Further, this tendency signifies a desire of some in the North to disentangle the North from the notion of having the status of a 'critical frontier' [241] when it comes to Turkey's international relations with Greece and Cyprus. This policy direction strengthens the territorial ideology that the North employs to secure its socio-spatial and ethnic homogeneity; only that in this mode the assertion of its identity is directed less towards the South and more towards Turkey.

VIEWING WATER TRANSFER THROUGH THE THEORETICAL LENS

As indicated above, water transfer projects represent complex areas for policy analysis, though they contain a number of different policy elements. As discussed in Chapter II, policy analysis primarily provides insight on how, why and to what effect authorities take particular courses of action or inaction. For the North, opting for the water transfer alternative could provide a technically feasible way out of the water predicament. At the same time, it constitutes an expensive and sophisticated option that would require heavy involvement of external actors through financial resources and human expertise.

The scepticism on implementing such policy reflects the desire for self-governance and for solutions that come from and are funded by initiatives within the community. In this sense, the water transfer policy, and whilst representing an issue of public policy debate, constitutes also a web of decisions/actions that are constructed by social and political processes and reflect evolving (cultural) values. Through these processes, there is clear indication of an active policy community/ sub-system that questions (directly or indirectly) the water transfer option. This also highlights the element of policy as collective action and the formation of a policy sub-system through this continuous interaction among actors coming (largely) from within as well as outside the hierarchical structure of the North.

While also considering that the discussion on the two dimensions of policy with regard to water transfer is very similar to the one for the desalination discourse, the value of policy analysis is enhanced as a good lens for comprehending the convoluted nature of water transfer. This analytical approach reveals the motivations that drive specific courses of action in a socially constructed manner and why the outcomes are as they

[241] Concept elaborated in Anderson, 1996: 30-31, and as analysed with regard to the 1962 Cuban Missile Crisis by Allison, 1971

are. For example, there is an interesting mixture of water security as the driving force with self-reliance and independence at its antipode. A similar analysis can be applied to the South with respect to water transfer options.

3.2 WATER TRANSFER TO THE SOUTH

Water transfer represents a politically fiery discursive theme for the South. Territorial proximity and water availability would render Turkey a strong candidate for water provision. However, high politics, associated with the sense of natural resource insecurity and the *de facto* island division after the events of 1974 have largely excluded this option from the South's list of water supply alternatives.

Water transfer has been considered, but not systematically adopted in the South. Stylianos (1998: 8) stated that importing water from other countries is a sensible and feasible way of improving the water balance through additional resource availability. In his paper he supported the water transfer idea, claiming that through the development of the appropriate technology, the cost of transported water over relatively short distances is likely to be much less than the cost of desalinated water. Given that the transfer would have to take place within reasonable geographical proximity, the options for Cyprus range among Greece, Turkey, Syria and Lebanon. With the exception of Turkey, the rest of the candidate providers face water scarcity problems in their own territories and are thus, unable to be water exporters. An investigation in 1992 of the possibility of importing water from the Greek island of Crete was proven unsustainable due to Crete's limited water resources and the inadequate port infrastructure in the South (Interviewee 17[242], Interviewee 28[243]).

Transferring water from Turkey was an option under careful consideration in the first years of the independent Republic of Cyprus (1960-63) (Interviewee 34[244]). However, the political turbulence of the period thereafter left this proposal without any support. For Interviewee 34, a former MANRE Minister, constructing a pipe from Turkey would have been a good solution to the entire island's water predicament and he would have preferred it to the use of desalination plants. Although Interviewee 34 considers the import of water a relatively inexpensive option, Socratous (unpublished) asserts that besides being risky and unreliable, it is economically unsustainable. In any case, and given the prolonged and delicate politico-security situation on the island, this option has

[242] A former WDD Director
[243] President of the Green Party and Member of Parliament at the time of the interview
[244] Former Minister of MANRE, General Secretary of the United Democrats Party at the time of the interview

been ruled out. As the sense of insecurity and the hostile relations with Turkey have not diminished, a future proposal for water transfer would most certainly continue to encounter opposition and fears of dependency and enslavement (Interviewee 6[245], Interviewee 28). This sense of insecurity and the desire for water self-sufficiency are profound in Cyprus; this was evident in the interviews whilst on fieldwork - on both sides. Northern and Southern respondents were uncomfortable or very uncomfortable on the issue of dependency on imported freshwater. "*It is a matter of culture that we want water to be a security issue, which can be managed by people at close distance rather than far away*", Interviewee 28 asserted.

However, following the post-2006 years of low precipitation and particularly during the drought of 2007-8, the South examined and opted for water transfer schemes from Greece. An official request was placed with the Greek National Water and Sanitation Utility in March 2008 for the provision of 90 tonnes of water (Kalatzis, 2008). A contract was signed with the Cypriot company Ocean Tankers in June and approximately 8 Mm^3 were agreed to be imported during the summer of 2008 - starting on July 25th, with a daily capacity of 50.000 m^3 (Joshi, 2008)[246]. After a highly controversial operation[247] that lasted until April 2009 at a total cost of about 40 million Euros, the contract with Ocean Tankers was not renewed (Greek MFA, undisclosed information, January 2009).

Complex regional geopolitics accompanied the consideration of a water transfer involving water from Lebanon early in 2008 and prior to the Agreement with Greece. Lebanon, in recognition of the support that the South offered during the summer 2006 conflict between Hesbollah and Israel, was positive towards water transfer to the South with tankers. Although this was well-received and it was hoped that the shipping of water could start in March 2008, it was finally frozen by internal Lebanese politics. The pro-Syrian opposition accused the Siniora Government[248] of indirectly supporting the enemy - Israel - on account of the close relations of Cyprus with Israel. It was even claimed that such water transfers would signify that the water was being transferred to Israel (Greek MFA, undisclosed information, March 2008).

[245] Senior hydro-geologist, Head of MANRE's Hydrology Division at the time of the interview

[246] The last shipment of Greek water was delivered at Yermasoyia early in April 2009, as a ship operated by Ocean Tankers brought 40,000 cubic metres of water from Greece, finally ending a highly controversial operation that started in summer 2008. Over a period of approximately ten months, Ocean Tankers fulfilled its contractual obligation to bring eight million cubic metres of potable water to the island (CyprusMail, 3 January 2010).

[247] Despite a contract clause of providing 20,000 euro per day bonus to the company if the water transfer could take place before 22 August 2008, the overall process was characterised by serious delays, problems with the infrastructure at the reception point in Lemesos and the inability of the Greek Utility to provide the desired volumes of water because of drought problems in Greece (Greek Ministry of Foreign Affairs, undisclosed information, July, September, October 2008).

[248] In power at that time

THE THEORETICAL IMPLICATIONS OF WATER TRANSFER TO THE SOUTH

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For the South, there is a clear policy practice in which water security is a way to maintaining and strengthening its territorial sovereignty. Relying on outside sources of water, specifically those coming from Turkey, would constitute very deep political dependence, jeopardising all post-1974 efforts to reach a viable and sustainable solution to the island's political question. As shown previously in Chapter V and in the discussion on desalination, the South is determined to achieve a positive water balance, even through the implementation of policies that are costly, energy-demanding and potentially damaging to the environment. Its political leadership and society are prepared to install large storage infrastructures and desalination schemes using dirty energy.

It became obvious to the author in the discussions with officials (and informal interaction with citizens), that water security is considered crucial for the South in establishing a strong negotiating position against the North and/or Turkey once a political settlement is in sight. In the South's policy agenda, there is a strong and direct link between water, politics and power. And it is interesting to note that within this policy agenda, energy imports and virtual water, despite being very relevant with respect to the concept of natural resource security, they do not figure in the definition of water security in the South. It is relevant to note that this approach is normal in the region[249]. The South is not exceptional.

With regard to the various policy elements, it is interesting to note that the social construction of the water transfer policy from Turkey appears largely unanimous across the different actors in the South; i.e. excluding the transfer from the potential policy options. It seems that a convergence between the two policy dimensions is in motion, while policy sub-systems are merged into one collectivity/community that opposes the transfer option, with only a few voices of individuals heard in its favour.

The water transfer debate represents a good example of how water policy-making and awareness about boundaries and politics co-exist and co-evolve in the domain of water resources allocation and management. The discussion of potential and actual water transfers further strengthens the argument (also endorsed by the thesis) that there is an inescapable linkage when it comes to water resources and politics in Cyprus.

[249] There is almost no exception to this in the neighbouring countries of the Middle East and North Africa, as revealed in the respective National Master Plans and water-related Strategies.

3.3 WATER TRANSFER ACROSS THE DE FACTO DIVISION: SOME HIGHLIGHTS

The water transfer debate forms a multi-faced and convoluted issue in Cyprus. A superficial assessment of this alternative highlights its practical elements that render it both feasible and sustainable for water provision. However, a more thorough examination of the political implications for Cyprus reveals a complex mélange of *policy* and *politics*.

What is of particular interest is the presentation of the water transfer option as a 'Cyprus Peace Water Project' (Aktar, 2008). This idea was raised after a March 2008 agreement between the two sides, which included the establishment of bilateral technical committees. This initiative was put in place prior to the new political paradigm in the affairs of the island following the 2008 summer Agreement on direct bi-communal negotiations. The South claimed (Theodoulou, 2008) that the pipeline project had been examined by the water-related bilateral technical committee, a statement that was firmly denied by the North (Kart, 2008). Despite the visibility of the topic (Turkish Daily News, May 2008; Economist, July 2008), new relations over water resources did not signal a policy shift towards potential bi-communal cooperation.

One thing appears clear: policy practice on both sides is firmly focused on achieving water security through resources that originate from within the two respective territories. This political aim also inspires the different policy options that have been occasionally implemented as ways out of the water impasse, namely grant storage schemes, over-exploitation of aquifers, and non-conventional resources amongst others. The desire for self-determination underpins the reluctance of the North to accept water even coming from Turkey. The desire for a power-related comparative advantage in the event of political negotiations sustains the refusal of the South to countenance water transfers. What is of particular interest is the feeling of perceived deep dependence that both sides express with respect to water transfers from Turkey.

The thesis identifies some common water security policy challenges faced by both the South and the North. It also identifies the commonly held (but non-constructive according to the thesis) assumption that water security is essential. This can be a point of departure for bi-communal cooperation. Given the cross-communal desire for adequate and reliable water resources, strengthening policy options that align with it could prove to be a way forward which unlocks the political logjam. The challenge of providing wastewater recycling services considered next, as well as the analysis of the

Nicosia wastewater treatment and drinking water systems that are analysed in Chapter VII could also be topics that help align water management policies.

4. WATER RECYCLING

The non-conventional water resource that has a lot of potential, but has not been yet developed adequately in Cyprus, is treated wastewater. Nonetheless, it has already formed a theme of political controversy, particularly in the South, with regard to its potential re-use. Primarily it encounters social objections as to its suitability for use in agriculture or for aquifer re-charge. In the North the debate is not as vivid, due to the limited financial potential that restrains the construction of expensive and technology-demanding infrastructure. The section starts with an examination of the debate in the South, continues with a similar analysis for the North and concludes with some theory-relevant highlights across the *de facto* division.

4.1 RECYCLED WATER IN THE SOUTH

Significant effort has been placed –especially during the last decade- in the South for the maximisation of the benefits from using treated wastewater. However, its re-use in irrigation and for aquifer replenishment faces reservation and -on occasion- opposition. As mentioned earlier, farmers hold a strong position in (water) politics and hinder the consideration of this type of resource in their water budget. Moreover, the location of wastewater treatment plants and the re-use of recycled water for aquifer replenishment face the opposition of local communities. People fear that such activities will jeopardise and undermine the quality of their immediate environment. At the same time, politicians and other key stakeholders promote local interests that do not necessarily accord with the long-term sustainability of the island's resources.

In the South, the disposal and treatment of wastewater is determined by legislation[250]. Two different types of recycled water are identified: treated sewage water and grey water (or domestically recycled water). In the first case the sewage is collected, treated (on secondary or tertiary level) and then -depending on the treatment level- becomes available for use in irrigation, aquifer replenishment and urban beautification schemes

[250] By the Environmental Impact Bill 57(I)/2001 published in the official newspaper of the Government (No. 3488) on the 12th April 2001. The Bill represents the transposition of the European Directive 85/337/EOK as modified by the Directive 97/11/EK (WDD website). However, the Environmental Bill concerns specific projects and not strategies or policies. For example it does not cover the consequences of a policy of covering all the urban water needs with desalination plants. Neither does it cover issues of energy that is directly linked with desalination (Interviewee 33). The legal framework on wastewater is complemented with the Wastewater Systems' Laws 1971-2007 that concern communities of less than 2000 people.

(grass and other planting)[251]. Grey water is the water gathered from the various uses within a household, cleaned, stored and then used for toilet flushing and garden watering. The main type of wastewater in the South is effluent from domestic use (Interviewee 24[252]), as no heavy industries exist on the island and the few small factories have individual sewage treatment plants in place (National Report, 1992: 4). In 1992 (ibid) the re-utilisation of treated effluent for agricultural purposes was very limited and was practised on an individual basis. In 2006 the contribution of recycled water in the overall water budget amounted to 6.5 Mm^3 (WDD Annual Report, 2006), while in 2008 it was said to have reached a total of 22.9 Mm^3 (WDD[253]).

SEWAGE TREATMENT

The most important steps regarding sewage treatment have been realised in the wider Nicosia area. The already existing treatment plant of Mia Milia/Haspolat, situated in the North and currently servicing both communities, increased its daily capacity from 14,000 m^3 in 2004 to 20,000 m^3 in 2007, but offers only secondary effluent treatment. The produced water, which is normally discharged in the Pedieos River, is utilised primarily by the North. The plan[254] is to rehabilitate this plant, upgrade the treatment level and increase the capacity to 43,000 m^3 per day.

In the framework of the Greater Nicosia Sewage System Plan[255], the South has proceeded with the construction of additional sewage treatment plants in order to cover the needs of Nicosia's exploding urban development. A plant in Anthoupoli and another in Vathia Gonia (also servicing the city of Larnaca) (Hajipakkos *et al*, 2000), with nominal daily capacity of 14,500 m^3 and 35,000 m^3 respectively[256] (Zampelas and Palantzis, 2003: 4) form part of this System. The Anthoupoli plant is small, constructed in the 1980s in order to serve the refugees of the 1974 events, and in 2005 was producing a mere 300 m^3 per day (Interviewee 20[257]). The plant has been upgraded and as of the 15th November 2007 produces 13,000 m^3 per day (Interviewee 22[258]). The envisaged 10-year Plan (until 2013) foresees further upgrade of the Anthoupoli plant with the parallel construction of a much larger unit in Vathia Gonia that will have a capacity of 22,000 m^3 per day in the first phase and an additional 20,000 m^3 per day in

[251] For more information on the guidelines for water re-use see US Environment Protection Agency, 2004
[252] Director of the Agriculture Research Institute at the time of the interview
[253] This information was made available on the WDD site only in 2010
[254] A detailed analysis of the Nicosia case and the Mia Milia/Haspolat sewage treatment plant follows in Chapter VII.
[255] A map of the existing and planned treatment plants along is available at www.moa.gov.cy/wdd
[256] Although the average figures mention daily production of 10,000 m^3 and 15,000 m^3 for the Anthoupoli and the Vathia Gonia treatment plants respectively (Interviewee 20; Interviewee 22)
[257] Director of Technical Services in the Sewage Board of Nicosia
[258] Project Director in the Sewage Board of Nicosia

the second phase (ibid). The first construction phase of the Vathia Gonia plant was completed in 2010 and it is in operation ever since[259].

It is important to note that this plant's second construction phase will materialise only if the Mia Milia/Haspolat plant does not go through (depending on the bi-communal situation). The planned policy anticipates the transfer of the recycled water from the two plants southwards into the Achna Dam in order to make it available for irrigation purposes to the eastern plains of Ayia Napa and Paralimni (Interviewee 22), which form the bulk of the South's agricultural land. Since the two plants will work on tertiary treatment level, the recycled water will be suitable for the irrigation of 96-97 per cent of all cultivated crops[260] (Interviewee 22, Interviewee 24[261]).

Photo 5: Location of the Vathia Gonia Wastewater Treatment Plant

Source: Hajipakkos *et al*, 2000, p.2

Although the Anthoupoli and the Vathia Gonia plants will cover the majority of the South's needs for sewage treatment, particular importance is still attached to the rehabilitation of the Mia Milia/Haspolat plant, as the second phase of the Vathia Gonia

[259] As on the website of the Sewage Board of Nicosia, www.sbn.org.cy
[260] Interviewee 22 mentioned that the European minimum BOD for recycled water is 10, while the aim of the South's treatment plants is for a BOD of 5 or even 4. This recycled water is very close to being characterised as drinking water and with further use of reverse osmosis it could even be used for drinking purposes. Interviewee 24 said that the recycled water is of such high quality that it can be used for all types of crops, even vegetables. However, out of fear that some people might not wash the vegetables before eating them, they do not recommend the use of such water for the production of vegetables that can be eaten raw. Interviewee 3 explained that during the EU accession negotiations, Cyprus achieved some exemptions from the Directive on the Free Movement of Trade and Services in order to block the import of products that include substances like vorio. Such substances may cause problems to the quality of the recycled water, as they are difficult to remove during the wastewater treatment process.
[261] Director of the Agriculture Research Institute at the time of the interview

plant will be halted should the Mia Milia/Haspolat plant be upgraded. This is the case for technical and political reasons: technically because of the land morphology that has downward direction towards the north-east and therefore facilitates the effluent flow towards the Mia Milia/Haspolat plant without the assistance of pumping stations. Politically, sewage treatment formed the reason that brought the two sides together shortly after the events of 1974 and thus, maintaining this channel of communication open and operational is of paramount importance. The conditions of the Mia Milia/Haspolat plant constitute an intriguing example where the theoretical (Chapter II) and analytical (Chapter III) considerations of the thesis converge and will be dealt with in detail in Chapter VII.

With reference to the remaining area in the South, and in accordance with the European Directive 91/271/EEC[262] that forms part of the EU accession harmonisation requirements, there is the obligation to construct sewage treatment plants for communities of more than 2,000 people. The Directive's transposition to Cypriot legislation has been achieved through a) the Water and Soil Pollution Control Law No 106 (I)/2002 and its Regulations ΚΔΠ 772/2003 on discharges and ΚΔΠ 111/2004 on sensitive areas, b) amendments to the Sewerage Systems Law No 108/2001 and c) the Environmental Impact Assessment Law No 57 (I)/2001 (Eliades, 2005). The Directive's implementation programme is expected to conclude by the year 2012 and will include the four greater urban areas of Nicosia, the cities of Lemesos, Larnaca and Paphos, the tourist resorts of Ayia Napa and Paralimni as well as 38 rural agglomerations with population of more than 2,000 people (Interviewee 3, Interviewee 19[263], Interviewee 32[264], Interviewee 34[265]; Dodou, unpublished; Matthopoulou-Postekki, 2006: 4).

For communities of less than 2,000 people, the Wastewater Systems' Law 1971-2007[266] forms the key legal framework. At the same time the Government promotes the installation of sewage systems in smaller rural agglomerations (of even 500 people) that do not come under the harmonisation scheme but face sewage problems (Interviewee 3, Interviewee 34; Matthopoulou-Postekki, 2006: 4). According to

[262] The Urban Waste Water Treatment Directive has as its objective to prevent the environment from being adversely affected by the disposal of untreated or insufficiently treated urban wastewaters. The following are the requirements for the member states: legal transposition (laws and regulations), infrastructure (implementation programme), authorisation (discharge permits), monitoring (quality of discharges) and reporting (to the EC and the public) http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31991L0271:EN:HTML

[263] MP and President of the Parliamentary Environmental Committee at the time of the interview

[264] Senior Engineer in MANRE's Division of Waste Water and Reuse and Deputy Chairman of the German-Cypriot Forum, both affiliations at the time of the interview

[265] Former MANRE Minister, General Secretary of United Democrats Party at the time of the interview

[266] http://www.cyprus.gov.cy/moa/wdd/WDD.nsf/All/6C633E021ED619C8C22576200026EA4A/$file/Page1_28.pdf?OpenElement

Interviewees 3 and 22, the construction of sewage plants is already in motion for Paphos, Lemesos, Larnaca, Ayia Napa/ Paralimni, thus covering all the major coastal cities in the South. The harmonisation process with the European *aquis* is considered the catalyst for the proliferation of sewage treatment in the South.

With the completion of the central sewage schemes in the four major coastal towns of the South, the total annual flow of recycled effluent after the ultimate treatment stage is expected to be around 30 Mm^3 in the year 2020 (Socratous, unpublished), although the WDD-FAO Synthesis Report (2002: 6) places the relevant timeline much earlier, in 2012[267]. The 1994 National Report (Lytras and Tsiourtis, 1994: 4) mentioned that the amount of recycled water in that year was calculated to be around 8 Mm^3 and its use was rather limited, while in 2002 the figure was calculated to be 3 Mm^3 and mainly used for agriculture and landscape irrigation (WDD-FAO, 2002: 6). In 2005 the recycled water accounted for 4 Mm^3 and was mainly used in agriculture in the Lemesos area (Interviewee 33[268]). However, the FEEOC (Interviewee 35[269]) claimed that the WDD did not disclose the related figures and therefore the allegation cannot be verified.

Interviewee 34, a former MANRE Minister, believes recycled water to be a soon-to-expand source of additional water and argues that this will come as a result from the EU harmonisation regarding urban and community wastewater. He claimed that in 2004 there was more demand than supply for recycled water[270]. The potential of recycled water in covering part of the South's total water demand is significant, but the social misconceptions surrounding its re-use along with the substantial investment in technology, have so far kept this potential somewhat underdeveloped[271].

[267] And according to the WDD website (2010) the total produced amount of treated wastewater reached 22.9 Mm^3 in 2008.
[268] Civil Engineer in MANRE and also member of FEEOC
[269] A founding member of FEEOC
[270] However, he did not provide any figures in support of this statement
[271] According to Stephanou (2009) in 2009 the total recycled water amounted to 46,000 m^3/day coming from six municipal treatment plants, while the undergoing expansion would increase this amount to 154,000 m^3/day by 2025 or 56 Mm^3/year. According to the WDD website (accessed in 2010) the total amount of produced treated wastewater is re-used, primarily in irrigation and then for aquifer recharge. A graphic presentation of the re-use in the years 2004-2008 is available at www.moa.gov.cy/wdd. This information was, however, not available during the fieldworks and prior to 2010.

GREY WATER

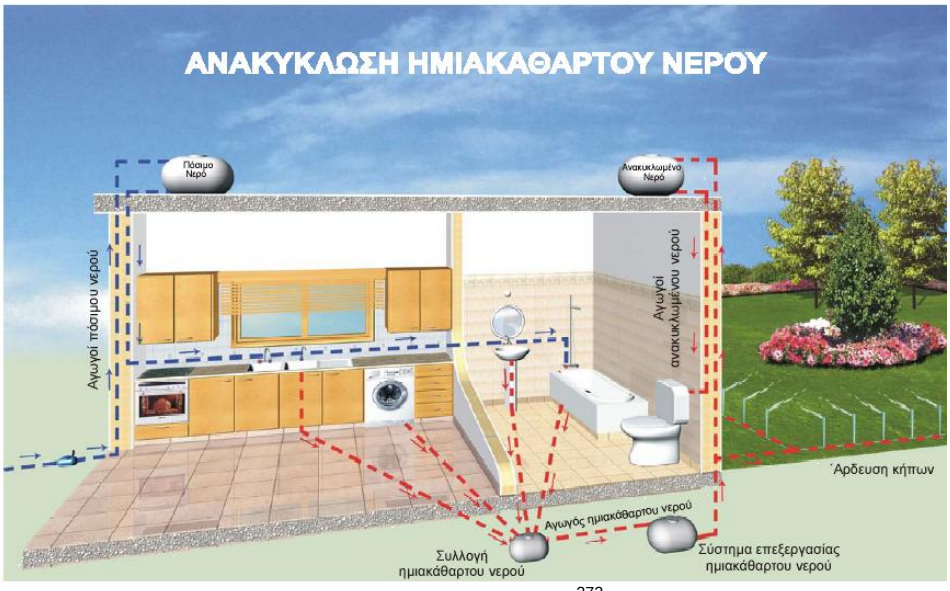
Domestic recycling in the South may take two forms (Kambanellas, 1998, 1999, 2005). One apparatus connects boreholes in the garden to toilets so that this untreated water can be used directly for flushing and watering the garden (in red colour in the picture).

Photo 6: Connection of borehole to garden and toilets

Source: WDD website[272]

Another mechanism collects the domestically used water, cleans it from soap and chemicals, stores it in a separate deposit and renders it available for use in toilets and gardens (in red colour in the picture).

Photo 7: Household Greywater Treatment



Source: WDD website[273]

[272] http://www.moa.gov.cy/moa/wdd/Wdd.nsf/All/D603F49E7E89D3D3C22576C4003F778B/$file/Diagram2.pdf

According to Interviewee 14, who is the inventor of this household recycling system[274], these two apparatuses save around 2 Mm^3 of water every year and have significant potential if applied on a wider scale. The water used for flushing toilets accounts for 35-45 per cent of the total water used within a household. It was also calculated that the water saved by three people through the domestic recycling system, is enough to cover entirely the needs of a fourth person (Kambanellas, 1999: 51). Therefore, Interviewee 14 asserted that using good quality drinking water (or desalinated water) for flushing toilets and watering gardens seems a terrible waste of an already scarce resource. More importantly, the two domestically applied mechanisms contribute to creating a social water consciousness as the recycling takes place at the vicinity of the human activity, within the household, in schools, in military camps and in courts (Interviewees 14 and 34). Especially in schools, with the view to strengthen the educational aspect of water consciousness, the taps are normally connected to storage facilities so that the collected water can be later used in gardens and green areas (Interviewee 14).

Interviewee 14 avowed that it is important to have recycling at home (and at the vicinity in general), so that the water saving can be true. He calculated the cost of water transferred from the outskirts of a city as being four times more expensive than the domestically (and within the city) recycled water[275]. This is important in Cyprus where all major water projects are built on the southern part of the island and water needs to be pumped up and transferred over long distances[276]. Domestic recycling does not reduce, however, the significance of central sewage treatment plants that contribute in the de-congestion of the drinking water demand by providing an alternative source of water for other uses.

Domestic recycling is notably encouraged by the state through the provision of subsidies for the installation of the respective apparatuses[277] that on average cover half of the total cost[278]. Although, the level of the subsidies has increased over the years[279],

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[273] http://www.moa.gov.cy/moa/wdd/Wdd.nsf/All/D1DF586E310D2BFAC22576C4003F9E60/$file/Diagram4.pdf

[274] Presentations on Interviewee 14's recycling model can be also found online on the Third World Water Forum website at http://www.world.water-forum3.com/

[275] However, he did not provide any figures from his study

[276] The location of the South's waterworks is available at www.moa.gov.cy/wdd

[277] http://www.moa.gov.cy/moa/wdd/Wdd.nsf/measures_gr/measures_gr?OpenDocument (in Greek) The website includes links with downloadable applications for the subsidies

[278] The subsidy amounts to CY £400 for the garden borehole and CY £1000 for the recycling apparatus installation (WDD website, 2008).

[279] From £100 and £100 in 1997-8, to £200 and £400 in 2005, to £300 and £600 in 2006 and to £400 and £1000 in 2007 respectively for drilling garden boreholes and installing grey water treatment plant for garden irrigation and/or WC flushing household recycling apparatuses (WDD website, 2007, 2008)

the number of households with such facilities remains low (Interviewee 14)[280]. It is interesting that the installation of the aforementioned mechanisms does not involve any hefty re-building work, as all houses in the South have -by construction- three sewage pipes: one from the kitchen, one from the bathroom and one from sinks, baths and washing machines. Therefore, it is easy to make the necessary connections. It is certainly easier to install the recycling mechanism whilst building a house; unfortunately no figures were available during the interviews on how many of the 20,000 new houses built in the years 2002-2005 (Interviewee 36[281]) have this system in place.

THE POLITICS OF REUSING RECYCLED WATER

There has been a strong debate –indicative of the inherent political connotations- on the re-use of the produced water from the *treatment plant in Lemesos*. Even the choice of the plant's location demonstrates the political steering behind the final decision. The laws of gravity in the area would suggest building the plant in Akrotiri on the western side of the city. Instead, it was built on the eastern side requiring the building of pumping stations in order to transfer the water from the one side to the other. According to Interviewee 4 it was the influence of three major players[282] in Akrotiri that convinced the government to change the plant's building site.

As for the produced water, which is of tertiary treatment, it ends up in the sea during winter and used for beautification purposes during the summer (Interviewees 4, 27, 33, 35 and 37). The plan to use this water to replenish the aquifer in Akrotiri faced the strong opposition of the local community that claimed it would endanger the quality of groundwater supply for drinking and irrigation purposes (Interviewee 33[283]). Although the government carried out a study on the potential consequences of such replenishment to nearby aquifers and concluded that it entailed no danger, the locals and the farmers were not informed about the study's results and blocked the overall process (Interviewee 4, former Geological Survey Director)[284]. Interviewee 17, a former WDD Director, claimed that the water produced from the Lemesos plant is stored in a dam during the winter and is used mainly for beautification purposes in the summer.

