

Water technology and sustainability in north Cyprus

Climate change and the Turkey-north Cyprus water pipeline

Michael Mason
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PCC REPORT 1/2017



THE LONDON SCHOOL
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CONTENTS

WATER TECHNOLOGY AND SUSTAINABILITY IN NORTH CYPRUS

NOTE REGARDING IMAGES AND NAMES IV
ACKNOWLEDGMENTS V
EXECUTIVE SUMMARY VI

PART ONE: BACKGROUND

INTRODUCTION 1
BACKGROUND 2
WATER USE IN NORTH CYPRUS 5
WATER GOVERNANCE IN NORTH CYPRUS 8

PART TWO: CLIMATE CHANGE AND WATER GOVERNANCE

THE CHALLENGE OF CLIMATE CHANGE 13
THE TURKISH WATER PIPELINE 15

PART THREE: RECOMMENDATIONS FOR WATER GOVERNANCE REFORM

REFORMING WATER GOVERNANCE 21
EFFECTIVENESS 23
EFFICIENCY 25
TRUST AND ENGAGEMENT IN WATER GOVERNANCE 26

Note regarding images and names

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Except in cases where explicit permission was granted, names of interviewees have been changed to protect their identity.

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EXECUTIVE SUMMARY

The Eastern Mediterranean is becoming measurably hotter and drier, while prolonged wars in countries such as Syria and Iraq have contributed to desertification in the region. As water resources dwindle, states attempt to manage those that remain through, for instance, damming water sources and thereby affecting neighbouring countries. Many experts predict that increasing water scarcity will exacerbate conflict and political unrest throughout the region.

Cyprus is equally affected by these developments, and although the island is divided, its resources are not. Melting snow on the Troodos Mountains feeds rivers and orchards in the Morphou region, now in the island's north, while the incline of Nicosia's infrastructure means that sewage flows from south to north and must be treated in the latter. Underground aquifers are accessed and relied upon by both communities. Moreover, population growth and tourism and other industries on both sides of the island have spurred overuse of limited resources, meaning that climate change is a problem being faced equally, and interrelatedly, on both sides of the Green Line.

Preparing for a sustainable future in the face of climate change is one of Cyprus's biggest and most immediate challenges. However, as a divided island with two administrations that engage in mutual non-recognition, there are limited opportunities for cooperation on an issue that requires joint and coordinated efforts. Indeed, each administration is making its own plans for climate change that take no or little account of efforts being undertaken on the other side of the divide.

One example of such unilateral planning is the water delivery project that pumps fresh water from the Taurus Mountains of Turkey and carries it across 80 kilometers of sea to a large dam in north Cyprus, from where it is now being distributed to farms and homes. This report represents an initial assessment of the potential for this innovative water delivery project to address and prepare for climate change in the island. In preparing this report, we asked, for instance, can such a water delivery project create a sustainable environmental future? What measures need to be put in place to avoid overuse of this water? What regulatory mechanisms may be available even for a divided island to help in making this new resource a more sustainable one?

Research for this report was conducted in May and July 2016 and consisted primarily of extended interviews with 21 legislators, members of regulatory bodies, and civil society representatives, including particularly members of professional unions such as architects and environmental engineers. Desktop research included media monitoring and study of the various reports, regulations, and laws that have been published regarding water management in the

island's north. At the time of our initial research, there was an ongoing controversy in the island's north about the water's management, and particularly about whether or not that management would be partially or fully privatised. As will become clear, the tentative conclusion of this research is that the water delivery project has the potential to produce positive change if properly managed. Management for sustainability, however, requires different priorities and perspectives than we found being emphasised in the discussions and debates over the water's privatisation.

The report, then, provides both a brief assessment of the problems and potentialities for managing this new resource and a set of recommendations that we believe go beyond the question of privatisation and emphasise potential cooperation with the island's south. Based on previous studies in both politically and environmentally sensitive regions, we make suggestions for cooperation in sustainable climate change management that may be implemented even in the context of a divided island and that, indeed, may encourage cooperation across the divide.

PART ONE:

INTRODUCTION

In late 2015, an undersea water pipeline to north Cyprus began to pump water from the south Turkish coast. The experimental, floating pipeline was a first in water delivery, paid for by the Turkish government as one of its many infrastructural gifts to its client state, the unrecognised “Turkish Republic of Northern Cyprus” (“TRNC”). At the time of the inauguration it became apparent that the north Cyprus administration had made almost no plans for the water’s management, despite about two years of negotiations with the Turkish government followed by three years of construction. The pipeline’s inauguration was marred by an acrimonious discussion of whether the water would be managed by a private Turkish company in cooperation with the north Cyprus administration, or whether its management would immediately be given over to municipalities, as they were demanding. Lost in this struggle over the water’s control has been any long-term plan for water management in the island.

The water pipeline has the prospect to make positive change in the island’s environment, if properly managed. Although the pipeline is currently only delivering water to the north, it was also constructed with the potential of delivering water to the entire island and thereby contributing to peace and reunification. However, it is not an unlimited supply of water, and long-term planning is critically necessary. Cyprus’s aquifers have become salinised from overuse, while an EU-sponsored water purification project outside north Nicosia is currently dumping purified water into ditches because no administrative body has claimed the project. The lack of effective water governance in the island’s north has resulted in overuse and salinisation of coastal aquifers, which will be exacerbated by climate change. Moreover, the failure to develop a water management strategy is directly related to the contradictions of unrecognised statehood, in which short-term political tactics take precedence over long-term planning.

BACKGROUND

In 1878, when British colonial officers first arrived in the island, they were disappointed to find a parched and bare landscape. Administrators repeatedly lamented that there were none of the forests they had expected—an expectation particularly fed by the writings of medieval travellers who had extolled the island’s verdancy.¹ Reforestation and improving irrigation were among the first actions on the part of the new administration, with officers consistently expressing concern to improve the island’s climate.²

By the mid-1950’s, this concern translated into a search for alternative water sources. For this, the administration of the period hired an American firm, Ralph Parsons Engineering, which first explored the possibility of water purification before deciding that its costs would be too high.³ Instead, they suggested importing water, a suggestion that was taken up by the Water Department, whose first choice was to import from Turkey because of its proximity. Although Greek Cypriot experts initially expressed concern because of ongoing intercommunal conflict, the 1959 London and Zurich Agreements that would establish the new Republic of Cyprus presented an opportunity for those experts to pursue the Turkish option. According to Ralph Parsons’ research, the most economically feasible options would be to bring water either by underwater pipeline or in floating plastic containers that could be pulled by ships.

