

Politics matter: Jordan's path to water security lies through political reforms and regional cooperation

Valerie Yorke^{*}

Abstract

Jordan faces a deepening water crisis, exacerbated by climate change, regional conflict, immigration, and poor governance. Its people are among the most water-deprived worldwide. With a focus on politics, the study addresses how Jordan's water challenge might be dealt with at national, regional and international levels. Analysis shows the crisis is linked to a wider problem – the organisation of political power. An evolving political bargain between Throne and people, underpinned by patronage, has permitted powerful anti-reformists to influence policymaking, especially over water resources. Jordan's political transition now provides unprecedented opportunity for the country to prioritise strategically-important water issues. If a path to water sustainability is to be found, a nationwide, coordinated approach to parallel political and water reforms, combined with imaginative regional diplomacy over shared and new water supplies will be indispensable. The study offers policy recommendations.

NCCR TRADE WORKING PAPERS are preliminary documents posted on the NCCR Trade Regulation website (<www.nccr-trade.org>) and widely circulated to stimulate discussion and critical comment. These papers have not been formally edited. Citations should refer to an "NCCR Trade Working Paper", with appropriate reference made to the author(s).

Research for this paper was funded by the Swiss National Science Foundation under a grant to the National Centre of Competence in Research on Trade Regulation, based at the World Trade Institute of the University of Bern, Switzerland.

^{*}Valerie Yorke is a consultant and writer on Middle East politics. Formerly she was a Senior Research Fellow at the London School of Economics (1996–2005) and prior to that Senior Middle East Editor at the Economist Intelligence Unit.

CONTENTS

INTRODUCTION

CHAPTER 1: THE NATURE AND SCALE OF JORDAN'S WATER CHALLENGE

Water supply
Water use: the pressure of population growth
Virtual water resources
Economic context
The outlook for the next two decades
Non-sector challenges exacerbate the problem

- i) Climate change
- ii) Arab Spring provides wake-up call

The task before Jordan's decision-makers

CHAPTER 2: GOVERNANCE; PART OF THE PROBLEM

Role of donors and Jordan's commitment to reform
The policy record over two decades
Reform efforts make limited impact

- i) Regulating Highlands groundwater abstraction
- ii) Raising tariffs and correcting distorted incentives
- iii) Reducing non-revenue water (NRW)

Implementing institutional reform
Lack of influence in, neglect by and marginalisation from wider government
Conclusion

CHAPTER 3: AN INCONVENIENT TRUTH: PATRONAGE POLITICS AND THE RESILIENCE OF THE SHADOW STATE

The shaping of the 'shadow state'
Political and social origins of the 'shadow state'
Restructuring the 'shadow state' post-1989
Water provision, patronage and the 'shadow state'

- i) Northern Highlands
- ii) Disi aquifer in the Southern Highlands

How resilient the patronage state?
Crises of monarchy and state

CHAPTER 4

BUILDING A WATER-SECURE FUTURE: RECOGNISING THE IMPORTANCE OF POLITICAL REFORM

Towards dismantling the patronage state and empowering citizens

- i) 'Top-down' leadership key to 'bottom-up' reform
- ii) National debate and comprehensive reforms
- iii) Transitional management with phased steps
- iv) Ending corruption and enhancing good governance
- v) Compliance with international law
- vi) International involvement

CHAPTER 5

TRANSFORMING THE WATER SECTOR: IDENTIFYING A MIX OF SOLUTIONS

Paving the way through integrated planning

Identifying a mix of water solutions

Towards sustainable water use: scope for demand- and supply-side solutions

- i) Reducing non-revenue water (NRW) losses
- ii) Cutting abstraction of Highlands groundwater through rethinking agriculture
- iii) Wastewater treatment and re-use

Regional desalination: the changing context

Regional cooperation and international diplomacy

- i) Towards a Regional Authority – dialogue and cooperation
- ii) Forging transboundary cooperation
- iii) Engaging in joint projects
- iv) Transfer of bulk water from Turkey

Conclusion

TABLES

1. Estimated Available Water Resources, 2010
2. Groundwater Abstraction Rates, 2010 (MCM)
3. Water Allocations by Sector, 1990-2007
4. National Water Balances, 2010-2030
5. Jordan: Selected Annual Indicators, 2007-2012
6. Options for Domestic and Regional Water Solutions, 2015-2025.

FIGURES

1. Estimated Available Water Resources, 2010
2. Total Water Use in Jordan by Sector since 1994
3. Projected Demands by Sector, 2010-2025 (MCM)
4. MWI Demand and Supply Projections, 2010-2030 (MCM)
5. Author's Summary of Supply and Demand Projections, 2010-2025
6. Highland Groundwater Use for Irrigation, 1994-2011

BOXES

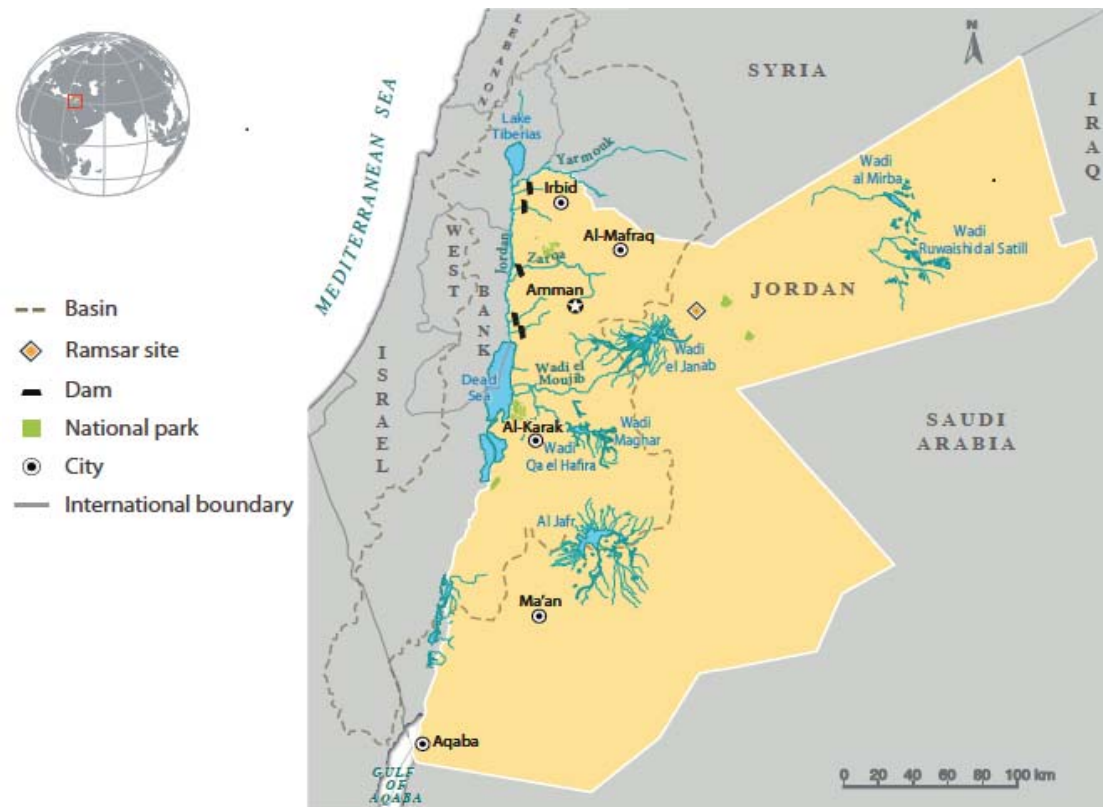
1. Projected Sectoral Demand, 2010-2030
2. Climate Change: Potential Impacts and Dilemmas
3. US Economic Assistance to Jordan
4. Conditionality and *Conditions Precedent*
5. RSDSWC and JRSP
6. Bilateral Water Sharing Accords and Talks

ACRONYMS

ACC	Anti-Corruption Committee
AWC	Aqaba Water Company
BCM	billion cubic metres
BOT	build-operate-transfer
CP	Conditions Precedent
EIU	Economist Intelligence Unit
EU	European Union
FOEME	Friends of the Earth Middle East
GCC	Gulf Cooperation Council
GDP	gross domestic product
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
GOJ	Government of Jordan
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit GmbH
HKJ	Hashemite Kingdom of Jordan
HWF	Highland Water Forum
IDARA	Instituting Water Demand Management in Jordan
IMF	International Monetary Fund
ISSP	Institutional Support and Strengthening Programme
JD	Jordanian dinar
JRSP	Jordan Red Sea Project
JVA	Jordan Valley Authority
LCD	Litres per capita per day
LEMA	Lyonnaise des Eaux – Montgomery Watson – Arabtech Jardaneh
MCM	million cubic metres
MDG	Millennium Development Goals
MENA	Middle East and North Africa
MWI	Ministry of Water and Irrigation
NWS	National Water Strategy
NGO	non-governmental organisation
NRW	non-revenue water
NWMP	National Water Master Plan
PA	Palestinian Authority
PMU	Performance Management Unit
PSP	private sector participation
RSDSWC	Red Sea Dead Sea Water Conveyance Project
RDS	Red Sea Dead Sea Study
RWC	Royal Water Committee
SFG	Strategic Foresight Group
SNC	Second National Communication
UFW	unaccounted for water
UN	United Nations
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention for Climate Change

USAID	United States Agency for International Development
USGS	United States Geological Survey
WAJ	Water Authority of Jordan
WDMU	Water Demand Management Unit
WRG	Water Resources Group 2030
WUA	water user association
WWTP	Wastewater treatment plant
YWC	Yarmouk Water Company

Jordan's Rivers



Source: UNESCO, *Fourth World Water Development Report*, Vol. 3, Chapter 39, Paris March 2012, p.793.

INTRODUCTION

As Jordan embarks on its political transition, it faces the critical challenge of securing water to provide for a fast-expanding population and to meet its aspirations for economic growth. Demand for water greatly outstrips available renewable and financed non-renewable supply, and the margin is worsening. Jordanians are amongst the most water-deprived worldwide with only 145 cubic metres available per head annually – a level expected to fall below the absolute water poverty line in little more than a decade. Moreover, 80% of current supply depends on non-sustainable over-abstraction of groundwater aquifers as well as and on cross-border surface flows, which are unpredictable and diminishing due to climate change, absence of joint management and regional instabilities. The implications of growing deficits are clear. On its current trajectory, Jordan will need access to costly new bulk water supplies by the early 2020s and since it lacks the resources to develop these on its own, long-term water security solutions will need to be negotiated.