[280] It was not possible for Interviewee 14 to provide any figures on how many houses have the recycling mechanism already installed. He claimed that the related paperwork has not been inserted into a computerised database and thus, providing any figures was particularly difficulty.
[281] Director of Technical Services in the Water Board of Nicosia at the time of the interview
[282] Who are said to have provided –as part of their policy-influencing efforts- a telex from Malta stating that no oranges would be imported from Cyprus should the plan to build the treatment plant in the Akrotiri area go ahead. The local actors claimed that the citrus production was in danger from the plant's operation (Interviewee 4).
[283] Civil Engineer in MANRE and also member of FEEOC
[284] Interviewee 4 claimed that Mr. Iakovides -a prominent water engineer from Lemesos and a former key employee in WDD- heavily influenced the non-transfer of the recycled water to Lemesos but to the sea instead.

However, no further information or approximate figures were provided, nor the name of the dam. According to the MEDIS Report (Constantinou G., 2003: 34), the South's Government decided in the end to transfer 10.6 Mm^3 of recycled water from the Lemesos sewage plant to the Akrotiri area for the artificial recharge of the aquifer[285].

In *Larnaca*, the *wastewater treatment plant*, as well as the desalination plant, has been built between the sea and the local ecosystem. During winter, when there is no demand for recycled water, the produced water ends up in the sea thus, affecting the ecosystem balance, according to a founding FEEOC member (Interviewee 35). The vicinity of the two plants, may also suggest that parts of the recycled water, when discharged into the sea, are later on desalinated and used for drinking purposes. Another problem involved the storage facilities for the recycled water in the area of Larnaca. The intention was to store water in order to then use it for nearby plot irrigation (Interviewee 4). However, due to bad construction work there were heavy leakages and the water ended up in the sea. As a result there were problems on the beach because of the water spill and the Environmental Department called for some action on the issue, "*but nothing was done about it*" (ibid). Interviewee 27 [286] commented that the recycled water ends up in the sea because the necessary social consciousness is not in place. Contradicting the above allegations, Interviewee 34, a former MANRE Minister, stated firmly that no recycled water in Larnaca goes into the sea.

Another example that alludes to the political nature of water recycling, concerns the *contract tendering process for the treatment units*. In 2001 a scandal broke out regarding the assignment for the construction of the treatment plant in the area of Platra to a specific company[287]. A rival company, after examining the winning project proposal found it incomplete and erroneous in its calculations and directly accused a member of the Environment Service (in the MANRE) of directing the project assignment to the winning company. The General Director of the rival company, via written correspondence to all concerned stakeholders, implied the involvement of the Water Development Department in the scandal (through the employee that examined the bids), claiming that preferential treatment was secured for reasons that were not

[285] The Report mentioned that BODs would be less the 10mg/l, while an environmental assessment study indicated that the quality of the pumped water from the recharged aquifer would pose no noticeable negative effects to the local environment and that the potable water boreholes located east of the recharge ponds would not be adversely affected from the recharge operations (Constantinou G., 2003: 34).

[286] Environment Officer at MANRE and also Director of an environmental NGO as well as Head of Unit in Intercollege

[287] The company that won the project was the C.P. Envirosystems and Cyprus Waterworks JV, the rival company was Hydrotech Water and Environmental Engineering Ltd and the accused civil servant from the Environment Service was Interviewee 10. This information along with part of the correspondence was provided during interviews with members of the Green Party.

related to scientific aptitude or expertise. The story reveals the problems nurtured in small-scale places like Cyprus, where the competition for projects is fierce and the vested interests between private and public sector well-grounded. "*Such scandals and allegations, of differing intensity, characterise a large number of project assignments in Cyprus (the South)*" (Interviewee 16[288]).

RECYCLED WATER AND AGRICULTURE

Using recycled water in agriculture is an option with a lot of potential but faces challenges that touch upon well-established social beliefs. Interviewee 24, the Director of the Agricultural Research Institute, explained that the South, with the financial assistance of the EU, has been carrying out experiments on recycled water for over 20 years[289]. Studies have concluded that its use in agriculture is feasible with due consideration for health issues and the environment (Aboukhaled *et al*, 1992). According to the WDD (Matthopoulou-Postekki, unpublished) the use of recycled water in agriculture, following the principle of rational agricultural practice, commenced in 1995 and has expanded over the years on a wide range of crops (citrus, potatoes, olives, vegetables like aubergines, tomatoes and peppers). In order to safeguard the quality of the provided recycled water, farmers need to submit an application if they wish to obtain the water, while the foreseen price ranges between 3-4 cents per m^3. It was calculated (ibid) that by the year 2012 the total available recycled water will amount to 52.7 Mm^3 annually, reaching 66.3 Mm^3 in the year 2030.

Perhaps, the most important drawback concerns the institutional aspect of this undertaking, as the agencies for managing wastewater collection, treatment and disposal are poorly organised and lack funding (Papadopoulos I, no date). According to Interviewee 10, a senior Environment Officer in MANRE, there are three practical obstacles for promoting treated wastewater re-use in agriculture: a) agriculture faces a declining development trend, b) the crops cultivated with treated wastewater are less competitive in the marketplace and are usually undersold because people are sceptical about their quality and, c) there is significant cost in transferring and storing treated wastewater. With reference to the use of recycled water in agriculture, Stephanou (2003) also identified the potential danger of soil salinisation, as this type of water is high in salt content, and added that extra care is needed to avert this possibility.

[288] Director of one of the main environmental consultancies in the South

[289] Interviewee 24 stated that they have been working on the topic since 1982 and the use of recycled water in agriculture has so far been the theme of five European projects. He said that the South's standards are stricter than those of California that is known as having the strictest standards with regard to recycling water.

For Interviewee 18, the President of the Parliamentary Committee for Agriculture and Natural Resources, guaranteeing high water quality through tertiary treatment and providing the necessary motives through low prices, could assist in incorporating recycled water into the water budget. Interviewee 22, the Director of the Project Management Unit of the Sewage Board of Nicosia, commented that the quality standards of the recycled water from the two treatment plants of wider Nicosia are purposely stricter than the European average, with the aim to produce water of such high quality that it can supersede the farmers' mentality and misconceptions. On the same topic, Interviewee 20, the Director of Technical Services in the Nicosia Sewage Board, emphasised the role of education in making people aware of the benefits of treated wastewater. However, Interviewee 12[290] remained sceptical about the future use of recycled water claiming that the farmers simply do not want it and local people react fiercely to the possibility of nearby aquifer replenishment. On a more positive stand, Interviewee 24, the Director of the Agriculture Research Institute commented that there will always be some level of suspicion towards recycled water, but Cypriot farmers will eventually get over it, like farmers have done so in other European countries.

THEORETICAL IMPLICATIONS IN THE WATER RECYCLING DEBATE

The previous presentation and debate analysis show that the reuse of recycled water is an intricate policy issue in the South. The policy analysis on desalination, applies to a large extent to treated wastewater as well (e.g. value of policy analysis in comprehending the complexity of policy options; policy as a web of decisions that allocate values; policy analysis explaining how, why and what governments pursue; etc). However, there is a fundamental point of differentiation that concerns the two public policy dimensions. The desalination debate showed a strong hierarchical policy formulation (vertical) and a participatory policy interaction (horizontal) well underway.

With regard to recycled water, the situation seems to be quite reverse. The impact of horizontal policy communities (farmers, local communities, private actors) seem to be determining the trajectory of this policy option, despite the efforts on behalf of the government (the vertical axis) to secure treated wastewater as part of the overall water budget. In this sense, it is interesting to note that socially constructed forms of governance shape the implementation of this particular policy option. Moreover, there are solid signs of a reproduction tendency of these socially constructed practices, as

[290] A retired Senior Engineer in MANRE's Drinking Water Division

prompted by the example of Larnaca (that followed chronologically the one in Lemesos).

Also, there is relevance of the wastewater debate to the distinction between analysis of and for policy. In theory, all decisions regarding the construction of treatment plans are well grounded on legislation that also complies with the EU *acquis* (and thus linked to external obligations that the government has agreed to meet). Therefore, it would be logical to expect that the hierarchical structure would face minimal objections (or objections that it could easily overcome) in this endeavour. In practice though, the situation differs significantly, with stakeholders heavily influencing the policy process and in fact altering the implementation of specific policies.

Interesting in the wastewater debate (and the case of Akrotiri in particular) has been the interplay of tacit and explicit knowledge. Despite the availability and transmission of explicit (and scientifically informed) knowledge about the suitability of the treated wastewater (in addition to the steady policy of the government for maintaining stricter than the international standards for treatment), the prevalence of tacit knowledge (strong belief that the aquifer replenishment with treated water would be hazardous) proved catalytic for blocking this particular use of this type of water. The Akrotiri case is a good empirical example of the complementarity between (tacit and collective) knowledge and knowing; what and how people understand a situation and the way this understanding enables and determines their organised activity.

Finally, it is worth-noting that the joint Mia Milia/Haspolat treatment plant is viewed as a boundary of contact (Minghi, 1991) due to the psychological, symbolic and socio-political significance it attributes to bi-communal contact. Detailed analysis of this theme is provided in Chapter VII and goes beyond the scope of the current section to further elaborate on this.

WATER RECYCLING IN THE SOUTH REVIEWED

Alike desalination, recycled water is a politically discursive topic because of the frequently contradictory interests of the involved stakeholders. The government wants to promote and expand its use, whilst farmers are apprehensive about using it in agriculture and people are suspicious about having their nearby aquifers replenished with such water. It is difficult to put forward such a policy without the approval of the local communities (Interviewee 10[291]) and even more difficult without the consent of the

[291] Senior environment officer in MANRE's Environment Service

farmer community. Unsurprisingly, demand for recycled water is rather profound during water scarce years, but always drops drastically when the rainfall levels rise again (Interviewees 10, 14 and 17).

During fieldwork, the majority of the interviewees commented that the official measures supporting the wider use of recycled water need to be strategically better planned and carefully implemented also during water-abundant years. Even though recycled water is far from forming an integral part of the South's water budget, its prospects seem promising if the key actors of this discourse (the farmers) are encouraged to use it[292]. Interviewees commented that cutting down on the subsidies and enforcing a water pricing system that reflects the true cost of water, also following the requirements of the WFD, could provide a convincing argument in that direction. Additionally, more active support for the domestic recycling system can facilitate the formation of social water awareness among the wider population and complement the policy implementation efforts.

4.2 RECYCLED WATER IN THE NORTH

Recycled water in the North constitutes an underdeveloped resource. This however, and contrary to the South, does not seem to be the outcome of a socially-driven policy debate (led by farmers and/or local communities), but rather the result of unsophisticated infrastructure hindering the extensive use of this non-conventional source of water.

In the North, there is one type of recycled water, namely that resulting from sewage treatment, and its regulation is governed by a set of legislative documents[293]. Sewage and sewage treatment is restricted to a proportion of the populations in Nicosia[294], Kyrenia and Lapithos/Lapta, while some 17 of the 28 municipalities with populations exceeding 2000 people (including Famagusta, Morphou and Lefke) depend on septic

[292] Although it goes beyond the scope of the thesis to elaborate on those, intriguing examples of widespread use of treated wastewater in agriculture are provided both within the EU context (especially Spain) as well as the MENA region (e.g. Jordan that faces harsh water scarcity and reuses 93% of the totally produced treated wastewater or Israel that spires to full use of this resource also due to sophisticated infrastructure being in place). It is noted that Cyprus is involved in a wide array of European Commission-funded projects that look practically into this issue using case studies from both shores of the Mediterranean (e.g. Horizon 2020, Sustainable Water Integrated Management, service contracts under the EUWI, to name a few).

[293] Wastewater Law and Regulations No.2/1987; Nicosia Turkish Municipality Sanitary Rules and Regulation No. 545/91; Nicosia Turkish Municipality Sanitary Fee Regulation No.548/91; Kyrenia Municipality Sanitary Rules and Regulation No. 597/91; Kyrenia Municipality Sanitary Fee Regulation No. 659/91; Environmental Impact Assessment Rules and Regulation No. 872/97 (Öznel, 2004)

[294] According to Öznel (2004), by June 2005 70% of the households and approximately 63% of the inhabit area of the Nicosia Turkish Municipality were meant to be connected to the sewage network. However, none of the surrounding communities, such as Gonyeli, Hamitkoy, Alaykoy and Haspolat, is connected to the sewage system.

tanks and indiscriminate dumping of septage and industrial wastewater (EC, Project Fiche 2006). Domestic recycling (grey water) is not practised, but forms part of the planned water policy (ibid; Interviewee 49[295]).

The largest sewage treatment plant in the North, and with the highest potential (Elkiran and Turkman, 2007), is located in the Haspolat/Mia Milia area of Nicosia[296]. A second plant in the Apartman area has a daily capacity of only 50 m^3 (Interviewee 49) and a third plant in Girne/ Kyrenia, dating back to the late 1980s, is no longer in operation and is solely used for wastewater collection (Interviewee 48). According to Öznel (2004), there are also a number of sequence batch reactor plants[297] in the districts of Nicosia, Famagusta and Kyrenia accounting for a total of 25,755 m^3/ day. It should be noted, however, that records of wastewater infrastructure assets, their ownership, condition, book value or remaining service life are not systematically kept (EC, Project Fiche 2006).

With regard to the Haspolat/Mia Milia plant, and as explained earlier, it is a bi-communal secondary effluent treatment project that services both communities with daily capacity of 14,000-20,000 m^3. The produced water is discharged into the Pedieos River or used for the irrigation of animal feeding crops in the North. The construction of a large treatment plant in Girne/ Kyrenia constitutes an EC reserved project[298] to be materialised with external donor's financial support.

In 1995 the recycled water potential of the North was calculated at 5 Mm^3 per year with a draft Master Plan suggesting an expansion of the figure to reach 20 Mm^3 annually (Tahal, 1995: 3). Ergil and Ateshin (1999: 14) asserted that 60 per cent of the consumed municipal water was not treated, a figure that amounted to 6 Mm^3 annually. They suggested that utilisation of this quantity could ease the demand on the already over-exploited groundwater resources. The ineffective re-use of treated wastewater is also reported by Gökçekuş (2001:15), who explained that sewage networks are either not completed or exist in areas (hotels and residential areas) where no proper treatment process can be utilised. As for the re-use of the treated wastewater, Elkiran and Turkman (2007) report that it only serves grass irrigation.

[295] Head of Wastewater and Sewage Treatment Plant in the Turkish Municipality of Nicosia, at the time of the interview
[296] An analysis of the plant and its policy implications will be conducted in Chapter VII
[297] A list of wastewater treatment plants is available in Annex 6
[298] As explained by Interviewee 55 and Interviewee 53 of the Task Force-Turkish Cypriot Community (Directorate General Enlargement of the European Commission), *reserved* is a project that has been proposed but is not accepted for implementation within a given framework of donor assistance. Such projects remain on a shortlist for implementation in case other approved projects do not go through as scheduled. More information on the status of the various projects is available at EC, Third Annual Report 2009.

According to the EC (Project Fiche 2006), there is no policy in the North concerning the re-use of treated wastewater or the recycling of sludge from treatment plants. Moreover, there is no pre-treatment for industrial discharges prior to entering the sewage network (such exists only in parts of Nicosia) and there is limited regulation governing the design of package wastewater treatment plants and sewage systems or the formal procedure for checking the quality of effluent produced by such package plants (ibid).

RE-USE OF RECYCLED WATER

The theme of recycled water has been extensively (and almost single-handedly) elaborated by Interviewee 49 in his capacity as Manager of the Wastewater and Sewage Treatment Plants in the Turkish Municipality of Nicosia. Therefore, this section draws heavily on the interviews[299] with him and the material that he provided. Öznel (unpublished) identified three types of wastewater reuse applications: groundwater recharge, agricultural reuse and non-potable urban uses. Groundwater recharge is a desirable solution, provided that certain quality standards are ensured. He added that given the rapidly increasing costs of chemical fertilisers, the organic and nutrient-rich value of reclaimed water cannot be overlooked (with its consequential contribution to both soil and crops).

Referring to the use of recycled water in agriculture, he claimed that the use of human excreta or 'night soil' for crop fertilisation has been widely practised for years in many regions of the world (ibid: 3). In Interviewee's 49 view: "…*a balanced approach combining low-cost wastewater treatment methods capable of providing reasonable, although not complete, reductions in pathogen levels with restriction of crops to those presenting a low level of public health risk, appears to be the most prudent policy to achieve the maximum social benefits from wastewater re-use*" (ibid: 4). He also identified five concrete benefits from such practice: reliability of supply; fertilisers' costs; compatibility with wastewater treatment policies and legislation; water conservation and reduced water cost (Öznel, 2004).

The non-potable urban use of recycled water is considered as having greater value than its use in agriculture, because it entails the possibility of full cost recovery (ibid: 5). Among the various non-potable uses (beautification schemes, fire protection, industrial and commercial use, etc) toilet flushing in commercial, industrial and residential buildings could also form a first step towards domestic recycling (grey water re-use).

[299] The author met with him on several occasions during her different fieldtrips

Most importantly, Interviewee 49 identified social and economic considerations, alongside good engineering, as constituting key elements for the implementation of wastewater reuse plans. He attributed particular importance to consultation processes through the provision of open dialogue with representatives of civil society and the wider public. Furthermore, he asserted that it is the quality of the recycled water that will determine in the end the level of public acceptance.

THEORETICAL LENS AND RECYCLED WATER IN THE NORTH

The re-use of recycled water may erroneously appear to be relatively policy-free in the North. In fact, it is the limited application of water recycling that does not facilitate a sound policy analysis. Nonetheless, the water deficit and the financial constraints the North systematically encounters, are likely to ease the social acceptance of treated wastewater in the water budget (Interviewees 40, 47, 48, 49 and 50). At the same time, the "official authorities" of the North have not drawn a clear policy with regard to this non-conventional water resource, though a Water Resources Master Plan is in the process of being developed (EC, Project Fiche 2006). It is interesting to note, and contrary to the related discussions in the South that focused on quality issues, that particular attention is paid primarily to cost-related elements as means towards expanding the re-use of treated wastewater.

It becomes apparent that recycled water in the North does not constitute yet an intra-community policy issue (with the vertical-horizontal axes of public policy). It may thus, be better examined in juxtaposition with other sources of water provision and the obligations towards the EU *aquis* in the event of a political solution. Should the water transfer option be materialised for example, then the heavy investment on treatment plants may be softened. At the same time, the need for harmonisation with EU legislation will most likely increase the pressure for wide-covering wastewater treatment according to EU standards. These particularities place the policy analysis of recycled water outside the Turkish-Cypriot community and shift the vertical policy axis to other actors (Turkey, EU).

4.3 RECYCLED WATER ACROSS THE DE FACTO DIVISION: SOME HIGHLIGHTS

The above intra-communal analyses of the treated wastewater debate, similarly to the desalination discussion, demonstrate that the two entities are within different stages in the modernity continuum.

The South, firmly within a postmodern water paradigm, has the human and financial capacity to develop recycled water into a significant component of its water budget. However, implications relating to the juxtaposition of the vertical-horizontal dimensions of public policy have rendered this task a complex endeavour. At the same time, it is this complexity that has paved the way for the manifestation of alternative forms of governance in the South through the active multi-stakeholder involvement in the policy debate. Dissimilar to desalination, the wastewater issue accentuates the role and influence of horizontal structures in the policy-making and policy implementation processes.

In the North, and similarly to desalination, the recycled water debate is at an infantile stage. This is mainly due to the lack of capacity (human and financial) that restrains the wide-spread implementation of a water recycling policy. Serious infrastructure deficiencies, leaving a large part of the population without access to sewage treatment systems, impede the inclusion of this water source into the overall water budget. It is interesting however, that in public policy's two-dimensional analysis, outside actors (Turkey, EU), and mostly through the provision of funding, seem to play the role engraved in the vertical axis.

A point of inter-community analysis concerns the Mia Milia/Haspolat sewage treatment plant. Its location in the North and the fact that it services both communities in Nicosia, render it a pivotal issue of potential bi-communal cooperation. The plant's role and potential impact on weakening the *de facto* division echo the theoretical consideration of policy analysis and reflect the speculations of the thesis' analytical considerations (i.e. policy networks, communities of practice and governance). Given the importance of this analysis, also in addressing the thesis' key research question, the Mia Milia/Haspolat treatment plant and the politics of cross-'border' recycled water are analysed thoroughly in Chapter VII.

5. CHAPTER EPILOGUE

'National policy, including water policy, is a political matter...water policy does not stand alone but meshes in with other national and sectoral policies' (WDD-FAO, 2002: 15)

Chapter VI discussed the relevance and applicability of the thesis' theoretical lens (policy analysis) to the case study of Cyprus. In order to do so, the Chapter conducted a comparative presentation and analysis of three water discourses (desalination, water transfer, water recycling) across the *de facto* division and provided empirical context to the theoretical explorations.

The Chapter established that policy does not exist in a vacuum, but rather it is well placed within a social system of multi-stakeholder governing that is characterised by interdependence of actions amidst a multiplicity of options and alternatives. In the case of Cyprus, this web of (inter)actions is determined also by a *de facto* border, which increases the complexity of the conducted analysis. At the same time, the Chapter demonstrated the contextualisation of policy within the Cypriot case study through the analysis of three water discourses.

More specifically, it was found that *desalination* constitutes a policy issue across the island, due to its highly discursive nature and the interaction of public policy's two dimensions. In the South, this interaction is manifested in an intra-community manner, with the confrontation of the government with civil society and opposition political parties. The hierarchical formulation of policy (constructed primarily by the MANRE) has been widely questioned and partially re-set to being more socially responsive through structured and organised interaction of stakeholders outside the realm of the government. Thus, the desalination policy seems firmly placed within a social system of multi-stakeholder governing. The importance of this policy shift is central to the thesis as it accentuates the value of socially constructed governing forms and their possible implementation across the 'border' to enhance bi-communal cooperation. Moreover, the option of assuring potable water for the population through desalination has eased the security concerns over water (as part of the island's political question) that may facilitate inter-community rapprochement.

In the North the desalination debate cannot pose, for the time being, a strong point of debate as the financial resources necessary for shifting towards produced/manufactured water are not available. Nonetheless, and with regard to public policy, it seems that Turkey is leading the vertical policy axis and the Turkish-Cypriot

community the horizontal one. This can be explained by the financial dependency on Turkey and the fact that many policy-related decisions go through Ankara prior to being discussed in the North. Moreover, it was interesting to find that some of the North's environmental organisations work jointly with respective organisations in the South and present a single front in the policy debate. This finding is also important for the thesis, as it strengthens the presence of bi-communal manifestations.

Nevertheless, it has become evident from the cross-division analysis that desalination needs to be evaluated through a combination of parameters; energy intensity, potential climate impacts and the actual cost of water services. It seems that for Cyprus the desalination debate runs the danger of becoming the new 'dam debate'. The South has embarked on a different hydraulic mission where the goal is not the maximum use of available water, but the unlimited provision of freshwater regardless of the source. With desalination being at the front-run, attention is diverted away from less costly and more environmentally benign alternatives like water conservation, water use efficiency measures and water recycling. The North is also within the hydraulic mission paradigm, but from the traditional viewpoint of increasing the use of surface and groundwater resources. It would be interesting to see how the produced/manufactured water debate develops in the North, should a more solid financial capacity be achieved along with a next step on the modernity continuum.

Water transfer, although a policy option of extensive study, has thus far had limited implementation. What is of particular interest is the feeling of deep dependency that both sides expressed during interviews with regard to water transfer from Turkey. In the North, and despite the different water transfer options (bags, tankers, pipeline), the stakeholders were concerned about this alternative water source. They felt it would compromise their efforts toward self-determination and weaken the accompanying territorial ideology in support of socio-spatial and ethnic homogeneity. At the same time, this scepticism expresses the desire for self-governance and finding solutions from within the community and echoes the social construction of policy. Much of the above findings have applicability in the South as well. An additional finding through interviews in the South, was the perception that water security would place the South in a better negotiating position against the North (and Turkey) once a political settlement is in sight. The examination of the political implications of water transfer to Cyprus revealed a complex mélange of policy processes and politics thus, rendering the applicability of the theoretical lens highly relevant.

Finally, it was found that *water recycling* bears several similarities with the desalination debate, in the sense that it is a well-developed policy issue in the South, while being at an infantile stage in the North mainly due to financial constraints. In the South, the horizontal dimension of public policy is well advanced, as different policy communities (farmers and local communities) are able to largely influence the re-use of treated wastewater. Based on this, the hierarchical formulation of policy (through the government) has faced serious objections to implementing schemes for aquifer re-charge or use in irrigation. This finding strengthens the thesis' argument on the existence of complementary governing forms besides the government with regard to water policy. In the North, as with desalination, there is restricted applicability due to insufficient infrastructure and limited financial capacity. Nonetheless, both sides recognise the value of recycled water within a sustainable water resources management framework. What entails particular importance in this debate, is the case of the Mia Milia/Haspolat wastewater treatment plant, which services both communities.

With reference to this last point, the following chapter is dedicated to a more thorough presentation of the Mia Milia/Haspolat treatment plant and the politics of cross-'border' recycled water. Chapter VII examines also two other forms of cooperation in Nicosia, one on drinking water and one on the rehabilitation of the old part of the capital. The thesis claims that these examples represent alternative/non-conventional forms of bi-communal governance.

CHAPTER VII

Framing cross-'border' co-operation in Nicosia

1. INTRODUCTION

This Chapter provides the third –and last- part of the empirical analysis. The aim is to examine and evaluate the applicability of the analytical frameworks of Chapter III (i.e. policy networks, communities of practice) in the case study of Cyprus. The analysis will focus on the island's capital Nicosia, because of evidence on existing forms of bi-communal cooperation across the *de facto* divided capital. This cooperative engagement concerns three areas: i) wastewater treatment, ii) drinking water supply, and iii) the rehabilitation of the shared capital's old district.

As presented in Chapter I, Nicosia carries special political weight since it functions as the capital for both communities, despite the *de facto* division. It therefore embodies the heart of the South's and North's respective policy-making and administrative apparatuses. Moreover, there is further research interest in this city because it represents the last divided capital in the world. This raises regional and international geo-political interest, as the Cyprus example of cooperation may prove relevant and replicable for other parts of the world, where populations live under conditions of quasi-conflict and separation.

It is reminded that policy networks – as analysed in the thesis - refer to non-hierarchical, semi-institutional and relatively stable formations that promote collective (or parallel) action in policy domains of common interest. These webs are based on interdependency, trust, communication and mutual adjustments. The concept has significant potential in politically challenged, *de facto* divided and overly securitised situations like that of Cyprus, because it promotes the rapprochement of the involved stakeholders by facilitating informal communication free of politically-loaded connotations. Especially for Cyprus, where official direct contact between the Greek-Cypriot and the Turkish-Cypriot communities is not feasible, policy networks may offer an alternative approach to the island's political deadlock. Especially with regard to water resources management, a close examination of the island's capital, Nicosia, in the following sections demonstrates that water policy networks exist, function and promote an alternative form of governance. The thesis claims that the implementation of such a framework, and in accordance with the philosophical considerations of

Chapter I, may signify a shift towards post-modern forms of governance in the water sector.

Methodologically, Chapter VII follows the same approach as the other empirical chapters and considers the island as a single entity and Nicosia as a unified city. In particular, the three areas of cooperation are examined in a thematic and cross-'border' manner. Thus, there is no parallel presentation of the South and the North and instead a thematic analysis is conducted.

The chapter's argument develops around the three areas of bi-communal co-operation in Nicosia, which are analysed separately along with linkages to the analytical frameworks of Chapter III with the aim to address the thesis' main research question. A brief summary and some conclusions bring the chapter to a closure.

2. THE NICOSIA SEWAGE TREATMENT PLANT[300]

This section analyses the different aspects of the joint Mia Milia/Haspolat wastewater treatment plant of Nicosia. After a brief presentation of how the project came about, the section examines the different stages of the plant's construction. The political complexities that impeded the smooth materialisation of the project are also analysed, with emphasis on the catalysing forces that pushed forward with its completion. An evaluation of the different types of bi-communal engagement that emerged as a result is made throughout the section. Finally, the section closes with an examination of the plant with respect to the thesis' analytical frameworks (policy networks and communities of practice).

BACKGROUND TO THE PLANT'S CONSTRUCTION

After 1960, the newly-independent Republic of Cyprus encountered a potentially hazardous problem: the inadequate and deteriorating sanitary sewage system of Nicosia. Most of the capital's buildings were equipped with their own septic system for wastewater processing, which was normally constructed below or near to the building's foundation so that the sewage could be filtrated through the soil[301]. In areas where the soil had no absorption capacity, holding tanks were used instead and relied on trucks to carry away and dispose of the untreated sewage (UNHCR, 1995: 6).

[300] Parts of this section, along with selected parts of the policy network section of Chapter III, have been published in Brouma and Ezel (2011)
[301] http://www.sbn.org.cy/cgibin/hweb?-A=30and-V=about

The unsustainability of this system became more apparent after independence and the capital's growing role and its expanding urban development. Some sections of the city had aging and defective septic or holding tanks. In other sections, the soil -due to its clay content- could not absorb the seepage from the growing number of individual septic systems. Nicosia faced increased incidents of sewage over-flowing and untreated wastewater flooding the streets (Robertson, 1987: 1). The problem reached its peak when raw sewage began emptying into the moat surrounding the old city.

As an emergency measure, septic systems were temporarily connected to the Pallouriotissa storm water drain. However, the storm drain ended up having an almost continuous flow of partially treated sewage, a situation which entailed serious health hazards. Moreover, the inadequacy of the storm water drainage system added to the sanitary absorption problems (Interviewee 20 [302]). Although some underground drainage pipes run beneath the walled city of Nicosia, storm waters were usually carried by open ditches along the streets. During heavy rainfall, storm water flooded septic and holding tanks, causing mixed sewage to back up into buildings thus, creating health and environmental problems. In addition, the potable water distribution system was also aging, endangering household drinking supplies with wastewater contamination from nearby leaky septic systems (UNCHR, 1995: 6). The magnitude of the problem was also manifested through its inclusion on daily discussions among locals as '*the nuisance to sight and smell*' (UNCHR, 1995: 6).