A first, tentative visit to Ankara by Cypriot water experts and representatives of the American firm yielded no results. However, British pressure eventually convinced the Turkish government that the deal would be in their interests, as it would preserve their presence in the island. One of the architects of the London and Zurich Agreements, Nihat Erim, recalled in his memoirs:

¹ For a discussion of the narrative of environmental decline, and its association with the previous Ottoman administration, see S. E. Harris (2007), *Colonial Forestry and Environmental History: British Colonial Policies in Cyprus, 1878-1960*, unpublished Ph.D. dissertation, University of Texas at Austin, particularly pp. 8-47. The broader theme of environmental decline in the Mediterranean, and particularly narratives of a “Ruined Landscape” or “Lost Eden,” is the subject of A. T. Grove and O. Rackham’s (2001) *The Nature of Mediterranean Europe: An Environmental History* (New Haven: Yale University Press).

² Harris 2007 provides a detailed discussion of these efforts.

³ For details of these early explorations, see M. Hatay (2015), “Asrın Projesi’nin 60 Yıllık Tarihi” [The History of the “Project of the Century”], *Poli, Havadis Newspaper*, 22 March.

Although at first glance the project appears impossible, if you take into account that the distance was only 45 miles and that today petrol is carried by undersea pipeline, it was not an unrealizable project. That day we did a rough calculation of what it would cost to construct a 45-mile underwater pipe. If I'm not mistaken, the cost was \$10 million, at the 1959 price. We put forward that it would be possible for \$10 million. And when we started thinking about where we would find this money, my English friends said, "Don't worry about it. We'll get it from America."⁴

Although the project gained tentative approval, then, it was put on hold when in late 1959 a Turkish vessel was discovered off the Cyprus coast preparing to deliver weapons to Turkish Cypriots. After the establishment of the Republic of Cyprus in 1960 there were investigations into the possibility of importing water from Syria, but the political climate in Syria during the period was not amenable to taking the project any further. Instead, the Republic of Cyprus (RoC) concentrated on dam construction and encouraging water conservation.

The 1960's were a period of both development and conflict. In late 1963 intercommunal strife led Turkish Cypriots to retreat into armed enclaves, where they developed a separate administration, a state-within-a-state. The RoC became a de facto Greek Cypriot-run administration, and it proceeded with development programmes, especially related to tourism. It should be noted that a number of Greek Cypriot urban planners today remark that tourism infrastructure in Cyprus, beginning in the 1960's, has been consistently built with little regard to water use and management.⁵

When in 1974 a Greek-sponsored coup d'état and subsequent Turkish military invasion led to the de facto division of the island, the result was two distinct and non-cooperating administrations. While the United Nations recognises the RoC as having sovereignty over the entirety of the island, a self-proclaimed state in the island's north has effective control over 36% of the island's territory. The legislature of that self-proclaimed entity in 1983 declared it the "Turkish Republic of Northern Cyprus," an administration that only Turkey recognises.

Although north Cyprus continued to rely on electricity provided by the RoC through the mid-1990s, since that time the infrastructure of the two administrations has been separate, and natural resource management has been handled by each administration without cooperation or consultation with the other. The single exception has been the handling of sewage in the Nicosia municipality, which is united underground by its pipes but divided above ground by military barricades. Because the municipality was already divided into separate Greek Cypriot and Turkish Cypriot administrations before the island's division, the mayors of the two sides of Nicosia

4 N. Erim (1975), *Bildiğim ve Gördüğüm Ölçüler İçinde Kıbrıs* [Cyprus as I Knew It and Saw It] (Ankara: Ajans-Türk Matbaacılık Sanayii), pp. 37-38.

5 Presentations by Glafkos Constantinides and Symeon Matsis at conference, "Reviving Famagusta? From Ghost Town to Eco-City," held at the London School of Economics, 21 February 2014.

have been able to cooperate without the impediments of what Greek Cypriot politicians refer to as “recognition by implication,” or the widespread belief that cooperation with the island’s north will constitute a form of political recognition.

Moreover, because of its recognised status, the RoC is subject to EU and other environmental directives and is signatory to various environmental and climate change protocols. In 2003, the RoC became an EU member state, and while the EU considers that the entire island is part of its territory, the *acquis communautaire*, or body of EU law, is suspended in the island’s north. This means that north Cyprus remains outside of EU or any other international regulatory structures, and it participates in environmental and climate change directives unilaterally and without oversight. Indeed, persons interviewed for this report characterised the north Cyprus administration’s approach to environmental and climate change management as disorganised, short-term, and ad hoc.

Despite this administrative separation, water resource management is one area in which there is a growing acknowledgment that division is not sustainable. This is particularly the case with regard to management for climate change. The island’s north relies on water flowing from the Troodos Mountains in the south, while several underground aquifers are shared by the two sides. This means that water management decisions or mismanagement ultimately will affect the water supply of the other side of the island, while climate change planning in a small island will be most effectively undertaken in cooperation rather than competition.

WATER USE IN NORTH CYPRUS

In summer 2009, the town of Lapithos/Lapta on the island's north coast ran dry. Before the island's conflict began, the town was known for its lemon orchards and its complex irrigation system. It had two mills that ran on water rushing from the mountain, and older Turkish Cypriot and former Greek Cypriot residents recall that irrigation was controlled so that each field received water for a certain number of hours each week. Even after 1974, the town was known for its water, whose source was in the Five Finger Aquifer deep in the mountain and which was considered by many people to be the cleanest and most drinkable in the island's north.⁶ However, successive droughts were complicated by overuse, as well as a palimpsest of law and practice that made implementation of water conservation difficult.⁷ By the time the townsfolk found their taps empty, the water level had apparently fallen to below 162 metres.⁸

Ferdi Sabit Soyer, a former "minister" of agriculture, natural resources and energy (1994) and "prime minister" (2005-9), remarked,

There used to be significant water harvesting until 1968, but the whole system was destroyed because of the conflict, subsequent population movements and the loss of knowledge. And then there was uncoordinated water infrastructure development – the south building dams on flows moving north, and the north building dams on flows moving south.⁹

During the Ottoman and early British periods, one held titles not only to land, but also to water and trees. By the time of the RoC's establishment, titles were only to land, which included the water and trees on them. Although the pre-1974 water law, still in effect in the north, says that water legally belongs to the state, one former "minister" of finance commented, "There is non-implementation which creates de facto rights."¹⁰ One must have a license to dig a well, and such a license includes extraction depth, well diameter, and horizontal rights. In practice, however, the restrictions on such licenses have rarely been enforced.