Jordan has vital national and human security interests in finding a path to water sustainability and has introduced water reforms over more than two decades. The dedicated efforts of reformists, supported by donors, produced a modest increase in municipality water use, a decline in agriculture's share of renewable water use to 66% and increased waste-water use. However, Jordan has not achieved the improvements required either to protect aquifers and the quality of water in them or to narrow worsening deficits. Jordan remains uniquely vulnerable to any interruption to its transboundary flows and has yet to find a long-term bulk supply solution. Failure to tackle these challenges could threaten domestic stability, particularly given the popular discontent related to the Arab uprisings and the unresolved Arab-Israel conflict. More needs to be done.

Jordan must confront these realities and prioritise and accelerate reforms in order to use available resources more efficiently, and do so while there is still flexibility to mitigate adverse effects. It must also proactively support initiatives to raise levels of regional

cooperation to protect and coordinate the use of shared resources and find new supplies. Jordan has the ability to do all this, but in order to fulfil this potential it must recognise the political dimensions of the water challenge and address them. How can Jordan use the unprecedented opportunity that the political transition, accelerated by King Abdullah, has provided to implement the strategies required to achieve a water-secure future? Furthermore, what contributions can international players make to assist?

These are the concerns addressed in this case study which was commissioned by the Switzerland-based National Centre of Competence in Research (NCCR) Trade Regulation at the World Trade Institute of the University of Bern as part of its research programme on water-related dimensions of climate-change adaptation and interdisciplinary approaches and solutions to meet the challenge in trade and related policies. Promoting global and regional responses to water scarcity in international law, and future trade regulation in particular, requires an understanding of the countries most affected, how regional and domestic realities have constrained the way they manage water, and what the preconditions for more effective governance would be. In the Middle East, climate-change impacts have already adversely affected water availability, and in this respect water-scarce Jordan is particularly vulnerable.

NCCR Trade Regulation was therefore delighted to launch its study on Jordan in 2010 in order to investigate how the country's problem of securing access to sufficient fresh water supplies could most effectively be dealt with at national, regional and international levels. In dealing with these issues, the study has focused on understanding the political dimensions of the challenge. It explores the record of Jordan's water governance over the past twenty years and the extent to which the water sector's capacity to implement reforms has been limited by factors outside the sector. It examines how these factors are rooted in the distinctive organisation of power to which Hashemite rule gave rise, and identifies the role of water provision in its shaping and restructuring over time. It analyses the evolution of the political bargain between Throne and people, its patronage underpinnings in which privileges and benefits – including access to cheap water – have been exchanged for allegiance as well as how it permitted powerful anti-reformist groups to influence

policymaking and allocation of resources - including over water use and management. Taking account of these political impediments to water reform, the study assesses how Jordan might address its water challenge in the context of the political transition underway and seize the unprecedented opportunity it presents to implement a mix of local and regional solutions to lay the foundations for a water-secure future. The study provides options for policies that might usefully be pursued by international donors in support of Jordan's efforts to implement a set of parallel political and water reforms, whose success will be interlinked.

The study builds on the author's past work on Jordan's domestic politics and regional relations¹ and its development has benefited from in-depth discussions during a field visit to Jordan in 2010 with Jordanian politicians and officials, landowners, water experts, academics, journalists and representatives of the diplomatic, donor and NGO communities, and from follow-up discussions by telecommunications and in the UK. In view of the politically-sensitive nature of the topic, interviews were semi-structured and informal, permitting interviewees to discuss the politics surrounding water governance frankly and on the basis of anonymity. The analyses and narratives collected have provided an empirical basis for the arguments in the study, which also draws on extensive library research. The study is as up to date as possible in view of global and regional developments which directly or indirectly impact Jordan's search for water security – the global financial crisis and rising energy and food prices, the Arab uprisings which have accelerated the country's political transition and reform process, the inflow of more than half a million refugees from Syria and the resulting pressures on services. It has proved possible to take account of these because they have added weight to the analysis rather than qualified it. The study's findings and policy proposals were presented at a workshop held by NCCR Trade Regulation in Bern on January 24, 2013 and reflect feedback provided. The power

¹ Valerie Yorke, *Domestic Politics and Regional Security: Jordan, Syria and Israel: The End of an Era?*, Gower Press: IISS, 1988. Valerie Yorke, 'Exploding Jordan's demographic myth', *Middle East International*, No 323, April 16 1988; Valerie Yorke, 'A New Era for Jordan?', *The World Today*, Vol. 46, No. 2, February, 1990, pp. 27-31. <http://www.jstor.org/page/info/about/policies/terms.jsp>

point and the press release identifying the work's main messages can be found on the NCCR's website.²

With regard to NCCR follow up, the study is intended to support further work on the status of fresh water, which will examine what contribution international law and trade law in particular might make in virtual water trade and bulk water trade. It provides the empirical basis for potentially generalisable insights into a complex problem which many countries face around the globe. Jordan already heavily depends on virtual water trade while access to bulk fresh water supplies is an option for consideration for the long term. This study suggests Jordan will need to adopt a bolder approach than hitherto with regard to rethinking irrigated agriculture in the Highlands and transitioning to more productive and efficient farming techniques in order to arrest the depletion of aquifers and protect vital renewable groundwater resources. If it chooses to do so, it would be interesting to assess to what extent international trade regulation could support a package of reforms, whether Jordan's tax, customs and subsidy regimes are in line, and how future international trade regulation might be shaped to complement local efforts to ensure renewable groundwater resources are used sustainably and efficiently. Jordan's bilateral trade agreements and their implications would be worthy of attention in this regard. Do they reinforce inefficient water allocations, and if so, how might this issue be addressed? Finally, since Jordan's long-term water security lies in finding access to new bulk supplies from the region, either from desalination or by transfer, how might international trade law assist Jordan and its neighbours to agree the mechanisms to coordinate shared water resources, develop new sources, and consolidate current inadequate bilateral arrangements between them?

The study is arranged as follows: Chapter 1 assesses the nature and scale of Jordan's water challenge and, on the basis of available data, considers supply and demand projections and

² Valerie Yorke, *Seizing the moment: A step change in Jordan's water management in the context of political transition*, NCCR Water, Trade and Sustainable Development Workshop, Bern, January 24, 2013, see [http://www.nccr-trade.org/events/water-trade-and-sustainable-development/?tx_nccr_pi1\[filter\]\[eventdate\]=all&tx_nccr_pi1\[filter\]\[wp\]=5&cHash=ae478d2c7378fd59042425c7d84ba0c7](http://www.nccr-trade.org/events/water-trade-and-sustainable-development/?tx_nccr_pi1[filter][eventdate]=all&tx_nccr_pi1[filter][wp]=5&cHash=ae478d2c7378fd59042425c7d84ba0c7). NCCR Trade Regulation Press Release (January 24, 2013), see <http://www.nccr-trade.org/publication/post-elections-jordans-new-national-leaders-must-prioritise-and-accelerate-water-reforms/>

the additional water volumes annually required to 2025, noting the country's vulnerability to global climate change. Chapter 2 explores the achievements and shortcomings of two decades of water reforms and sheds light on the sector's limited capacity to realise its own policy goals. Chapter 3 analyses the historical origins of the organisation of power, the evolution of the Throne's political bargain with the people based on patronage, the emergence and resilience of powerful, privileged 'shadow state' networks whose members, often with interests in land and water provision, influence policymaking, water reforms and governance outcomes. Following this analysis of the links between Jordan's distinctive political dynamics and water governance, Chapter 4 sets out interlinked criteria for implementing effective water reforms and assesses how these might best be met in the context of Jordan's political transition. Chapter 5 provides an assessment of the policies Jordan is currently adopting and could accelerate as well as other options it might pursue locally, regionally and internationally in order effectively to address its medium-term water challenge and to lay the foundations for a water-secure future.

Acknowledgements

The author would like to thank all those who agreed to be interviewed and who generously shared their views, as well as the Ministry of Water and Irrigation for providing water statistics and projections. For assistance in organising meetings in Jordan, she is grateful to the Government of the Hashemite Kingdom of Jordan and its Embassy in London and the British Foreign and Commonwealth Office. Special thanks are due to Professor Thomas Cottier for his encouragement throughout. Thanks also go to Fitzgerald Temmerman and Baris Karapinar for sharing perspectives on water issues, to those who commented on draft chapters, to Edith Hodgkinson for editorial assistance, and to NCCR Trade Regulation and World Trade Institute staff for administrative support. The contents of this study are, however, entirely the responsibility of the author.

April 2013

CHAPTER 1

THE NATURE AND SCALE OF JORDAN'S WATER CHALLENGE

“The scarcity of water in Jordan is the single most important constraint to the country’s growth and development... as water is not only considered a factor for food production but a very crucial factor of health survival and social and economic development” (Second National Communication to the United Nations Framework on Climate Change, 2009).¹

“The water sector is of strategic importance as water scarcity can significantly impede socio-economic growth” (National Agenda, 2005).²

Jordan is one of the driest countries in the world³ and one of the ten most water-scarce.⁴ Like other Middle East countries, it suffers from a harsh climate and environment, but its geo-strategic situation and the legacy of regional conflict have also contributed to its uniquely dire and deteriorating water picture. Jordan suffers from a serious, and worsening, imbalance between resources and population. In 2008, the available water per head was around 145 cubic metres (CM)⁵ – significantly below both the international average of 1,000 CM⁶ and the ‘absolute water scarcity line’ of 500 CM⁷ – and it is still declining, as demand for water exceeds renewable and currently financed non-renewable supply by a growing margin. With few additional resources within the country that can be developed to narrow the gap, Jordanians could face absolute water poverty with only 90 CM per head per year by 2025. At this level there is grave risk that human and economic needs and aspirations would not be met, with clear implications for economic growth, political stability, and national security.

¹ Ministry of Environment, *Jordan’s Second National Communication to the United Nations Framework Convention on Climate Change (UNFCCC)*, 2009, p.1.

² *The National Agenda, 2006-2015: The Jordan We Strive For*, 2005.

³ Jordan’s Water Strategy, *Water for Life, 2008-2022*, 2009.

⁴ In terms of water resource availability per capita. See *UNDP 2006 Human Development Report*. .