Faced with this acute situation, the Government of Cyprus requested in 1965 the World Health Organisation to prepare a pre-feasibility study for the sewage and drainage system of Nicosia in order to determine if a full study was required (UNCHR, 1997b: 1). The findings formed the basis of a full study that was completed in 1968 by the Canadian consultancy MacLaren International Limited (MacLaren, 1968) and led to the development of a 50-Year Master Plan for the Sewage and Storm Collection System in Nicosia (The Management Centre, 2003: 5). The 1968 study included the whole urban area of Nicosia (on both sides of the post-1974 Green Line) bordered by the Nicosia Airport to the west and the Pedieos River to the north. The decision on whether to install joint or separate storm drainage and sanitary systems was left to the consultants, who opted for the latter (ibid).

Therefore, the full study proposed a three-stage plan for the development of the sewage collection system and a treatment plant designed to treat flows from the first

[302] Director of Technical Services in the Sewage Board of Nicosia

two stages of the collection system with provisions for future expansion (MacLaren, 1968; Nicolaou, 2000: 4). The slope of the ground within the study area, coupled with the direction of the prevailing wind, suggested the prime location for the treatment plant to be towards the north-east of the city and a site was chosen at the south-eastern part of the Mia Milia village (about 2.5 kilometres east of Nicosia) (Robertson, 1987: 2; Sewage Board of Nicosia: 2005).

CONSTRUCTION OF STAGE I & THE EVENTS OF 1974

Construction of Stage I [303] of the Master Plan commenced in 1972 after the necessary institutional and legal framework had been set up that would govern the management of the system. This framework included the adoption of the General Sewage and Drainage Law in 1971 and the establishment of the Sewage Board of Nicosia (on 22nd January 1971) with the key responsibility to study, construct, operate and maintain the sewage system of the capital (Nicolaou, 2000: 8). Therefore, the materialisation of Stage I started in 1972 and was near completion –including the construction of the treatment plant- in 1974. By that time, most of the collection systems had been completed. This amounted to some 84 kilometres (52 miles) of sanitary sewers and about 26 kilometres (16 miles) of house connections (Robertson, 1987: 3).

However, the events of 1974 and the *de facto* partition of the capital halted the completion of the system, which would have required two more months in order to finish (Interviewee 5 [304]). According to UNHCR (1995: 7), the major consequences of Nicosia's *de facto* division could be distinguished among impacts on the plant on the one hand, and the political impediments for the plant's continuation on the other.

Besides halting the plant's completion and delaying it for several years, the events of 1974 had additional adverse impacts. Sudden population shifts occurred and the bulk of the displaced population centred itself in Nicosia, changing significantly the demographics upon which the sewage plan had been initially based. The city expanded in areas that had not been anticipated in order to accommodate the increased population density. This made the expansion of the sewage coverage an urgent and

[303] The original plan was comprised of three stages. (1) Stage I (1969-1974 and 1979-1980): Original design completed and sewage treatment plant at Mia Milia constructed in 2 phases due to *de facto* division of the island in 1974. (2) Interim Period (1980-1983): Completion of Stage I (Mia Milia treatment plant became functional) and preparation of Stage II (UNDP searched for funding for Stage II and the plans were redesigned due to changes in soil absorption capacities and increased population density from the influx of displaced populations). (3) Stage II (1984-1987): Beginning of expansion of Mia Milia sewage treatment plant by 100% of original capacity and further update of the plan due to new areas of urgency. (4) Stage III (1986-ongoing): continuation of expansion and development of sewage treatment plant at Mia Milia and men-power training (UNHCR, 1995).

[304] The Greek-Cypriot Mayor of Nicosia at that time

pressing need. At the same time, the absorption capacity of the soil continued to decline placing additional pressure on the already malfunctioning sewage system. Furthermore, the constructed plant remained inoperable and started to deteriorate as a result of the damages it suffered in 1974 and the consequential neglect after that.

Impediments to resuming the project stemmed from the new political reality. The most severe impediment was the “no-recognition” between the South and the North, with each side in effect denying the political existence of the other. Thus, there was no single authority with the responsibility to overview and manage the project. To add to the complexity, and as a result of 1974, the project was now spread across three different areas. Most of the infrastructure (e.g. lying of main trunk, connections, etc.) of the sewage system was located on the Greek Cypriot side of the Green Line, while a small part of the system, including the treatment plant, was within the Turkish Cypriot side. The treatment plant in particular, was now located 2.5 kilometres (1.5 miles) north of the Green Line. Moreover, substantial work was left unfinished within what had become the Buffer Zone, including a crucial part of the main outlet through the within-the-walls Nicosia (Sewage Board of Nicosia, 2005). Furthermore, the treatment plant sustained significant damage during the 1974 events and coupled with the deterioration that took place afterwards, would require substantial work in order to be repaired. Given the status of ‘no-recognition’ between the two communities, there was no single authority with the responsibility to operate in all three areas (UNCHR, 1995: 7).

Contact between the two communities became effectively unfeasible. Separate administrative systems were established with no link between the two communities; permits to cross were usually denied and, even with this important project in progress, the ability to meet on-site to engage in problem-solving and sharing of information was restricted. From the financial point of view, the loan used for the project’s early construction (amounting to some 100 million CY £, Interviewee 5) had to be repaid by the internationally-recognised Government of Cyprus, even though the political situation made completion of the project impossible. And because of the above difficulties, the process of planning and executing the remaining project had to rely on third parties (UN, USAID, EC) for its realisation.

RESUMPTION OF TALKS IN 1977 & THE INITIATION OF A POLICY NETWORK

The political turbulence continued relentlessly after the events of 1974 and communication between the Greek Cypriot and Turkish Cypriot communities was virtually non-existent. Yet, the sewage problem of Nicosia remained urgent and neither community was in a position to address it separately; '*the impasse had to be resolved*' (UNHCR, 1995: 8). It was only three years after 1974 that a way out was found and it relied entirely on the vision, diligence and good will of two people: the two mayors of Nicosia, Mr. Lelos Demetriades and Mr. Mustafa Akinci.

It was Mr. Demetriades that initiated the process in 1977, during the first UN-mediated bi-communal meeting of the leaders of the two communities, Mr. Glafkos Clerides and Mr. Rauf Denktash. During this meeting, in which Mr. Demetriades secured his attendance, he raised the issue of the sewage system of Nicosia and achieved the high-level political commitment to deal with it. During the interview he gave to the author, he explained what happened in an anecdotal way (info from Interviewee 5; also in Demetriades, 1998: 170):

"...we had a nice dinner during which all of us visited the restroom. Towards the end of the dinner I said to Mr. Denktash in a meaningful and sinister way: 'Rauf, tonight we all had to use the toilet. Don't you think there is an absolute necessity for a sewerage system for our capital as well? Don't you think that you need a sewerage system and so do we?' He smiled in a cunning way for he understood what I meant. Then I continued: 'Look, it's a pity, both of us need a sewerage system and the system is there, but it is not functioning, so why don't we do something about it? We all need it'. They started laughing when Glafkos (Clerides) said something like 'here is that fool again with his funny ideas', but they both agreed that we do something about it. This was, believe it or not, how an agreement was reached, which could not be reversed afterwards..."

After receiving this green light, Mr. Demetriades also sought the go-ahead from the then President of the South, Archbishop Makarios. Although he agreed, Makarios stressed that should the whole initiative fail, and given the extreme sensitivity of the task, no political backing could be provided to Mr. Demetriades[305]. Following his theory on *fait accompli* (accomplished fact) and examining the consequences after initiating a process, Mr. Demetriades invited Mr. Akinci, the Turkish Cypriot Mayor of Nicosia, to his house for dinner in late 1977.

[305] Information shared during the interview

"...in this way, in 1977 Mr. Akinci came to my house with a UN escort along with some other officials. I asked my wife to cook something and we also got an assistant for the day, who literally dropped the dishes when saw out guests...it was a rather dangerous thing to do...in the Report that the UN representative prepared after the meeting, I found that he was puzzled by the interaction we had... In fact, that was the very first bilateral meeting to take place, if we exclude those between the political leaders of the two sides. It was at that meeting that we agreed the scope for discussing the possible commencement of the joint sewerage system, which would be for the benefit of both communities..." (Interviewee 5 [306])

On the same event, Mr. Akinci recalled:

"...given the situation in Nicosia and the almost-completed plant, the best option was to come together and try to find a way to work on it. So in late 1977, and together with a group of people, I visited Lelos Demetriades in his house...the borders were not open like they are now...I had to go to Lelos in a UNDP car...perhaps he mentioned that his child insisted on seeing us and later on said ' but father, they look just like us'..." (Interviewee 39[307])

According to Mr. Demetriades, his strong belief on the positive outcome of this dangerous attempt was based on two –rather unconventional- parameters: that both he and Mr. Akinci were originally from Limassol and they were both architects. As architects, they cannot tolerate seeing buildings/constructions in bad state, taken down of left to collapse; thus, they shared a passion for maintaining the originality and the character of the old city of Nicosia. As regards the locality, "*people from Limassol are known to be more open and flexible, and maybe slightly crazy; thus, able to embrace potentially precarious acts*" (Interviewee 5).

It should be noted that it was not only Demetriades who faced political resistance in his attempt. For Mr. Akinci, It was mentioned that "*Denktash had to give his consent of course, which he did reluctantly and from time to time was considering how to stop this...an additional difficulty was that I was not an independent mayor, I was a political figure belonging to the opposition...*" (Interviewee 39)

[306] Quoted from the interview held with Mr. Demetriades
[307] Quoted from the interview held with Mr. Akinci

Perhaps the most challenging part of the joint endeavour was breaking into the mentality –particularly in the North- of keeping the two sides apart and convincing people on both sides of cooperation's long-term benefits. It was this separatist mentality, for example, that led to the complete segregation of the electricity infrastructure and power provision in the capital (Interviewees 22 and 43). And it was in this difficult political context that the two mayors were promoting the stand that co-operation between the two sides was something feasible, positive and needed.

What was also interesting from the interviews with the two mayors, was the parallelisms the two men used to stress the urgent need and inevitability for a joint sewage system. According to Interviewee 5 [308] "*the treatment plant is to Nicosia what kidneys are to the human body: if they don't exist or work well the body dies*". From his side, Interviewee 39 [309] explained that "*we may have different colours for our national flags, we have red they have blue, but the sewage we are producing is the same: there are no differing colours there*".

Despite the ideological congruence between the two men, the initiation process faced several obstacles and took more than a year for an agreement to be concluded. Perhaps the most significant obstacle related to the issue of recognition, since the South did not wish to act in any way that would imply the recognition of a legitimate entity in the North and *vice versa*. This issue prohibited the use of job titles or affiliations and there was difficulty even in directly addressing one another in meetings.

This problem need not be taken lightly as it was more than mere semantics; it captured the essence of the post-1974 turmoil where every word entailed strong political connotations. Following attempts to reach an agreement, the two men decided that "*whatever we were, we were two persons representing in a way each community in dealing with matters of Nicosia...so I, [Demetriades], became the Representative of the Greek Cypriot community and Mr. Akinci the Representative of the Turkish Cypriot Community...*" (Demetriades, 1998: 171)

Another obstacle was linked to the actual meeting place, which was agreed in the end to be the Ledra Palace in the Dead Zone. However, the first two meetings, arranged through UN mediation, produced limited results as they were too bureaucratic and included many people. Faced with this issue, Demetriades and Akinci jointly opted for a less conventional approach. As they explained during interviews with the author, prior

[308] The Greek-Cypriot Mayor of Nicosia at that time
[309] The Turkish-Cypriot Mayor of Nicosia at that time

to every meeting they would sit outside the meeting room on a couch and discuss the topics at stake before getting to the table with the UN and the rest of the attendees. This unconventional proposal was not officially agreed, and instead the two men simply announced to their respective sides that they had sorted out the meeting arrangements in a slightly different way. *This arrangement has been going on for more than 30 years and through practice acquired a status of its own*[310].

A POLICY NETWORK IN THE MAKING

The thesis claims that these developments formed the beginning of the sewage policy network in Nicosia. This un-orthodox, non-political approach entailed a clear shared vision (Nicosia as a unified capital), dropped all political titles (both men were simply representatives), put formalities aside (no minutes from the meetings were kept) and focused on a practical agenda (the completion of the sewage treatment plant) and on building trust by trusting. These characteristics seem to fit-in well with the context of a policy network, as presented earlier in Chapter III.

The existence of a common interest along with the acknowledgement that co-operation is the best way to achieve common goals and the orchestration of efforts towards a solution of common policy, underpin the policy network literature (Borzel, 1998; Kenis and Scheider, 1991). From a provisional assessment, these elements seem to be in place in the process the two mayors initiated in 1977; moreover, they both had a shared interest in a specific policy problem (i.e. the completion of the sewage treatment plant), which is also accentuated in network-related scholarly work. Furthermore, this direct contact entailed the significant element of defusing the coordination problems deriving from the political deadlock.

Signalling the acknowledgement as well as the importance of the agreement, a cartoon was published in the Greek Cypriot press, adding a communicative if not humorous touch to the process. It showed the two smiling mayors sitting on toilets opposite each other, jointly pulling the single overhanging flushing chain.

[310] Emphasis added

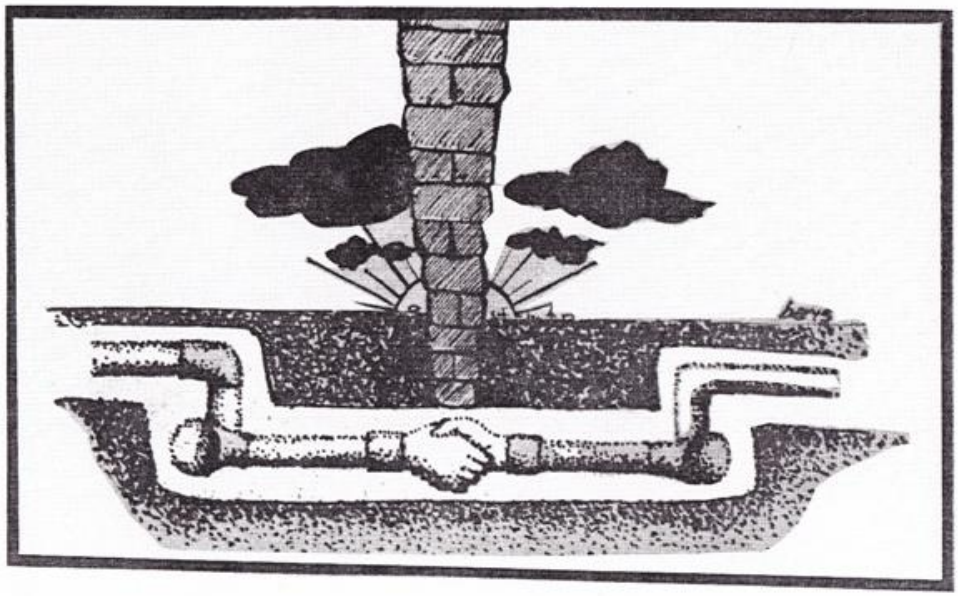
Photo 8: Demetriades and Akinci agree on sewage matters

The representatives of the Greek Cypriot Community Mr. Lellos Demetriades and of the Turkish Cypriot Community Mr Mustafa Akinci agreeing on seweage matters.

From the Greek Cypriot weekly "Satiriki" of the 30th September 1978.

On the other side of the 'border', another cartoon was published in the Turkish Cypriot press showing a mighty wall above ground as two metal pipes shook hands beneath. *De facto* divided on the ground, Nicosia was unified underground

Photo 9: Underground pipes shaking hands



"From the newspapers: The Municipalities reached agreement on the subject of the sewers of Nicosia".

From the Turksih Cypriot Newspaper "Yeni Duzen" of the 28th January 1979.

Both cartoons indicate recognition at wide scale (and involving the public that still struggled with the memories of the 1974 events) of what was achieved during the mayors' meetings: the establishment of direct and regular contact between the two sides. This also signalled an inevitable alteration of the official policy process. Despite the political deadlock and the absence of any bi-communal interaction (aside from the one at the highest level in search of a political solution), a concrete policy was being implemented across the 'border' for the completion of the Mia Milia/Haspolat plant. Based on this, it is argued that the sewage policy network took off; its endurance for more than 30 years after its establishment indicates that it acquired a life of its own. And as both Demetriades and Akinci accentuated during the respective interviews, this was a process that could not be reversed; not only it continued successfully (it is operational until the present day), but it also led to a city-planning project (the Nicosia Master Plan) only a year later after the two mayors' first meeting.

CONTINUATION WITH THE PROJECT'S CONTRUCTION

Following the unorthodox rapprochement between the two *de facto* divided communities in 1977, an agreement was reached in 1978 to continue with the construction of the Nicosia Sewage Treatment Plant. The agreement contained three important aspects: a) to include the northern part of Nicosia as an area and not as individual buildings, b) to seek expert opinion on how to re-use the treated effluents and c) to share the expenses of the plant according to usage, which resulted in 80 per cent covered by the South and 20 per cent by the North (Interviewee 39 [311]).

With the encouragement and assistance of the United Nations Development Programme and the World Bank, the treatment plant, including some new network connections in the North, was completed in June 1980 (UNHCR, 1995; UNHCR, 1997b; Nicolaou, 2000; The Management Centre, 2003). Stage I was funded by the International Bank for Reconstruction and Development (now World Bank), the South's Government and the South's Sewage Board of Nicosia[312]. As mentioned previously, the Mia Milia/ Haspolat plant is located on the south bank of the Pedieos River, 6 kilometres (3.6 miles) from the centre of Nicosia and around 3 kilometres (1.8 miles) from the point of collection of all sewage at Kaimakli. The Nicosia General Hospital, Saray Hotel and the US, UK and Chinese Embassies were immediately connected to the plant. *"...when we were ready we first connected vital buildings like hospitals on the*

[311] The Turkish-Cypriot Mayor of Nicosia at that time
[312] http://www.sbn.org.cy/cgibin/hweb?-A=30and-V=about

two sides and foreign embassies to the sewage system. That way no one could try to take it apart..." (Interviewee 5)

Given the successful completion of Stage I, and with the support of UNDP, funding was sought for Stages II and III of the project. Two Protocol Financial Agreements were signed with the (then) European Community during the 1980s and consisted of a combination of grants and loans from the European Investment Bank (The Management Centre, 2003: 6). In terms of context, Stage II had to be partially re-designed to better respond to the circumstances on the ground after the events of 1974. Particularly, the project had to address the changes in soil absorption capacities and the increased population density from the influx of displaced people.

However, the continuation of the project would face additional delays, as on November 15th 1983 the North unilaterally declared the establishment of the independent "Turkish Republic of Northern Cyprus"[313], recognised to this day only by Turkey. This caused a new round of politico-security turmoil and bi-communal contacts were once again halted. It required one more year for the European Community to approve its financial support and works resumed in 1984 with Stage II reaching completion in 1987[314]. The explosive nature of the situation during those years was demonstrated by the fact that UNFICYP had to transport equipment and escort work crews in and along the Buffer Zone to ensure that field contact between the crew and the military of each side did not result in misunderstandings or conflict (UNHCR, 1995: 19). Nonetheless, it is important to note that the construction works during Stage II fulfilled, in terms of total treatment capacity, what was envisaged in the 1968 Master Plan (The Management Centre, 2003: 7).

Based on the positive outcome of these efforts and some remaining funds from the two EC Financial Agreements, Stage III of the project commenced in 1988 and was completed in 1995[315]. The majority of the funding was provided by UNHCR[316], as the project came under the auspices of the High Commissioner in 1986 due to its bi-communal and humanitarian nature. It is noted that the project started originally as a technical assistance project of the United Nations Development Programme (UNDP) and was funded by the then International Bank for Reconstruction and Development (now World Bank). Therefore, further extensions of the collection system during Stage

[313] http://www.trncinfo.com/tanitmadairesi/2002/ENGLISH/ALLaboutTRNC/Page01.htm
[314] Stage II included the remaining part of within-the-walls Nicosia, as well as the areas of Omorphita and Kaimakli http://www.sbn.org.cy/cgibin/hweb?-A=30and-V=about
[315] Stage III included the areas of Agios Andreas, Agios Pavlos and Vorios Polos in Kaimakli, the areas of Akropolis in Strovolos and a part of Agios Dometios. Stage III also covered areas in the North http://www.sbn.org.cy/cgibin/hweb?-A=30and-V=about
[316] http://www.water-technology.net/projects/nicosiawastewatertre/

III were largely implemented with UNHCR funds, which were distributed on a bi-communal basis. In the early 1990s, and upon completion of Stage II and part of Stage III, the Mia Milia/Haspolat treatment plant was expanded by 100 per cent of its original capacity and additional areas in the South and the North were connected to the system, primarily in the within-the-walls parts of the city.

POST-1990 DEVELOPMENTS & RECENT EFFORTS

Given the consequential expansions of the system and the need for additional connections, concerns were expressed on the capacity of the plant, especially as the occurrence of strong unpleasant odours had been reported regularly since 1991 and most notably during the winter months. A decision for the installation of additional technical infrastructure was made in a bi-communal meeting in 1993, and was executed in 1995 with financing provided by UNHCR.

As this work did not eliminate the problem, the second half of the 1990s was dedicated to studies on the potential expansion of the treatment plant. In 1994, the Commission of the European Communities issued a technical assistance contract to elaborate on the design and potential problems from such an expansion. Based on the recommendations (Commission of EC, 1994), all parties agreed that proposals for alleviating the overloading of the treatment works need to be formulated within a long-term strategic plan for the Nicosia Sewage System. Although the necessary documents for launching the tenders were ready in 1997, the project came to a standstill because the Turkish Cypriot Community opposed to the wording included in the documents and objected to the channelling of the funds through the Greek Cypriot Community.

In 1997, UNHCR (1997b) commissioned an environmental assessment regarding the next phase of improvements of the Nicosia Sanitation Project. The study considered the extension of the system in areas southern and northern of the Green Line, as well as the expansion and re-development of the Mia Milia/ Haspolat plant. Among the key recommendations, the assessment identified the need for longer term planning (and well beyond the 2005 horizon that the 1968 Plan foresaw) and the need for mitigation measures especially towards integrating sewage planning with infrastructure and economic planning in Nicosia (UNHCR, 1997b: section 9). A year later (in July 1998) the bi-communal programme was taken over by UNDP's executing agency UNOPS, which decided to proceed with the financing of the plant's expansion without, however, making any progress.

As works remained largely at a standstill due to the political circumstances, and given the urgent need for sewage treatment, the South proceeded with the development of separate infrastructure. Stage IV of the project was completed as early as 1993 with funding from the South and included the construction of the Anthoupoli treatment plant (Nicolaou, 2000: 6) in the South. Moreover, the construction of the ambitious Greater Nicosia Sewage System began in 2003 in the South and was expected to finish by the year 2012[317].

Despite the separate efforts to deal with wastewater treatment, the (political) importance of the Mia Milia/ Haspolat treatment plant has not diminished. At present, the Nicosia Sewage System serves a population of approximately 140.000 people and covers an area of 20 km^2. The total quantity of treated sewage amounts to 14,000-15,000 m^3/day, 30 per cent of which comes from the Turkish Cypriot side (Interviewees 20[318] and 49[319]). The volumes of treated water vary considerably; during summer for example, the flow is reduced by half as a result of evaporation[320] and people leaving the city for the seaside (ibid). The treated water, which is of very poor quality, is used mainly for i) groundwater recharge, ii) agricultural use (mainly for growing fodder crops such as sorghum and alfalfa) and iii) non-potable urban uses (Öznel, 2004).

However, the plant's operation has been characterised by a series of problems that have become more acute over the years. These can be summarised as: excessive infiltration; leakages; erosion; contamination of ground soil and groundwater; evaporation; odour problems; limited capacity; unacceptable quality of treated wastewater (Sewage Board of Nicosia, 2003: 3). Given the deteriorating condition of the Mia Milia/Haspolat plant and its negative impacts on the environment, bi-communal discussions started on re-building the plant prior to Cyprus' accession to the EU in 2004 (Interviewees 20, 22 and 49). Finally, in 2006 an agreement was reached between the –then- two mayors of Nicosia, Michalakis Zampelas and Cemal Bulutoglulari (Leonidou, 2006). According to the two mayors "*the new plant is the only way to solve existing problems...it is the best possible bi-communal project*" (ibid). Following an EU-commissioned environmental impact assessment study for the plant

[317] More information on the number of plants, capacity and work progress in the South was provided in Chapter VI. Also related information is available on the website of the Sewage Board of Nicosia at http://www.sbn.org.cy/cgibin/hweb?-A=30and-V=about The completion of the System did not take place by 2012, as initially proclaimed (ibid).
[318] The Director of Technical Services in the Sewage Board of Nicosia at the time of the interview
[319] Head of the Wastewater and Sewage Plant of the Turkish Municipality of Nicosia at the time of the interview
[320] The deposits used in the plant have a 1-metre diameter and thus, the evaporation during the summer months (with temperatures reaching 45^o Celsius) is almost 50 per cent (Interviewee 20)

(EC EuropeAid, 2008), efforts have been underway for the construction of the new bi-communal wastewater treatment plant at Mia Milia/ Haspolat[321].

Upon completion, the plant will be the largest in Cyprus (with a daily capacity of 42,000 m^3/ day) and one of the largest facilities using membrane bioreactor –state of the art wastewater treatment- technology in the world[322]. The plant will have the capacity to treat additional effluent from both communities, rendering it possible for the North to expand the existing collection system and abandon the methods of septic tanks and open pits, which are currently in use (UNDP-PFF, 2006). More importantly, the new plant will form an integrated system for the whole Nicosia, offering the opportunity to many people from both communities to work together thus, strengthening the efforts for re-unification. Moreover, in the event of a political settlement, the new plant will be able to support and facilitate the expected urban development of the united capital.

THE PLANT'S MANAGEMENT MODALITIES & A COMMUNITY OF PRACTICE

As mentioned earlier, and due to the *de facto* geographical and political division in 1974, two distinct authorities provide sewerage services in the South and North Nicosia respectively. The Sewage Board of Nicosia (SBN), in the South, and the Sewerage Department of the Nicosia Turkish Municipality, in the North, have the responsibility for the collection and management of sewers and the sewage treatment within their operational 'boundaries'. Following the 1978 agreement between Demetriades and Akinci, the South contributes with 80 per cent of the plant's operating costs, while the North contributes with the remaining 20 per cent. Although bi-communal cooperation has been in place since then regarding the plant's operation and maintenance, the differing internal conditions of the two responsible bodies pose additional difficulties in the efficient joint management of the plant. This becomes more obvious when considering the operational modalities of the two bodies.

[321] A €25 million contract to design and build the bi-communal wastewater treatment plant of the Greater Nicosia Area at Mia Milia/Haspolat commenced in March 2010. On 19 March, the appointed contractor, the WTE-EMEK Consortium, started working on the project. The new plant will be financed by the Nicosia Sewage Board (for the Greek Cypriot community) and the European Union (for the Turkish Cypriot community) and will be completed in May 2012. The project is implemented by UNDP/Partnership for the Future, which will act as the contracting authority/employer. Upon completion, the plant will be the largest in Cyprus and one of the largest facilities using membrane bioreactor technology in the world. It will serve approximately 270.000 people and treat an average flow of 30,000m^3/day by 2017 (http://ec.europa.eu/cyprus/news/press_releases/20090609_eu_aid_waste_water_en.htm). A project-specific website has been set up by UNDP and is available at http://www.miamilia-haspolat-undp.org/index.php. Information on the project is also available at http://www.water-technology.net/projects/nicosiawastewatertre/

[322] http://ec.europa.eu/cyprus/news/press_releases/20100319_waste_water_plant_en.htm

The Sewage Board of Nicosia, established in 1971 following the enactment of the Sewage and Drainage Law, was constituted as a non-profit corporation within the jurisdiction of the Ministry of Interior. Overall, the Board's role is to construct, acquire, maintain, improve, extend and operate a proper and adequate system of sewage works for the collection, conveyance, treatment and disposal of sewage within its operational boundaries (Nicolaou, 2000: 8-11). In addition the Board co-operates with the Turkish Cypriot community for the operation and maintenance of the Mia Milia/ Haspolat plant. For this purpose the Board employs a British member of staff who visits the North daily and inspects the existing system and facilities and collects samples to be analysed in the South (UNHCR, 1997b: 1-2). The Board enjoys financial self-sufficiency and a positive financial balance. The system connection tariffs, following a block structure, represent an elaborate combination of land price evaluation and the water consumed per household.

Across the Dead Zone, the Sewerage Department is one of the 10 departments under the Nicosia Turkish Municipality. It was established under the Municipalities Law and operates within the terms of the Law of Water and Soil Pollution and Protection of Air Quality No. 375. Its role is to operate, maintain and extend the sewage system and wastewater treatment facilities in the Turkish Cypriot area of Nicosia (UNHCR, 1997b: 1-3)[323]. Being under the Municipality's authority signifies reduced responsibilities for the Department, limited decision-making power and no financial autonomy. The financial dependency of the Department and the need for self-reliance were particularly accentuated in a 2003 review of the Plant's management system (The Management Centre, 2003; 15-21). Regarding revenues, the households (or other buildings) that apply for connection to the sewage system are required to pay a standard fee of 5 million TR Liras (Interviewee 49). The fee has to be paid even if the system passes through the street where the household is located, irrespective of whether the system is used.