⁶ H. Doğandor (2009) "Lapta bile susuz kaldı!" [Even Lapta is without water!], *Starkibris*, 16 July, <http://www.starkibris.net/index.asp?haberID=34377>

⁷ For more on the water resources of Lapithos, see R. Bryant (2010) *The Past in Pieces: Belonging in the New Cyprus* (Philadelphia: University of Pennsylvania Press), and Greek-language sources quoted therein.

⁸ Doğandor 2009.

⁹ Interview on 9 May 2016 in Nicosia.

¹⁰ Birikim Özgür, member of parliament from CTP and former "minister" of finance, interview on 9 May 2016 in Nicosia.

As a result, not only climate change but also uncontrolled use have led to dropping water levels. Development of hotel and apartment complexes has not been guided by an integrated water resource management plan, and while some hotels have small desalination facilities, the environmental effects of these are not monitored. Similarly, the manner in which agriculturalists have used water has not been regulated, with certain farmers reporting to us that in areas that have direct access to aquifers and other water sources, many farmers continue to resist drip agriculture and instead irrigate by flooding their fields. While the Lapta area depends on the Five Finger Aquifer, with underground spring sources, the Kyrenia/Girne Aquifer to the east relies entirely on rainwater and has become polluted. Municipalities report that in both cases they have now reached the bottom of their water resources, and in the Lapta area water now being extracted is mixed with mud. As the former head of the Environmental Engineers Association remarked to us,

We know we're in trouble with increasing water scarcity, but there has been no appropriate preparation. The aquifers have been salinised; the Kyrenia mountains aquifer has been polluted by surrounding construction development, septic tank overflows. There is no political will to address the water issue. Changes in leadership and governments here causes problems in creating a lasting policy on environment and water.¹¹

As with the RoC, water use in the island's north is currently unsustainable. Total annual freshwater resources are 90 million cubic metres (Mm³) (compared to 300 Mm³ in the south): over 90% of this is supplied by groundwater. Annual demand of 105-110 Mm³ exceeds supply by up to a third. The bulk of water (60-80%) is allocated for agricultural use, though there is no policy for determining the most effective or efficient supply of agricultural water. Such a policy would include not only better techniques for irrigation but also encouragement for planting crops and trees that can survive more arid and saline conditions. Furthermore, there is no policy or strategy for natural resource use in tourism. Where some of the larger hotels have built their own desalination plants, these remain unregulated, so that there is no assessment of their affect on seawater, for example.

Extraction of groundwater resources above sustainable yields has caused the partial depletion of all aquifers. The three coastal aquifers in north Cyprus – Kyrenia (Girne), Famagusta (Mağusa) and Morphou – are all impacted by salt water intrusion, while the Morphou aquifer in the western Messaoria plain—an aquifer shared with the south—is also at a critical level of over-use.¹² Birol Kahraman, a mining engineer from the Architects and Engineers Association,

¹¹ Interview with Nilden Bektaş, 10 May 2016.

¹² G. Elkiran and A. Turkman (2007) 'Water scarcity impacts on Northern Cyprus and alternative mitigation strategies', in J. Qi and K.T. Evered (eds.) *Environmental Problems of Central Asia and their Economic, Social and Security Impacts* (Dordrecht: Springer), pp. 241-250.

observed, "Aquifers are all at critical levels because of non-sustainable water usage. All except the mountain aquifers have a salinisation problem; mountain aquifers have a mineralisation problem."¹³ While salinated water is problematic both for crops and for domestic use, mineralisation is detrimental to both citrus production and animal husbandry.

There are three municipal water purification plants in the north (Kyrenia, Famagusta and Nicosia) with the capacity to produce 10 Mm³ a year, but 6 Mm³ is not being used because of problems with salt content. In the case of the Famagusta plant, this is because the contractor built the plant below sea level.¹⁴ In the case of the Nicosia plant, however, it is because the origin of the water being purified is the already salinated Morphou aquifer. As a result, much of the purified water from this plant is currently being dumped into ravines.¹⁵

While the unsustainability of water use in the island's north is partly attributable to successive droughts and climate change, then, all of our interviewees insisted that the main factor in overuse was a failed system of water governance. That ineffective system too often enables de facto practices to trump regulation, and its accretion of law and practice creates confusion regarding management.

¹³ Interview on 9 May 2016 in Nicosia.

¹⁴ Various interviews on 9 and 10 May 2016.

¹⁵ Site visit to the New Nicosia Wastewater Treatment Plant, 10 May 2016.

WATER GOVERNANCE IN NORTH CYPRUS

“They try to save the day, not the future.” These were the words of a young olive producer, Hüseyin Bıykoğlu, who returned to the island after studies abroad with the aim of investing in his homeland, only to find himself embroiled in a struggle with an inefficient system.¹⁶ Like many other younger Turkish Cypriots whom we interviewed for this report, Hüseyin found his vision of what north Cyprus could be, and his understanding of the urgency of environmental management, in collision with an entrenched system focused on short-term tactics rather than long-term strategies. “You have to convince people that being sustainable is profitable over the long term,” he commented.

Like Hüseyin, Nilden Bektaş, an environmental engineer and until recently head of the Environmental Engineers Association, also attributed much of the blame to a short-term perspective on economic growth. “Environmental issues are being marginalised by economic development,” she remarked. She said this in the context of observing that although on paper population centers of more than 2000 were required to have water purification facilities, only four of the north’s 25 municipalities had facilities in operation. Moreover, these are facing pressure from economic development and summer homes, particularly in coastal areas.

As Rebecca Bryant and Mete Hatay demonstrate in a forthcoming book,¹⁷ the de facto state that developed in the island’s north after 1974 was built from its inception on “managing” or “getting by” the international order. One former bureaucrat remarked, for instance, “Everything happens, but with a work-around.” As the sociologist James Scott has observed, “getting by” leads to the development of short-term tactics rather than long-term strategies.¹⁸ While such short-term tactics may set precedents or become embedded in law, in north Cyprus they have led to a system that all of our interviewees remarked is structurally unsound, ad hoc, and particularly weak in terms of the long-term planning necessary for sustainable environmental management.

The system of water allocation and management that exists in the island’s north is a decentralised one, partly inherited from the British colonial system. The system vests water governance authority with municipalities who have responsibility to licence extraction, arrange distribution and collect payments for water use. Because of this decentralisation, the central water department is weak, and there is no independent water regulator, resulting in a chaotic,

¹⁶ Interview on 10 May 2016 in Nicosia.

¹⁷ R. Bryant and M. Hatay, *De Facto Dreams: Building the So-Called State* (Philadelphia: University of Pennsylvania Press, forthcoming 2018).