⁵ Jordan Water Strategy, op.cit.,p.3-1.

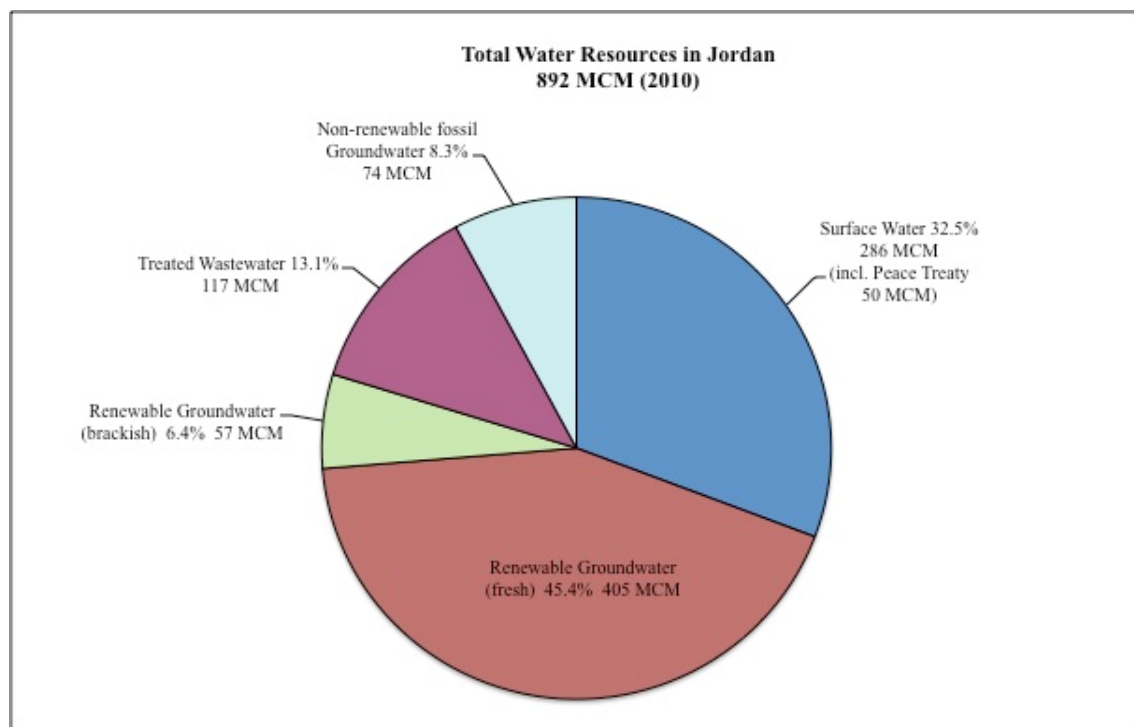
⁶ Coyne et Bellier, *Project Flow Rates, Flow Configurations and Potable Water Demands, Work in Progress paper*, 2010, p. 7.

⁷ Jordan Water Strategy, op.cit.; Ministry of Environment, op.cit., p.31; UN Dept of Economic and Social Affairs, *Water for Life, 2005-2015*. www.un.org/waterforlifedecade/scarcity.shtml. World Health Organisation and the United Nations Environment Programme, The Health and Environment Linkages Initiative, “Water, health and ecosystems,” <http://www.who.int/heli/risks/water/water/en/index.html>, accessed 3 December 2012.

Water supply

Jordan's available water resources are estimated by the Ministry of Water and Irrigation (MWI) at 892 million cubic metres (MCM) (2010) (Table 1).⁸ Of this, more than three quarters is sourced from renewable groundwater (including brackish) and surface water (including peace treaty water) – 46.5% and 32.5% (Fig.1). Of the remainder 8.3% is sourced from non-renewable fresh fossil groundwater and 13.1% from treated wastewater.

Fig 1: Estimated Available Water Resources, 2010



Source: Data derived from MWI, *Water Budget Projected Demand and Resources 2010-25*, 2012.

Jordan's water supply is constrained by the country's physical features and geographic location.⁹ The country is more than 90% arid to semi-arid and suffers multi-year droughts.

⁸ MWI, *Water Budget: Projected Demands and Resources 2010-2025*, 2012.

⁹ The following analysis benefited from S. McIlwaine, 'Managing Jordan's Water Budget: Providing for Past, Present and Future Needs' in *The Jordan River and Dead Sea Basin: Cooperation Amid Conflict*, NATO Science for Peace and Security Series, Springer, 2009.
<http://www.springerlink.com/content/g40hu167223x4403/abstract/>? Also see Strategic Foresight Group, *The Blue Peace: Rethinking Middle East Water*, 2011.

Total annual rainfall has historically averaged 8,230 MCM / year, the lowest in the region.¹⁰ Annual volumes are reportedly declining. Moreover rainfall varies across Jordan's three geographic regions, and is seasonal and unpredictable.¹¹ With declining surface water flows, Jordanians have increasingly relied on groundwater, which is the main water supply source for populated areas and Highlands agriculture. The majority of renewable aquifers are used at rates exceeding sustainable yields and taken together are over-pumped by 52% beyond safe yield (Table 2).¹² The depletion of aquifers has in turn diminished flows released to side *wadis* (drainage courses) along the Jordan Valley. Non-renewable fossil aquifers are pumped within safe yields.

Supply from surface water and groundwater resources is subject to further uncertainty, since a significant proportion originates from transboundary, shared sources. For most of its surface water, Jordan relies on the Yarmouk river system,¹³ although the Jordan River flows were important in the past. These rivers originate outside Jordan's borders with their flows both diminishing and unpredictable as a result of unequal distribution among riparians or over-extraction through upstream damming and diversions. With regard to the Yarmouk River in northern Jordan, Syria, the upstream riparian, agreed in 1987 to supply 208 MCM / year, but Jordan reportedly receives only around 50 MCM / year,¹⁴ and even less in recent drought years. Water experts argue that Syria's construction of tens of dams upstream and the digging of wells have deprived Jordan of its rightful share under bilateral agreements. Jordan shares the Lower Jordan River waters with the Palestinian West Bank but these are

¹⁰ Strategic Foresight Group, *op.cit.*, p. 85. Rainfall varies between 5,200 and 12,000 MCM / year. Of the annual total some 5.4% infiltrates into aquifers and recharges groundwater, and 2.4% goes to surface runoff, with the rest lost to evaporation.

¹¹ For details see Strategic Foresight Group, *op.cit.*, pp. 84-85. Jordan's scarce water resources can be related to three geographic regions and their climate zones: the northern and southern highlands, where most of the population is located, receives most - average rainfall around Ajloun in the north can reach 600 mm/yr; in the Jordan Rift Valley, which extends along the country's western border from Lake Tiberias to Wadi Araba, average rainfall varies from 350mm/yr in the north around Lake Tiberias, to 220 mm/yr around the Dead Sea and 50 mm/yr towards Wadi Araba in the south; in the eastern Badia and southern desert, stretching east of the highlands to Iraq and comprising more than 80% of Jordan, average rainfall is below 100 mm/yr. Most of the population is located in towns in the highlands. Villages are located along the Jordan River and settlements sparsely scattered in the desert.

¹² MWI Water budget 2009/2010, as cited in USAID, *op.cit.* (2012). The MWI Water Strategy, 2002 put the rate at 60% beyond safe yield, MWI, *Jordan's Water Strategy and Policies*, 2008 at 47%. Some 2,000 wells, many illegal, contribute to over exploitation.

¹³ For an analysis see David E. Rosenberg, 'The Yarmouk River Agreements: Jordan-Syrian Transboundary Water Management, 1953-2004', *The Arab World Geographer*, Vol 9, No 1, 2006, pp.23-29.

¹⁴ For discussion of various points in this para, see Strategic Foresight Group, *op.cit.*, p.26.

polluted. Under the 1994 Israeli-Jordanian Peace Treaty, Israel is obligated to release 100 MCM / year from Lake Tiberias to Jordan, but the actual amount released is closer to 50-60 MCM / year.¹⁵ In both cases, reduced flows are also attributed to climate change.

Table 1: Estimated Available Water Resources, 2010

	MCM / year	%
Renewable groundwater	405	45.4
Groundwater safe yield	275	
Return flow	54	
Over abstraction	76	
Surface water	236	26.5
Non-renewable groundwater	74	8.3
Disi	61	
Jafr	7	
Lajjoun	6	
Treated wastewater	117	13.1
Renewable groundwater (brackish)	10	1.1
Peace Treaty*	50	6
Total resources (MCM)	892	105
Of which groundwater loss	54	5

Source: MWI, *Water Budget 2010-2025*, 2012. * Surface water

Notwithstanding the above, Jordan does enjoy sovereignty over surface water supplies from the Zarqa River which feeds the King Abdullah Canal, and nine side wadis which flow westwards from the Highlands. However, the base flows of the former have been much reduced by over-pumping from the Amman groundwater basin, the workings of the King Talal dam and commercial activities. Flows are severely polluted.

Uncertainty also applies to even more important groundwater. A significant proportion of renewable groundwater and non-renewable fossil resources is transboundary – coming from shared aquifers. Of the eleven renewable groundwater reservoir basins, four in the north are

¹⁵ MWI, *Water Budget*, 2012, op.cit.

shared with Syria. Meanwhile, the Disi-Mudawwara aquifer, the most important of Jordan's three non-renewable fresh fossil water aquifers, straddles Jordan's border with Saudi Arabia and is shared with it. Surrounded by controversy,¹⁶ Disi resources have been used since the early 1980s for municipal and industrial purposes in Aqaba and, subsequently, for agriculture; and from 2013, water will be pumped by pipeline to Amman to supply the city with 100 MCM / year of drinking water.¹⁷

A worrying factor in view of the strategic importance of transboundary surface and groundwater is the lack of bilateral agreement with either Syria or Saudi Arabia on the joint management, protection and conservation of these waters, or on dispute settlement procedures and the absence of regional mechanisms to plan for the future (see Box 6).

Water use: the pressure of population growth

The very rapid rise in Jordan's population has put serious pressure on available water resources. In 1922 it was only 225,000,¹⁸ by the late 1940s it had reached 430,000,¹⁹ and in 2010 it was 6.2 million²⁰ - and is projected to double in the next 30 years.²¹ Jordan's available water resources per capita of some 145 CM / year (2008), represents a dramatic change compared with 1946 when average renewable water supply per capita was 3,600 CM.²²

When the state was formed in 1921, the meagreness of renewable resources did not pose a problem, due to the population's small size. However, unpredicted and unimaginable population increases occurred during the second half of the 20th century and through into the first decade of the 21st. Hundreds of thousands of Palestinians arrived in Transjordan after the 1948-49 and 1967 wars with Israel, followed by influxes from Kuwait in 1990-91, and Iraq in 2003, and most recently from Syria.