This brief overview of the two responsible bodies – Sewage Board of Nicosia and Sewerage Department of the Nicosia Turkish Municipality - highlights the different potentials in the plant's management system. The separate modalities on the two sides, based on different legislative frameworks, make the implementation, for example, of effective pollution control and environmental protection difficult (UNHCR, 1997b). In addition to the evolving relationship between the communities of Nicosia and their need to respond to environmental hazards, the South has also had to comply with

[323] Öznel (2004) makes reference to some additional legal documents: the Municipalities Sewerage By-Laws 1991; Wastewater Law and Regulations No.2/1987; Nicosia Turkish Municipality Sanitary Rules and Regulation No. 545/91; Nicosia Turkish Municipality Sanitary Fee Regulation No.548/91.

the EU environmental *acquis*. This last condition has underpinned the recent efforts to re-build the plant. Moreover, another urgent need concerns the coordination of cross-'border' local planning activities to optimise the use of scarce financial resources. It is important to stress that key to the function of the North's Sewage Department is the financial contribution of the South's Board. The latter contributes 80 per cent to the operation and maintenance costs (including salaries) of the plant.

The significance of these management modalities, lies with the existence and continuous operation since 1978 of a Bi-communal Team, responsible for the Nicosia Sewage Project. The Team meets quarterly, while a technical sub-committee meets on a monthly basis for trouble-shooting and problem-solving as well as to assess the status of the project. The team identifies the most urgent needs and establishes priorities for the expenditure of the funding allocated annually to the project (UNHCR, 1995: 12). The fact that several of the Team's members are trained experts and on-site technicians familiar with the daily operation of the system facilitates the discussions at technical level.

In addition to the meetings of the Bi-communal Team, communication between the Sewage Board and the Sewage Department takes place almost on a daily basis. The existing close coordination is paramount when problems arise that need immediate cross-'border' action (like leakages, bursting of pipes, plant's operation etc). The importance of this interaction was particularly stressed during interviews with the responsible people in the two organisations (Interviewees 20, 22 and 49).

Based on the regularity of contact and the primarily technical nature of the interaction, the thesis claims that it represents a community of practice. Scholarly literature identifies CoP based on the sharing of a common concern/problem, the regular interaction through joint work and the sharing of know-how (Wenger, 2000; Brown and Duguid, 1998; Brown and Duguid, 2002). The accompanying definitions include a combination of those elements while stressing that through on-going practice, the members of such a group will develop into a *de facto* community. In the case of the Mia Milia/Haspolar plant, and as mentioned above, the working modalities of the Bi-Communal Team as well as the cooperation among the Sewage Board and the Sewage Department appear to reflect well on the CoP characteristics. As the following section will argue, there is a practical element of such technical cooperation (i.e. the operation and maintenance of the treatment plant) that reflects on the linkages between individual and collective knowledge/expertise and how this is operationalised; and it is the ensemble of the members' respective expertise that is indispensable for

the effective operation of the plant. Moreover, the importance of the CoP lies predominantly with the ability to collectively create and share knowledge through shared practice, which at the same time shapes identity (the members of the group no longer represent their respective communities but the management team of the bi-communal plant).

Before delving into the analytical discussion on the sewage CoP and policy network, it is important to mention the strong impression made to the author by how highly each side spoke of the other and how much the joint management of the treatment plant has enhanced bi-communal cooperation. It merits attention that the contact with the Sewage Department in the North was rendered possible through personal introduction by the Director of the Sewage Board in the South. During the phone-call to arrange the meeting, the author realised with surprise that the conversation was carried out in Greek with several Turkish words being used from time to time. From the different interviews it was made clear to the author that Mia Milia/ Haspolat plant represents more than a treatment plant servicing the two sides; it encapsulates a concrete example of practical cooperation underpinned by a shared vision for Nicosia.

VIEWING MIA MILIA/HASPOLAT THROUGH THE ANALYTICAL LENSES

The above elaborate analysis of the different construction phases of Mia Milia/ Haspolat was conducted in order to highlight the particular circumstances that have enabled the plant's implementation as its role in bringing the two communities together. The political impediments and occasional setbacks transformed the completion of a mere infrastructure project into a three-decades-long marathon of negotiations and multi-lateral political mayhem, which is still on-going while bringing incremental improvements in water and sewage services

At the same time, and amidst this political scenery of semi-conflict, *de facto* division and political deadlock, the Nicosia Sewage Water Treatment Plant played an important role in the process of cross-'border' co-operation for two main reasons:

> i) it is the first project that the Greek and Turkish Cypriots jointly implemented shortly after the *de facto* division of the island in 1974, when people were still suffering from the traumas of the war and grieving after the dead or missing people, and

ii) the successful implementation of the project laid the foundations for developing a more comprehensive project for the mutual benefit of Nicosia's two communities (i.e. the Nicosia Master Plan).

In a nutshell, Mia Milia/Haspolat may be regarded as a "monument" to a very significant bi-communal cooperation initiative in Cyprus.

With regard to the analytical frameworks of the thesis (as presented in Chapter III), it is claimed that the bi-communal collaboration on the Nicosia treatment plant represents a policy network complemented by a community of practice with regard to the daily interaction on technical issues.

CoP for Mia Milia/Haspolat

Concerning the community of practice analytical framework, evidence from the fieldwork as well as from secondary sources shows that regular interaction is in place through a) the establishment and operation of a Bi-Communal Team and b) direct contact between the Sewage Board and the Sewage Department. This interface concerns technical management issues related to the operation and maintenance of the Mia Milia/Haspolat sewage treatment plant. The Team meets regularly (on a quarterly basis) while technical sub-committees meeting on a monthly basis for trouble-shooting, problem-solving and for assessing the project's status. The two departments are on daily contact (as derived from the interviews) and deal also with emergency issues (like leakages, bursting of pipes) which require immediate (if needed also outside the working hours) and on occasion in-person interaction.

This interaction is about dealing with a common concern/problem, on a regular basis while utilising individual expertise that is incorporated into a collective know-how about the operation of the plant and the implementation of the overall plant project. This represents an ongoing process where the group works together for its dispositional know-how to be put into practice. These elements align very closely with the definitions of CoP (Wegner, 2000; Brown and Duguid, 1998, 2001, 2002; Little, 2002).

Moreover, through this regular interaction this group of individuals collectively creates and shares knowledge through shared practice. This coincides with the understanding of knowledge within CoP as being embedded into routines, processes, practices and norms (Cook and Brown, 1999), while this shared practice is unique and characterises the group and thus, shapes an identity (Davenport and Prusak, 1998). In the case of

the Mia Milia/Haspolat plant, the Team and the two departments possess and practice the necessary knowledge, both through their individual expertise on specific tasks and collectively as the bodies responsible for the operation and maintenance of the plant. It is important to note that the ensemble of all individual expertise is what makes the smooth operation of the plant possible and reversely the CoP is the key to the effective application of know-how because it directly links knowledge to practice (Nonaka, 1994; Little, 2002). This reality has put in place an inter-reliant and interdependent net, which is the glue that holds the actors together in the Mia Milia/Haspolat case (all members are needed for the smooth operation of the plant). Besides the knowledge/expertise interdependency, an additional gluing factor that cannot be overlooked concerns the financing of the plant that is done on a bi-communal basis.

The regular interaction and the interconnectedness of expertise can be considered as connecting factor among individuals for thinking together. They have developed a shared understanding of what the operation of the plant entails and thus, have created a common knowledge basis that they can refer back to. This is also embedded in the craft-like learning process when including new members to the existing CoP. Given that the sewage CoP is operational since 1978, it is only logical to assume that this learning process has been taking place considering the needed personnel changes. The long duration of the CoP's existence (for more than 30 years) has endowed it with a clear – and recognised at cross-'border' level- status when discussing water services in Cyprus as a whole. This provides a distinct identity to the sewage CoP.

This is closely linked to the shaping of an identity within the CoP that is unique and characterises the members of the group (they are no longer considered representatives of the two sides, but one team responsible for the plant). The identity-shaping quality of the interaction can be further strengthened if the community of practice is seen as a 'shared history of learning' (Wenger, 1998) where learning and the engagement with knowledge are on-going cultural processes embedded in everyday practice. It is argued that this is valid in Nicosia, with the 30 years of uninterrupted engagement and the shared vision on the plant's status and further development. The identity of the group, its function and the accompanying interdependency among the members for the smooth operation of the plant were highlighted during interviews on both sides.

In sum, the thesis argues that a CoP indeed exists in the case of the Mia Milia/Haspolat plant, has been operational for more than 30 years and complements the existence and operation of a policy network for the plant. However, the operation of the CoP is

limited to technical issues and the day-to-day running of the plant and entails no influence on policy; this is done through the policy network.

A policy network for Mia Milia/Haspolat

The thesis argues that a policy network is present in the case of Mia Milia/Haspolat. In order to provide justification for this point, the exploration will commence by cross-checking whether the key characteristic of a policy network are in place. As presented in Chapter II, the qualities of such formations include communication and trust, a non-obligatory nature and a semi-institutional status.

As explained previously, it was the need for communication that brought together the two sides in order to tackle the deteriorating status of the plant and proceed with completing its construction. Admittedly the initiation was done in an unorthodox manner thanks to the personal initiative and voluntary risk-taking of the two mayors. However, this channel of communication has remained open and functional for more than 30 years. Given the political uncertainty and potential implications of this endeavour, a certain high level of trust is essentially involved. This has been strengthened over the years and manifested by the fact that all mayors following the two that initiated the process have been committed to sustaining the process. Therefore, the gradual building of trust and the certainty that both sides are committed to the process (and thus, are reliable counterparts) has formed the glue that kept the cooperation active and operational over the years.

As also mentioned, the two sides decided to come together out of free will and on voluntary basis, as there was no obligation –external or internal- forcing them to do so. On the contrary, external influences would advise for the opposite (as seen by the reactions at highest political level within the two communities or the perceptions of UN personnel present in meetings). It was a shared vision and a common interest/concern that prescribed this development.

Lastly, the informal manner of conducting the joint meetings (no official titles for the attending representatives, no minutes from the discussions) signifies a semi-institutional status of the interaction, also dictated by the political issue of no-recognition. The informality of the contact is further accentuated by the conscious decision of the two mayors to hold bilateral talks and agree on issues prior to the meetings involving more personnel and UN mediators. Based on interviews, this has been a preferred practice followed by mayors that succeeded the two initiators; over

time (and the relaxing of the political implications) this contact has been possible also via the phone or even through in-person meetings. This semi-institutional status has been strengthened through the prolonged (quasi 30 years) practice of the unconventional meeting arrangements and is not expected to receive a more rigid status in the absence of a political settlement.

Based on the above, the bi-communal interaction on Mia Milia/Haspolat entails all three core characteristics of policy networks. Whilst aiming for a thorough argumentation in favour of this finding, more elements that ascribe to policy networks will be highlighted. The various definitions of policy networks are kept abreast in this discussion as reference points.

The initial interaction over the plant involved specific individuals and was retained within a close circle of people (i.e. the two mayors and UN mediators). When the agreement to work together was reached (in 1978) a Bi-Communal Team was formed consisting of representatives from both sides, primarily coming from the departments in charge of sewage management, and enhanced with external experts. This group involved trained and on-site technicians that as argued formed a CoP. This involved also high level personnel from the Sewage Board and the Sewage Department (Directors in both cases) who have developed a practice of most regular communication for the day-to-day management of the plant. Therefore, the interaction has ended up involving a wide range of actors (representing also organisations) who are connected to each other by interdependent relationships over information, expertise, access and legitimacy. Moreover, they have chosen voluntarily to cooperate around a specific function (wastewater treatment) and in pursue of a shared goal (the smooth operation of the plant). All the above incorporate extensively the key elements described in several policy networks' definitions (Borzel, 1998; Bomberg, 1998; Benson, 1982; Parsons, 1995; Coleman and Perl, 1999; Bressers *et al*, 1994).

A most important element for the case of Mia Milia/Haspolat is the influence that the bi-communal interaction has exercised onto the formal policy processes on both sides. This is also what distinguishes the policy network from the CoP. More specifically, the initiative of the two mayors back in 1977 directly opposed the official policy line of no interaction among the two communities. By engaging in bi-communal talks (despite conducing them in an informal manner and with all the particularities described above), there was a clear shift away from the policy of segregation, which was –in effect- imposed on the formal structure. By nurturing this informal interaction and establishing a regularity and continuity, the policy network has determined policy choices that are

bi-communal in nature (i.e. the completion of the plant that services areas across the Dead Zone). The longevity and impact of this process has been manifested through formal decisions to further the collaboration and implement the joint project for the upgrading of the plant (as discussed above); it is also included in the joint efforts towards the mobilisation of the necessary financial resources.

It merits attention mentioning that this bi-communal interaction has materialised within a non-hierarchical structure that places emphasis on the horizontal dimension of policy (the participatory element. It was an unconventional modality that functioned horizontally across the two communities for the achievement of a shared goal and was flexible enough to adapt to the variations of the political circumstances (as seen during the recurrent stalling of the plant's construction and the lingering official policy of alienation between the two sides). As stressed already, it has not remained confined within a strictly technical context, but has influenced the policy making process, since the decisions/agreements made during the informal interactions determine the operation and further development of the sewage plant.

Finally, what should be noted is the conscious choice to stay away from politics and to use the specific policy theme as an entry point for wider dialogue among the two sides. This is clearly shown in statements of the two mayors that pioneered the process (Dixon, 1980):

"*We tried to find common ground away from politics. We managed to reach agreement without interfering with the principles of politics...we had in mind during the negotiations the interest of all people in the Nicosia area, whether they are Greeks or Turks*" (Demetriades)

"*When we considered the project, we looked beyond the public health considerations and thought it would open up some more doors for a better dialogue between the two sides*" (Akinci)

As mentioned, the good cooperation on Mia Milia/Haspolat spilled over to more policy areas and namely to the rehabilitation of the capital's old segment. Before exploring the context of the Nicosia Master Plan, the following section analyses the Nicosia Drinking Water System using the analytical frameworks of Chapter III, and particularly that of communities of practice.

3. NICOSIA'S DRINKING WATER SYSTEM

This section will deal with the nature of bi-communal contact regarding the drinking water system of Nicosia. Although not as substantial or influential as the interaction on sewage treatment, the thesis argues that the interaction on drinking water has also constituted a community of practice and has achieved the goal of bi-communal rapprochement. The section commences with a brief presentation of the system and the organisational modalities on the two sides. It then examines the nature of their interaction and concludes with an assessment of this contact through the lenses of the analytical frameworks.

OVERVIEW OF THE SYSTEM & MANAGEMENT MODALITIES

Throughout Nicosia' history, the drinking water provision formed a single system covering the within-the-walls city and the consequential expansion of the capital in the 20th century. The joint system remained in place until 1974, when -and as a result of the *de facto* division- the South's Water Board of Nicosia cut off the water provision to pipes that continued into the North apart from two points. This was not an easy task, as there are hundreds of pipes that cut across the Dead Zone (Interviewee 36[324]), but it was rendered necessary due to the political circumstances. As a result, the management of the drinking water system for Nicosia was divided between the South's Water Board and the North's Water Department with responsibilities extending within their respective operational 'boundaries'.

The Water Board of Nicosia[325] (South) was established as an independent body in 1951 (under the Law on Water Provision for Municipalities and other areas No. 350) and started operating in 1953. Its operation has been complemented over the years by a series of other laws, regulations and directives[326] and its main tasks include: control and supervision of the distribution system; analysis, management and computer collection of data; leakage detection; repair and improvement of the network; installation, repair and calibration of the water metres; collection of user charges (UNHCR, 1997a: 6; Water Board website). The water is collected in three large and nine small reservoirs with total capacity of 74,600 m^3, responding to 36 hours of continuous water provision to consumers[327]. Although 24-hour water provision was

[324] Director of Technical Services in the Water Board of Nicosia at the time of the interview
[325] http://www.wbn.org.cy/index.php/frontpage available only in Greek
[326] A list of these documents (and full access to them) is available on the Water Board's website (in Greek) http://www.wbn.org.cy/index.php/nomothesia-kanonismi
[327] http://www.wbn.org.cy/index.php/diathesinerou (in Greek); further information on the incremental tariff system according to consumption and type of use is provided at http://www.wbn.org.cy/index.php/teli-

achieved in 2001 due to desalination, the post-2006 drought years have necessitated the implementation of rationing measures and occasionally the non-continuous domestic water supply (Pirovolakis, 2008).

The Board's responsibilities start with the reservoirs, including the water produced by the desalination plants, as explained by the Board's Director of Technical Services (Interviewee 36). Thus, the Board operates as a water utility, ensuring its independence and financial autonomy. A suggestion to integrate the Water Board and the Sewage Board into one entity for the comprehensive management of water and wastewater in Nicosia, has formed a policy agenda item but thus far, has not been concretised further (Interviewees 2, 17, 20, 22 and 36).

Across the Dead Zone, the North's Water Department was established in 1993 as one of the ten departments of the Nicosia Turkish Municipality with the main task of distributing water to the population, as explained by the Head of the Department (Interviewee 45). The legislative framework dates back to colonial times, with the majority being British water laws (ibid). The Department is not an autonomous body and relies entirely on the Municipality for support, financial, technical and otherwise. As a result, there are serious restrictions on financial availability and the budget provided by the Municipality mainly covers the salaries of the personnel (UNHCR, 1997a: 7).

The key difference with the South's Water Board is that the responsibility of the Water Department does not start with the reservoirs, as these remain under the North's Waterworks Department. This poses serious difficulties for planning, mapping and managing the system as the personnel is responsible only for following the daily line of work. As Interviewee 45, Head of the Department, eloquently explained: "*imagine operating a car where the petrol deposit belongs to someone else*". Nonetheless, efforts have been underway by the Municipality and the Head of the Water Department to bring these responsibilities under their management framework. Efforts are also underway for the construction of a treatment plant, as the metered and paid-for water that reaches the consumers is only chlorinated in the reservoirs.

The overall drinking water system of Nicosia, and as mentioned, was separated in 1974 leaving only two pipes cutting across the Green Line and running on both sides. Given that, until then the water provision of the capital was unified, the separation of the system caused acute problems in supplying potable water to North Nicosia's

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nerou (in Greek), while the management of the system is explained at http://www.wbn.org.cy/index.php/diaxirisidiktiou (in Greek)

population. In response to this urgent need the North constructed a pipe bringing 8,000 m^3 of water per day from the Morfou area (where the largest aquifer lies) directly to the capital. Upon completion of the infrastructure in 1986, the Nicosia water distributional system became dual, and shutting down the valves in the South no longer affected the water provision in the North (Interviewee 45).

However, even with this new pipe, North Nicosia was still short on water to meet its population's needs, amounting to 20,000 m^3/ day, and the provision had to be complemented with water from the South through the two existing joint pipes. This volume of water is calculated at about 5,000 m^3/ day, although according to Interviewee 45 the actual amount it 3,000 m^3/ day, with the remaining 2,000m^3/ day being water that the South withdraws from the Morfou aquifer on its side of the divide and gives back to the North. These figures represent subjective approximations, as the areas from which the water flows are beyond the Department Head's responsibility and thus, he could not provide more accurate data. More reliable information was provided by the Water Board of Nicosia that has set up metres and calculates the water going into the North. This flow, and for an indicative five-year period (2000-2004) amounted to:

Table 10: Water provision to the North

Year	**Quantity (in m^3)**
2000	681770
2001	1258200
2002	1751370
2003	1792880
2004	1166360

Source: Water Board of Nicosia[328]

The cost of the water flowing across the Dead Zone is covered by the Government of the South, as this water quantity is deducted from the total that the Water Board buys from the WDD (Interviewee 36[329]). However, the domestic water demand of North Nicosia is still not covered (there is a remaining deficit of 7,000 m^3) and the "authorities" have been exploring other ways of complementing the provision, including the water transfer option from Turkey, as mentioned in Chapter VI. In the meantime, strict rationing measures have been in place, with water provided on average three times per week to each of the 27 areas of North Nicosia. Given that the drinking water supply of South Nicosia relies predominantly (95-99 per cent) on expensive desalinated water,

[328] The data was made available at the premises of the Water Board by Interviewee 36 and is not included in the official documents or the website of the Board
[329] Director of Technical Services in the Water Board of Nicosia at the time of the interview

any further provision of water to the North would have simply been "*unfair*", as the Turkish Cypriot Mayor, Interviewee 43, commented.

BI-COMMUNAL INTERACTION ON THE DRINKING WATER SYSTEM

The level of co-operation between the representatives of the two communities regarding drinking water may appear negligible when compared to the level of co-operation for sewage treatment or the Nicosia Master Plan. Nonetheless, direct communication has been possible and regular between the South's Water Board and the North's Water Department after the latter's establishment in 1993 (Interviewees 36 and 45). UNHCR (1997a: 8) reported direct contacts (1-2 per week) between the two bodies regarding the daily inflow and distribution system in Nicosia, as the two systems are interconnected. An additional four bi-communal meetings were held with UNHCR support between 1993 and 1995 in order to discuss the water distribution system in Nicosia, focusing mainly on the leakage detection system implemented in the South. The meetings, however, were stalled for two years after that, due to the political unwillingness of the South's representatives to visit the North's premises and the lack of sufficient data from the side of the North in order to carry out joint studies.

The bi-communal contact resumed in 1997 with a meeting in UNHCR premises that focused on the actual water situation on both sides and the different projects and studies underway. The meeting concluded with an agreement to form a bi-communal team to carry out a hydro-geological study of the Morfou aquifer (that concerns both sides). Nevertheless, the contact was halted again and has remained dormant ever since. The reasons for the stalemate, as assessed by UNHRC (1997a: 15-16), include i) the reluctance of the South to engage into potentially political discussions, manifested through its representation in the meetings by retired personnel, ii) internal institutional miscommunication in the North resulting in the participation of the Near East University in the meetings (instead of the Waterworks Department), iii) the potential negative climate created by a UN-proposed joint study on the cross-'border' Karyotis/Atsas River.

Another possible explanation could be the different priorities of the two sides with regard to their respective drinking water systems. The South, through the implementation of extensive leakage detection and prevention systems managed to reduce leakages to 5 per cent (Interviewee 36). The North, on the other hand, still faces serious leakage problems and maintains the issue high on its water policy agenda. Thus, the conditions for bi-communal co-operation, coupled also with the

political circumstances, were adverse, if not redundant. According to the Head of the Water Department in the North "*...I offered to work on bi-communal projects, but the political situation was not in the right time and place and I understood that they* [the Greek Cypriots] *did not face similar problems and were not interested in such projects...but they also did not object when leakage detection projects were put forward for our side and we got the technical and financial assistance*..." (Interviewee 45). Moreover, the suspension of bi-communal contacts until the 1997 Luxembourg Summit and the finalisation of Cyprus' EU accession procedure [330] placed an additional impediment to bi-communal engagement of any type.

Although joint project work was not rendered possible, regular communication has been in place between the Water Board and the Water Department for the operation and maintenance of the two joint pipes and the provided water (Interviewees 36 and 45). The contact is of technical nature (e.g. for shutting down the water provision in order to repair broken pipes) but nonetheless frequent (at times even daily according to the interviewees). This communication, although informal and based on good personal relationships, serves the effective operation of the interconnected drinking water system and presents another area of bi-communal co-operation in the capital.

Another good example of cooperation regarding potable water, although outside Nicosia (and thus, of the thesis' focus area), concerns the Pyla village. Pyla[331] is one of the four villages located within the Buffer Zone and is the only bi-communal settlement in the island (Bailey, 2004). As the two communities live side-by-side, the distribution system provides water to the entire population and therefore, there is a joint consultation and decision-making process in order to improve the quantity and quality of the provided drinking water (UNHCR 1997a).

THE NICOSIA DRINKING WATER SYSTEM AS A COMMUNITY OF PRACTICE

The type of bi-communal interaction on the drinking water system, as presented above, seems to fit well into the characteristics of a community of practice. Based on interviews as well as secondary material, regular interaction is in place between the Water Board of Nicosia (South) and the Water Department (North) on the issue of drinking water provision. The two departments are on regular contact (as derived from the interviews) and deal also with emergency issues (like leakages, bursting of pipes) which may require daily communication. The group of people involved in this

[330] http://ec.europa.eu/enlargement/press_corner/key-documents/index_archive_en.htm
[331] An empirically based analysis of the socio-psychological aspects of the bi-communal co-existence in Pyla is provided in Papadakis (2005: 207-237)

interaction deals with purely technical issues relating to the drinking water system and needs to work together for the effective operation of a system that is interconnected.

Moreover, the group's engagement has been on-going since 1993, despite some brief periods of non-contact. The members of the group, though not interdependent for the operation of the systems within their respective 'boundaries', they share practice when it comes to the two pipelines that cut across the Dead Zone. Thus, there is a level of transfer of know-how among individuals (and on occasion of material and equipment) from the one side to the other (Interviewee 36[332]). Through this on-going practice the members of the group have become the focal points for this collaboration and have developed into a *de facto* community. The identity of this community is distinct and even the names of the members are provided when related queries are posed (as experienced during the fieldwork).

However, it is not the mere sharing of knowledge that is important, but the role of knowledge in increasing the capacity for bi-communal action and enhancing an on-going cultural process embedded in everyday practice. As mentioned also in the sewage system section, it is the regularity of engagement and the mutual pursue of a common concern that creates bonds among the group members. This is paramount in the creation of a shared identity that is defined according to function and not according to 'boundaries' (even if they are *de facto* determined). It merits attention to note that the author's interview with the Water Department in the North was facilitated by the South's Water Board through direct personal communication.

Based on the above and *vis-a-vis* the definition and functions of a CoP, the thesis argues that the bi-communal collaboration on selected parts of the drinking water system in Nicosia represents such a formation. It is further argued that the drinking water system CoP in has not evolved into or does not complement a related policy network. This is because the bi-communal interaction covers exclusively technical issues and does not entail any policy connotations. Despite some efforts to develop joint projects on the drinking system, the different development levels, financing opportunities and water priorities have left these efforts void of context. Having said that, the value of the drinking water interaction should not be diminished; it functions in complementarity to all other efforts supporting bi-communal rapprochement. This is particularly significant, as in the post 1974 context each side has undertaken separately a series of water projects for the provision of drinking water. Recalling the presentation of Chapter V, in the South the Southern Conveyor Project, a large number

[332] Director of Technical Services in the Water Board of Nicosia at the time of the interview

of dams and reservoirs and desalination plants have been constructed; in the North, a number of dams and reservoirs have been built, boreholes drilled, a water conveyance pipeline constructed and studies completed on importing water from Turkey.

An examination of the two sides' trajectory with regard to the overall drinking water provision for Nicosia shows that bi-communal collaboration is at best challenged (as shown also in the standstill of joint projects across the Dead Zone on the Karyotis/Atsas River for example). Nonetheless, bi-communal interaction on drinking water needs to be further developed and fortified, given the partially interdependent nature of the systems. The South's comparative advantages could be beneficial for the North, especially with regard to leakage detection, aquifer observation, training of personnel, etc. Also the mutual benefits from establishing an inter-communal trade in water could be further explored. As in the case of sewage treatment and the Nicosia Master Plan that will follow next, the thesis is firmly placed in favour of such informal modalities that provide more flexible (though lasting and well-recognised) forms of bi-communal interaction.

4. THE NICOSIA MASTER PLAN

This semi-final section of Chapter VII is dedicated to the Nicosia Master Plan and the applicability of the analytical frameworks of the thesis to this element of bi-communal interaction. The section commences with the presentation of the Plan, its background and the circumstances under which it came about amidst the politically-loaded post-1974 era. It continues with an evaluation of the bi-communal engagement and concludes with an assessment of whether it represents a CoP or a policy network.

BACKGROUND TO THE NICOSIA MASTER PLAN

As discussed in Chapter I, Nicosia is a multi-cultural city and the hub of urban activity in Cyprus. Over its long historical trajectory, the city has formed a living legacy of the island's rich heritage of architectural and urban infrastructures, also reflecting the amalgam of different cultures that have shaped Cyprus' unique identity. However, the events of 1974 have resulted in the physical *de facto* partition of the capital. A Buffer Zone splits the town into two separate urban parts that have been developing independently of each other ever since, causing the transformation of the city's structure and the disintegration of its unified character. The Green Line, cutting across the capital's historical and cultural heart, brought about the abandonment of the central

area. The centre lost its identity as the city's core and its capacity to attract investment and activities, thus resulting in the decay of its architectural fabric and the quality of its environment (Demetriades, 1998). More importantly, Nicosia turned into a 'frontier town'[333], forming the point of contact and separation for the island's *de facto* divided communities. Under the impact of rapid growth and the reality of the *de facto* division, years of unplanned, uncontrolled and un-coordinated development have created accumulated problems for contemporary Nicosia (Interviewee 39[334]).

Encouraged by the success of the Nicosia Sewage Treatment Plant in 1978, the then two mayors, Mr. Demetriades and Mr. Akinci, representing the Greek and Turkish Cypriot communities respectively, met under the auspices of UNDP on 24th October 1979 at the Ledra Palace to discuss the coordinated urban development of the shared capital.