¹⁸ J. Scott, *Domination and the Arts of Resistance: Hidden Transcripts* (New Haven: Yale University Press, 1990).

non-transparent form of water management. Municipalities use water bills to collect payments for other local services (e.g. waste disposal), making them a major revenue-raising instrument for local government. The politicisation of municipal water governance has undermined efforts to promote good water governance, leading to over-extraction, allocative inefficiencies and under-investment in water infrastructure. Moreover, five changes of government over as many years have made planning and regulation difficult.

Despite these weaknesses, the north Cyprus administration has consistently attempted unilaterally to implement EU environmental laws and regulations in anticipation of a negotiated reunification of the island. As one person who has worked for many years on the technicalities of EU harmonisation explained,

We asked the EU to draft an environmental law, which was received in 2010 and adopted in December 2012. It covers solid waste, nature protection... It aimed for 100% compliance with the *acquis communautaire*, with about 85% compliance when adopted because of some irregularities.¹⁹

For ten years a draft water law has been in preparation by the Turkish Cypriot administration that features a proposed autonomous water management board. In the preparation of this, interviewees reported that they have often sought the assistance of the EU and the EC Task Force in north Cyprus, with little success. Technically, EU assistance in north Cyprus aims to promote management practices consistent with the *acquis communautaire*. This includes support for water practices consistent with the Water Framework Directive (2000/60/EC), which promotes sustainable water use through river basin management planning.

However, it is precisely this island-wide River Basin Management Plan, adopted by the Republic of Cyprus in 2011,²⁰ that members of the EC Task Force judged to preclude justification for a separate environmental or water agency in the island's north. As they expressed it, "We don't recognise the political border."²¹ As a member of the (locally staffed) EU Coordination Office in the north remarked,

The EU in a way is invisible in this society, which makes our job very tough. The EU is not willing to support the establishment of an environment agency in northern Cyprus. Administrative structures always exist on the other side [Republic of Cyprus], so there is no point, it is claimed, in creating mirror agencies. . . . But north Cypriot agencies are not an obstacle to reunification.²²

¹⁹ Interview on 9 May 2016 in Nicosia.

²⁰ Republic of Cyprus (2011) *Cyprus River Basin Management Plan* (Nicosia: Ministry of Agriculture, Natural Resources and the Environment), p. 12.
[http://www.moa.gov.cy/moa/wdd/Wdd.nsf/all/1AE1F4E1B33E432CC22578AF002C0E71/\\$file/RBMP_EN.pdf?openelement](http://www.moa.gov.cy/moa/wdd/Wdd.nsf/all/1AE1F4E1B33E432CC22578AF002C0E71/$file/RBMP_EN.pdf?openelement)

²¹ Interview with members of the EC Task Force for the Turkish Cypriot Community, 11 May 2016, Nicosia.

²² Interview on 11 May 2016 in Nicosia.

Indeed, members of the European Commission Task Force for the Turkish Cypriot community echoed this manager's remarks when they reiterated that "north Cyprus is part of the EU as Cyprus is sovereign over the whole island" but that "unlike a normal candidate country, we cannot work officially with the public administration in the north." Indeed, one EU expert echoed recent polls in the north that show disenchantment with the EU's work in the island. "The EU is seen as weak in relation to the Greek Republic," she said, "which sets the agenda for EU interventions."²³

In sum, EU recognition of the exclusive sovereignty of the RoC means that European assistance on water management in the north must avoid anything that might be perceived as state-building. This has sometimes led to an inability to manage or get around the problems of "recognition by implication" that often hamper EU intervention. One example given by a number of interviewees was an EU-funded seawater desalination plant that had been tendered and was set for construction on the island's northwest coast. The project planned to supply 30,000 m³/day to a population of 100,000, with the plan of reducing overexploitation of the Morphou aquifer. The location of the planned €27 million-plant was in Sirianokhori near a Turkish military camp, which led to access restrictions for the Spanish contractor. One report observes, "The programme experienced problems including site access restrictions imposed by the Turkish army, which emerged at the end of 2010. Once those restrictions were lifted in March 2011, the contractor was unwilling to continue. The Commission terminated the contract in December 2011."²⁴ Our interviewees focused on the fact that on termination of the contract, this Spanish company received €7-8 million in compensation. Moreover, several interviewees charged that the government of the National Unity Party, known for its nationalist views, was against international control of water when at that time the potential Turkish pipeline was on the table.

Following this, the EU invested in the New Nicosia Wastewater Treatment Plant. At a cost of €29 million euros, the project was funded jointly by the Sewerage Board of Nicosia (RoC) at 70% and the European Union (30%) on behalf of the Turkish Cypriot community. The plant was built on the site of an original treatment plant whose construction had been halted in 1974 and which was only completed after an agreement between the city's two mayors in 1978. The plant produces treated water and sludge for agriculture, as well as biogas. However, since the new plant was opened there have been problems with convincing the north Cyprus administration to approve the water and sludge for agricultural use.

²³ Interview on 11 May 2016, Nicosia.

²⁴ Report from the Commission to the Council and the European Parliament Sixth Annual Report 2011 on the implementation of Community assistance under Council regulation (EC) No 389/2006 of 27 February 2006 establishing an instrument of financial support for encouraging the economic development of the Turkish Cypriot community: COM/2012/0243 final.



Image 1: A stabilisation pond at the New Nicosia Wastewater Treatment Plant at Mia Milia (Haspolat) outside north Nicosia.

As one engineer at the treatment plant remarked,

The TRNC bureaucracy is not ready for this. With the help of the EU we ran a workshop on sludge use attended by the environment ministry, the agriculture ministry and the health ministry. There is also a working group in the legislature. Permission by the agriculture ministry is necessary for use of the sludge, but there has been opposition to use both of the sludge and treated water from importers of artificial fertiliser and private water companies.

The engineer remarked that it was through intervention of the EU that the agriculture “ministry” dropped its opposition to agricultural use of the water, though it still opposes use of the sludge. The engineer insisted, “We exceed European standards: our fertiliser is actually of better quality than equivalent German sludge compost which has heavy metals contamination.” The EU has intervened on this issue again by preparing a tender for reuse of water and sludge. Nevertheless, the water remains underused, and at the time of our site visit was flowing into ditches at the back of the plant.

The EU, then, has taken a careful approach to the problem of resource management in the island’s north, always insistent on projects that are supported by the RoC and do not suggest statebuilding. However, the Turkish water pipeline, discussed below, demonstrates cases where this approach may backfire and where refusal to cooperate may indirectly lead to statebuilding in cases where infrastructural investment is itself politicised. Regarding the pipeline,



Image 2: Purified wastewater from the NNWTP spilling into ditches behind the facility.