¹⁶ The controversy concerns levels of radiation. See F. Degreco, *The Securitization of Disi Water*, 2010.

<http://www.slideshare.net/francescagreco78/master-dissertationfrancescagreco78watersecuritization>

¹⁷ Experts say Disi could provide water for 50-100 years if water is extracted according to current design. As of 2012, pumping from Disi for agriculture was reportedly cut back, but not curtailed. See Chapter 3.

¹⁸ See McIlwaine, op.cit., p.63.

¹⁹ See Valerie Yorke, (1988), op.cit.

²⁰ MWI, *Water Budget*, op.cit. EIU estimates 6.4 million. EIU *Jordan Country Forecast*, April 2012, p.11.

²¹ Coyne et Bellier, op.cit., p. 6.

²² Jordan Water Strategy, op.cit., p.2-1.

The government's response during the 1960s, 1970s and 1980s to the surge in population was to ensure food security but the expansion of agriculture was reactive and unplanned, and it produced structural distortions in the water sector. With only 5% of land estimated to receive sufficient rainfall to support agriculture, water policy focussed on developing supplies to meet the sector's demand. Irrigated agriculture was developed in the Jordan Valley,²³ using waters from the Yarmouk and Jordan Rivers and from side *wadis*. As a result of extensive infrastructural works, a comprehensive irrigation network was built based on the King Abdullah Canal and a number of dams to feed it. From 1977 the Jordan Valley Authority (JVA) assumed responsibility for the operation and development of this vast irrigation area. Though Jordan Valley development - measured in terms of the employment it provided - was a success, it hugely boosted water demand and agriculture's disproportionate share.

Exacerbating the problem was the state's decision in due course to support private landowner development of irrigated agriculture in the northern Highlands, which led to the over-abstraction of groundwater aquifers. This practice also developed in the Badia to the east and, very controversially, in the south where the government granted licences to private farming enterprises to use Disi aquifer's non-renewable fossil water. Groundwater-irrigated agriculture in the north alone is estimated to have used an average 207 MCM / year since 1994, nearly 25% of total estimated water supply (as of 2010).²⁴ In the south, water has been abstracted from Disi at the rate of around 40 MCM / year and historically used to grow subsidised water-intensive crops, such as citrus and wheat.

Table 2: Groundwater Abstraction Rates, 2010 (MCM)

Source	Safe annual yield	2010 Abstraction	Difference (deficit)
Renewable	275	427.2	(152.2)
Non-renewable/fossil	143	83.7	59.3
Total	418	510.9	(92.9)

Source: MWI Water Budget 2009/2010 cited in USAID, *Review of Water Policies in Jordan and Recommendations for Strategic Priorities, Final Report*, April 2012, p.7.

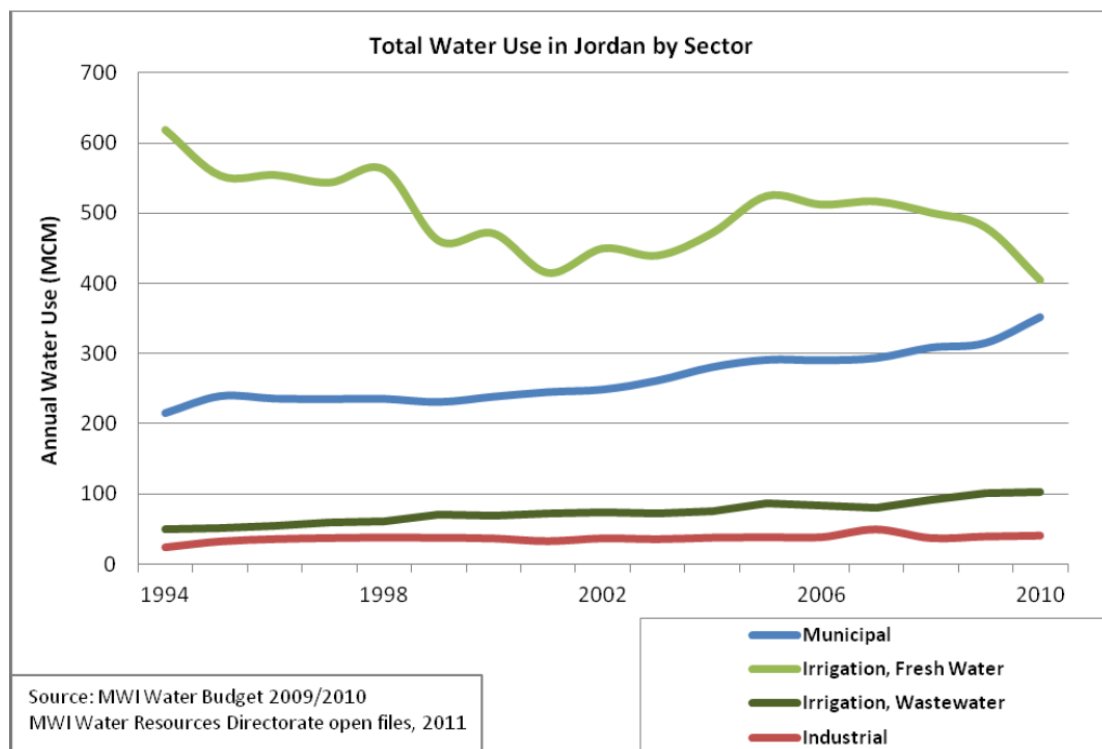
²³ For an account of the Jordan Valley's history, development, and financing of irrigated agriculture see Rami G. Khoury, *The Jordan Valley*, Longman: New York, 1981; also Anne M. Peters and Pete W. Moore, 'Beyond Boom and bust: External Rents, Durable Authoritarianism, and Institutional Adaptation in the Hashemite Kingdom of Jordan', *Studies in Comparative International Development*, Springer, 44, 2009, pp. 256-285.

²⁴ See USAID, April 2012, op.cit., p.7.

This expansion of agriculture dramatically increased total water demand, with irrigated agriculture taking a disproportionate share of available resources – around three times the combined consumption of the municipal and industrial sectors by the early 1990s (see Fig 2). Meanwhile, contributing to water demand pressures was the fast-growing urban population and to a lesser extent industry’s development.

Recently-released MWI figures, cited in an USAID report,²⁵ show trends in water use by the municipal, agriculture and industry sectors since 1994 (see Fig 2). These figures broadly reflect those reported by Coyne et Bellier for 1990-2007 (Table 3). Over the 1994-2010 period, available annual supply varied only slightly in percentage terms within the range of 800-900 MCM, while the population increased by 48%.²⁶

Fig 2: Total Water Use in Jordan by Sector since 1994



Source: MWI Water Budget 2009/2010, MWI Water Resources Directorate open files, 2011. Cited in USAID, *Review of Water Policies in Jordan and Recommendations for Strategic Priorities, Final Report*, April 2012, p.viii.

²⁵ The following discussion draws on these figures. See USAID (2012), op.cit., pp. 6-7, pp.10-12.

²⁶ USAID (2012), op.cit., p.5.

Agriculture has remained the dominant consumer of fresh water - although its share fell over the period to the benefit of the municipal sector - whilst contributing only 3.5% of GDP (2009).²⁷ The sector accounted for nearly two thirds of water supply by 2010, comprising groundwater (42%) and surface water (58%)²⁸ - over half of which was wastewater. Highlands agriculture uses an estimated annual average of 207 MCM of groundwater - contributing to groundwater over-abstraction which is unsustainable. Abstraction remains way beyond safe yield, with only a slight reduction in over-abstraction levels in recent years;²⁹ the benefits won as a result of improvements in farm efficiency appear to have been offset through the use of groundwater for low-value olive tree planting to increase land values.³⁰ Irrigated agriculture in the Jordan Valley uses the 83 MCM / year of annual surface water available to it – the rest (48 MCM) being pumped to Amman. The use for irrigation of increasing amounts of reclaimed wastewater, estimated at over 110 MCM in 2010, has reduced the level of need for freshwater. With donor financial assistance, total treated wastewater is projected to increase to 165 MCM by 2015 and to over 240 MCM by 2025 (Table 4). In addition, up to 35 privately-run groundwater desalination plants are in operation, mostly in the Jordan Valley.

Municipal water use, met mostly by groundwater sources, increased modestly over the period from 1994, accounting for around 30% of supply by 2010. Per capita consumption remained at an average 142 litres-per-caput-per-day (LCD) notwithstanding rapid population growth. However, supplies to urban areas, Aqaba excepted, are delivered intermittently and rationed - with householders depending on water stored in roof tanks and purchases of privately-supplied 'tanker water' to augment piped supplies.

Industrial and tourism use increased to around 40-60 MCM by 2010, with their share of available water remaining at a low 4.5-7%.

²⁷ WRG / MWI Confidential Paper, 2011, p.23.

²⁸ MWI, *Water Budget 2009/10* cited in USAID (2012), op.cit., p.12.

²⁹ Reported by a US Geological Survey study, cited in USAID (2012), op.cit.p.ix., p.7,

³⁰ This conclusion regarding the speculative nature of planting of low productivity olive trees is discussed in the USAID (2012) study. The issue has raised questions amongst analysts for some time. See J.P. Venot, J.P. and F. Molle, F., *Groundwater Depletion in the Jordan Highlands: Can Pricing Policies Regulate Irrigation Water Use*, Springer Science, 2008 and WRG / MWI Confidential Paper, op.cit.

The growing need to prioritise the municipal sector led to increased supplies (around 50 MCM / year) of the Jordan Valley's available surface water being pumped to Amman (with irrigation water for the Valley held below requirement during some of the period) – but even then, municipal consumption was constrained by intermittent supply or rationing. A more positive development has been the reduction in groundwater use for Highlands irrigation, likely owing to more efficient management. Overall, supply has been supported by the increasing volumes of treated wastewater and the coming into operation of privately-run groundwater desalination plants, mostly in the Jordan Valley. However, a significant contribution continues to be sourced from high-level over-abstraction of water from aquifers.