The good personal contact of the two men, fuelled by their common architectural background and their sensitivity towards issues of urban planning, formed again the catalyst for the initiative. As Interviewee 5 [335] recalled:

"...when we succeeded with the sewage plant, we continued with the city-planning project. Once the Master Plan idea started moving we travelled together with Mr. Akinci to various places pursuing our common goal. We went to Venice for example, to seek financial assistance for the restoration of Nicosia's Venetian walls. We went to Berlin, which was a revelation for both of us...we saw the old beautiful buildings, museums and other public premises of West Berlin being separated with the wall from the depressed areas of East Berlin and realised the amounts of money and effort that a potential re-unification –which in fact happened- would require...we decided that we couldn't let Nicosia become another Berlin..." (also in Demetriades, 1998: 174)

NMP'S CONTEXT & WORK PHASES

Following the 1979 meeting, a bi-communal dialogue started on a comprehensive urban plan for the within-the-walls city and the Nicosia Master Plan (NMP) was launched in March 1980. The overall objective was "*the improvement of the existing and future habitat and human settlement conditions of all the inhabitants of Nicosia"*[336].

[333] http://www.nicosia.org.cy/english/enniaio_eisagogi.shtm
[334] The Turkish-Cypriot Mayor of Nicosia when the informal bi-communal cooperation started in 1978, Leader of the Peace and Democracy Movement Party at the time of the interview
[335] The Greek-Cypriot Mayor of Nicosia at that time
[336] http://www.undp-pff.org/index.php?option=com_contentandtask=viewandid=80andItemid=140

A set of immediate objectives were set within the NMP Project[337] and for this purpose, a bi-communal multi-disciplinary team of national and international experts was formed in 1981 in order to handle the difficult task of preparing a joint Master Plan and securing the harmonious development of Nicosia. The team consisted of town planners, architects, civil engineers, sociologists, economists and experts in traffic and transportation, conservation, landscape, urban finance and other technical staff from both sides, amounting to more than 50 people[338]. It is important to note that this bi-communal team was one of the first attempts for large-scale joint technical co-operation between the two communities.

During the preparation of the master plan particular attention was paid to the preservation and rehabilitation policy for the Walled City, which is considered the most precious part of Nicosia. The NMP confronted the rehabilitation of the historic centre as a multi-dimensional process incorporating architecture, planning, as well as social and economic objectives[339]. Moreover, the Buffer Zone was identified by the NMP as the most important 'gluing' area for the functional integration of the city. According to the NMP policy, its development should assume its original but enriched role as the hub of activity, which will benefit the Walled City and Nicosia as a whole.

The NMP has been conducted in three phases: the first two were dedicated to its preparation, while the third one (on-going) has been dealing with its implementation in targeted pilot areas.

Phase I of the NMP was realised between December 1980 and July 1984. It involved a detailed survey of the existing situation and the preparation of a Diagnostic Report[340]. What is important is that the proposed Plan was sufficiently flexible in order to address needs under existing circumstances and was capable of meeting new demands should favourable political developments occur. For this purpose it included two scenarios for Nicosia: one with and one without a Buffer Zone (UNDP, 1987; Interviewees 26[341] and 46[342]).

[337] These objectives, as outlined in the NMP Project Document were to: present a diagnostic survey of the existing situation; prepare an inventory of problems; to identify proposals for measures to be taken to address these problems, which would be compatible with the objectives of the project; ensure a wide exchange of views on the proposed measures between all parties with an interest in the NMP project; prepare a physical master plan compatible with the cultural and socio-economic aspects of Nicosia as a whole.
[338] http://www.nicosia.org.cy/english/enniaio_omada_meletis.shtm
[339] http://www.undp-pff.org/index.php?option=com_contentandtask=viewandid=80andItemid=140
[340] A long-term physical plan for a greater Nicosia up to the year 2000 was drafted, including a general development strategy based on the need to "*concentrate and consolidate the city*" (NMP Leaflet).
[341] Project Officer in the Nicosia Master Plan, at the time of the interview
[342] Deputy Director of the Town Planning Department in the North at the time of the interview

During Phase II (1984-1985) an Area Scheme for Central Nicosia was drawn up, including the walled city and the central business centre, along with an approved investment programme for special projects (Interviewee 46). The major task of the NMP team was to strengthen the administrative and service functions of this part of the city for greater economic impact and to contribute to the creation of a visually identifiable city centre for Nicosia[343].

The official presentation of the NMP was made during a ceremony at the Ledra Palace on the 18th January 1985. The two pioneer mayors, present at the ceremony, commented the occasion as "*...a landmark in the tormented life of our capital city...not only because of the development accomplished, but also the will of all its people to protect Nicosia and make it a better place...*(Demetriades)", and described the NMP as *"...a set of policies and proposals, which could be the tool in solving the problems of our city...*(Akinci)" (NMP Leaflet)

Photo 10: The Nicosia Master Plan Logo

Source: Nicosia Municipality website; UNDP-PFF website

In 1986-1987 the NMP entered Phase III, its implementation phase, which is on-going. During this phase, the NMP has placed special emphasis on short and medium-term development projects (5 to 10 years) that represent the backbone of the project's policy and have constituted the common implementation tool for both sides[344]. The aim was to stimulate the physical, functional, economic and cultural reactivation of central Nicosia, as the key to the overall development of the city (NMP Leaflet). The phase's strength - and challenge at the same time- is that it relies on the initiative of the public sector to actively shape the future direction of the city (UNDP, 1987), although the projects are

[343] http://www.nicosia.org.cy/english/enniaio_anaviosis.shtm

[344] In the late 1980s, physical bricks-and-mortar projects began with two major residential rehabilitation projects in the areas of Chrysaliniotissa and Arabahmet in the Greek and the Turkish quarters of Nicosia respectively (UNDP, 1987). This implementation phase is in progress with a large number of special projects pursued simultaneously by the NMP team, amounting to almost a hundred. The focus is on the reconstruction of the central area of the city, the rehabilitation and renovation of important areas of the historic centre, the improvement of traffic and transportation and visual improvements in the landscape, urban form and urban design. Priority is given to twin projects on the two sides.

overall funded either by local funds or by foreign organisations committed to contributing to the revitalisation of Nicosia as a whole.

A revision of the original Plan was deemed necessary in light of the developments over the last twenty years, the contemporary needs of the city, and the challenges posed by future development. The NMP 'New Vision' initiative (Interviewees 26[345], 44[346] and 46[347]) has a strong external backing as it is supported by the Bi-communal Development Program[348] and the EU-funded programme Partnership for the Future[349] and aims to define new short- and long-term initiatives that will bolster the city's development as the centre of economic activity based on Nicosia's rich cultural heritage[350]. The focus of NMP's 'New Vision' on the buildings of the Buffer Zone renders the project an essentially bi-communal one. This element is strengthened by other smaller projects like the opening of information centre in the Buffer Zone (providing information on the NMP and bi-communal activities) or the tourist walking tours, as mentioned by the Mayor of Nicosia (Interviewee 38).

IMPLEMENTATION IMPEDIMENTS & BI-COMMUNAL INTERACTION

The NMP was intended to form a flexible planning process, involving technical teams from both communities in order to design and implement infrastructure and cultural preservation projects throughout the city. The multi-disciplinary composition of the team ensured an integrated approach to the project, while the focus on twin projects across the Dead Zone strengthened the role of NMP as a catalyst for bi-communal rapprochement.

In terms of organisational modalities, in the South the responsible bodies (the City Planning Department and the Town Hall) are under the same administration (Nicosia Municipality) (Interviewee 26), which facilitates coordination. In the North however, the situation is more complicated, with a number of administrations involved in the project (Works and Improvement Department of the Turkish Municipality, Town Planning

[345] Project Officer in the Nicosia Master Plan, at the time of the interview
[346] Civil Engineer in the Turkish Municipality of Nicosia at the time of the interview, heavily involved in the NMP
[347] Deputy Director of the Town Planning Department in the North at the time of the interview
[348] Funded by the United States Agency for International Development (USAID) and UNDP and executed by the United Nations Office for Project Services (UNOPS)
[349] Which has been implemented by UNDP, in collaboration with its executive agency UNOPS, since October 2001. PFF was presented in Chapter V. It aims at contributing to the peace-building process in Cyprus through different levels of intervention ranging from urban infrastructure rehabilitation to assistance to small and medium-sized enterprises as well as the de-mining of the Buffer Zone, more information is available at:
http://www.undp-pff.org/index.php?option=com_contentandtask=viewandid=1andItemid=2
[350] The Project includes works in the Omeriye Area, the Selimiye Quarter, the Samanbahce Area, the Phaneromeni Area (Stage 1), the Municipal Market (Stage 1) and Bedestan (UNDP-PFF, 2004)

Section, Department of Antiquities, among others) (Interviewee 44). Regarding the legal framework, NMP was incorporated in the South's legislation almost since the beginning of works, but in the North the necessary law for the whole scheme was only signed and published in the 'official' Gazette in 2001. As Interviewee 39 recalled *"...it was with my signature [as Minister of Economy and Tourism at that time] that the NMP started to be used in full...it was an honour to be able to put into effect a Plan for which I was one of the initiators...at the same time I was upset that it took a long time to be prepared and years were spent without proper implementation...*"

Additional obstacles were encountered in the implementation process in relation to the project's financing. In the South the process was faster, as the internationally recognised Government had access to credit (Interviewee 38[351]). In the North, "*the situation was very disappointing at first as the project foresaw the spending of $5 million in five years and we only had available about $ 150.000 per year...we could only restore one building per year in areas where the majority of buildings required restoration*" (Interviewee 44[352]). As a result the project was delayed and the restoration activities were isolated and of minimum impact to the public. It was only when the implementation method was modified that "*we tried to concentrate the activities on the same street, taking all the buildings and restoring their facades so that we could have something to show to people*" (Interviewee 44).

Despite the legal and financial impediments, a partial implementation of the NMP took place, mainly in the within-the-walls city. The bi-communal team used to meet periodically at Ledra Palace to discuss technical aspects of projects underway. Before 1998 (and the initiation of Cyprus' EU accession negotiations) meetings were taking place every 15 days in neutral (UN) areas (Interviewee 46). "*We used to put on the table all the common problems and try to see how we can find common answers. For example, the city walls were deteriorating on both sides. We agreed to bring somebody from abroad to make a survey...for the first time photos of the walls were taken in the military zone...using the survey the way opened to repair the walls on both sides*" (Interviewee 44).

Since the initiation of the 'New Vision' initiative, the meetings tended to be more irregular and were usually held between individuals (and not the team) according to needs (Interviewee 46). In this case the issue of non-recognition of the North is more palpable given the more active involvement of external actors (USAID, UNDP/UNPOS,

[351] Greek-Cypriot Mayor of Nicosia at the time of the interview
[352] Civil Engineer in the Turkish Municipality of Nicosia at the time of the interview, heavily involved in the NMP

and EU). It is interesting that the bi-communal NMP team is not registered anywhere and for the North the relevant letters/documents are always addressed to individuals and not to the Turkish Municipality (that is the main counterpart) (Interviewee 44). Nonetheless, the contact is on-going and the post-2003 opening of crossings has facilitated more direct contacts, without necessarily the intervention of UNOPS (Interviewee 26).

Despite the various impediments, the withstanding implementation of the NMP confirms the bi-communal commitment to work together for the benefit of the shared capital. This reality was also made obvious to the author through interviews with key actors of the NMP (Interviewees 5[353], 39[354], 38[355], 43[356], 26[357], 44[358] and 46[359]). An assessment of whether this engagement represents a policy network follows below.

THE NMP POLICY NETWORK

The thesis argues that the NMP bears the characteristics of an active policy network in Nicosia, though not related to the water sector. As in the case of the development of the sewage plant policy network, the NMP emerged in order to capture the inter-connectedness and dependencies that a common goal (i.e. the rehabilitation of old Nicosia) entails. Alike the Mia Milia/Haspolat policy network, it was initiated and set in motion through the good personal relationship of Demetriades and Akinci, but its implementation necessitated the formation of a non-hierarchical bi-communal team consisting of more than 25 people from each community. Thus, it includes an identifiable and policy-concerned set of actors that depend on one another for resources, including information, expertise, access (to resources and also to locations) and legitimacy. In the case of the NMP, its formation illustrates more vividly the ability to include diverse actors (over 50 experts from different disciplines and organisations across the division) into webs of stable and regular interaction so as to offer plausible solutions to coordination problems; all this is in alignment with policy networks' proclamations.

The NMP reflects the qualities of a policy network in that it is a semi-institutional formation of non-obligatory nature that is based on communication and trust. The

[353] The Greek-Cypriot Mayor of Nicosia when the informal bi-communal cooperation started in 1987
[354] The Turkish-Cypriot Mayor of Nicosia when the informal bi-communal cooperation started in 1978
[355] Greek-Cypriot Mayor of Nicosia at the time of the interview
[356] Turkish-Cypriot Mayor of Nicosia at the time of the interview
[357] Project Officer in the Nicosia Master Plan at the time of the interview
[358] Civil Engineer in the Turkish Municipality of Nicosia at the time of the interview, heavily involved in the NMP
[359] Deputy Director of the North's Town Planning Department at the time of the interview

analysis of the sewage plant concerning the network's characteristics has applicability in this case as well. The network was formed voluntarily and this is also how is has been sustained over time. It represents an informal, though stable, web of co-operation between a wide range of actors; as mentioned, the bi-communal NMP team is not registered anywhere and the involvement of actors is done at a personal level and not as representatives of specific bodies. The actors have interdependent interests and thus, strive to solve urban planning issues of collective action outside the hierarchy of the two communities. Moreover, the on-going character of NMP (for about 30 years) and the uninterrupted bi-communal involvement form evidence that the two sides consider cooperation as the best way to achieve the common goal and pursue the shared interest of rehabilitating the capital in a sustainable and integrated manner. This was clearly recognised and accentuated by different actors during interviews.

A key difference with the sewage plant policy network is that the NMP benefitted from (and was largely based upon) the positive climate of trust cultivated within and across the two communities as a result of the agreement over Mia Milia/Haspolat. Thus, securing the initial levels of trust for setting the policy network in motion was provided by the collaboration on the sewage plant that preceded chronologically; the endurance of this trust and its strengthening over time however, was the result of the cooperation modalities and achievements of the NMP team alone.

Importantly, and in addition to the other elements it demonstrates, the NMP has strengthened the horizontal dimension of cooperation on a public policy issue (through the active participation of different stakeholders) and has provided an adaptive policy making metaphor that is discharged of the rigid connotations of vertical policy making. The composition of the NMP team (in terms of fields of expertise and roles) plausibly displays that in complex political economies (charged additionally with a *de fact* division) there is no single actor possessing all necessary resources to effectively deal with a complex policy issue like that of the old city's rehabilitation.

The flexible structure of NMP responded to the needs of a shared goal without compromising the politically-charged requirements of official policy of segregation and non-recognition. Even more so, it demonstrated ability to by-pass the official line of no-contact and 'impose' the implementation of a set of activities of essentially bi-communal nature. As with the sewage policy network this is perhaps the most important aspect and what differentiates a policy network from a community of practice: the ability through the networks' operation to alter the policy process, influence the selection of policy options and to allow for a social construction of policy that does not

remain on paper but is translated into specific action. In the NMP case, a policy for the rehabilitation of the within-the-walls parts of the capital was explicitly included in the two sides' policy agendas and it was materialised through a policy that necessitated bi-communal interaction. The NMP project, has acquired a semi-autonomous status with its implementation largely depending on the bi-communal team, including its continuation as well as any modification of scope (as the initiation and implementation of the New Vision Initiative for example).

Underlying the NMP project – and reflecting the essence of policy networks - has been the idea that close and systematic co-operation can foster new bonds of understanding. And this is taking place beyond the imposed restrictions of formal policy- making in Cyprus. Over the long-term, such linkages may assist to overcome the prevailing fear and mistrust between the two communities (UNDP, 1987). Above all, the revitalisation of the ancient Cypriot capital symbolises the promise of two communities living in harmony (UNDP, 1987).

5. CHAPTER EPILOGUE

Chapter VII concluded the empirical analysis. The above discussion addressed the third objective of the thesis and therefore delved into the exploration of its key research question: whether bi-communal engagement exists in Nicosia, in what context and whether it reflects the analytical frameworks of the thesis.

In order to address these issues, the Chapter elaborated separately on the three types of bi-communal interaction in Nicosia; an assessment on whether they respond to the characteristics of the thesis' analytical frameworks was provided under each one. In order to carry out this task, a detailed presentation of the underlying conditions for these interactions was carried out, coupled with ample reference to their background and step-by-step development. Based on empirical evidence from interviews and secondary sources, the thesis found that:

- a policy network and a community of practice exist and are on-going with regard to the sewage system of Mia Milia/Haspolat,
- a functional community of practice is present concerning the drinking water system, and
- a stable and operational policy network is in place regarding the Nicosia Master Plan for the rehabilitation of the capital's old segment.

Based on evidence from the separate analysis of the three co-operation sectors against the principles of the analytical frameworks, the thesis shows that forms of alternative governance are present in Nicosia and defy the communities' political segregation. As such they represent an alternative vehicle for the rapprochement of the two sides. The key quality of these informal, stable, non-hierarchical clusters of co-operation is that they strengthen bi-communal inter-dependencies, promote joint practice and gradually shape a shared identity. And through their longstanding operation (of about 30 years) they have acquired a distinct status that is well-recognised by both sides. Moreover, they have succeeded in surpassing the island's political deadlock by challenging the political implications of direct contact. In that way they have facilitated the horizontal self co-ordination among diverse actors on concrete policy issues and the entry of the informal agreements/decisions into the official policy line.

More importantly, they have set off a process of bi-communal rapprochement that is "*irreversible*" (Interviewee 5 and 39[360]). Given the post-1974 climate of fear and suspicion between the two communities, these alternative forms of governance enhance the restitution of trust through on-going communication and shared practice. The more the two sides work together, the more they re-evaluate the notion of 'us' as opposed to 'them' and break away from a segregated mentality. It is the thesis standing point that in the same way that the alternative governance modalities on sewage spilled over onto issues of urban planning, they may entail further spill-over qualities for effectively 'responding' to Cyprus' political question.

A synthesis of the empirical findings of the last three chapters *vis-a-vis* the theoretical and analytical frameworks employed by the thesis will be carried out in the next, and final, chapter of the thesis.

[360] The two mayors that were in office and initiated the bi-communal interaction in 1978

CONCLUDING CHAPTER

Policy Networks across the Dead Zone: a shift towards alternative forms of water governance?

1. INTRODUCTION

The thesis' concern has been with the issue of bi-communal cooperation over water in Cyprus. It has sought to answer whether this engagement exists and, if so, to describe the form it takes. The convoluted and discursive nature of water resource management in the island cannot be stressed enough; it is not merely another issue in the policy agenda but, rather, it represents the second most important issue after the political question. On the one hand, there is an inherent scarcity that—coupled with an ambitious socio-economic development—has led to an overexploitation of groundwater resources and to a maximum storage capacity for surface water. On the other hand, since 1974 the island's *de facto* division has arbitrarily split the scarce water resources between two diverging although interdependent entities. Therefore, the competition between different users and uses has led to the intense politicisation of water, a situation that has been additionally charged with security concerns due to the *de facto* boundary separation. As a result, a complex water-politics nexus has emerged that impedes the development of a much-needed integrated approach to water resource management on the island.

To effectively answer the thesis' research question, the theoretical framework of *policy analysis* has been selected because it addresses the centrepiece of water management in Cyprus (i.e. the politics/policy interaction). The island's post-1974 political deadlock inhibits formal interaction between the two communities and has necessitated a search for the tools and/or methods that are capable of transcending these constraints. Therefore, the thesis has chosen *policy networks* and *communities of practice* as its analytical frameworks; both respond well to politically-charged environments as they focus on theme-specific and objective-centred, informal, horizontal interaction. These tools are complemented by elements of policy analysis that support actor interaction within (and without) a specific structure and accentuate the role of contact over discord. Equipped with the above and a combination of research methods, answers to the research question have been sought.

The aim of this final chapter is to review and assess the overall procedure. It begins by reflecting on the research process and the limitations that have been encountered. It

then continues with an assessment of the thesis' threefold objective against the empirical analysis which simultaneously highlights the main findings. The chapter concludes with a review of the thesis' research question, its added value and the identification of potential directions for future research.

2. REFLECTIONS ON THE RESEARCH PROCESS

As explained in Chapter IV, the thesis has followed a qualitative, interpretivist and constructivist research approach. This approach was adopted on the basis of the research question and the focus of the enquiry. The main research method was the semi-structured interview: 55 interviews were carried out with stakeholders from both sides of the island. Secondary sources, available in libraries, online and also collected during four sets of fieldtrips were also vital. The interviews were particularly important in the research process as they provided information that was not available/documented elsewhere. Moreover, the selection of interviewees covered the key stakeholders and all the players involved in those bi-communal activities that are of interest to the thesis. Securing the input of high level representatives from the respective institutions in both the South and the North (including former and current Mayors, Water Directors, former Ministers, Heads of Sewage and Drinking Water Department, to name a few) proved invaluable for capturing the essence (and on occasion the first-hand experience) of bi-communal collaboration. Additional research methods were also used, namely case studies/focus themes, narrative presentation, a grounded theory approach and mind maps.

During the research process some limitations were encountered:

(i) Access to resources

Perhaps the most significant limitation concerned the availability of information for the North. This was more pronounced than initially anticipated. Given its international isolation and the issue of non-recognition, Turkish-Cypriot academic materials are scarce (the North's Universities face issues of representability in European and other academic forums) or are accessible only within the respective institutions in the North, and most often only in Turkish. Moreover, and as was confirmed during the fieldtrips, the digitisation of data/information is particularly limited; for example, annual reports of the "Water Development Department" were not available (even in Turkish) and neither were copies of laws and plans, such as the Master Plan for Water.

Similar problems—although to a lesser extent—were encountered during information-gathering in the South (e.g. data on households using the greywater reuse system or accurate figures on recycled water quantities). It is noted that the figures provided during several interviews (in both the South and the North) were largely rough estimates of the interviewees and were not necessarily confirmed by secondary material. There was a widespread tendency in both South and North for approximations when discussing raw amounts/data, a reality that rendered the compilation of information (in a reliable scholarly manner) challenging. The thesis tried to overcome the problem of data availability (and reliability) by triangulating information from available secondary sources, interviews and material collected during fieldwork.

Another challenge for accessing material concerned language limitations. Accessing Turkish language material was problematic; although the author has a basic knowledge of Turkish that is adequate for correspondence and social interaction, this was not sufficient for making proper use of Turkish academic resources.

(ii) The issue of subjectivity

Linked with the problem of access to material, was the issue of subjectivity; it concerned both the reliability of information and its interpretation. For example, the overview of water supply and demand (Chapter V), or the analysis of water recycling (Chapter VI), include an array of alternative figures that many not necessarily converge. The thesis opted to present the whole range of figures in an attempt at objectivity and to represent all opinions, even when they conflict. Again triangulation was sought among all available information to reduce the potential margin for error.

The subjectivity of interpretation is an expected risk of qualitative analyses, one heightened in this case given the use of interviews as a primary source of information. The juxtaposition of the different opinions and viewpoints of stakeholders was chosen as a way of counterbalancing the subjectivity of the provided information, given that the issues of enquiry are not quantifiable. Simultaneously, acknowledgement has been made of the risk of subjectivity derived from the involvement of the researcher/interviewer in the research process by incorporating the element of interpretivism into the research approach. With the use of neutral terminology (i.e. South, North, the events of 1974), effort was made throughout the research process to minimise the levels of interpretational subjectivity as far as it is possible to do so. Moreover, by opting against observation as a method of analysis, the author has tried

to keep biases and preconceptions from her own background (as a Greek national with certain viewpoints on the triangular relationships among Cyprus-Greece-Turkey) from entering into the research process and potentially compromising the objectivity of findings.

(iii) Focus of the thesis

The thesis focused on the context of the research question (bi-communal cooperation on water) and therefore did not consider other examples of bi-communal engagement in its analysis (e.g. the preservation of historical monuments, rehabilitation of old neighbourhoods, de-mining activities, cultural activities and civil society co-operation). These examples might have further illustrated the essence of bi-communal cooperation but examining them would have unduly extended the thesis' scope of work beyond the focus theme (water). Similarly, the thesis did not examine the Cyprus' political question because (a) this issue has already received extensive coverage in the existing literature and (b) any attention afforded to the issue would have diverted from the consideration of alternative forms of governance (given that it would have focused on conventional political discourses).

3. ADDRESSING THE THESIS' THREEFOLD OBJECTIVE

The following section examines in sequence the three objectives of the thesis, as outlined in Chapter I, the aim being to assess them against the empirical analysis.

3.1 REVIEWING CONVENTIONAL WATER MANAGEMENT ACROSS THE DEAD ZONE

The thesis' first objective was to *conduct an integrated presentation of conventional water resources management based on information from both sides of the island*.

This review (Chapter V) contextualised the thesis' geographical scope and the thematic focus on water over the entire island of Cyprus. It illustrated the island's challenging water conditions, exacerbated by unreliable and seemingly reduced rainfall patterns since 1970, and the efforts made, by each side, to maximise the use of conventional water resources. Moreover, a review of water demand was conducted, which indicated the growing gap in the water budget across the *de facto* division. Besides demonstrating the scale of the water deficiency, the systematic presentation of water

resources management across the island highlighted the unsustainability of conventional water development and the implications of segregated water management efforts.

More importantly, the review was conducted in an integrated manner, juxtaposing and collating information for both sides of the island. To the best of the author's knowledge, the compilation of water-related information for the two sides in a single document has not so far been undertaken in scholarly work. Previous conducted reports date in the pre- or immediate post-independence period (circa 1960) and therefore do not reflect on recent developments (e.g. the changes in water demand due to the mass movement of people after the 1974 events, the post-1970s evidence-based reduction in rainfall patterns or the colossal development of water infrastructure that the South completed by the 1980s, to name a few).

Therefore, a primary contribution—and originality---of the thesis was in its integrated presentation of information coming from both sides of the island. There is no claim of providing or generating new information, although some of the data collected during interviews with Northern stakeholders is not documented elsewhere; instead the aim was to direct attention to a cross-'border' review of available information.

3.2 POLICY ANALYSIS FOR CYPRUS: THREE DISCURSIVE WATER THEMES

The second objective of the thesis was to *examine selected discursive water themes in Cyprus and through this to highlight the value of viewing them through the theoretical lens of policy analysis.*

This endeavour (as in Chapter VI) included the comprehensive discussion of three discursive water themes, i.e. desalination, water transfer and water recycling with the parallel evaluation on whether the chosen theoretical framework has relevance and value for the case study. An elaborate presentation on these three themes, one that includes the examination of the topic at a cross-'border' manner has not been –to the best of the author's knowledge- conducted elsewhere. Information on these discourses is scattered across scholarly work, reports/studies, websites and the press. Thus, one of the thesis' contributions lies with the compilation of this information in a single document that is –more importantly- enhanced with insights, viewpoints and information derived from the conducted interviews. The discussion on desalination in the South for example, contains an exhaustive elaboration of the process, the debate

and its turning points. A similar discussion is conducted for the water transfer options in the North.

Following a comprehensive discussion on the chosen theoretical framework along with considerations on its relevance and value for the case study (Chapter II), the thesis evaluated its applicability to Cyprus through the examination of the said three discursive water themes. As with the review of the conventional water resources (in Chapter V), the discussion of the three themes was conducted in an integrated manner for the whole island, juxtaposing information on the South and North.

The empirical analysis established that water policy in Cyprus does not exist in a vacuum; rather it is embedded within a social system of multi-stakeholder governance characterised by interdependent actions selected from a multiplicity of options and alternatives. Therefore, the selected policy-related theory -enhanced with social science considerations- seems appropriate for the case study analysis, because of its capacity to shed light onto the policy process, identify the types of interaction among actors and governing structure and account for the shift towards a more socially constructed formulation of policy. This reflects the philosophical direction embraced by the thesis towards post-modern and post-positivist governance formations that have moved away from the central role of the state and are able to reflect on the increasing involvement of a range of other actors in the policy process.

This shift is important in Cyprus where water represents a public policy issue (for both sides) firmly placed in the hands of the respective government authorities who play the central role in the related decision and policy-making processes. Therefore, the implications of other actors emerging in the policy process benefits greatly from the selected theoretical framework. Furthermore, the theoretical lens and the orientation of the thesis around critical geopolitics have been suitable for acknowledging and taking stock of the role of politics in the water policy-making with regard to these three themes.

Desalination

The desalination debate in the *South* leaves a strong policy-centred aftertaste. The debate is rich with public policy elements, as the government (and MANRE/WDD in this case) has been the driving force for action in this process primarily as the legitimate carrier and implementer of decisions. At the same time, the debate appears consistent with the discussion on the two dimensions of public policy (vertical-horizontal) and the

disentanglement of policy analysis from the exclusive realm of the government. Thus, it was rendered possible for policy collectivities (i.e. civil society, individuals, private sector, the press) to engage more actively in the desalination policy process and through this practice to alter the water policy-making landscape. Furthermore, the debate allowed for policy sub-systems to materialise and strengthen the involvement of actors already within the policy-making process (e.g. the Green Party, the Parliamentary Committees, the State Inspector, the General Accountant and notwithstanding the President of the Republic).

This reality signalled a significant enlargement of the spectrum of stakeholders involved in the debate. In this case, the enduring practice of questioning and scrutinising the favourable orientation towards desalination provided by the government resulted in widening the discourse and firmly placing the debate within a social constructivist framework with regard to the policy process. An additional trigger to this process has also been the EU accession process and the need to comply with related procedures such as public consultation on the implementation of the respective WFD articles.

Moreover, the desalination debate offers a good example for the differentiated application of the policy process and the policy content (the distinction between analysis of and for policy); although in theory it should have formed a last policy resort subject to previous intense research scrutiny (as acknowledged by different actors), in practice it was introduced hastily as an aversion measure in a crisis situation.