EC Task Force members asserted, “We were not informed on the Turkish pipeline; we receive information on the pipeline from the media.” Members of the EU Coordination team, however, told a different story:

In the previous CTP government [2013-2016], the agriculture minister, through us, requested Commission assistance in the preparation of a dossier to support our negotiations with Turkey over the terms of reference for the operational tender [regarding the pipeline’s management]. The Commission refused as this was seen as a political issue. But we wanted, and requested, them to assist our waterworks department.²⁵

However, despite the hands-off approach of the EU, the water pipeline is clearly not simply any infrastructural project. While Turkey has long funded infrastructure in the island’s north, such as roads and the electric plant on the north coast, this is an infrastructural project that links Cyprus to Turkey indefinitely. It brings us back to Nihat Erim’s recollection of a lunch with Sir Hugh Foot, then governor of Cyprus. “One of the English civil servants there said to me, ‘If you want to keep Cyprus under your influence, let me recommend something to you. There’s no water in Cyprus. Send water from Anatolia here under the sea.’”²⁶ As we will see below, it is precisely this potential for continuing Turkish influence that has worried many Turkish Cypriots, as they try to address future management of the project.

²⁵ Interview on 11 May 2016 in Nicosia.

²⁶ Erim, op. cit.

PART TWO:

THE CHALLENGE OF CLIMATE CHANGE

The water pipeline from Turkey, discussed in the next section, is expected to meet north Cyprus's water needs for the next 50 years. As we discussed in the Background section, water has long been understood as a scarce and dwindling resource in the island. In addition to the first discussions of a pipeline in the 1950's, there were studies and unsuccessful attempts to bring water by floating balloons to north Cyprus from Turkey in the mid-1990's. According to a member of the Turkish Aid Commission, the body in charge of dispensing Turkish aid monies, the first phase of the pipeline project was conducted in 1999-2007 under the then Demirel government in Turkey, when the focus was on determining water needs and the technical feasibility of such a project. According both to this official and to engineers from the Turkish Waterworks Department, their calculations at the time included not only current and future water use in the island but also attempts to account for climate change. One of our central questions in this research, however, has been: given that the Turkish water is not predicted to be an unlimited supply, how can the water be managed such that it does not produce further overuse?

The eastern Mediterranean is a region particularly exposed to climate change on account of water scarcity, rapid urbanisation and a reliance on rain-fed agriculture. Regional climate modelling indicates a warming trend, more pronounced in summer and autumn, alongside a rise in high temperature events. Precipitation is projected to decrease across all seasons, contributing towards an increased frequency and intensity of drought. A decline in soil moisture in all seasons, but especially in summer, is also projected for the eastern Mediterranean.²⁷ There is significant uncertainty about local climatic changes, in part because the Mediterranean is a dynamic transition zone between temperate European and tropical African climatic processes.

Informed by regional climate models, projections of climate change in Cyprus are more confident regarding temperature changes than precipitation. According to a business-as-usual scenario, there is projected to be up to a 4°C increase in mean annual temperature by the end of the century with more extreme heat events (heatwave duration for Nicosia could increase

²⁷ B. I. Cook, et al. (2016) "Spatiotemporal drought variability in the Mediterranean over the last 900 years", *Journal of Geophysical Research: Atmospheres* 121: 2060-2074; M. Dubrovský, et al. (2014) "Multi-GCM projections of future drought and climate vulnerability indicators for the Mediterranean region", *Regional Environmental Change* 14(5): 1907-1919; J. Jacobeit, et al. (2014) "Statistical downscaling for climate change projections in the Mediterranean region", *Regional Environmental Change* 14(5): 1891-1906.

tenfold to over more than four months a year). Over the course of the twentieth century average precipitation in Cyprus decreased by 17%.²⁸ There is significant uncertainty over projections of future precipitation. A possible annual rainfall reduction of 2-8% by the end of the century masks local variations; for example, lower precipitation frequency is projected in low elevation and coastal areas, while mountainous areas (Troodos and Pentadaktylos ranges) could experience more frequent rainfall.²⁹ There is also uncertainty over the impacts of climate change on the river basin in southern Turkey (Mersin Province) supplying water for transfer to northern Cyprus. Climate change projections for the Mediterranean coast of Turkey indicate a more irregular precipitation regime and greater evaporation from rising temperatures.³⁰

There has been no systematic study of projected climate change impacts on north Cyprus. Although the Aid Commission and Turkish Waterworks Department claim to have conducted such a study, they have not released its results. A recent review of climate change impacts in the RoC claims that the current unsustainable use of groundwater resources will be exacerbated by the projected decrease of rainfall and rise in temperatures. Water quality is also expected to deteriorate further with increased salinisation of coastal aquifers and higher concentrations of industrial and agricultural pollutants.³¹

The water sensitivity of the agricultural sector in Cyprus means that the projected decline in water availability will impact both rain-fed and irrigated crops. EU-funded research on the economic impacts of climate change projects falling crop yields in the eastern Mediterranean as a result of declining water availability and a truncated growing season.³² This is corroborated by a recent study of climate change impacts on the agricultural sector in the Republic of Cyprus, which projects a decline in crop yields, reducing net profits by up to 40% by mid-century, particularly for rain-fed crops.³³ In north Cyprus there is already concern that saline intrusion of groundwater is negatively affecting yields and citrus crops.

As a result, not only agriculturalists and environmental engineers but also businesspeople and economists have been concerned with the potential effects of the Turkish pipeline for economic development. It is not surprising that those concerns are often at odds in the absence of a sustainable model for economic development in the face of a changing climate.

28 E. Shoukri and T. Zachariadis (2012) *Climate Change in Cyprus: Impacts and Adaptation Plans: Environmental Policy Research Group Report* 01-12 (Limassol: Cyprus University of Technology). http://works.bepress.com/theodoros_zachariadis/24

29 J. Lelieveld, et al. (2014) "Model projected heat extremes and air pollution in the Eastern Mediterranean and the Middle East in the 21st century", *Regional Environmental Change* 14(5): 1937-49; T. Zachariadis (2016) *Climate Change in Cyprus: Review of the Impacts and Outline of an Adaptation Strategy* (Dordrecht: Springer), pp. 18-22.

30 M. Demircan, et al. (2017) "Climate change projections for Turkey: three models and two scenarios", *Turkish Journal of Water Science & Management* 1(1): 22-43.