Behind these data demonstrating structural distortions in water use lie the dangerous trends they represent: i) the continuing depletion of aquifers due to over-abstraction, causing irreversible damage to them; ii) the continuing inefficient use of water in terms of generating economic growth and iii) the diminishing flexibility for dealing with climate-change impacts.

Table 3: Water Allocation by Sector

Year	Municipal	Industrial	Agriculture	Livestock	Total
Quantity (MCM)					
1990	176	37	652	5	870
1995	240	33	596	9	878
2000	239	37	534	7	817
2007	294	49	589	8	940
Distribution (% of total)					
1990	20	4	75	1	100
1995	27	4	68	1	100
2000	29	5	65	1	100
2007	31	5	63	1	100

Source: Data on reported water supplies cited by Coyne et Bellier, *Project Flow Rates, Flow Configurations and Potable Water Demands* (Work in progress), 2010.

Virtual water resources

The above data do not convey the full scale of Jordan's water challenge for there is an added 'hidden' dimension represented by the growing level of 'virtual water' imports in the form of grain and food commodities over the past half century.³¹ From the 1960s, water shortages

³¹ The term 'virtual water' was coined by Tony Allan. The concept and use of virtual water as a policy instrument have been extensively analysed, including with regard to Jordan. *Inter alia*, see Munther J.

and the resulting inability to produce food for its growing population led Jordan to import growing quantities of food.³² In short, Jordan helped to relieve its water stress and reach a level of water and food security in the past through its access to water on the international market in the form of ‘virtual water’ embedded in imported commodities. This has led some to say that Jordan’s internal stability has been maintained thanks to ‘virtual water’.³³

Although ‘virtual water’ has been analysed by academics and water experts for nearly two decades, there has been a surprising absence of *public* discussion in Jordan on either the importance of trade to its water security, or the role of ‘virtual water’ trade as part of its future resource strategy. The question remains how Jordan’s small, cash-strapped economy will pay for even higher levels of food imports for an expanding population. In disguising the depth of the water deficit, the availability of ‘virtual water’ pre-empted a debate about it. Policy-makers’ management of water scarcity through ‘virtual water’ trade permitted ‘business as usual’ in terms of patterns of water use and governance, when it should have triggered politically-difficult water reforms. Moreover, for as long as aid flows continued, these relieved pressure on policy makers to initiate the required economic reforms to shift investment to more productive sectors in order to generate jobs and faster economic growth that could produce the revenues to pay for future food, energy and water sector requirements. Jordan’s trade balance today is a sobering reminder of the country’s vulnerability to external shock through global food shortages and price rises (Table 5).

Haddadin, *Water Resources in Jordan: Evolving Policies for Development, Environment and Conflict Resolution*, RFF Press Book, 2006; J.A. Allan, *The Middle East Water Question: Hydropolitics and the Global Economy*, I.B. Tauris, London, 2002; J.A. Allan, *Virtual water eliminates water wars? A case study from the Middle East*, Ch 9 in A. Hoekstra (Ed), *Virtual water trade*, Delft (Netherlands): IHE, 2003, pp.137-145. A. Sadek, *Virtual Water Trade*, WANA Forum, Power Point, 2011.

<http://www.slideshare.net/WANAforum/virtual-water-trade-alaa-el-sadek>

³² See A. Chapagain and A. Hoekstra, *Globalisation of Water*, Blackwell Publishing, Oxford, 2008. In Jordan’s case, the ‘water footprint’ is calculated at 6.27 billion CM/year (2008), reflecting a water self-sufficiency level of 27%, one of the lowest in the world. This footprint, which comprises total water use of a country, minus water used in the production of commodity exports plus the ‘virtual water’ in commodity imports, allows quantification of dependence or self-sufficiency of a people in relation to amounts of water they consume.

³³ For a discussion see J.A. Allan, *Virtual water eliminates water wars*, Ch 9, op.cit.

Economic context

The scale of the water challenge is inevitably linked to the changing realities of the wider economy with which it interacts and which has important linkages to water. Policy choices made outside the sector on agriculture, trade, finance, industry and energy all have implications for water supply and / or demand. They affect water management and are affected by it.

Jordan's water scarcity has major implications for economic growth since production capacity is inhibited by restrictions on water supply. This interconnection was recognised in the government's National Agenda of 2005, a ground-breaking planning initiative which set out economic targets for the following ten years to tackle the country's socio-economic and financial crises.³⁴ It suggested a unique, holistic, inclusive and transformative approach – amounting to a move from rentierism to an economy characterised by internally-generated growth to meet the socio-economic aspirations of Jordanians. Without a change in the economic status quo, the study asserted, Jordan would be unable to address the critical challenges it faced. Although the Agenda was never implemented, it was important because for the first time water issues were placed at the top of the national policy agenda, their cross-sectoral significance formally recognised and and rigorous reforms called for.

*“The water sector is of strategic importance as water scarcity can significantly impede socio-economic growth. In addition to the scarcity of renewable water resources and depletion of underground water, the water sector suffers from distribution inefficiencies, inadequate tariffs, limited wastewater treatment capabilities and restricted private sector involvement.”*³⁵

The National Agenda proposed the following:

- Develop water supply and new resources, exploit unconventional resources and enforce the Kingdom's water rights according to international agreements related to water sharing within a framework of regional cooperation.
- Improve efficiency of water distribution networks to decrease operational costs and non-revenue water.
- Restructure tariffs and progressively reduce subsidies.

³⁴ Ambitious targets included achieving annual real GDP growth of 7.2%, reducing public debt from 91% to 36% of GDP, converting the budget deficit into a surplus of 1.8% (excluding grants) and halving the unemployment rate to 6.8%. See *National Agenda*, 2005.

³⁵ Ibid., p.34.

- Develop and upgrade wastewater treatment facilities by using state-of-the-art technology and re-use treated water for agriculture and industry.
- Encourage involvement of the private sector in developing the water sector and creating an investment-friendly environment.

Today, independent projections forecast annual economic growth rates of 4% (2012-16), significantly below the 7.2% aspired to by the National Agenda, with domestic demand growth depressed by regional instability, fiscal austerity and the continued poor performance of the world economy. In the absence of the step-change in socio-economic development that could generate higher growth rates, unemployment will rise inexorably and the country will be unable to pay for food, energy or water requirements.

The outlook for the next two decades

The scale of the challenge facing Jordan in delivering sufficient water to meet its growth aspirations and provide for a water-secure economic future has been reflected in recent studies with updated projections for national water balances.³⁶ MWI and international consultants' projections on demand and supply differ. However, all show substantial deficits, the narrowing of which will at some stage entail a marked rise in bulk supply costs from the current average of JD0.35 / CM to JD0.95-1.10 / CM, or more. The MWI's annual water budget of 2012 (Table 4) provides the basis for the following analysis.³⁷

Table 4: National Water Balances, 2010-2030

	2010	2015	2020	2025	2030
Population mn	6.2	7.0	7.7	8.5	
Unaccounted for water NRW % of total	43	37	30	25	
DEMAND (MCM)					

³⁶ These studies (referred to in the footnotes) - compiled for different purposes and employing different methodologies - include: the findings of consultants, employed by GOJ to consider strategies to deal with Jordan's water challenge, in Water Resources Group / MWI Confidential Paper (2011) op.cit.; the World Bank-funded draft feasibility study, Coyne et Bellier, *Project Flow Rates, Flow Configurations and Potable Water Demands, Work in Progress paper*, 2010 and a study by USAID consultants, *Review of Water Policies in Jordan and Recommendations for Strategic Priorities*, April 2012.

³⁷ Budget projections reportedly draw on the National Water Master Plan, May 2004 and aspects of the Jordan Water Strategy, 2009.

Irrigation – fresh / mixed	700	700	700	700	700
Municipal*	320	418	515	613	710
Tourism	13	21	26	29	35
Industrial	64	90	107	117	150
Nuclear			50	100	100
TOTAL DEMAND	1097	1229	1398	1559	1695
RESOURCES (MCM)					
Surface Water	236	244	255	266	
New dams		5	15	25	
Water Harvesting		3	4	5	
Yarmouk River to Jordan		30	30	30	
Groundwater Renewable	405	380	355	329	
Safe yield	275	275	275	275	
Return flow	54	54	54	54	
Over abstraction	76	51	26	0	
Groundwater Non-Renewable	74	142	142	142	
Disi	61	122	122	122	
Jafr	7	12	12	12	
Lajoun fossil water	6	8	8	8	
Brackish / Saline water	10	25	25	25	
Treated Wastewater	117	165	223	247	
Peace Treaty	50	50	50	50	
Red Sea Conveyance/ Desalinated Water			210	370	
TOTAL RESOURCES(MCM)	892	1006	1260	1429	1500
BALANCE	-205	-223	-137	-130	-195
BALANCE ** (without Red Sea conveyance)			-347	-500	

Source: MWI, *Water Budget 2010-2030*, 2012.

* Reflecting percentage improvement in NRW; ** Author's addition.

The MWI's *Water Budget* forecasts that overall water demand will rise to 1,559 MCM by 2025, a 42% increase over 2010 demand, even though the requirement for agriculture is capped in line with allocation policy. Reflecting the country's growth aspirations, the budget forecasts significant growth in need for municipal, industrial, and nuclear uses (see Box and Fig 3).³⁸ These demand projections rest on the assumption that 'capping' of irrigation water and reductions of unaccounted for water will be implemented, as planned. They do not include

³⁸ Projected water demands reflect the growth outlook for these sectors as detailed by the national sources cited by the MWI budget as well as requirements for them according to government commitment made.

unreported abstractions. Irrigation demand projections would be higher if efficiency measures are not effectively implemented and if unreported abstractions are included.³⁹

BOX 1: PROJECTED SECTORAL DEMAND, 2010-2030 *

Municipal sector

Municipal demand is projected to almost double between 2010 and 2025, driven by high urban population growth. National population is projected by the Department of Statistics to grow from 6.2 million in 2010 to 8.5 million in 2025, with population rate increases declining from 2.4% per year to 2.1% by 2020-2025. The Greater Amman region, which currently accounts for nearly 40% of the population, is likely to become more dominant in the future with increasing migration from the governorates. Municipal demand projections reflect a target net average of 112 litres-per-caput-per-day (LCD) (at-tap supply following non-revenue losses) and factor in government commitment to reduce non-revenue water from 43% in 2010 to 30% by 2020 and 25% by 2025.