What is important to stress is the role of the above elements on the actual policy process and the significant effects it has invoked on action (e.g. reconsideration of desalination as a policy option; open debate and demand for transparency from the side of the government; or the buy-out of the Dhekelia contract prior to its expiration as a result also of stakeholder pressures, to name a few). Notwithstanding is that the policy shift towards desalination -as a significant contributor to the water budget- has relaxed the security concerns over water that would facilitate potential inter-community rapprochement.

Again based on evidence, desalination in the *North* represents a discourse in the making given the lack of the necessary financial and human resources for shifting towards produced/manufactured water. Furthermore, the discussion is structured in a different way than in the South with the policy-making process in the North is not confined to its “boundaries”. Given the financial dependency on Turkey and the fact that the majority of high-level decisions need to go through Ankara first before being

debated in the North, it seems that the vertical policy dimension (the top-down transmission of authorised decisions) may apply more to the guidance provided by Turkey, while the horizontal dimension may be more linked to the discussions held within the North. At the same time, the two dimensions of policy have applicability also within the North. It is civil society, and environmental NGOs in particular, that lead the front against desalination measures by raising the issue of environmental impacts. Nonetheless, the empirical analysis showed that a desalination policy debate is gaining force, mostly through the activities of environmental organisations that (even more interestingly) work jointly with respective organisations in the South and often present a single front in the environmental policy debate (e.g. the development of the bi-communal village of Pyla or the exploitation of the cross-cutting Karyotis River).

Nevertheless, it has become evident from the cross-'border' analysis that the desalination policy requires further evaluation based on a combination of parameters: energy intensity, potential climate impacts and the actual cost of water supplies. There is a real danger that the desalination debate becomes a new 'dam debate'. The South has embarked on a different hydraulic mission where the goal is not the maximum use of available water, but the unlimited provision of freshwater regardless of the source. With desalination being favoured, it is easy to divert attention from less costly and more environmentally benign alternatives such as water conservation, water use efficiency measures and water recycling. As explained in Chapter I, the North remains within the conventional hydraulic mission paradigm in which the maximisation of water development is the end goal. It would therefore be interesting to see how the produced/manufactured water debate develops in the event that a more solid financial capacity be achieved, and the next step upon the modernity continuum reached.

Water Transfer

Regarding the second water discourse, water transfer, the empirical analysis found that although extensively studied as a water policy option so far its implementation has been limited. It was applied intermittently for four years (1998-2002) in the North with water bags from Turkey and, for less than a year (July 2008-April 2009), in the South with water tankers from Greece providing an emergency response to the intense drought of 2007-8.

For the *North*, opting for the water transfer alternative could provide a technically feasible way out of the water predicament. At the same time, it constitutes an expensive and sophisticated option that would require heavy involvement of external

actors through financial resources and human expertise. Useful for the discussion is the value of policy analysis for providing insight on how, why and to what effect authorities take particular courses of action or inaction. The scepticism on implementing such policy reflects the desire for self-governance and for solutions that come from and are funded by initiatives within the community. In this sense, the water transfer policy, and whilst representing an issue of public policy debate, constitutes also a web of decisions/actions that are constructed by social and political processes and reflect evolving (cultural) values. Through these processes, there is clear indication of an active policy community/ sub-system that questions (directly or indirectly) the water transfer option. This also highlights the element of policy as collective action and the formation of a policy sub-system through this continuous interaction among actors coming (largely) from within as well as outside the hierarchical structure of the North.

The discussion on the two dimensions of policy with regard to water transfer is very similar to the one for the desalination discourse. The top-down transmission of authorised decisions is even more prominent by the active steps taken by Turkey in this direction through the provision of expertise, financial resources as well as political backing for the endeavour. At the same time, the horizontal dimension may be more linked to the discussions held within the North.

A similar analysis can be applied to the *South* with respect to water transfer options where there is a clear policy practice in which water security is a way to maintaining and strengthening its territorial sovereignty. Relying on outside sources of water, specifically those coming from Turkey, would constitute very deep political dependence, jeopardising all post-1974 efforts to reach a viable and sustainable solution to the island's political question. As discussed in preceding chapters, the South is determined to achieve a positive water balance, even through the implementation of policies that are costly, energy-demanding and potentially damaging to the environment. Its political leadership and society are prepared to install large storage infrastructures and desalination schemes using dirty energy.

With regard to the various policy elements, it is interesting to note that the social construction of the water transfer policy from Turkey appears largely unanimous across the different actors in the South; i.e. excluding the transfer from the potential policy options. It seems that a convergence between the two policy dimensions is in motion, while policy sub-systems are merged into one collectivity/community that opposes the transfer option, with only a few voices of individuals heard in its favour.

Of particular interest was the finding of the interviews that the option of water transfer from Turkey triggers feelings of deep dependency for both sides. In the North, and despite the availability of different water transfer options (bags, tankers, undersea pipeline), the stakeholders were concerned that dependency would compromise their efforts toward achieving self-determination and, further, weaken the accompanying territorial ideology that underpins socio-spatial and ethnic homogeneity. Simultaneously, this scepticism seemed to encapsulate the North's desire for self-governance with respect to water, to find solutions from within the community and this echoes a social construction of water policy. Many of these findings also have applicability for the South. An additional finding, made through interviews conducted in the South, was of the desire for a strong negotiating position against the North and/or Turkey once a political settlement is in sight. In the South's policy agenda, there is a strong and direct link between water, politics and power and this sustains the South's refusal to countenance water transfers. The empirical examination of the political implications of water transfer to Cyprus revealed a complex mélange of policy and boundary components and this made the application of these two theoretical lenses highly relevant to the case study.

Water Recycling

The reuse of recycled water appears to be an intricate policy issue in the *South*. The policy analysis on desalination, applies to a large extent to treated wastewater as well (e.g. value of policy analysis in comprehending the complexity of policy options; policy as a web of decisions that allocate values; policy analysis explaining how, why and what governments pursue; etc). However, there is a fundamental point of differentiation that concerns the two public policy dimensions. While the desalination debate showed a strong hierarchical policy formulation (vertical) and a participatory policy interaction (horizontal) well underway, in the case of recycled water it is the impact of horizontal policy communities (farmers, local communities, private actors) that seem to be determining the trajectory of this policy option, despite the efforts on behalf of the government (the vertical axis) to secure treated wastewater as part of the overall water budget. In this sense, it is interesting to note that socially constructed forms of governance shape the implementation of this particular policy option. Moreover, there are solid signs of a reproduction tendency of these socially constructed practices, as prompted by the example of Larnaca (that followed chronologically the one in Lemesos).

Also, there is relevance of the wastewater debate to the distinction between analysis of and for policy. In theory, all decisions regarding the construction of treatment plans are well grounded on legislation that also complies with the EU *acquis* (and thus linked to external obligations that the government has agreed to meet). Therefore, it would be logical to expect that the hierarchical structure would face minimal objections (or objections that it could easily overcome) in this endeavour. In practice though, the situation differs significantly, with stakeholders heavily influencing the policy process and in fact altering the implementation of specific policies.

In the *North*, re-use of recycled water may erroneously appear to be relatively policy-free. In fact, it is the limited application of water recycling that does not facilitate a sound policy analysis. Nonetheless, the water deficit and the financial constraints the North systematically encounters are likely to ease the social acceptance of treated wastewater in the water budget and within an integrated water resources management framework. Although an "official' policy on this is not yet in place (in the absence of a Water Resources Plan that was under elaboration during the fieldworks) it is interesting to note, and contrary to the related discussions in the South that focused on quality issues, that particular attention is paid primarily to cost-related elements as means towards expanding the re-use of treated wastewater.

Moreover, it was interesting to find that in the two-dimensional public policy analysis that was made with regard to water recycling, external actors—Turkey (providing funding) and the EU (with respect to common legislative compliance)—seem to play the role engraved in the vertical policy axis. Given that in the North, water recycling does not constitute yet an intra-community policy issue, it may thus, be better examined in juxtaposition with other sources of water provision and the obligations towards the EU *aquis* in the event of a political solution. Should the water transfer option be materialised for example, then the heavy investment on treatment plants may be softened. At the same time, the need for harmonisation with EU legislation will most likely increase the pressure for wide-covering wastewater treatment according to EU standards. These particularities place the policy analysis of recycled water outside the Turkish-Cypriot community and shift the vertical policy axis to other actors (Turkey, EU).

Of particular importance to the water recycling discourse at cross-'border' level is the case of the Mia Milia/Haspolat wastewater treatment plant. Its location in the North and the fact that it services both communities in Nicosia, render it a pivotal issue of potential bi-communal cooperation. For the North, and given the absence of adequate

infrastructure, the maintenance and upgrading of the plan represents a most desired option. For the South, and despite having in place a sophisticated wastewater treatment infrastructure, the role of the Mia Milia/Haspolat plant in its overall sewage system is significant. It is noted that further investment on infrastructure in the South is linked to the decision on whether to expand and upgrade the specific plant. Input from interviews highlighted the crucial role of the plant for maintaining open the bi-communal communication channel (and in retrospect weaken the *de facto* division).

The empirically-based discussion of *the three discursive water themes* highlighted an additional element that relates to the paradigm shifts outlined in Chapter I. The South and North have, demonstrably, followed similar trajectories in the modernity continuum of water paradigms, although at different speeds. As two of the policy options (desalination and water recycling) have been more substantially implemented in the South, previewing the benefits and shortcomings of specific water policy options may be useful for the North in attempts to ameliorate future political debates and social turbulence. In other words, understanding the water reform trajectory of the South through an analysis of current policy debates (such as desalination or water recycling) may provide important insights for the North's future trajectory.

3.3 BI-COMMUNAL COOPERATION IN NICOSIA: ARE THESE POLICY NETWORKS?

The third and last objective of the thesis, lying at the core of the research question, was to *evaluate the applicability of the policy network analytical framework in the case of Cyprus, thereby contributing, through empirical work, to the better understanding and the potential further development of the framework.*

An elaborate presentation of the analytical frameworks (policy networks complemented with governance analysis and communities of practice through the lens of knowledge management) was conducted in Chapter III. Based on their key characteristics, the thesis carried out an empirical assessment of three forms of bi-communal engagement in Nicosia: wastewater treatment, drinking water and the rehabilitation of the within-the-walls city (Chapter VII). Given that formal contact between the two communities has not been possible since the 1974 *de facto* division, cooperation in these sectors has taken place within an informal framework that however influences heavily the related policy process. The thesis found that these forms of interaction represent alternative forms of governance that fit well into the politically-loaded and policy sensitive context of Cyprus.

Cooperation on the Mia Milia/Haspolat plant

Based on empirical evidence, the thesis found that the bi-communal collaboration on the Nicosia treatment plant represents a *policy network* complemented by a community of practice with regard to the daily interaction on technical issues. Given the weight of this discussion in response to the thesis' main research question, an elaborate analysis of the above was conducted within the scope of Chapter VII. Therefore, below are provided only the highlights of this analysis.

The cooperation over the Mia Milia/Haspolat plant set off in a most unconventional manner: it was the two mayors' (Mr. Demetriades and Mr. Akinci) shared vision and firm belief in the benefits of co-operation that triggered the process. It was the need for communication that prompted this process that was realised thanks to the personal initiative and voluntary risk-taking of the two mayors. And this took place only three years after the events of 1974 and within heavy securitisation on both sides. The two men considered the completion of the joint treatment plant (which had been suspended in 1974) to be essential for a functioning capital and so decided to bypass the political segregation through establishing direct bi-communal contact.

This unorthodox approach clearly represented a shared vision (Nicosia as a unified capital) and it was operationalised by dropping the political titles (both men were simply 'representatives'), putting formalities aside (no minutes from the meetings were kept, no formal documents of any kind) and focusing on a practical agenda (the completion of the sewage treatment plant) and on the building of trust. Through the shared interest in a specific policy issue, the two mayors established a cluster of stable, non-hierarchical and interdependent relationships. The existence of a common interest along with the acknowledgement that co-operation through practice is the best way to achieve common goals and the orchestration of efforts towards a solution of common policy, underpin the policy network literature (Borzel, 1998; Kenis and Scheider, 1991). Given also the non-obligatory/voluntary nature of the interaction, this bi-communal cooperation seems to encapsulate all key characteristics of a policy network.

Most importantly, this channel of communication has remained open and functional for more than 30 years. Given the political uncertainty and potential implications of this endeavour, a certain high level of trust is essentially involved. This has been strengthened over the years and manifested by the fact that all mayors following the two that initiated the process have been committed to sustaining the process.

Therefore, the gradual building of trust and the certainty that both sides are committed to the process (and thus, are reliable counterparts) has formed the glue that kept the cooperation active and operational over the years. Perhaps it was the imperative attached to this task (having a functioning treatment plant for the capital) that facilitated the process but, once established, it was irreversible (as explicitly stated by both mayors during interviews). And although nothing is available in writing on this 'arrangement', both communities have treated their interaction in this area as binding and enforceable.

The policy network represents an unconventional modality. It functioned horizontally, across the two communities, in order to achieve a shared goal and it was flexible enough to adapt to the variations of the political circumstances. A most important element for the case of Mia Milia/Haspolat is the influence that the bi-communal interaction has exercised onto the formal policy processes on both sides. This is also what distinguishes the policy network from a CoP. More specifically, the initiative of the two mayors back in 1977 directly opposed the official policy line of no interaction among the two communities. By engaging in bi-communal talks (despite conducing them in an informal manner and with all the particularities described previously), there was a clear shift away from the policy of segregation, which was –in effect- imposed on the formal structure. By nurturing this informal interaction and establishing a regularity and continuity, the policy network has determined policy choices that are bi-communal in nature (i.e. the completion of the plant that services areas across the Dead Zone). The longevity and impact of this process has been manifested through formal decisions to further the collaboration and implement the joint project for the upgrading of the plant (as discussed above); it is also included in the joint efforts towards the mobilisation of the necessary financial resources.

The initial interaction over the plant involved specific individuals and was retained within a close circle of people (i.e. the two mayors and UN mediators). When the agreement to work together was reached (in 1978) a Bi-Communal Team was formed consisting of representatives from both sides, primarily coming from the departments in charge of sewage management (trained and on-site personnel), and enhanced with external experts. This involved also high level personnel from the Sewage Board and the Sewage Department (Directors in both cases) who have developed a practice of most regular communication for the day-to-day management of the plant. Therefore, the interaction has ended up involving a wide range of actors (representing also organisations) who are connected to each other by interdependent relationships over information, expertise, access and legitimacy. Moreover, they have chosen voluntarily

to cooperate around a specific function (wastewater treatment) and in pursue of a shared goal (the smooth operation of the plant). All the above incorporate extensively the key elements described in several policy networks' definitions (Borzel, 1998; Bomberg, 1998; Benson, 1982; Parsons, 1995; Coleman and Perl, 1999; Bressers *et al*, 1994).

Concerning the involvement of different actors in the bi-communal collaboration and with emphasis on the technical management issues the thesis claims that a *Community of Practice* is in place in the case of the Mia Milia/Haspolat plant. Scholarly literature identifies CoP based on the sharing of a common concern/problem, the regular interaction through joint work and the sharing of know-how (Wenger, 2000; Brown and Duguid, 1998; Brown and Duguid, 2002). The various CoP definitions include a combination of those elements while stressing that through on-going practice, the members of such a group will develop into a *de facto* community. In the case of the Mia Milia/Haspolar plant, and as mentioned already, the working modalities of the Bi-Communal Team as well as the cooperation among the Sewage Board and the Sewage Department appear to reflect well on the CoP characteristics.

Through regular interaction this group of individuals collectively creates and shares knowledge through shared practice. This coincides with the understanding of knowledge within CoP as being embedded into routines, processes, practices and norms (Cook and Brown, 1999), while this shared practice is unique and characterises the group and thus, shapes an identity (Davenport and Prusak, 1998). In the case of the Mia Milia/Haspolat plant, the Team and the two departments possess and practice the necessary knowledge, both through their individual expertise on specific tasks and collectively as the bodies responsible for the operation and maintenance of the plant. This reality has put in place an inter-reliant and interdependent net, which is the glue that holds the actors together in Mia Milia/Haspolat (all members are needed for the smooth operation of the plant).

The regular interaction and the interconnectedness of expertise can be considered as connecting factor among individuals for thinking together. They have developed a shared understanding of what the operation of the plant entails and thus, have created a common knowledge basis that they can refer back to. This is also embedded in the craft-like learning process when including new members to the existing CoP. Given that the sewage CoP is operational since 1978, it is only logical to assume that this learning process has been taking place considering the needed personnel changes.

This is closely linked to the shaping of an identity within the CoP that is unique and characterises the members of the group (they are no longer considered representatives of the two sides, but one team responsible for the plant). The identity-shaping quality of the interaction can become particularly important if considered as a 'shared history of learning' (Wenger, 1998) where learning and the engagement with knowledge are on-going cultural processes embedded in everyday practice. It is argued that this is valid in Nicosia, with the 30 years of uninterrupted engagement and the shared vision on the plant's status and further development. The identity of the group, its function and the accompanying interdependency among the members for the smooth operation of the plant were highlighted during interviews on both sides.

In sum, the thesis argues that a CoP indeed exists in the case of the Mia Milia/Haspolat plant, has been operational for more than 30 years and complements the existence and operation (for an equal length of time) of a policy network for the plant. However, the operation of the CoP is limited to technical issues and the day-to-day running of the plant and entails no influence on policy; this is done through the policy network.

In closing, it should be mentioned that during interviews it was made clear that the Mia Milia/Haspolat plant represents more than a treatment plant servicing the two sides; it encapsulates the practical aspect of '*a common bi-communal vision for a Nicosia that is divided at present but re-united tomorrow*' (Zampelas and Palantzis 2003).

The Nicosia Master Plan

Responding to this shared vision for Nicosia, and encouraged by the success in the sewage treatment sector, the two mayors initiated another type of bi-communal contact regarding the rehabilitation of the within-the-walls city through the Nicosia Master Plan. Similarly to the case of the treatment plant, this interaction began only four years after 1974, within a loaded politico-security context. The NMP emerged in order to capture the interconnectedness and interdependency involved in the materialisation of a joint vision, i.e. the harmonious and coordinated urban development of each side of Nicosia in order to facilitate the processes of an eventual reunification. The NMP benefitted from (and was largely based upon) the positive climate of trust cultivated within and across the two communities as a result of the agreement over Mia Milia/Haspolat; the endurance of this trust and its strengthening over time however, was the result of the cooperation modalities and achievements of the NMP team alone.

In contrast to the case of the treatment plant, its implementation necessitated the involvement of a wide range of actors. More than 50 individuals from various departments of both communities (municipalities, planning departments, departments of antiques, etc) have been involved. So too have the UNDP/UNOPS, with respect to mediation and project funding, and a number of third party actors (consultants and NGOs), on an *ad hoc* basis, for the provision of specialised knowledge. Thus, NMP has included an identifiable and policy-concerned set of actors that have depended upon one another for resources (including information, expertise, access and legitimacy); this has demonstrated that there is no single actor that possesses all the necessary resources for effectively dealing with a policy issue as complex as the old city's rehabilitation.

The thesis found that the NMP reflects the qualities of a policy network: it is a semi-institutional formation, non-obligatory by its nature, based on communication and trust. It represents an informal, although stable, web of cooperation between actors with interdependent interests who strive to solve collective action problems on a non-hierarchical level. Moreover, the ongoing character of the NMP (for around 30 years) and the uninterrupted involvement of the two sides demonstrate that cooperation is the best way to achieve common goals and pursue shared interests. More importantly, and in addition to the technical aspects, the NMP has strengthened the horizontal dimension of public policy (through the active participation of different stakeholders). It has also provided an adaptive policy-setting method from which the politically-charged connotations of the official (vertical) policy making of the two sides are removed.

The NMP policy network has been held together because of the participants' shared practice and their belief in a common vision for their city. This has made cooperation feasible, has assisted in the gradual expansion of the network's policy domain (with the inclusion of more policy sectors like the proposal for a joint rainwater drainage system project), and has established a governing model for the old city of Nicosia that defies the island's political situation. A causal link seems to exist among the policy network, the policy-making process and the policy outcomes. This supports the thesis' argument in favour of networks as alternative forms of governance. And it is interesting to note that processes of policy-making regarding joint projects take place within the NMP policy network rather than through negotiations between representatives of the two sides. According to several interviewees the project has acquired a certain *status quo*, the authority of which cannot be questioned by any government (and similarly to the Mia Milia/Haspolat policy network).

Underpinning the NMP project has been the idea that regular and systematic co-operation can foster new bonds of understanding. And this is taking place beyond the imposed restrictions of formal policy- making in Cyprus. It has been claimed that over the long-term, such linkages may assist to overcome the prevailing fear and mistrust between the two communities.

Cooperation over the joint drinking water system

Unlike the policy network qualities manifested by both the NMP and the sewage plant, the thesis found that the bi-communal interaction with regard to the drinking water system, represents a community of practice. Its operation covers exclusively technical issues (overseeing the exchange of quantities of drinking water between the two communities) and does not involve any policy implications. This bi-communal engagement emerged when the post-1974 situation of *de facto* division, made the drinking water system of Nicosia inoperable. Although the system is unified for the whole city, most of the pipes crossing between the two sides have not been operational since 1974. The South cut off water provision to the northern part of the capital, except for two pipes that cut across the Green Line, thus supporting the potable water budget of the northern part of Nicosia.

This reality necessitated some form of bi-communal co-operation and the empirical analysis found this to represent a community of practice. The group of people involved in this interaction deals with purely technical issues relating to the drinking water system and needs to work together for the effective operation of a system that is interconnected. The group's engagement has been ongoing since 1993, despite some brief periods of non-contact, since 1993 and may even take place on a daily basis. The members of the group, though not interdependent for the operation of the systems within their respective 'boundaries', they share practice when it comes to the two pipelines that cut across the Dead Zone. Thus, there is a level of transfer of know-how among individuals (and on occasion of material and equipment) from the one side to the other. Through this on-going practice the members of the group have become the focal points for this collaboration and have developed into a *de facto* community the identity of which is distinct.

However, it is not the mere sharing of knowledge that is important, but the role of knowledge in increasing the capacity for bi-communal action and enhancing an on-going cultural process embedded in everyday practice (and the use of tacit knowledge). As discussed also with regard to the sewage plant community of practice it is the

regularity of engagement and the mutual pursuit of a shared goal that transforms learning into a personal development experience and creates bonds among the group members. This is paramount in creating a shared identity that is defined according to function rather than 'boundaries' (even if they are *de facto* determined). Based on these elements the thesis found that the management of the drinking water system constitutes a community of practice.

However, and unlike the two other forms of bi-communal interaction, this community of practice has not moved beyond the technical cooperation over the interconnected system. Some efforts to promote joint projects remained devoid of context due to the disparities between developmental levels, financial opportunities and each side's water priorities. That said, the value of the drinking water interaction should not be underplayed; its functioning complements all of the other efforts that support bi-communal rapprochement. This is particularly significant, as in the post-1974 context each side has separately undertaken a series of projects in order to secure the provision of drinking water. Therefore, the bi-communal interaction over drinking water needs to be further developed and fortified given the partially interdependent nature of the system. The South's comparative advantage could benefit the North, especially with regard to leakage detection, aquifer observation and the training of personnel (etc). Also the mutual benefits of establishing an inter-communal trade in water could be further explored.

4. REFLECTIONS ON THE ADDED VALUE OF THE THESIS

The significance and originality of this research was outlined in Chapter I along the lines of theory, analytical frameworks and case study. Following the same categorisation, below are reflections on what the author considers to have been achieved, the added value of the thesis and suggestions for future research.

In terms of the theoretical framework of policy analysis, the thesis used a jigsaw approach combining different policy elements identified as relevant to the case study and the research question. The contribution lies primarily with the provision of empirical evidence in support of the explanatory power of these specific policy elements. For example the desalination and water recycling debates confirmed the explanatory relevance and usefulness to these specific policy issues from the application of approaches like the analysis of and for policy; public policy; policy communities/sub-systems (e.g. how the desalination or the recycling public policies were intended to be

and what form they ended up having; how the creation of policy communities/sub-systems in the respective debates took form and what it signified for the policy process, etc).

Through the analysis of the discourses, examples were provided on the role and potential of horizontal interaction for an actor-led and socially constructed policy process (e.g. the direct questioning of the desalination option that brought about a fierce public debate and was related to the buy-out of the Dhekelia contract before it expired; the reservation about information provided by MANRE and its cross-checking through open processes; the change of plans in the case of Akrotiri or Lemesos regarding the plant's location and use of treated wastewater, etc).

In this line of thought, and whilst maintaining a post-positivist predisposition, the analysis of the three discursive issues demonstrated specific examples of successful questioning of the state's (and the official authorities') centrality as the main level for water analysis and instead put forward a pluralistic form of governing the policy process.

Importantly, the three debates (though with differing emphases) highlighted the centrality of politics within water policy and showed the extent to which the politicisation of water can affect policies and options (e.g. the clear stand against water transfer; the South's pursue of water supply enhancement as a negotiating advantage in the event of a political settlement; notwithstanding the water clauses in the Annan Plan and the way they were perceived).

With regard to the analytical frameworks, the three examples of bi-communal cooperation in Nicosia on the one hand utilised them for explaining the on-the-ground situation and on the other provided evidence for their relevance and applicability in a politically-contested environment. For example, the CoP framework captured very well the interaction at technical level on the Nicosia Sewage Treatment Plant (NSTP) and on the interlinked parts of Nicosia's drinking water system. It also captured the limitations of these forms of collaboration with regard to influencing the policy process. Thus, the two examples may serve as case studies of practical implementation of the CoP analytical framework.

The analytical framework of policy networks has been selected as an explanatory tool to reflect on the changed relationship between the two communities in Nicosia. Because of its context, a policy network captures well the type of bi-communal

collaboration manifested in the NSTP and the rehabilitation of the city's old segments, i.e. regular interaction on a specific theme, shared vision, trust, voluntary involvement but most importantly informality, interdependency, a politically silent nature and the ability to influence policies despite its non-institutionalisation. The two examples in Nicosia were cross-checked *vis-a-vis* the policy network's characteristics and core elements and it was found that they –indeed- form such formations. So, the policy network framework was used in order to explain these types of bi-communal engagement in Nicosia and provide them with analytical context and grounding.

On the antipode of this purpose, and following the context of grounded theory[361], the empirical findings provided case studies of real life situations that accord with the policy network modalities, thus adding to its solidification as an analytical framework and its potential to evolve as a theoretical construction. Regarding this latter point, the NSTP network focuses on actors as the analytical targets, and can provide these insights to the framework, which is said to lack theoretical grounding on the account that affords little attention to actors. Moreover, the case study can provide empirical evidence as to the dialectical approach that is said to be important for bridging the policy networks' theoretical deficiencies. This concerns the interactive relationship between actors and structure with regard to policy outcomes; the case study provides evidence of such interaction taking place and affecting the policy outcome (the actor-imposed bi-communal engagement shifted the official policy of the structure from segregation to direct contact and collaboration).

Further to strengthening the dialectical approach, the case study offers examples of networks as self-organising and self-governing structures. As noted in the empirical analysis of previous chapters, the actors became engaged on a voluntary basis and sustained the engagement over time out of free will. Given the non-involvement due to the political deadlock of the formal structure (the respective authorities of the two sides) in the operation of the Nicosia policy networks, it can be safely deducted that they have been managing their organisation from within the network.

Finally, the case study can provide a plausible response to the policy networks' critique concerning the lack of democratic control. This concerns the case study's provision of real-life lasting policy networks that have been operational through action for more than 30 years. A certain (even substantial) level of legitimacy can be derived from action, especially when it is sustained over long periods of time. The functionality and sustainability elements of the case study's policy networks may also assist in

[361] That serves as a complementary methodological approach for the thesis

overcoming this gap as both elements are considered indicative of existing legitimacy as well.

Lastly, and with regard to the Cypriot context, the thesis claims to have contributed substantially to enhancing knowledge about the case study with regard to water. One of the key contributions concerns the compilation of water-related information and the conduct of analysis about the South and the North under one document, a task which – to the best of the author's knowledge- has not been undertaken thus far. Especially in the post-1974 era, scholarly work and studies concern either of the two sides and not the island as a whole, aside from the work on Cyprus' political question. Thus, this contribution has materialised through a) a review of conventional water resources management and b) a critical analysis of three contemporary and highly discursive themes, both of which were done whilst treating the island as a single entity. One of the key inputs in this task concerns the compilation, analysis and juxtaposition of insights and opinions coming from key stakeholders across the 'border', information that is not recorded elsewhere. Moreover, it has recorded the informal bi-communal interaction that is taking place in Nicosia, and which due to the non-recognition issue it is not registered or documented elsewhere.

Lastly, by recording and solidly analysing the bi-communal engagement in Nicosia and shedding light onto its particularities (with emphasis on what has rendered them possible), there is potential in exporting the cooperation model to places characterised by community segregation, political sensitivity and an official policy of alienation. The thesis has aspired to contribute to this effort and to showcase the Cyprus case study. This aspiration has underpinned the choice of themes, the type of analysis and the exclusive focus on Cyprus throughout the research process[362].

[362] This was done consciously and on occasion at the expense of not including examples beyond Cyprus that might have added value to the research analysis of the thesis.

6. EPILOGUE – WATERING DOWN DIVISIONS IN CYPRUS?

The thesis' research quest set off to answer the question of whether bi-communal cooperation over water does exist, and, if so, what forms this cooperation takes. Equipped with a set of theoretical and analytical frameworks—chosen strategically in order to respond to the particular context of the case study—and an array of research methods, with semi-structured interviews at its core, the empirical analysis found that bi-communal engagement is present and operational in Nicosia. Additionally, it found that this engagement has proved to be susceptible to the analytical capacities of the frameworks employed in the thesis.