31 Zachariadis (2016), *ibid.* pp. 29-30.

32 J. C. Ciscar, et al. (2014) *Climate Impacts in Europe. The JRC PESETA II Project*: EUR Number: 26586 EN, pp.54-59. <http://ipts.jrc.ec.europa.eu/publications/pub.cfm?id=7181>

33 AGWATER (2014) *Options for Sustainable Agricultural Production and Water Use in Cyprus under Global Change* (Nicosia: The Cyprus Institute). http://www.cyi.ac.cy/images/AGWATER_Scientific_Reports/Project_Summary_def.pdf

THE TURKISH WATER PIPELINE

“It used to be the case that drinking water flowed from our taps, but today we have to buy drinking water in bottles.” These were the words of Turkish Cypriot leader Mustafa Akıncı when, in October 2015, he took the stage with Turkish President Recep Tayyip Erdoğan to inaugurate what the latter has dubbed the “project of the century.” Only a couple of hours earlier, the two leaders had opened a pump in the coastal city of Anamur, on the southern Turkish coast, and they were set to do the same in Cyprus. Even as the leaders were speaking, one could see water already gushing into a dam the size of a small city.



Image 3: Boy drinking water from a holding pool during the Turkish water delivery pipeline's inauguration.

Construction of the underwater pipeline in 2013-2015 was a major engineering feat, managed by the General Directorate of State Hydraulic Works (DSİ). The water's source is the Anamur River in southern Turkey, and the Alaköprü Dam that was built there captures a tenth of its annual flow. The construction of the dam, high in the Taurus Mountains near the river's source, entailed the displacement and resettlement of three mountain villages.³⁴ The water travels a total of 107 km to the Panagra Dam and reservoir west of Girne, northern Cyprus, and the Turkish aid commission member emphasised to us that the energy costs for its transport were low, as the flow as far as the Cyprus coast is mostly gravity-led. For 80 km the pipeline transverses the sea, mostly suspended 250 metres below sea level, “floating” on the higher density seawater and tethered by cables to the seabed.

³⁴ “Alaköprü konutları için kura çekimi,” *Toki Haber*, 25 October 2014, <http://www.tokihaber.com.tr/alakopru-konutlari-icin-kura-cekimi/>



Image 4: Map of the water delivery project from the website of the Turkish Waterworks Department (DSİ), <http://www.DSİ.gov.tr/projeler/kkct-su-temin-projesi>. The drawing shows both the 80-km undersea pipeline and the distribution network in north Cyprus.

The pipeline is intended to transfer 75 Mm³ of water annually to north Cyprus, initially shared equally between (treated) drinking water and (untreated) water for agriculture, with a rising allocation over time to drinking water to cope with projected demographic growth. Water is pumped from the Panagra dam to the water treatment facility where the inauguration ceremony was held. Although engineers claimed that the water was among the purest in Turkey and can immediately be used for agricultural use, they are purifying the water for domestic use. The Turkish Aid Commission notes that this is the only section of the project that requires pumping, as the water is otherwise pushed by gravity. As financed by the Turkish Aid Commission, the construction phase of the pipeline has included the installation of a 480-km network of distribution pipes from Panagra across northern Cyprus. At the time of the inauguration, the traces of that construction were still visible throughout north Cyprus, with many roads and parts of the countryside torn up to lay pipes.



Image 5: Water aeration at the new treatment facility.



Image 6: Pipes for the distribution network in the island.

Despite Akıncı's words of appreciation, however, his tone was tempered. Indeed, the pipeline's inauguration was marred by an increasingly acrimonious discussion over the water's management and control. The controversy arose because of the lack of coordination and planning discussed earlier: what had become apparent a few months before the inauguration was that despite about two years of negotiations with the Turkish government and then three years of construction, the north Cyprus administration had made almost no plans for the water's management. This was partly because when Erdoğan had first announced the plan four years earlier, Turkish Cypriots looked on it sceptically because of their previous, failed experiments with water delivery projects. As a result, it was only when pipes to distribute the water began to be laid, and it became clear that the project was going to be realised, that previous agreements with Turkey over the water's management became a matter of public concern.

The 2010 Water Agreement between Turkey and the north Cyprus administration commits the parties to the piped transfer of water over 30 years with the possibility of renewal for a further five years. Following completion of the construction phase of the underwater pipeline and key arteries, the Turkish government began a tendering process for inland water distribution and management. According to the Aid Commission, "Privatisation is not a political choice but a necessity to improve governance." In particular, the Aid Commission's belief is that "Water pricing will lead to more efficient water use on the island" and that the only way to induce consumers to conserve is for water to have a cost. The tendering process, then, is designed to facilitate efficient demand management. Moreover, this will be accompanied by water pricing facilitated by a new metering system of water use, including metering of previously unregulated well water. It is claimed by DSI that, alongside generating a reasonable profit for the contractor, the net revenues earned will fund further development of water distribution.

In addition to concerns to make price a form of water management, the Turkish government has been unwilling to provide funding for the significant infrastructural development that will be necessary for the water's efficient distribution. The Aid Commission representative remarked, "We could give the water to existing distribution lines but a lot would be lost until further upgrading of the infrastructure. There is still 30% leakage on some places and also evaporation from storage tanks. The existing network is also polluting from diesel-powered pumps." He noted that any private company acquiring the tender would be expected to make further investments in infrastructure of an estimated €350 million. In Nicosia alone, the cost for upgrading water pipework is estimated at €15 million for water, €15 million for wastewater, though according to north Nicosia's mayor, Mehmet Harmancı, about 70% of the wastewater pipeline network is completed. However, Harmancı commented that in some regions of the island there is still the infrastructure from the British years, which needs to be changed completely. Moreover, the walled city of Nicosia has a problem with asbestos pipes.

The tendering has been an antagonistic process, encountering resistance from Turkish Cypriot municipalities fearing a loss of control of water management. The particular bone of contention amongst many on the political left has been the proposed privatisation of water management, to be undertaken in cooperation with the north Cyprus administration. Instead, municipalities initially demanded to maintain control over water management, though eventually all signed on to the new tendering agreement. There is a perception of some Turkish Cypriot actors that the tendering involves an imposition of Turkish government interests, catering in part to major Turkish investors in the north, e.g. development of hotels and residential property.³⁵ Others, such as north Nicosia's mayor, are concerned that the water pipeline will result in a monopoly.

The Turkish pipeline has pushed aside discussion of other alternatives, such as desalination. The water is seen as the gift of the motherland. Yet there is projected to be a water shortage in Turkey by 2050, so the supply guarantee of up to 75 million mcm/pa must be questioned. There is no minimum limit to what they give. We need the water, but we must embrace also new technologies and have a strategy.³⁶

There has also been considerable ambivalence amongst Turkish Cypriots about a project that many people described as yet another way of tying them "like an umbilical cord" to Turkey.