Industrial sector

The projected increase in industry's water demand by some 82% - from 64 MCM in 2010 to 117 MCM in 2025 - is based on National Water Master Plan figures. It includes plans for uranium and oil shale mining.

Nuclear industry

Up to four planned nuclear reactors are forecast to push the energy's sector's water requirement to 50 MCM in 2020 and 100 MCM in 2025.

Agricultural sector

The agricultural requirement is limited to 700 MCM / year, in line with the JWS's objective of capping water supplies for irrigation and augmenting use of treated wastewater. The agricultural growth target of a 2% per year increase would be achieved mainly through expanding rain-fed agriculture, according to the Ministry of Agriculture's Strategy.⁴⁰

* Source: MWI *Water Balance 2010-30*, 2012.

The MWI puts Jordan's total water supply availability at 892 MCM in 2010, rising to 1,430 MCM for 2025 (Table 4 and Fig 4). These projections are built on assumptions about the pace of implementation of supply-side efficiency measures, and development of costly new supplies, which may not be well founded.

There are two major uncertainties in the MWI supply forecast. First, the projected increase in treated wastewater volumes from 117 MCM in 2010 to 247 MCM in 2025 appears to assume significant levels of foreign direct investment and donor contributions, over and above commitments for projects already underway.

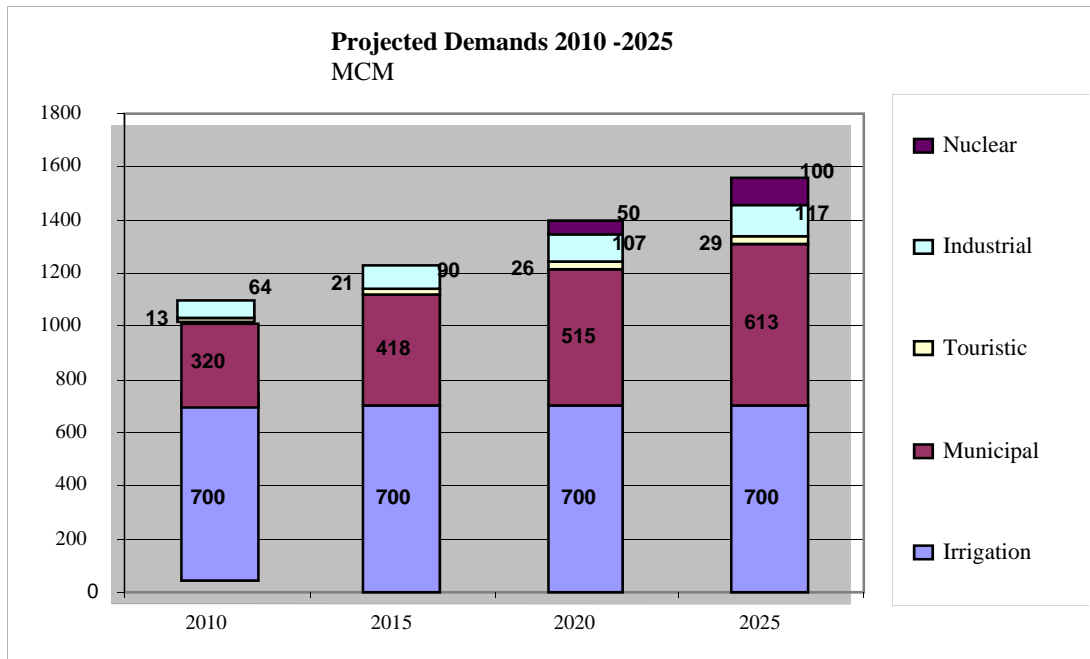
Second, desalinated water from a Red Sea Dead Sea conveyance is forecast to come on stream by 2020 supplying 210 MCM in 2020 and 370 MCM in 2025. However, in late 2012, the

³⁹ For example, the RSDSWC feasibility study - citing the NWMP 2004 estimates for 'reasonable' projections of future gross irrigation requirements in an unstressed environment - puts *irrigation demand on its own* at 1,076 MCM in 2010 and 900 MCM in 2030 (reflecting improved water-use efficiency). These significantly higher irrigation demand projections increase overall demand by 200-300 MCM / year. See Coyne et Bellier, op cit., pp. 15-16.

⁴⁰ Cited in Coyne et Bellier, op.cit.

Jordan Red Sea Project (JRSP) was dramatically scaled down and it remain unclear whether the parallel Red Sea Dead Sea Water Conveyance (RSDSWC) project would receive

Fig 3: Projected Demands by Sector, 2010-2025 (MCM)



Source: MWI Water Budget, 2010-25, 2012

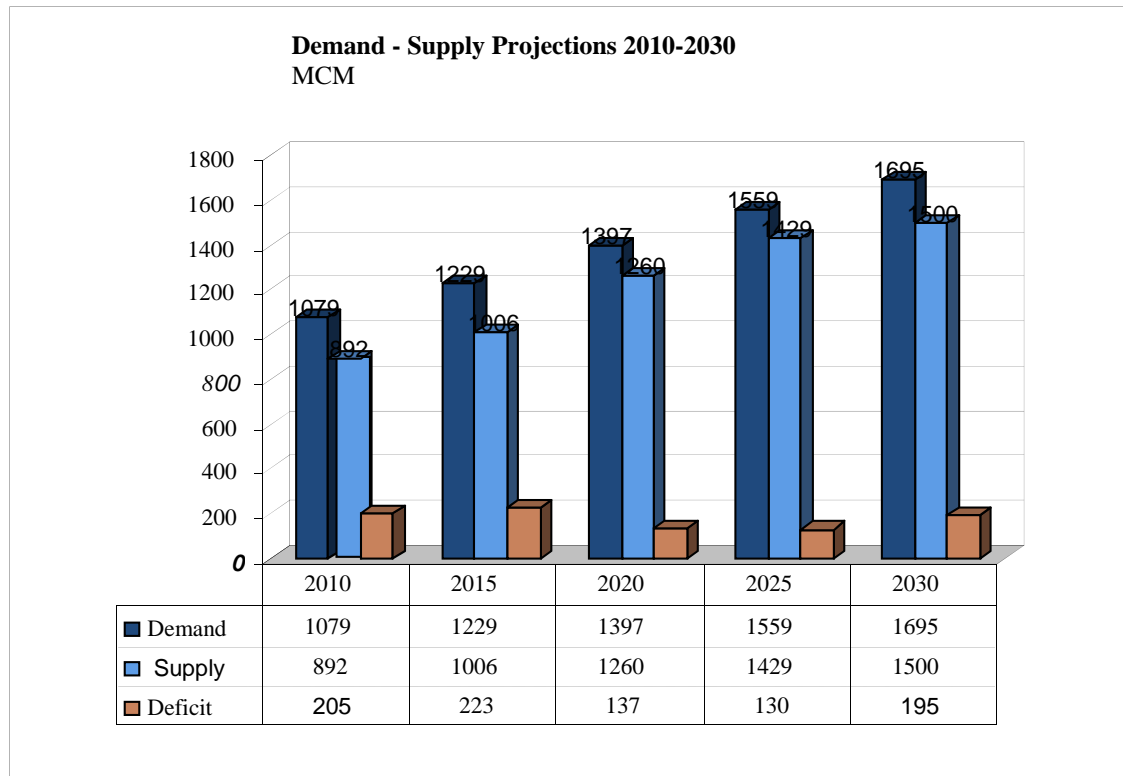
international backing and funding (see Chapter 5). Given the current global financial climate, further delay over a decision, let alone implementation, remains a high possibility, suggesting additional supplies would not be available within the 2025 frame.

Although over-abstraction of renewable groundwater is projected to fall every year, it will not reach zero until 2025, meaning that for most of the period this source will be depleted, groundwater tables will continue to fall and water quality will deteriorate.

In view of the uncertainties implicit in the MWI's assumptions, a more realistic projection of water balances to 2025 that gives a clear picture of the scale of the water challenge is the following (Fig 5). On the basis of the MWI projections, sustainable water supply (total supplies of 892 MCM in 2010 minus over abstraction of 76 MCM of groundwater and minus irrigation use of 40 MCM of Disi non-renewable resources) is calculated to be 776 MCM in 2010. On

top of this, it is reasonable to assume that infrastructure projects to develop new water supply already under construction or with funds committed will be realised: the Disi-

Fig 4: MWI Demand and Supply Projections, 2010-2030 (MCM)



Source: MWI Water Budget, 2010-25, 2012.

Amman water conveyer (100 MCM / year); the As Samra Wastewater Treatment Plant Extension in Zarqa (45 MCM / year);⁴¹ the Kufranjah dam (5 MCM / year)⁴² as well as small wastewater treatment plants (3 MCM / year).⁴³ If these projects are completed, Jordan will have an overall sustainable water supply of around 929 MCM / year through to 2025. The supply projection does not include a mega Red Sea Dead Sea conveyance project, since agreement on the project must still be reached, nor supply-side efficiency measures whether in progress or planned, which are discussed later in the paper.