More specifically, there are two well-established and ongoing policy networks (one on the Mia Milia/Haspolat sewage treatment plant and one on the Nicosia Master Plan) and two well-functioning communities of practice (one on the Mia Milia/Haspolat sewage treatment plant and one on the drinking water system of Nicosia). What seems to underlie these types of interaction is the idea that regular and systematic co-operation (primarily over technical issues) may foster new bonds of understanding and rebuild trust between the two communities. The thesis claims that such cooperation entails spill-over qualities; if tested on more politically-loaded policy issues, these qualities might offer a plausible way beyond the island's predicament.

Stemming from the above, further research on Cyprus would benefit from an evaluation of other forms of bi-communal cooperation (besides water) and examine them *vis-á-vis* the policy networks and communities of practice frameworks. With regard to water resources overall, interest has been expressed for the anticipated bi-communal cooperation on rainwater drainage management. Bi-communal cooperation on rivers and groundwater aquifers that cut across the 'border' would form a promising (and much needed) area of interaction, especially given Cypru's small scale and the fact that the island represents a single hydrological basin under the EU WFD.

As for the theoretical frameworks, "*in political thought and analysis, we still have not cut off the head of the king*" (Foucault, 1986: 88-9). Until the hierarchical authority finds a more reflexive way to adjust to social reality, policy analysis is in search for alternative models that would weaken vertical structures and strengthen the horizontal ones. In this search, policy networks could prove pivotal; further examination of their potential empirical application has much to offer.

Returning to Cyprus, the existence of ongoing bi-communal interaction should not be considered inherent or normal within the island's daily life. The effects of the 1974 *de facto* division have been central to Cyprus' trajectory ever since. It can only be fully appreciated through *a posteriori* analyses. Besides the obvious economic costs, the creation of a 'border' across this small island has caused trust and goodwill between its two principal communities to evaporate. Therefore, the initiation of bi-communal contact in the water services, only a few years after an armed and open conflict that caused heavy casualties, needs to be evaluated within this sensitive political and potentially conflictual background.

The determination and personal initiative of the Greek and Turkish representatives of Nicosia, besides leading to the completion of the Mia Milia/ Haspolat plant, also paved the way for the more comprehensive Nicosia Master Plan for the rehabilitation of the within-the-walls areas of the capital. As the bi-communal engagement has been sustained for more than 30 years, it has set in motion an "*irreversible rapprochement process that cannot be questioned by any government*" as the two mayors who initiated the rapprochement asserted.

Whilst acknowledging the external assistance provided, it was the shared vision and enlightened approach of Greek Cypriots and Turkish Cypriots that formed the catalyst for the bi-communal rapprochement to materialise amidst conflict and remain active for more than 30 years. People in Cyprus have shown to the world that when will and determination exist, no divisions are strong enough to prevent cooperation –

"*a gift from Cyprus to the complicated world of peace-making*" (UNHCR, 1995).

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ANNEXES

ANNEX 1: List of interviewees

No.	SURNAME	NAME	Title	Organisation	Affiliation (at the time of the fieldworks)	e-mail
Interviewees in the South						
1	ALETRAS	Stavros	Mr.	Drinking Water Division, Water Development Department, Ministry of Agriculture, Natural Resources and Environment	Responsible for legal issues	saletras@wdd.moa.gov.cy
2	ARTEMIS	Christodoulos	Mr.	Water Development Department, Ministry of Agriculture, Natural Resources and Environment	Director	director@wdd.moa.gov.cy & cartemis@wdd.moa.gov.cy
3	CONSTANTINOU	COSTAS	Mr.	Geological Survey, Ministry of Agriculture, Natural Resources and Environment		
4	CONSTANTINOU	GEORGE	Mr.	Geological Survey, Ministry of Agriculture, Natural Resources and Environment	Former Director (retired)	
5	DEMETRIADES	Lellos P.	Mr.	Nicosia Municipality	Former Mayor (1971-Jul 1974 & Oct 1974-2001), Barrister	lellos@ldlaw.com.cy www.ldlaw.com.cy
6	GEORGIOU	Adonis Pieri	Mr.	Hydrology Division, Water Development Department, Ministry of Agriculture, Natural Resources and Environment	Senior Hydro-geologist, Head of Hydrology Section	Previous e-mail: ageorghiou@wdd.moa.gov.cy New mail: adonis47@cytanet.com.cy
7	GLEKAS	Ioannis	Mr.	Aeoliki Environmental Consultants	Director	aeoliki@cytanet.com.cy www.aeoliki.com
8	HADJILOE	Theodosia	Ms.	Green Party	Party member, Parliamentary Assistant of MP George Perdikes	
9	HADJIPANAYIOTOU	Costas	Mr.	Environment Service, Ministry of	Environment Officer	coshadji@cytanet.com.cy

				Agriculture, Natural Resources and Environment		
10	HADJIPAKKOS	Charalambos	Mr.	Environment Service, Ministry of Agriculture, Natural Resources and Environment	Senior Environment Officer	hajipakkos@cytanet.com.cy
11	IACOVIDES	Iacovos	Mr.	IACO Environmental & Water Consultants/ Water Development Department, Ministry of Agriculture, Natural Resources and Environment	Director/ Former Head of Hydrology Division (retired)	iaco@cytanet.com.cy
12	IOANNOU	Michalakis	Mr.	Drinking Water Division, Water Development Department, Ministry of Agriculture, Natural Resources and Environment	Senior Engineer (retired)	mioannou@wdd.moa.gov.cy
13	IOANNOU	Christakis	Mr.	Hydrology Division, Water Development Department, Ministry of Agriculture, Natural Resources and Environment	Former Head of Hydrology Division (retired)	chrink@cytanet.com.cy
14	KAMBANELLAS	Chrysostomos A.	Mr.	Drinking Water Division, Water Development Department, Ministry of Agriculture, Natural Resources and Environment	Executive Engineer-Class I	Kambanel@cytanet.com.cy
15	KYRIAKOU	Maria	Ms.	Central Statistics Office, Ministry of Finance	Responsible for the Agricultural Sector	
16	LOIZIDES	Michael	Mr.	ISOTECH Environmental Consultants	Director	info@isotech.com.cy www.isotech.com.cy
17	MARKOULIS	Christos	Mr.	Water Development Department, Ministry of Agriculture, Natural Resources and Environment	Former Director (retired)	
18	MAVROKORDATOS	Christos	Mr.	Member of the AKEL Party	President of the Parliamentary Committee	eka.ammochostou@cytanet.com.cy

					for Agriculture and Natural Resources	
19	MAVROU	Eleni	Ms.	Member of AKEL Party	Member of Parliament for Nicosia & President of the Environmental Committee of the Parliament	EMavrou@akel.org.cy www.akel.org.cy
20	NICOLAOU	Evgenios	Mr.	Sewage Board of Nicosia	Director of Technical Services	s.b.n@cytanet.com.cy
21	OMORPHOS	Charis	Mr.	Water Development Department, Ministry of Agriculture, Natural Resources and Environment	Executive Engineer-Class I, Director's Office	comorphos@wdd.moa.gov.cy & Samuel@cytanet.com.cy
22	PALANTZIS	Charalambos	Mr.	Sewage Board of Nicosia, Project Management Unit	Project Director, Consultant	s.b.n.palantzis@cytanet.com.cy
23	PANTELIDES	Panayiotis	Mr.	European Institute of Cyprus	Researcher and Director of Seminars	pantelides@eic.ac.cy
24	PAPADOPOULOS	Ioannis	Mr.	Agriculture Research Institute, Ministry of Agriculture, Natural Resources and Environment	Director	papado@arinet.ari.gov.cy & dari@arinet.ari.gov.cy
25	PAPADOPOULOS	Stylianos	Mr.	Sewage Board of Nicosia	Consultant	stylianos.p@cytanet.com.cy
26	PAPADOPOULOU	Athina	Ms.	Nicosia Master Plan Project	Project Officer	Athina.Papadopoulou@nicosiamunicipality.org.cy www.nicosia.org.cy
27	PAPASTAVROS	Costas	Mr.	NGO Ecotopia; Unit of Environmental Studies, Research and Development Centre – InterCollege; Environment Service, Ministry of Agriculture, Natural Resources and Environment	Director; Head of Unit; Environment Officer	ecognos@intercollege.ac.cy
28	PERDIKES	George	Mr.	Member of Parliament, Green	President of the Green	greenpar@cytanet.com.cy

				Party	Party, Member of Parliament	www.cyprus-green-party.org
29	POLYCARPOU	Polycarpos	Mr.	Agriculture Research Institute, Ministry of Agriculture, Natural Resources and Environment	Research Officer	p.polycarpou@arinet.ari.gov.cy www.ari.gov.cy
30	RAFTOPOULOS	Michael	Mr.	Law Office, Republic of Cyprus	Senior Counselor of the Republic	mraftopoulos@law.gov.cy
31	SOCRATOUS	George	Mr.	Consultant, Water Development Department, Ministry of Agriculture, Natural Resources and Environment	Retired Senior Engineer	gsoc@cytanet.com.cy
32	SOFOCLEOUS	Pantelis	Mr.	Division of Waste Water and Reuse, Water Development Department, Ministry of Agriculture, Natural Resources and Environment German-Cypriot Forum	Senior Engineer Deputy Chairman of the Forum's Executive Committee	p.sophocleous@web.de
33	STEPHANOU	Spyros	Mr.	Planning Division, Water Development Department, Ministry of Agriculture, Natural Resources and Environment	Civil Engineer Member of FEEOC	stephans@spidernet.com.cy
34	THEMISTOCLEOUS	Costas	Mr.	United Democrats Party	General Secretary Former Minister of Agriculture, Natural Resources and Environment (1998-Feb 2003)	edicy@spidernet.com.cy
35	THEODOSIOU	Antonia	Ms.	Federation of Environmental and Ecological Organisations of	Founding member	

				Cyprus		
36	THEODOULIDES	Panayiotis	Mr.	Water Board of Nicosia	Manager/Director of Technical Services	waterbrd@cytanet.com.cy
37	THEOPEMPTOU	Evi	Ms.	Green Party FEEOC	Member Founding Member	cyprusgreens@hotmail.com www.cyprus-green-party.org
38	ZAMPELAS	Michael	Mr.	Nicosia Municipality	Mayor of Nicosia	municipality@nicosia.org.cy www.nicosia.org.cy
Interviewees in the North						
39	AKINCI	Mustafa	Mr.	Peace and Democracy Movement Party	Leader Also former Mayor of Nicosia in the Turkish Municipality of Nicosia (initiated the bi-communal cooperation on the sewage plant and the NMP)	akinci.ncy@yahoo.com www.barisvedemokrasi.net
40	ALKARAVLI	Mustafa	Mr.	Geology and Mines Department	Director	geologyandmines@superonline.com
41	AŞIK	Simavı K.	Mr.	Turkish Municipality of Nicosia	Deputy Mayor	simavi@north-cyprus.net
42	ÇAĞLAR	Mehmet	Mr.	Republican Turkish Party – United Forces	Member of Parliament Turkish Cypriot Elected Representative in the Council of Europe	chaglarm@yahoo.co.uk
43	ERK	Kutlay	Mr.	Turkish Municipality of Nicosia	Mayor	
44	GÜRALP	Ali N.	Mr.	Turkish Municipality of Nicosia, Works and Improvement Department	Civil Engineer, heavily involved in the Nicosia Master Plan	anguralp@yahoo.co.uk
45	GÜRALP	Hasan	Mr.	Turkish Municipality of Nicosia, Water Department	Head of Department	hnguralp@analiz.net

46	MESUTOĞLU	Layık Topcan	Ms.	Town Planning Department	Deputy Director	layiktopcan@yahoo.com
47	NECDET	Mehmet	Mr.	Geology and Mines Department	Senior Engineer	mehnec@kktc.net
48	ÖRTÜRK	Serap	Ms.	Water Planning Department, Water Works Department, Ministry of Interior	Senior Engineer	soztev@yahoo.com & waterworks@superonline.com
49	ÖZNEL	Nevzat	Mr.	Turkish Municipality of Nicosia, Waste Water and Sewage Treatment Plant	Head/Manager of Project	nevzatoznel@hotmail.com
50	SIDAL	Mustafa	Mr.	Water Works Department, Ministry of Interior	Director	sidalmustafa@yahoo.com & waterworks@superonline.com
Other interviewees						
51	CAGLAR	Ali	Mr.	UNDP/UNPOS, Partnership for the Future, Programme Management Office	Senior Technical Officer	ali.caglar@undp-unopspff.org & www.undp-unopspff.org
52	JARRAUD	Nicolas	Mr.	UNDP/UNPOS, Partnership for the Future, Programme Management Unit	Environmental Compliance Officer	nicolas.jarraud@unopspmu.org
53	RUPLYS	Vidmantas	Mr.	European Commission, Enlargement Directorate-General, Task Force – Turkish Cypriot Community	Senior Officer	vidmantas.ruplys@ec.europa.eu
54	RUSSELL	Andrew	Mr.	UNDP/UNPOS, Programme Management Unit	Programme Manager	andrew.russell@unpospmu.org
55	VIEZZER	Alessandra	Ms.	European Commission, Enlargement Directorate-General, Task Force – Turkish Cypriot Community	Deputy Head of Mission	alessandra.viezzer@ec.europa.eu

NUMBER OF INTERVIEWS IN THE SOUTH	38
NUMBER OF INTERVIEWS IN THE NORTH	12
NUMBER OF INTERVIEWS WITH THIRD PARTIES	5
TOTAL NUMBER OF CONDUCTED INTERVIEWS	55

ANNEX 2: Annual water balance of main aquifers in the South

Summary of the annual water balance of the main aquifers in the South

Source; MEDIS Report (Constantinou, 2003)

Areas	Water in Storage in million m^3 (1969)	Optimum additional storage	Average replenishment	Extraction	Flow to the sea	Water Balance
Western Mesaoria	900	600	62	86	2.5	-26.5
South-eastern Mesaoria	600	160	25	47	0	-22
Akrotiri-Kouris Valley	215	6	48.5	29	20.5	-1
Central Mesaoria	320	60	14	15	0	-1
Maroni Aglisighes	90	1	8	1,5	6.5	0
Ayia Irini Kormakitis	35	6	6,4	2,6	3.8	0
Karpasia Peninsula	70	4	20	8	12.5	-0.5
Larnaca Area	230	0	28	8	20	0
Kyrenia Range	160	0	11.5	12	0	-0.5
Kyrenia Coast	160	0	11.5	12	0	-0.5
Pissouri-Paramali	300	0	53	7	46	0
Paphos Coast	32	16	13	7	6.2	-0.2
Paphos River aquifers	27	0	13	2	11	0
Polis Area	35	0	25	5	20	0
Troodos Area	?	0	110	55	45	10
TOTAL	3,174	853	448.9	297.1	194	-42.2

ANNEX 3: List of dams in the South

A/A	NAME	YEAR	RIVER	TYPE	HEIGHT (M)	CAPACITY (M^3)
1	Kouklia	1900	-	Earthfill	6	4.545.000
2	Lythrodonta (Lower)	1945	Koutsos (Gialias)	Gravity	11	32.000
3	Kalo Chorio (Klirou)	1947	Akaki (Serrachis)	Gravity	9	82.000
4	Akrounta	1947	Germasogeia	Gravity	7	23.000
5	Galini	1947	Kampos	Gravity	11	23.000
6	Petra	1948	Atsas	Gravity	9	32.000
7	Petra	1951	Atsas	Gravity	9	23.000
8	Lythrodonta (Upper)	1952	Koutsos (Gialias)	Gravity	10	32.000
9	Kafizis	1953	Xeros (Morfou)	Gravity	23	113.000
10	Agios Loukas	1955	-	Earthfill	3	455.000
11	Gypsou	1955	-	Earthfill	3	100.000
12	Kantou	1956	Tabakhana (Kouris)	Gravity	15	34.000
13	Pera Pedi	1956		Gravity	22	55.000
14	Pyrgos	1957	Katouris	Gravity	22	285.000
15	Trimiklini	1958	Kouris	Gravity	33	340.000
16	Prodromos Reservoir	1962	Off - stream	Earthfill	10	122.000
17	Morfou	1962	Serrachis	Earthfill	13	1.879.000
18	Lefka	1962	Setrachos (Marathasa)	Gravity	35	368.000
19	Kioneli	1962	Almyros (Pediaios)	Earthfill	15	1.045.000
20	Athalassa	1962	Kalogyros (Pediaios)	Earthfill	18	791.000
21	Sotira - (Recharge)	1962	-	Earthfill	8	45.000
22	Panagia/Ammochostou	1962	-	Earthfill	7	45.000
23	Ag.Georgios - (Recharge)	1962	-	Earthfill	6	90.000
24	KanliKiogiou	1963	Ghinar (Pediaios)	Earthfill	19	1.113.000
25	Ammochostou - (Recharge)	1963	-	Earthfill	8	165.000
26	Paralimni - (Recharge)	1963	-	Earthfill	5	115.000
27	Agia Napa - (Recharge)	1963	-	Earthfill	8	55.000
28	Ammochostou - (Antiflood)	1963	-	Earthfill	5	50.000
29	Argaka	1964	Makounta	Rockfill	41	990.000
30	Mia Milia	1964	Simeas	Earthfill	22	355.000
31	Ovgos	1964	Ovgos	Earthfill	16	845.000
32	Kiti	1964	Tremithos	Earthfill	22	1.614.000
33	Agros	1964	Limnatis	Earthfill	26	99.000
34	Liopetri	1964	Potamos	Earthfill	18	340.000
35	Agios Nikolaos - (Recharge)	1964	-	Earthfill	2	1.365.000
36	Paralimni Lake - (Recharge)	1964	-	Earthfill	1	1.365.000
37	Ag. Loukas Lake - (Recharge)	1964	-	Earthfill	3	4.545.000
38	Frenaros - (Recharge)	1964	-	Earthfill	5	115.000
39	Deryineia - (Recharge)	1964	-	Earthfill	6	23.000
40	Polemidia	1965	Garyllis	Earthfill	45	3.400.000
41	Agia Marina	1965	Xeros	Rockfill	33	298.000
42	Kalopanagiotis	1966	Setrachos (Marathasa)	Earthfill	40	363.000
43	Mavrokolympos	1966	Mavrokolympos	Earthfill	45	2.180.000

44	Pomos	1966	Livadi	Rockfill	38	860.000
45	Makrasyka - (Recharge)	1966	-	Earthfill	8	195.000
46	Frenaros - (Recharge)	1966	-	Earthfill	7	45.000
47	Avgorou - (Recharge)	1966	-	Earthfill	3	68.000
48	Kontea - (Recharge)	1966	-	Earthfill	5	82.000
49	Xylofagou - (Recharge)	1966	-	Earthfill	7	86.000
50	Sotira - (Recharge)	1966	-	Earthfill	5	32.000
51	Achna Mesania - (Recharge)	1967	-	Earthfill	4	90.000
52	Lysi - (Recharge)	1967	-	Earthfill	7	77.000
53	Agios Georgios - (Recharge)	1967	-	Earthfill	3	68.000
54	Germasogeia	1968	Germasogeia	Earthfill	49	13.500.000
55	Sygkrasis	1968	Merikeros	Earthfill	7	1.115.000
56	Ormideia - (Recharge)	1968	-	Earthfill	5	100.000
57	Agios Epiktitos - (Recharge)	1968	-	Earthfill	6	34.000
58	Akanthou - (Recharge)	1968	-	Earthfill	6	45.000
59	Morfou - (Recharge)	1969	-	Earthfill	5	130.000
60	Vrysoulles - (Recharge)	1969	-	Earthfill	7	140.000
61	Xylotymvou - (Recharge)	1969	-	Earthfill	7	50.000
62	Protopapades - (Recharge)	1970	-	Earthfill	6	90.000
63	Lefkara	1973	Syrgatis (Pentaschoinos)	Earth/Rockfill	71	13.850.000
64	Masari - (Recharge)	1973	Serrachis	Earthfill	15	2.273.000
65	Palaichori - Kampi	1973	Akaki (Serrachis)	Gravity	33	620.000
66	Kyperounta No1*	1974	Off - stream	Earthfill	7	50.000
67	Arakapas	1975	Germasogeia	Gravity	23	129.000
68	Lympia (new)	1977	Tremithos	Gravity	12	220.000
69	Agioi Vavatsinias No1 *	1980	Off - stream	Earthfill	17	55.000
70	Eptagoneia No1 *	1980	Off - stream	Earthfill	16	92.000
71	Chandria *	1980	Off - stream	Earthfill	35	70.000
72	Melini *	1980	Off - stream	Earthfill	22	59.000
73	Pelendri *	1980	Off - stream	Earthfill	18	123.000
74	Agioi Vavatsinias	1981	Vasilikos	Arch	19	53.000
75	Eptagoneia No3 *	1981	Off - stream	Earthfill	12	65.000
76	Akapnou - Eptagoneia *	1981	Off - stream	Earthfill	9	132.000
77	Kato Mylos *	1981	Off - stream	Earthfill	23	104.000
78	Eptagoneia No2 *	1982	Off - stream	Earthfill	8	127.000
79	Arakapas No1 *	1982	Off - stream	Earthfill	12	192.000
80	Asprokremmos	1982	Xeros Potamos	Earthfill	53	52.375.000
81	Xyliatos**	1982	Lagoudera (Elia)	Rockfill	42	1.430.000
82	Agridia *	1983	Off - stream	Earthfill	18	59.000
83	Kyperounta No2 *	1983	Off - stream	Earthfill	27	273.000
84	Lagoudera*	1983	Off - stream	Earthfill	36	71.000
85	Ora *	1983	Off - stream	Earthfill	18	62.000
86	Agioi Vavatsinias No2 *	1984	Off - stream	Earthfill	25	43.000
87	Farmakas No1 *	1984	Off - stream	Earthfill	18	21.000
88	Farmakas No2 *	1984	Off - stream	Earthfill	24	61.000
89	Arakapas No2 *	1984	Off - stream	Earthfill	12	120.000
90	Dierona *	1984	Off - stream	Earthfill	24	159.000
91	Choirokoitia *	1984	Off - stream	Earthfill	16	205.000
92	Esso Galata *	1985	Off - stream	Earthfill	27	35.000
93	Kalavasos	1985	Vasilikos	Rockfill	60	17.100.000
94	Dipotamos***	1985	Pentaschoinos	Rockfill	60	15.500.000

95	Evretou	1986	Stavros tis Psokas	Rockfill	70	24.000.000
96	Achna	1987	Off - stream	Earthfill	16	6.800.000
97	Aradippou	1987	Parthenitis	Gravity	14	90.000
98	Kouris	1988	Kouris	Earthfill	110	115.000.000
99	Vyzakia	1994	Off - stream	Earthfill	37	1.690.000
100	Odou No1*	1996	Off - stream	Earthfill	33	32.000
101	Odou No 2 *	1996	Off - stream	Earthfill	34	53.000
102	Melini No2*	1996	Off - stream	Earthfill	36	97.000
103	Arminou	1998	Diarizos	Earth/Rockfill	45	4.300.000
104	Tsakistra	2000	Limnitis	Gravity	23	100.000
105	Tamassos	2002	Pediaios	Earth/Rockfill	34	2.800.000
106	Kannaviou	2005	Ezousa	Earth/Rockfill	75	18.000.000
107	Klirou-Malounta-Akaki	2007	Akaki (Serrachis)	Earthfill	38	2.000.000
108	Solea (Under construction)	2010	Off - stream	Earthfill	56	4.500.000
TOTAL						**331.933.000**

 # Replaced by dam no 69

** Ponds with membrane lining (height 10 m)*

*** The storage capacity of the dam was increased in Feb. 1998 from 1.220.000 to 1.430.000 m^3*

**** The storage capacity of the dam was increased in Jul 1998 from 13.700.000 to15.500.000 m^3*

Source: http://www.moa.gov.cy/moa/wdd/Wdd.nsf/dams_en/dams_en?OpenDocument

ANNEX 4: Location of dams in the South

Information available in Greek

Source: www.moa.gov.cy/wdd

ANNEX 5: Dams and storage capacity in the North

As they appeared in the newspaper Kibris (3rd February 2005)

NAME OF DAM/ GÖLETIN ADI	STORAGE CAPACITY (IN M^3)/ TOPLAM DEPOLAMA HACMI (METREKÜP)
1) Yilmazköy/ Polat Dere	517,167
2) Geçitköy/ Daĝ Dere	1,820,150
3) Arapköy/ Uzun Dere	444,150
4) Arapköy/ Ayani Dere	608,881
5) Beşparmak/ Alagadi-Çiftlik Dere	774,575
6) Hamitköy/ Baştanlik Dere	529,125
7) Deĝirmenlik/ Çatal Dere	296,814
8) Serdanli/ Aĝilli Dere	391,880
9) Geçitkale/ Eĝri Dere	1,360,510
10) Ergazi/ Saya Dere	-
11) Mersinlik/ Azganli Dere	1,145,065
12) Daĝyolu/ Üçparmak Dere	392,250
13) Gemikonaĝi/ Maden Dere	4,121,205
14) Gönyeli	453,857
15) Kanliköy	730,294
16) Haspolat	117,390
17) Gönendere	938,666
18) Akdeniz	1,468,157
TOTAL CAPACITY	**16,110,136**

As provided by Ms. SERAP ORTÜRK ("Water Development Department")

NAME OF DAM/ GÖLETIN ADI	STORAGE CAPACITY (IN M^3)/ TOPLAM DEPOLAMA HACMI (METREKÜP)
1) Yilmazköy/ Polat Dere	517,167
2) Geçitköy/ Daĝ Dere	1,820,150
3) Arapköy/ Uzun Dere	444,150
4) Arapköy/ Ayani Dere	608,881
5) Beşparmak/ Alagadi-Çiftlik Dere	774,575
6) Hamitköy/ Baştanlik Dere	529,125
7) Deĝirmenlik/ Çatal Dere	296,814
8) Serdanli/ Aĝilli Dere	391,880
9) Geçitkale/ Eĝri Dere	1,360,510
10) Ergazi/ Saya Dere	405,025
11) Mersinlik/ Azganli Dere	1,145,065
12) Daĝyolu/ Üçparmak Dere	392,250
13) Gemikonaĝi/ Maden Dere	4,121,205
14) Gönyeli Göleti	453,857
15) Kanliköy Göleti	730,294
16) Haspolat Göleti	117,390
17) Gönendere/ Göndere Göleti	938,666
18) Akdeniz Göleti	1,468,157
19) Karşiyaka/ Karşiyaka Göleti	Under construction
20) Tatlisu – Zerdali Portokalli Dere	Under construction
21) Zeytinlik Köprü Dere	Under construction
TOTAL CAPACITY	**16,515,161**

ANNEX 6: List of wastewater treatment facilities in the North

DISTRICT	PLACE	CAPACITY (M^3/DAY)	TYPE
NICOSIA			
	Nicosia Treatment Plant	20,000	Pond system
	UC University	200	Sequence Batch Reactor
	Levent College	100	Sequence Batch Reactor
	Tashkent Slaughter House	30	Sequence Batch Reactor
	SOS Children Village	50	Sequence Batch Reactor
	Salih Boyaci House	10	Sequence Batch Reactor
	Soldier Campus	100	Sequence Batch Reactor
	Ercan Airport	75	Sequence Batch Reactor
	Dumlupinar Levent	50	Sequence Batch Reactor
	SUB-TOTAL	*20,615*	
FAMAGUSTA			
	Eastern Med. University	1300	Sequence Batch Reactor
	Doctors Housing Estate	80	Sequence Batch Reactor
	Park Hotel	100	Sequence Batch Reactor
	Student Dormitory	100	Sequence Batch Reactor
	Famagusta State Hospital	50	Sequence Batch Reactor
	Toros Showroom	20	Sequence Batch Reactor
	Laguna Apartments	60	Sequence Batch Reactor
	Mesan Bogaz Village	60	Sequence Batch Reactor
	Noyanlar Housing Estate	50	Sequence Batch Reactor
	Salamis Bay Hotel	250	Sequence Batch Reactor
	Cyprus Garden Hotel	75	Sequence Batch Reactor
	Magusa Medical Centre	10	Sequence Batch Reactor
	Palm Beach Hotel	100	Sequence Batch Reactor
	SUB-TOTAL	*2,255*	
KYRENIA			
	Kyrenia Treatment Plant	1000	Sequence Batch Reactor
	Olive Tree Holiday Village	100	Sequence Batch Reactor
	High Life Holiday Village	25	Sequence Batch Reactor
	Ada Hotel	40	Sequence Batch Reactor

	Deniz Kizi Hotel	60	Sequence Batch Reactor
	Merit Crystal Cove Hotel	200	Sequence Batch Reactor
	Mountain View Hotel	25	Sequence Batch Reactor
	Mr. M. May Hotel	10	Sequence Batch Reactor
	Top-Set Bungalow	75	Sequence Batch Reactor
	Bogaz Police Houses	75	Sequence Batch Reactor
	Karaoglanoglu Baris Sitesi	87.5	Sequence Batch Reactor
	Karaoglanoglu Prestij Sitesi	87.5	Sequence Batch Reactor
	Lapta Treatment Plant	600	Sequence Batch Reactor
	Acapulco Holiday Village	500	Sequence Batch Reactor
	SUB-TOTAL	*2,885*	
	TOTAL	**25,755**	

Source: Nevzet Oznel, Wastewater Management, presentation at the Workshop of the German-Cypriot Forum (DZF) on *Sustainability for Cyprus*, 15-16 October 2004, Goethe Centre, Nicosia, Cyprus

ANNEX 7: Discussion on Boundaries & Frontiers in the context of Cyprus

WHY BOUNDARY ANALYSIS?