Erdoğan has called this "Peace Water," and construction has included a terminal that would be able to pump water to the island's south. However, as we noted earlier, both the

³⁵ Interviews, 10-11 May 2016.

³⁶ Interview on 11 May 2016 in Nicosia.

RoC and the EU have watched developments from a distance, despite the potential for environmental and economic effects on the entire island. The Greek Cypriot press has tended to look with suspicion on the project, with one commentator remarking, "After natural gas, this is the most important project for Cyprus and will be very profitable, though only for Turkish Cypriots. . . . I have no doubt that this water will be a terrible weapon in the hands of Turkey to be used against Greek Cypriots."³⁷

In the context of Turkish Cypriot tensions and Greek Cypriot suspicions, then, and given the difficulties of developing water management capacity under the EU umbrella, it seems worthwhile to consider other models that may enable and facilitate increased cooperation on water management for climate change, particularly in light of the new de facto situation in the island's north.

³⁷ F. Fotiadhis (2014) "Απειλή για την Κύπρο το νερό από την Τουρκία" [The Water from Turkey is a Threat to Cyprus], *Fileleftheros*, 17 November.

PART THREE:

RECOMMENDATIONS FOR WATER GOVERNANCE REFORM

The water pipeline between Turkey and northern Cyprus creates an opportunity for the reform of water governance in north Cyprus. Turkey's EU accession negotiations suggest at least the possibility of an overlap in water governance objectives promoted by Turkey and EU water management initiatives in the north. Indeed, as one high-level advisor remarked to us ironically, "The Turkish government is implementing EU-compatible [environmental] policies in Turkey, but not in north Cyprus."

However, as the section on water governance made clear, there is no formal coordination between DSI and the EU Office in Nicosia. The EU continues not to recognise the Turkish Cypriot government as exercising sovereign authority and has accordingly assisted the Republic of Cyprus in implementing the EU Water Framework Directive. For geopolitical reasons, the *OECD Principles of Water Governance* therefore offer a more neutral starting-point for discussions on freshwater management in north Cyprus, particularly as both Greece and Turkey are OECD members. This is a framework that, consistent with the EU Water Framework Directive, recognises sustainability as a key objective, that is "delivering sufficient water of good quality, while maintaining or improving the ecological integrity of water bodies."³⁸

The OECD Principles on Water Governance emerged from a practitioner network set up to inform discussions on "good governance" at the 2012 World Water Forum in Marseille, which a year later became the OECD Water Governance Initiative. Seeking a more robust operationalisation of integrated water management, the OECD Principles express three complementary aspects on water governance:

- *Effectiveness* – the contribution of governance to define and implement water policy goals and targets at all levels of government.
- *Efficiency* – the contribution of governance to maximise the benefits of sustainable water management and welfare at the least cost to society.
- *Trust and engagement* – the contribution of governance to building public confidence and ensuring inclusiveness of stakeholders through democratic legitimacy and societal fairness.³⁹

³⁸ OECD (2015) *OECD Principles of Water Governance* (Paris: OECD), p. 5.

³⁹ OECD (2015), *ibid*, p. 3.

These principles inform the following recommendations for water governance in north Cyprus. The projected impacts of climate change in Cyprus heighten the need for governance measures that deliver the long-term, adaptive functions of water sustainability – enhancing natural storage capacity, protecting surface and groundwater quality, and promoting efficient water use.⁴⁰ Prior to any specification of concrete institutional designs, a necessary first step is stakeholder discussion of these general recommendations in order to identify the scope, if any, of possible agreement and prioritisation.

⁴⁰ Zachariadis (2016), *op. cit.*, p. 54.

EFFECTIVENESS

1. There is a need to identify projected climate change impacts on Turkish water resources transferred to north Cyprus

The effective contribution of the Turkish water pipeline to water sustainability, in the context of climate change, is contested. For Turkish government actors and their Turkish Cypriot supporters, the pipeline will deliver an ecologically sustainable flow from the Anamur River, reducing pressure on, and allowing the recovery of, groundwater aquifers in northern Cyprus. Turkish Cypriot critics question the dependence on an external water source that may be vulnerable to competing Turkish demands in future decades, as well as the impacts of climate change in the Anamur Basin, southern Turkey. Increased evaporation rates at the Alaköprü and Panagra dams, as a result of climate change-induced temperature rises, will be negligible according to DSI, but there seems to be no assessment available of these and wider climate change impacts on this water source.

2. Diversifying water supply in the face of demographic and climate change pressures justifies consideration of a seawater desalination plant powered by renewable energy sources

Various stakeholders interviewed stated that, despite the cancellation of the desalination plant approved in 2006 for EU funding and the completion of the Turkish water pipeline, sustainable water governance in northern Cyprus will be served by construction of a seawater desalination plant, reducing rates of groundwater extraction if accompanied by water conservation and other demand management measures. However, in contrast to the fossil-fuel powered desalination plants in the Republic of Cyprus, climate mitigation goals justify a reverse osmosis desalination plant using renewable energy (e.g. by concentrated solar power), which is now technologically feasible and would be a candidate for international climate finance.

3. Greater centralisation of water governance in northern Cyprus is necessary for strategic planning and the clearer allocation of roles and responsibilities for operational management

The widespread perception among stakeholders that current water governance is dysfunctional supports their calls for more centralised control by the Turkish Cypriot administration. This is compatible with a continued role for municipal authorities in water licensing, distribution and revenue collection, but the administrative discretion for municipalities would be constrained by centrally coordinated water management objectives.

The draft water law under development for ten years (and not seen by leading nongovernmental water professionals) should, when enacted, facilitate clear roles and responsibilities for water policy-making and implementation. The integrity and transparency of water regulation should be overseen by an autonomous water management board (see *Trust and engagement* recommendations below).

4. The administrative and technical capacity of the north Cyprus water works office should be enhanced to implement integrated water resources management

It was reported in stakeholder interviews that there are no more than three water engineers in the water department of the “Ministry of Agriculture and Natural Resources”: this is clearly insufficient. EU development cooperation has provided environmental governance training and secondments for some public officials, while DSI is training ten Turkish Cypriot water engineers at the operational centre adjacent to the Panagra dam. However, these are uncoordinated capacity building initiatives detached from a network-wide assessment of administrative and technical needs in water governance. As prescribed by the OECD Principles on Water Governance, hiring of public officials and water professionals should be by means of transparent, merit-based processes independent from political cycles.