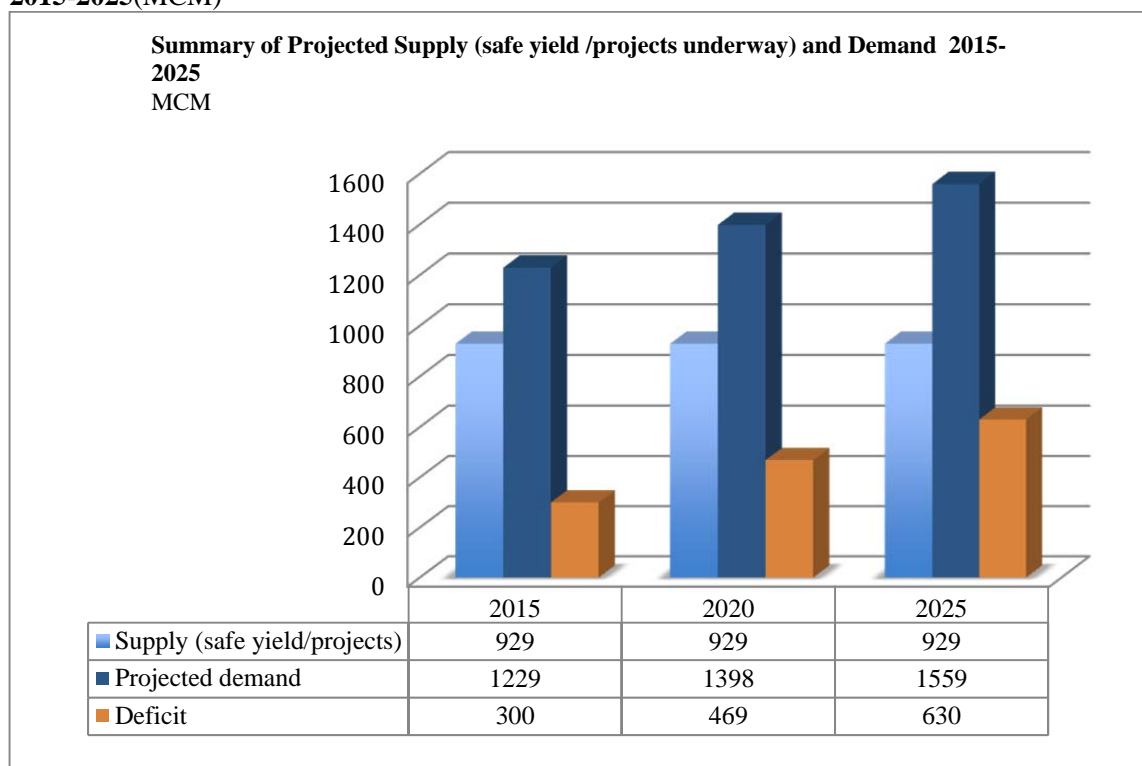
⁴¹ The \$185 million Samra Wastewater plant expansion project is due begin in August 2012 and be completed within three years. It is funded by the Millenium Challenge Corporation, the Samra Plant Company, Morganti Group and private investors.

⁴² <http://vista.sahafi.jo/art.php?id=bd0f2001daefb0fef07c9e11f652bf99f1f1c189>

⁴³ <http://www.jordanembassyus.org/new/newsarchive/2011/06302011004.htm>

⁴³ <http://vista.sahafi.jo/art.php?id=123553b4ce21fecab270d463c76715308ee2aafb>

Fig 5: Author's Summary of Supply (safe yield / projects underway) and Demand Projections, 2015-2025(MCM)



Year	Supply (safe yield / projects)	Projected demand	Deficit
2015	929	1229	-300
2020	929	1398	-469
2025	929	1559	-630

Source: Author's projections based on *MWI Water Budget, 2010-2030*, 2012

Jordan's water demand as projected by the MWI means that Jordan requires an additional 469 MCM / year by 2020 and 630 MCM / year by 2025, if it is to meet its economic aspirations. Projected deficits assume Jordan adheres to the allocation cap of 700 MCM / year in agriculture, reflecting *inter alia* an end to wasteful irrigation use of Disi non-renewable water.

Non-sector challenges exacerbate the problem

However, the situation is yet more serious and urgent than these figures or the MWI projections imply, because of a deepening of the impact of climate change and of domestic socio-political pressure stemming from the Arab Spring. Both non-sector challenges underscore the threats that the water crisis poses to Jordan's future stability.

i) Climate change

The Middle East region is one of the most vulnerable to the impacts of global climate change, according to the World Bank.⁴⁴ Water-scarce and relatively-poor Jordan will be one of the most seriously affected countries and its water crisis will worsen as a result.⁴⁵ Climate change is regarded as a ‘threat multiplier’. In Jordan’s case, climate-change impacts have the potential to interact with and exacerbate existing strains and stresses inherent in its resource scarcity, socio-economic trends and regional relations discussed earlier, with serious potential implications for human security and political stability. It is not known to what extent, or if at all, MWI supply projections take potential climate change impacts into account, hence the following points are made.

Most parts of Jordan have already suffered from climate change,⁴⁶ and the Kingdom is predicted to become hotter and drier. According to Jordan’s Second National Communication to the UNFCCC, average temperatures are projected to rise by 1.0-1.3 degrees Celsius by 2050, which will decrease water availability and increase demand – especially in agriculture – and lead to desertification. Patterns of rainfall are expected to change, resulting in declines of average levels of precipitation and more frequent dry years. With Jordan’s available fresh water resources highly dependent on rainfall, it has been calculated that climate-change impacts could reduce freshwater availability by up to 15% by 2020 – comprising 9% in surface water flow from the Jordan River and its tributaries and 5.5% in groundwater recharge.⁴⁷ On top of this, the quality of available water will deteriorate, affecting both rivers and groundwater supplies.

The resulting increased water stress would adversely affect agriculture, economic growth and employment, food security and health, exacerbating socio-economic problems and fuelling

⁴⁴ World Bank, *Making the Most of Scarcity: Accountability for Better Water Management in MENA*, MENA Development Report on Water, 2007.

http://siteresources.worldbank.org/INTMENA/Resources/WaterSummary_ENG.pdf

⁴⁵ There is a growing literature on likely climate-change impacts on Jordan. The following analysis draws from Jordan Ministry of Environment, op.cit.; Strategic Foresight Group, op.cit.; Mari Luomi (Ed), *Managing Blue Gold, New Perspective on Water Security in the Levantine Middle East*, FIIA Report 25, 2010.

⁴⁶ Over the past 45 years, precipitation has declined by an annual 5-20%, with resulting recurring drought and desertification. Cited in M. Luomi, op.cit., p.63.

⁴⁷ Based on projections by the International Institute of Sustainable Development (IISD), see Strategic Foresight Group, op.cit., p.92.

internal and external political tensions. Decision-makers will be faced with increasingly complex dilemmas, some of which are briefly identified (see BOX):

BOX 2: CLIMATE CHANGE: POTENTIAL IMPACTS AND DILEMMAS

Migration and unemployment: Dwindling water supplies will adversely affect agriculture. A decrease in the rate of groundwater recharge will accelerate the depletion of groundwater on which irrigated agriculture in the highlands depends. Pumping already exceeds the ability of the aquifers to refill. The government plans to decrease allocations to agriculture since water is needed for drinking purposes and it has no plans to pump water to these areas, which would in any case be too costly. In the absence of alternatives to agriculture, thousands working on farms could be expected to migrate to the cities.

Poverty: Climate-induced shortages of water would increase poverty amongst low-income rural households.⁴⁸ They depend on climate-sensitive resources – local water supplies and arable land – for arable farming and livestock husbandry, for both their own consumption and trade.

Health: Reductions in the availability and quality of drinking water would impact on health.⁴⁹ Jordan's initial success in fulfilling the Millennium Development Goals⁵⁰ is reportedly being undermined.⁵¹ The numbers of Jordanians with regular access to safe water is predicted to decline, whilst irregular flows and the damage this causes to infrastructure also carry health risks. Jordan is not new to protests over lack of access to and quality of water, and these could be expected to multiply.

Economic growth: Climate-change impacts on top of the pressures of urbanisation and population growth will increase domestic competition for scarce water resources, with implications for economic growth. Water scarcity and the skewed structure of the economy – with 66% of available water utilised for low-value uses in agriculture which contributes only 3.5% to GDP – have limited Jordan's own capacity to invest in new industries and services. Moreover, FDI will be more difficult to attract, since water availability, reliability and quality are key considerations in decisions to invest.

Inter-state tension: With climate-change impacts fuelling competition for ever scarcer water resources, tensions among communities – urban-rural, or within cities – can be expected to grow. These strains could in turn be felt across national borders, as perceptions on both sides alter regarding the past *modus vivendi* over shares of transboundary water, and distrust increases.

Food security: Jordan's reliance on food imports underscores its vulnerability to disruptions in supplies and rising world food prices. In addition climate change will affect agriculture, highlighting the need to adjust crop patterns.

Climate change-induced strains point to the need for government to accelerate and deepen reform efforts to address deteriorating water security. Water is a major vulnerability in efforts to cope with climate change.

ii) Arab Spring provides wake-up call

Climate change-induced shocks to food supplies and rising food price rises are increasingly considered a threat to political stability.⁵² The 2007-8 food crisis led to protests in more than 61 countries worldwide, including Jordan, and some argue that rising food prices may have also

⁴⁸ For details see Jordan Ministry of Environment, op.cit., pp.108-9.

⁴⁹ For details, Jordan Ministry of Environment, op.cit., p.102.

⁵⁰ http://unstats.un.org/unsd/mdg/Resources/Static/Products/GAResolutions/55_2/a_res55_2e.pdf

⁵¹ Citing the World Health Organisation, Luomi, op.cit. reports: Although Jordan has successfully met MDG No 7, water flows to urban areas are interrupted and 4% of Jordanians lack access to safe water.

⁵² Bernice Lee, 'Rio+20: This time politics must not be ignored', *World Today*, June & July 2012, pp.10-12.

contributed to the Arab Spring in 2011.⁵³ The timing of political upheaval and protest in the region, beginning in Tunisia and spreading rapidly to Egypt, Libya, Bahrain, Yemen and Syria and to other countries including Jordan, could not have been predicted. Protests were initiated against undemocratic government, but multiple drivers of dissent in these societies had been developing, to a greater or lesser extent, for many decades, suggesting the Arab Spring was likely to arrive at some point, in one form or another. For this reason, global warming, with its impact on food prices, though not the principal reason for the uprisings, may have contributed to their timing.

The Arab Spring has highlighted the socio-economic pressures discussed in this section. Geostrategic, demographic, resource, and economic vulnerabilities all fuel these society-wide pressures, many of which are linked to the Kingdom's lack of water security: population growth and rising living standards push up demand for water; a resource-poor and lopsided economy is unable to achieve levels of growth required to increase investment in water services or fund costly desalination; global resource scarcities make foreign business wary of the country's water footprint and high-level of dependence on imported food underscores vulnerability to spiralling food prices and external shock. In short, the water challenge is complex, feeding and fed by multiple wider problems, with the result that growing supply gaps constrain economic growth, endanger human security and potentially threaten internal stability, complicating national security.