"Boundaries represent the line of physical contact between states and afford opportunities for cooperation and discord"

Prescott (1987: 5)

"The boundary is the place of intercourse with the foreigner"

Fawcett (1918)[363]

The goal of this section is to consider the boundary aspect of the water-politics-boundaries nexus, which, as seen, characterises water resource management in Cyprus. In doing so, this section will firstly clarify some selected boundary frameworks that are relevant to the case study and, secondly fortify the claim that a consideration of boundaries must form part of any water policy analysis in Cyprus. Although a 'boundary' exists and operates only in *de facto* terms in Cyprus, its significance and the implications cannot be ignored. At the same time the section supports the use of a 'boundaries/frontiers of contact' lens, one that is constructive in water analysis in Cyprus and which privileges the horizontal policy dimension (stakeholder engagement, actors versus structure, etc) that forms the centrepiece of the thesis.

History demonstrates the ubiquity, through time, of the process of claiming and reclaiming land and the access to natural resources. Given that well-located and well-endowed land is itself a scarce resource, conflict over its ownership, or title, and access to it is highly likely, if not inevitable. As Prescott (1987: 1) states "*a significant part of the history of several countries concerns the struggle for territory*". With that in mind, an account of the various changes of national boundaries could provide an authentic historical overview of the stages in a country's territorial expansion and development. For Cyprus, the formation of the 1974 *de facto* division line, has marked and determined the island's subsequent historical trajectory.

A reference to boundaries is normally made in analyses of conflicts, disputes, security concerns and in efforts at dispute resolution within interstate relations (Prescott, 1987). In the same way that security studies are conventionally conceived of as the encapsulation of military operations (Buzan, 1991; 1994), most research in boundary studies is dedicated to exploring ways of negotiating and reconciling differences between bordering states. Unsurprisingly, therefore, most boundary research focuses on situations of conflict and political turbulence and too little importance is attributed to instances of contact and cooperation along frontiers. Boundaries do not only mark the division lines between states; they also denote points of connection and exchange. This is particularly relevant as it pertains to water resources where it would seem more constructive to consider boundaries/frontiers as points of contact and consolidation. There is, of course, a need to share water, a scarce and precious resource, which pays no heed to

[363] Quoted in Newman and Paasi, 1998: 186

borders or boundaries, although at times natural features---watercourses, mountain ranges and water run-off---determine the path borders take. So the conception of boundaries as points of contact is more appropriate for the analysis of Cyprus and Nicosia in particular.

This section begins by providing conceptual definitions for boundaries, frontiers and borders and considers their applicability in Cyprus. It continues with the presentation of similarly applicable boundary frames and models of borderland interaction. Thereafter, an analysis of the post-modern understanding of frontiers as points of contact is presented, an aspect intrinsically linked to the thesis' main research question on policy networks. A summary and some conclusions close the section.

BOUNDARIES VERSUS FRONTIERS

The concepts and terminologies used to denote the dividing lines between states suffer from an inherent vagueness. They may refer to the actual borderline, signalled by fences or sables or to the zone that separates - or joins, depending on perspective - two or more territories. Boundary concepts have varied connotations: they may be present simply for functional/administrative purposes, as in the cases of Canada-USA and USA-Mexico; they may be politically sensitive in dispute-prone areas, as in India-Pakistan and Greece-Turkey; or their formal utility may be under re-evaluation as border controls are reduced or eliminated (as in the Schengen zone or the UK-Eire common travel area).

The matter of definitions is broad in itself and involves a rich and changing vocabulary. Besides the initial distinction among the concepts of borders, boundaries and frontiers, additional terminologies and concepts, such as 'borderlands', have grown up. In addition, it is now common to speak of: open or closed borders (Welchman, 1996); political, social, cultural, economic, pioneer, antecedent, subsequent and superimposed boundaries (Anderson, 1996; Prescott, 1987; Newman and Paasi, 1998); borderlands of alienation, co-existence, integration or interdependency (Martinez, 1994; Krakover, 1997); and frontiers of contact, cooperation, peace, conflict or war (House, 1980; Minghi, 1991; Newman, 1996; 1998).

BOUNDARIES

There is a range of boundary-related definitions and terminology. To Prescott (1987: 13-14), "*a boundary refers to a line, a borderland refers to the transition zone within which the boundary lies and a frontier refers to a zone*". For Anderson (1996: 9) 'frontier' may also denote a zone – its original use was a military one - but is also the term with the broadest meaning and it may be used to signify the precise line at which jurisdictions, and the attendant administrative functions and authorities, meet. The term 'border' can be applied to a zone - usually a narrow one - or it can be two entities' demarcating line. 'Boundary' itself is always used to refer to a line of delimitation/demarcation; it is the narrowest of the three terms. Anderson (1996) employs a particular distinction, using 'frontier' to refer to international boundaries and 'boundary' to refer to the frontiers of political and administrative authorities. For Newman and Paasi (1998)

boundaries and borders signify the lines separating sovereign territories, while frontiers constitute the area of proximity to the border whose internal development is affected by the existence of the line.

According to Lapradelle (1928) and Jones (1945) (cited in Prescott, 1987: 11) there are three stages in boundary evolution. Lapradelle referred to a boundary's "*preparation, decision and execution"* and Jones to "*allocation, delimitation and demarcation"*. Allocation is the initial political division of territory between two states. Delimitation refers to the selection of a boundary site and its definition, and demarcation to the (physical) construction of the boundary in the landscape.

Cyprus did not follow this pattern of boundary formation; the demarcation of the *de facto* South-North boundary occurred overnight and has been sustained by military presence. In this sense it is useful to consider Jones' (Jones, 1945: 11) argument that *"the process of boundary-making is smoothed by considering each boundary as special case with individuality more pronounced than resemblance to a theoretical type*" (cited in Prescott, 1987: 12). Nonetheless, the creation of the *de facto* boundary in Cyprus seems to most closely correspond to the formation of a frontier and the island is divided by the no-man's land represented by the Buffer Zone. This UN-supported and UN-sustained 'dead zone' may be viewed as either a point of division or contact depending upon the particular political circumstances.

From another perspective, "*boundary changes will be indicators of a shift in the balance of forces, caused either by an increase in driving force on the one side of the frontier (boundary) or by a decrease in resistance on the other*" (Spykman and Rollins, 1939: 392 – cited in Prescott, 1987: 10). In Cyprus the demarcation of the *de facto* boundary along the northern part of the island does not fit this model of boundary change. Rather, it is the result of third-parties' interventions in the internal affairs of Cyprus; a complex set of Greek and Turkish political and military manoeuvres created and sustained the conditions that enabled the *de facto* division, after the military operations and occupation (of the 37% of the island) by Turkish troops. (These actions violated international law and have been condemned in numerous UN Security Council Resolutions[364]). Moreover, with Spykman and Rollins' (1939) view in mind, the *de facto* division has neither fostered nor reflected any increase in the 'driving force' of the Turkish-Cypriots. Indeed, the situation (and specifically the Turkish military presence) has led to the Turkish-Cypriots' international isolation and generated the appearance of what resembles a Turkish enclave rather than an independent and self-governing entity.

In the traditional political-geographical context, boundaries are considered as the lines that denote the edges and (separating) interfaces of national spaces. There is a close association with the concepts of territory and sovereignty and this has resulted in a view of boundaries as manifestations of state territoriality (Taylor, 1994; Johnston, 1995). Considering the state as the

[364] A list of all UN Security Council Resolutions on Cyprus is available at http://www.un.int/cyprus/resolut.htm and condemnation of the military activities forms part of Resolutions 353 onwards

departure point in the boundary discussion has been scrutinised and questioned by an emergent critical geopolitical discourse suffused with the post-modernist insights of Derrida and Foucault (see Agnew, 1994; O'Tuathail, 1996). The questioning of the traditional conceptualisation of boundaries is tied up with intellectual currents that have prompted the re-assessment of boundaries in light of the recognition of their social construction. The latter has placed priority to questions of power, culture and social groups arguing that political boundaries are being drawn to coincide with cultural alignments (Huntington, 1996). The post-modern discourse on boundaries (and their social consequences) are explored later in this section as they are of direct relevance to Cyprus and the policy networks that seem to traverse the 'Dead Zone'.

Additionally, it may be argued that the division implied by the presence of a boundary creates its own distinctive region, "*making an element of division also the vehicle for regional definition*" (Minghi, 1991: 15). This paradox is at the core of the borderland concept and the Nicosia case study seems to epitomise it; on the one hand the city forms the borderland between the South and the North; on the other it is precisely through this reality that the city has developed its own distinct post-1974 identity. However, the thesis argues that in the case of Nicosia it is as a frontier, rather than boundary, that the situation is best characterised and this necessitates a more comprehensive presentation of the frontier concept.

FRONTIERS

Besides denoting the zone that links (or, according to viewpoint, divides) two or more states, a frontier can be also conceived of as an institution and as a process (Anderson, 1996). The institutional understanding derives from the fact that frontiers are conventionally established by political decisions and that legal documents regulate their subsequent existence and operation. The importance of the frontier concept lies in the multiplicity of understandings that it may acquire, and the flexibility it bestows in providing insights on border interactions. More specifically, according to Anderson's classification, frontiers' institutional aspects correspond to the administrative functions that, in turn, denote the nature of the bordering entities' relationship. In Cyprus, for example, the necessity to display personal documents on both sides when crossing the *de facto* frontier creates a semi-hostile environment which informs the aloof and suspicious atmosphere that characterises the two sides' mutual interactions.

In contrast, when understood as processes, frontiers are said to have four dimensions (Anderson, 1996: 2-3):

1) as instruments of state policy;
2) as factors that may constrain the policies and practices of governments;
3) as markers of identity (since they normally form part of the political beliefs and myths about the unity of the people) and;
4) as a discourse, depending on the meanings attributed to specific frontiers or to the concept of frontiers in general.

As a process, a frontier provides further insights into the relations between two neighbouring entities. The services and the facilities available along the frontier illustrate a level of integration reserved for frontier populations and for those people that cross it. In the case of Cyprus, examining the direction of state policy as it pertains to the frontier may be even more revealing given that the island's capital forms a part of the frontier. At the same time, government policies are constrained by the simple existence of the frontier, since there is a physical restriction on its authority to operate which cannot extend to the other side. When a capital forms the frontier, these restrictions can cause extensive problems for the everyday running of the city. But, surprisingly, the operation of both the sewage treatment plant and the drinking water distribution system in Nicosia has managed to disregard the division of the city and treated the two parts of the capital as a single unit. This is seemingly a unique example within the context of post-1974 Cyprus, one where a frontier has emerged as a point of regular contact and cooperation. The frontier as an identity marker may signify either the diversity or the commonality of frontier populations. In Nicosia, the frontier has not altered the perception of its inhabitants as 'Cypriots' over Greeks or Turks. Indeed, it has enhanced a sense of identity and has strengthened a common desire to unite around a common vision to develop their city (which, as will be analysed in Chapter VII, materialised in the Nicosia Master Plan).

For Anderson (1996) frontiers may be attributed a variety of values. There is a psychological value that refers to maintaining one's space while at the same time discouraging intrusions of this space by outsiders. There is a symbolic value when frontiers are referred to as the zones that distinguish and differentiate one state entity from another, one nation from another. There is also a socio-political significance that concerns state formation and state organisation within a certain geographical area. The various frontier significances are primarily affected by the nature of people's perception of their boundaries. Usually, when disputes arise, boundary perceptions clash. For Cyprus, incompatible, contradictory boundary perceptions have formed a main political theme, which has discouraged the two communities' borderland interaction. The North functions within a *de facto* borderline – essentially a boundary - in order to define and justify its existence. The North is dependent upon a demarcation that contradicts the South's (internationally-supported) view that the island of Cyprus, in its totality, gives territorial expression to a single and undivided entity.

Within the same context, Lamb (1968: 32) refers to frontiers as "*a cell wall of the basic unit of national identity, marking an emotional and psychological divide as well as a political geographical line*". In Cyprus, this is essentially the function of the buffer zone that on the one hand forms a divide and on the other constitutes a contact point for the two communities. Anderson (1996: 6) comments that "*a pervasive, often almost superstitious, fear characterises closed frontiers as lines of transition between two worlds*". When crossing the border from the South to the North in Cyprus, this feeling is particularly pronounced; the checkpoints form the gates between two substantially different worlds, one in its late modernisation phase and the other stuck firmly in a pre-modern paradigm.

DISCUSSING FURTHER THE BOUNDARY FRAMEWORK

This sub-section presents three frameworks in boundary analysis that have applicability for the Cyprus case study and demonstrate why boundary analysis is relevant for Cyprus. They are the 'critical frontier' concept, the use of territorial ideologies and the notion of space purification.

Boulding (1962, cited in Anderson, 1996: 30-31) introduced the concept of the 'critical frontier' while analysing the 1962 Cuban Missile Crisis (also analysed in Allison, 1971). The USSR made efforts to deploy missiles with the potential to carry nuclear weapons on Cuba, considered as the USA's 'backyard'. Though not formally established as such, Cuba constituted a critical frontier for the USA and so the (re)actions of the superpowers brought them to the brink of nuclear war. But the critical frontier concept also has applicability for Cyprus. In 1998 the Republic of Cyprus announced its intention to install Russian S-300 surface-to-air theatre missile defence system (Cyprus PIO, 01/06/98 and 13/07/98; Barletta, 1998), a plan that provoked a severely hostile response from Turkey. Turkey considers that its proximity to the island meant that the installation of this equipment was impermissible (Kibaroglu, 1998). Turkey heightened tensions by stating that should Cyprus proceed to make the purchase of the S-300, Turkey would regard it as *casus belli* (cause of war) and take military action accordingly (Koch 1998; Hendawi, 1998; Alitheia-Αλήθεια, 01/06/98; Simerini-Σημερινή, 01/06/98; Pharos-Φάρος, 01/06/98; Phileleutheros-Φιλελεύθερος, 01/06/98; Charaugi-Χαραυγή, 01/06/98). After intense diplomatic discussions between Greece and the Republic of Cyprus (Banks, 1998), it was decided to drop the purchase of the S-300 missiles (Cyprus PIO 30/12/98; Jorgensen, 1999), although the decision did not entirely neutralise the tension (Austa, 1998).

The application of the 'critical frontier' frame to Cyprus may explain its inability to determine its own trajectory, given Turkey's consideration that the island's destiny is inextricably linked to its own geopolitical position and current and future planning. Had the political interplay between the two countries been more consensual, it would have been possible to provide viable alternatives in the case of the island's water predicament, for example with water transfers from Turkey to service the entire island (see Chapter VI).

According to Anderson (1996: 35), territorial ideologies are more likely to be espoused by populations in weak and vulnerable positions. In Cyprus, this applies – although for different reasons- to both the North and South. The North embraces a territorial ideology because of its long-standing isolation and in order to legitimise its own existence in the eyes of the international community. This is the argument advanced by Turkey in order to ground the Turkish-Cypriots' right to self-determination, while simultaneously, the fear of intense immigration from Turkey's Anatolian areas underpins the North's argument in favour of closed borders and extensive controls. The South, on the other hand, uses a territorial ideology to establish its right to the territory and to maintain the unity of its people in view of the island's critical political situation. References are often made to the long presence of Greek-Cypriots on the island as far back as the 6th century BC (PIO, 2000: 12).

But more importantly, both the South and the North use a territorial ideology as a means by which they might seek to establish and further a right to use and develop the island's water resources. Water availability in Cyprus is limited; there are no perennial rivers and the main groundwater aquifers are either heavily salinised or under serious threat of depletion (or both). Therefore, the water potential of each side primarily depends on dam construction and the use of alternative water resources, such as desalinated or recycled water. However, these projects presuppose a certain level of economic development, although attained in the South it has not been in the North. This may explain the North's dependence upon a territorial ideology in securing an entitlement to groundwater resources. Alternative water sources and dam construction notwithstanding, a reliance on groundwater has characterised the practice of Cypriot farmers, whether Greek-Cypriot or Turkish-Cypriot. But it should be pointed out that sustainable and integrated utilisation of groundwater aquifers in Cyprus needs to involve both sides, as the aquifers cut across the *de facto* dividing lines. If developed, this practice could render any territorial ideology rather obsolete.

The concept of the 'purification of space' (Sibley, 1988; 1995) develops out of the conceptual trajectory of territorial ideology. Sibley rejects the idea of group and cultural differentiation and claims that groups use boundaries as means of securing socio-spatial and ethnic homogeneity. By constructing a distinct idea of otherness, dominant groups attempt to 'purify their space' and work to include and exclude particular groups (ibid). In Cyprus, attempts at space purification have been made and particular emphasis placed on the function of the buffer zone. Both the South and the North have developed their own strategies for the purification of space, which have been accompanied by the discourses and practices that convey the images of threat perceived by one community towards the other. Such practices are viewed as crucial and defining when directly linked to issues of access to vital water resources (for example to the Morfou aquifer or the seasonal rivers that run from the Troodos range in the South towards the Morfou bay in the North). Exclusive access to water is directly linked to the construction of a distinct and hostile image of otherness. This reality has engendered the factors that have limited the joint exploitation of the rivers that cut across both sides, or the sustainable use of the Morfou aquifer. The purification of space framework, coupled with territorial ideologies, prolongs the alienation of the island's two communities and contributes to their further estrangement. Both concepts stand in direct opposition to the policy network framework and to the boundaries/frontiers of contact conception that the thesis embraces.

BORDERLAND INTERACTION

> "Political balance (between countries) is to a large extent dependent on the (characteristics of) borders between them"
>
> Ratzel (1897: 584)[365]

[365] Quoted in Prescott, 1987: 9

Borderland interaction requires special attention in order to illustrate the conditions that lead to cooperation or conflict in inter-state relations. For Cyprus, interaction along the *de facto* division line - especially in Nicosia - has provided the basis for the two communities' rapprochement and may offer a plausible way out of the island's political predicament.

Globally, conditions in borderlands vary considerably, but despite this heterogeneity "*more borderlands have tended towards convergence rather than divergence*" (Martinez, 1994: 1). In an attempt to understand the varying types of borderland interaction, Martinez has created a model that identifies four types of such interaction: alienated, co-existent, interdependent and integrated and some of them are applicable to post-1974 Cyprus. Shortly after the events of 1974, the borderland interaction between the South and the North fell within the alienated model - contact and daily interchange became non-existent – and intense militarisation and the rigid control and UN mediation (through the presence of UNFICYP[366]) of crossing characterised the processes at 'border' checkpoints.

This situation continued until April 2003, when the two checkpoints in Nicosia (one for pedestrians and one for vehicles) opened, and Cypriots could cross from the one side of the 'border' to the other (Talas, 2003). This change may be understood, after Martinez (1994), to have facilitated the transformation from a borderland of alienation to one of co-existence. The two communities were forced to acknowledge each other; the Greek-Cypriots would visit the villages from which they were forced to flee in 1974, while the Turkish-Cypriots would visit the South in an attempt to reconnect with the world outside the internationally isolated North. The process of co-existence was further strengthened after 1 May 2004 and Cyprus' accession to the European Union[367]. At present, border crossings take place on a daily basis contingent upon nothing more than the satisfactory inspection of personal documents[368]. Indeed, in all areas of the island, the freedom of movement has been secured. Although borderland interaction has increased significantly and barely resembles the alienated post-1974 situation, none of this is to argue that a stage of interdependence has been reached. The path upon which change must depend is long and requires political will to ameliorate the island's polarised situation.

Another model on cross-boundary interaction applicable to Cyprus was developed by Krakover (1997) and involves four general factors to determine the degree of boundary permeability: (1) potential economic benefits; (2) national-political considerations; (3) compatibility between leadership and popular desires; (4) the nature of the dispute between the bordering nations. In this conceptual framework the first two factors are considered to be the main ones for cross-boundary interaction; the last two may simply modify the first two. Krakover's position is a contrast to Martinez's (1994) perception that the nature of neighbouring countries' dispute is the determining factor for the degree of boundary permeability. Krakover (1997: 33) claims that "*it is only after a country sets preferences in its internal affairs [factors 1, 2 and 3 in his classification] that the impacts of the bilateral relationships can be considered [factor 4]*".

[366] United Nations Peacekeeping Force in Cyprus
[367] http://europa.eu.int/abc/european_countries/eu_members/cyprus/index_en.htm
[368] This excludes settlers from Turkey who reside in the North and who do not enjoy the freedom of movement.

In Cyprus, the economic benefits of boundary interaction have been disregarded. The South has been locked into a trajectory of modernisation and Europeanisation, while the North has come to depend upon Turkey for financial assistance and most of its economic activity[369]. Moreover, the national-political considerations of both sides are responsible for the boundaries' enduring closure and the nearly thirty years' non-interaction. In Cyprus, cross-boundary interaction has been enhanced mainly through third party mediation and specifically, by the efforts of the UN and EU. In addition, and as the main argument of the thesis suggests, it is through informal structures that contact has been established and the two sides' rapprochement facilitated. Policy networks seem to have functioned as catalysts in bringing together the two sides over issues of common interest such as sewage treatment or the rainwater drainage system. In fact, it is the nature of the dispute that has determined the trajectory of both the Cyprus case and of cross-boundary interaction particularly. Hostility, suspicion and mistrust have characterised the dispute since 1974. Over the years, this climate has been diluted by ideas of unifying the island under the UN and EU auspices in order that its full economic and social potential might be achieved.

POST-MODERN FRONTIERS: MOVING FROM CONFLICT TO CONTACT

"Frontiers are indeed the razor's edge on which hang suspended the modern issues of war and peace"

Lord Curzon of Kedleston (1907: 7)[370]

The shift from paradigm to paradigm in the modernity continuum is also relevant to the boundary/frontier discussion. The pre-modern feudal system of land allocation was followed by a modern paradigm of nation-state formation. Amongst other things, the transition from modern to post-modern paradigms has involved the questioning of the functions and primacy of the nation-state in a world that is becoming interdependent, multi-polar and increasingly small. Particularly in Europe, the evolution of the European Union has provided a laboratory for the theories of integration that stress the importance of political action and institutional factors. Integration theories make reference to concepts such as interdependence, inter-reliance, co-ordination, co-evolution (etc). The perceived significance of boundaries - as the principal source of division among states – has come to be challenged and this has been demonstrated also by a shift in security studies; a wider approach, exceeding simply the strategic/military and (geo)political concerns, has been developed to encompass the economic, social and environmental aspects (Buzan, 1991; 1994; *et al* 1998). If security has become a less rigid concept and denotes interdependence and permeability rather than division and states' materiel capacity, how have such changes affected borders, boundaries and frontiers?

[369] http://www.state.gov/r/pa/ei/bgn/5376.htm
[370] At the time of the statement Lord Curzon was Viceroy of India (quoted in Prescott, 1987: 5)

Wallerstein, a well-known interdependence theorist has been mainly associated with the neo-Marxist school of thought (Preston, 1997). Wallerstein (1974) claims that greater integration of world markets and increasing concentration of capital in the core capitalist societies has formed part of an inexorable process; one that will abolish the significance of geographical distance and will make all frontiers permeable. He suggests that global integration, or globalisation, will eventually have the indirect effect of diminishing the interest of rich and powerful countries in changing the location of frontiers. On globalisation, Robertson (1992) claims that the consciousness of the world as being a single whole has increased and that boundaries are doubtless significant in this process and becoming increasingly permeable in a global world. Whether the globalisation process will lead to a 'borderless world' (Allen and Hamnett, 1995) or whether the state will remain a powerful component within (a perhaps multi-layered form of) international governance (Hirst and Thompson, 1995) remains to be seen. But the most important consequence of the post-modern boundary discourse is the emergence of other parameters in boundary studies alongside politics. Boundaries have become both symbols and manifestations of power relations and social institutions and form part of divergent and day-to-day institutional practices (Newman and Paasi, 1998). Boundaries create identities and are created through identity; they create practices and forms, which then become the basis of separate meaning and interpretation (Tester, 1993); finally boundaries not only separate groups and communities from each other but also mediate contacts between them (Minghi, 1991; Newman, 1998).

Abolishing the significance of boundaries/frontiers is central to policy network analysis that advocates horizontal, multi-actor coordination on issues of common interest irrespective of boundaries and division lines. This boundary 'overlook' characterises the formation and operation of engagement in Nicosia that cuts across the *de facto* frontier between the South and the North and involve stakeholders from both communities.

In Cyprus, Nicosia constitutes part of the frontier between the South and the North. It is one of the few examples of frontiers/boundaries of contact, in which the actual existence of the frontier constitutes the reason for the two sides' rapprochement. This development is linked to and facilitated by forms of bi-communal engagement in Nicosia. Minghi (1991) has proposed the concept of frontiers of contact, claiming that the analysis of border landscapes is being transformed because of a shift in focus, away from the context of war towards prospects for peace. He remarks that boundary studies in the post-War period have mainly dealt with "*havoc situations of turbulence and conflict, with little attention directed towards boundaries as political-geographical phenomena during 'normal times*" (Minghi: 1991: 17). Minghi argues for a new focus in boundary studies in order to encourage research on more 'normal' situations in boundary landscapes. Such a development would take boundary studies closer to recent trends in political geography, in which there has emerged a greater "*concern for making a more positive contribution to the study of peace*" (Minghi, 1991: 18). Similarly, Galtung's (1994) thought on 'co-existence in spite of borders' views borderland interaction and cooperation as a means for promoting political harmony. According to Minghi (1991: 29) the major thrust of

borderland study is that borderlands allow for normalcy and "*it is this process that takes us from war to peace and hence from conflict to harmony at the national level*".

In support of Minghi's analysis, Newman and Paasi (1998: 190) assert that "*borderlands and political frontiers have largely been studied within the context of conflict, separation, partition and barriers as contrasted with peace, contact, unification and bridges*". Prescott (1987: 160) states that research on border landscapes tends to "*concentrate on the dramatic at the expense of the routine, with the dramatic tending to be conflict and the routine more normal, peaceful situations*". On this view "*a boundary is a line of physical contact between states and hence affords opportunities for both discord and cooperation*" (Prescott, 1987: 5). Indeed, it is this view that the thesis embraces and it therefore considers that the frontier in Cyprus embodies, primarily, prospects for contact over conflict alone.

SUMMARY - CONCLUSIONS

This section presented selected concepts pertaining to boundaries and frontiers. It demonstrated the relevance of these frameworks for the Cyprus case study and the claim has been made that boundary analysis offers a dependable way of viewing the historical trajectory of an entity, be it state, region, locality, (etc.). In Cyprus specifically, boundary changes respond to major politico-social transformations. The events of 1974 resulted in the demarcation of a borderland and the *de facto* division of the island. Ever since, Cyprus' history has revolved around attempts to either legitimise or deconstruct the borderland reality. Undertaking any kind of research in and on Cyprus cannot bypass this reality.

The formation of *de facto* boundaries in Cyprus has largely been the outcome of external interventions in the island's internal affairs, coupled with turbulent internal socio-political conditions. It does not necessarily signify a shift in the power balance between the two communities. The artificial frontier of the Buffer Zone created to keep the two sides apart, cuts through the island's capital and therefore it incorporates the city firmly into the frontier zone. The frontier, although denoting separateness, also signals a meeting point for the two communities because Nicosia is at the heart of Cyprus' administrative, political and socio-economic activity. Simultaneously, the existence of bi-communal collaboration in Nicosia, on sewage treatment and the rehabilitation of the within-the-walls city, has demonstrated the prospects for cooperation, the necessity for joint action and has strengthened the unique nature of the Cypriot identity. More importantly, this engagement has brought the two sides together within a framework that is beyond political connotations and party interests. As a result, the purported rigidity of the Buffer Zone is questionable, and it increasingly resembles of a frontier of contact rather than one of conflict.

With respect to water management in Cyprus, the frontier of contact is both an outcome and a prerequisite. An effective water management requires cross-'boundary' cooperation, as water ignores the presence of the Buffer Zone and cuts from one side of the *de facto* division to the

other. Moreover, the sewage treatment system and, to a lesser extent the drinking water distribution system, are interlinked. That this is the case means that the two communities are compelled to work together and this reality forms a stepping stone towards a water management framework closer to holistic and integrated models.

Boulding (1989) claims that it is only when they are not made from sabres, that good fences make good neighbours. However, becoming good neighbours does not occur overnight; it requires time and political will so as to establish trust and ensure stability. Perhaps this is a characteristic of the bi-communal engagement in Nicosia. Since April 2003, Cyprus has entered a substantial phase of reconciliation and rapprochement at which point the presence of a fence of sabres no longer automatically caused the alienation of the two sides. Although the border is not adequately caricatured by a wooden garden fence between two good neighbours, important steps towards rapprochement have been firmly taken by the South and the North.

The type of boundary analysis derived for the thesis has, by no means, exhausted the literature of its insights. In fact, it responds pragmatically to the needs of the case study in its explanation of the formation and connotations of the post-1974 *de facto* boundary. The examination of various forms of frontier interaction was made in order to present the spectrum on which bi-communal interaction may operate. This may constitute at the same time an assessment of the effectiveness of policy networks because it constructs a platform upon their contribution may be tested. The thesis claims that although *de facto* divided, Nicosia has come to constitute an example of a boundary of contact rather than of conflict. The research question seeks to discover whether the formation and operation of communities of practice and policy networks across the Dead Zone in the capital have signalled such a change. In this respect, in Cyprus boundary analysis is bound to policy analysis.

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