5. Prevention and mitigation of climate change risks requires close coordination of sustainable water governance with the agricultural sector

Cross-sectoral coordination is a necessary property of good water governance. The lack of such horizontal governance was viewed by one interviewee as the main problem in water policy-making in northern Cyprus. Given that the agricultural sector is both water-sensitive and the leading user of water, priority should be given to coordinating policies between water and agriculture. There is no central control of water management in agriculture, leading to unregulated, wasteful water use. Donor interventions from the EU and USAID have assisted the identification and expansion of crops (e.g. pomegranate and olive) both less water-intensive and salt intolerant than traditional citrus crops. Nevertheless, there have been issues about the importation of inappropriate varieties (e.g. favouring southern European olive tree rootstock over more drought-resistant Cypriot varieties), and a lack of integration with water governance needs. There are also perverse incentives undermining efficient water use, such as the government subsidies given to farmers affected by drought. Similarly, the prospect of receiving water for agriculture from Turkey may increase demand: commercially valuable crops previously constrained by water scarcity (e.g. artichokes) become viable for scaling up production.

EFFICIENCY

6. There is a need for the systematic collection by public authorities of water-related data and information, which should be shared as appropriate across relevant levels of government

A range of stakeholders interviewed claimed that the collection and dissemination of water-related data by north Cypriot public authorities is poor. One professional association interviewee recalled waiting three months to receive basic, and reportedly incomplete, hydrological and meteorological data from the water office. External actors have delivered specific improvements. EU external aid on crop husbandry has funded monitoring equipment for wells extracting water from the Morphou aquifer, and the New Nicosia Wastewater Treatment Plant, which was partly financed by the EU, has state-of-the-art facilities for the chemical and microbiological testing of water. In addition, water quantity and quality within the Turkish underwater pipeline network is comprehensively monitored by DSİ. However, the Turkish Cypriot administration has no integrated water information system.

7. Water governance should generate revenue that covers regulatory costs and efficiently prices water according to user-pays, polluter-pays and payment for ecosystem services

The tendering process for the management of water supplied by the Turkish pipeline has raised concerns in north Cyprus about privatisation and associated water pricing. In negotiations with Turkey, Turkish Cypriot politicians moderated an initial Turkish proposal for full privatisation of the water resource, restricting private sector authority to management responsibilities and ensuring regulatory constraints on pricing. Revenues raised by the operator will be used in part to invest in upgrading and extending the distribution network. The high inefficiency of water allocation in north Cyprus justifies demand management (particularly in the agricultural sector) and the pricing of water use according to usage and sustainability criteria (incorporating the external social and environmental costs of water usage). A user pays principle, set out in Article 8 of the 2016 *Intergovernmental Agreement between the Republic of Turkey and the TRNC Regarding the Delivery and Management of Water*, promises increased water efficiency, but sustainability is only covered indirectly through a commitment to ensure that water management is in accord with international standards and the principle of respect for the environment (Article 1). Concerns about possible inequities from water pricing can be addressed by safeguards, such as lower prices for those in need (e.g. Article 16 of the 2016 Intergovernmental Agreement). According to stakeholders consulted, price-setting methodologies should be transparent and subject to wider consultation.

TRUST AND ENGAGEMENT IN WATER GOVERNANCE

8. The creation of an independent water management board, outside ministerial structures, is necessary for regulatory integrity and transparency in water governance.

Various Turkish Cypriot stakeholders expressed the view that water governance in north Cyprus lacks integrity, citing a non-payment culture, unfair water licensing and the non-meritocratic hiring of at least some public officials. Frequent changes of management at the water office in the “Ministry of Agriculture and Natural Resources” are alleged to reflect the politicisation of appointments in water governance. Whatever the merit of such claims, the introduction of a major private sector operator to manage the water supplied by the Turkish pipeline requires the legal creation of a non-ministerial water regulator to oversee the pricing, investment and service delivery of private (and public) water authorities. The regulatory body to be established under the 2010 and 2016 treaties between Turkey and north Cyprus, with members from both governments, has only weak supervisory powers. For the purpose of integrated water management, an effective regulator would need to have monitoring and enforcement powers across north Cyprus. The legal framework for this regulatory body should include transparent rules for membership, structure, regulatory functions, and corporate governance.⁴¹ Long-term planning for water sustainability would also justify a regulatory approach that includes climate change adaptation responsibilities, such as the promotion of risk management and resilience planning in water provision.

9. The promotion of open and inclusive stakeholder engagement, including bi-communal water governance initiatives and institutions

Open and inclusive deliberation on water governance featuring those with authority and expertise over, as well as those affected by, allocation and management decisions can be a major source of democratic legitimacy for institutional reforms. Stakeholder engagement will be necessary in the design and implementation of demand management measures and

⁴¹ M. Al’Afghanim (2016) *Legal Frameworks for Transparency in Water Utilities Regulation: A Comparative Perspective* (London: Routledge).

other means for rationing water use in north Cyprus. Even with new sources of supply, rapid demographic growth and projected climate change caution against the continued wasteful use of water. Bi-communal water governance initiatives are consistent with basin-wide management of water resources, and also facilitate trust-building across the Green Line. The Nicosia Wastewater Treatment Plant was the first major example of Greek-Turkish Cypriot cooperation after the 1974 partition, with the two Nicosia mayors coming together to forge cooperation on wastewater treatment. Inaugurated in July 2013, the New Nicosia Wastewater Treatment Plant has continued this bi-communal water cooperation. Further bi-communal initiatives could be encouraged around island-wide planning on climate change adaptation.

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The Eastern Mediterranean is becoming measurably hotter and drier, and many experts predict that increasing water scarcity will exacerbate conflict and political unrest throughout the region. Cyprus is equally affected by these developments, and although the island is divided, its resources are not. Preparing for a sustainable future in the face of climate change is one of Cyprus's biggest and most immediate challenges. However, as a divided island with two administrations that engage in mutual non-recognition, there are limited opportunities for cooperation on an issue that requires joint and coordinated efforts.

One example of such unilateral planning is the new water delivery project that pumps fresh water from the Taurus Mountains of Turkey and carries it across 80 kilometers of sea to a large dam in north Cyprus, from where it is now being distributed to farms and homes. This report represents an initial assessment of the potential for this innovative water delivery project to address and prepare for climate change in the island, assessing the problems and potentialities for managing this new resource. Based on previous studies in both politically and environmentally sensitive regions, the report makes suggestions for cooperation in sustainable climate change management that may be implemented even in the context of a divided island and that, indeed, may encourage cooperation across the divide.

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