The task before Jordan's decision-makers

The strategic importance of water is recognised by Jordan's decision-makers as is the country's water crisis. The key question is whether Jordan's rulers and people will be able to step up to their water problem and implement the necessary cross-society, cross-sector water governance reforms in order to mitigate the dangers inherent in the external and internal dynamics at work, and whether they can do so in time. In terms of timescale, most urgent is an accelerated effort to rein in demand, curtail groundwater over-abstraction, improve water quality and cap

⁵³ Before the protests in Jordan, Tunisia and Algeria, the UN Food and Agriculture Organisation published figures showing prices at their highest since the 2008 food crisis, with the global average price of food (including cereals, cooking oil, meat and dairy products) 25% higher in December 2010 compared with a year earlier. <http://www.guardian.co.uk/world/2011/jan/15/jordanians-protest> See Sarah Johnstone and Jeffrey Mazo, 'Global Warming and the Arab Spring, *Survival*, Vol 53, No 2, April-May 2011, pp.11-17.

agricultural use in order both to protect less costly renewable resources and prepare for climate change – before instability takes hold. These urgent steps will help buy time until an affordable long-term bulk supply solution for the mid-2020s and beyond is found. The attempts made and the policies adopted will have profound implications for the country's stability, for the region and the West.

The next chapter looks at the record: at Jordan's past water governance and reforms and at whether or not action taken amounted to steps in the right direction – ones that could now be built upon and make a difference.

Table 5: Jordan: Selected Annual Indicators, 2007-2012

	2007a	2008a	2009a	2010a	2011b	2012b
Real GDP growth (%)	6.9	5.8	2.3b	3.1b	2.6	3.4
GDP growth per head (%)	3.5	2.5	-0.6	0.7	0.7	1.1
Population (m)	5.9	6.1	6.3	6.5	6.6	6.7
Unemployment (%)	13.1	12.7	12.9	12.5	12.3	12.3
Nominal GDP (US \$ m)	17,006	22,719	23,470	27,543	29,518	31,617
GDP per head (US\$)	2,860	3,700	3,710	4,260	4,480	4,690
Trade balance (US \$ m)	-6422	-7,126	-6,280	-6,640	-8,213	-8,090
Trade balance (% GDP)	-37.8	-31.4	-26.8	-24.1	-27.8	-25.6
Current transfers balance (US\$ m)	2,863	4,081	3,798	3,941	4,118	3,453
Current-account balance (m)	-2,865	-2,000	-1,145	-1,301	-2,863	-2,873
Current account (% GDP)	-16.8	-8.8	-4.8	-4.7	-9.7	-9.1
Budget balance (US \$ m) d	-1,343	-1,449	-1,126	-1,294	-2,863	-2,877
Budget balance (% GDP) d	-7.9	-6.6	-11.1b	-7.4b	-12.4	-11.9
External debt (US \$ bn)	8.4a	6.6a	6.6a	7.6	7.6b	7.6c
Government debt (US \$ m)	11,479	12,063	13,683b	15,782b	16,972	18875
Government debt (% GDP)	67.5	53.1	58.3	57.3	57.5	59.7

a. Actual. b. EIU estimates. c. EIU forecasts. d. Excludes grants

Source: EIU Jordan Country Report, April 2012, EIU Jordan Country Forecast, April 2012 based on IMF, *International Financial Statistics*.

CHAPTER 2

GOVERNANCE; PART OF THE PROBLEM

“...managing challenges arising from or exacerbated by the consequences of climate change require the framework of a well-functioning state.” (Dan Smith, May 2010)¹

One of the most perplexing features of the water situation in Jordan is the ambiguous role of rulers and government - in the view of donors, water specialists and Jordanian water reformers - in coping with a crisis that potentially endangers internal stability. Solutions will ultimately depend on the country's national leaders finding the political will to make the tough decisions and implement the policies that will make a difference - that will narrow the deficit, protect groundwater, and improve the country's capacity to deal with crisis - thereby placing the country on a path to a sustainable water-secure economic future. Instead, the decision-makers themselves, as a result of a combination of actions and indecisiveness, are perceived as part of the problem. This widely-held view - and the discontent it has generated - is of such importance that the circumstances informing it deserve careful analysis.

Jordanian reassurances regarding intentions to reform the water sector abound. Strategies have been published. Water reformers, keen to push through water demand management, are present throughout the sector. A plethora of water conferences have been held in Amman. Although some important steps towards reform have been taken, referred to in this chapter, results to date have been disappointing, amounting, some say, to 'tinkering at the edges'. Indeed, neither a comprehensive, coherent set of water reforms nor the governance reforms at national level necessary to facilitate their implementation have been systematically pursued over the past decade. This is especially remarkable given King Abdullah's instructions to successive prime ministers to implement water reforms, the series of measures to this end proposed by reform-minded ministers and their ministries, and the extent of Jordan's collaboration with donors, backed by extensive financial and technical assistance for the sector, to promote these measures. In the absence of accelerated reforms to arrest adverse trends in the sector, it could well be a water crisis that turns today's publicly-articulated grievances into a serious source of instability.

¹ Dan Smith, 'Water, peace and security', in Josephine and Dr David Tickner, *Tackling the World Water Crisis: Reshaping the Future of Foreign Policy*, Foreign Policy Centre, May 2010, p.28.

Role of donors and Jordan's commitment to reform

Any discussion of Jordan's water strategies, policies and practice must take into account the role of donors. For the US and other Western powers, Jordan is of vital strategic importance as an ally. It is viewed as a key 'voice for moderation, peace and reform' in the turbulent Middle East.² Located on the borders of Israel, Syria, Iraq, Saudi Arabia and the occupied West Bank, Jordan has been continually affected – politically and economically – by regional instabilities. Nonetheless, its leadership has pursued the peace process and concluded a peace treaty with Israel in 1994. The country has absorbed hundreds of thousands of Palestinians, Iraqis and, recently, Syrians, and until the present, has remained stable. Long-standing recognition by the West of the strategic importance of moderate Jordan to its own political and security objectives has translated into generous budget support and aid programmes. The US economic assistance programme to Jordan, which includes strong support for the water sector, is one of the largest in the world.

BOX 3: US ECONOMIC ASSISTANCE TO JORDAN*

Total over 60 years – 1951-2011 (\$billion)	7.4
2011 Total (\$million)	840
of which total grants (USAID)	359.3
of which:	
trade, investment, job opportunities	39.8
management of water / increase water supplies	25.0
political development	22
education reform initiatives	49
public and private health	24.5
opportunities for youth; poverty alleviation	15
cash transfer to GOJ to advance reforms/decrease international debt	184

Source: US Embassy Press Release, *US provides \$359.3 in grants to Jordan*, September 28, 2011.

* US economic assistance aims to keep Jordan on the path to growth and development, while supporting the Government of Jordan in advancing a political, economic, and social reform agenda (US Department of State).

Decades of US assistance to the water sector have been driven by the recognition that assured access to good-quality water is a major driver of development – economic growth, health, education, energy provision and poverty alleviation. Conversely, reductions in water availability would adversely affect economic growth, with knock-on effects for social and political stability. For Jordan, sustaining this outside support for its water sector has been and continues to be vital. With chronic budget deficits, high debt levels and inadequate growth

² USAID, *Jordan Country Strategy: 2010-2014*, March 2010, p.5.

(Table 5), Jordan is in no position on its own to fund investment to build new water infrastructure, to rehabilitate the old, and to develop the sector to the extent required to generate economic growth at rates that meet the aspirations of Jordanians.

Over the years this shared interest of the Kingdom and its allies in guaranteeing Jordan's ability to provide water for an ever-growing population has evolved into a close collaborative relationship between Jordan's water institutions, donors and their consultants aimed at keeping the taps running. As mentioned earlier, USAID has been by far the largest donor to the water sector, but Germany, Japan, and others are deeply involved.³

Two factors have shone the spotlight on the relationship as never before. Over more than two decades, Jordan has made its voice heard in the international climate change debate⁴ and has been active in meeting UN Millennium Development Goals (MDGs) set in 2000, in particular MDG 7.⁵ The need to combat water scarcity through the sustainable management of fresh water resources has become an issue of public debate in Jordan; and, long discussed by academics and aid agencies, the urgency for more efficient and productive water use and the need for water management reform has now been taken up in the press. As the interest of outsiders in the Middle East water challenge has grown, so has Jordan raised its international profile on these issues. Keen to receive assistance from the international community to enhance its capacity to adapt to climate change, and, most importantly, continued donor funding for water projects, the Kingdom has presented itself as a responsible player and taken steps towards reform at home.

Undoubtedly King Abdullah, government ministers and much of the public are deeply concerned about the sustainability of Jordan's water system and the need for sector reforms. Foreign water advisors, who have worked with the government for decades on water

³ For a discussion see Setta Tutundjian, *Water Resources in Jordan*, 2000, Part III.

⁴ See for example Jordan's Second National Communication to the UNFCCC, 2009.

⁵ The MDG 7 Goal – Ensure environmental sustainability. MDG Target 7C – Halve by 2015 the proportion of people without sustainable access to safe drinking water and basic sanitation. As estimated in 2010, 91% of Jordan's population had access to an improved drinking water source in 2008.

<http://unstats.un.org/unsd/mdg/SeriesDetail.aspx?srid=667&crd=400>

management and planning, confirm these good intentions.⁶ USAID has reported ‘growing commitment’ to water-sector reform, which, it argues, provides a more ‘conducive environment to address the key challenge of water scarcity.’⁷ Manifestations of this commitment include: Jordan’s updated National Water Master Plan (2004), the creation of the Royal Water Committee (RWC) by Royal Decree (2008), government approval of the new Jordan Water Strategy, *Water for Life*, 2009 prepared by the Committee, the development of Action Plans to implement it, the Ministry of Water and Irrigation (MWI)’s Water Strategy (2009) updating an earlier 1997 version, and Jordan’s Second National Communication to the United Nations Framework Convention in Climate Change (UNFCCC) (2009). Most recently, the creation of the National Water Advisory Council in late 2011 represented a significant move to improve inter-ministerial, cross-sector and public-private coordination.⁸ Chaired by the Minister of Water and Irrigation and with ten other ministries and government organisations and private sector and NGO representatives participating, the council discusses water sector policy, including financial implications, and reviews strategy, plans and programmes to implement it.

However, against the backdrop of widening water deficits, the collaborative relationship between donors and the water sector has showed signs of strain. Malaise has grown among World Bank and USAID officials, though this was privately rather than publicly expressed.⁹ While Jordanian policies have reflected a shift of emphasis from a supply-oriented approach towards demand management of precious water resources, the government has been slow to advance beyond commitment towards implementing *significant* demand management reforms to protect depleting groundwater reserves, cut back on fresh water used for irrigated agriculture, raise and restructure tariffs, reduce non-revenue water and introduce market-oriented reforms. Jordan has appeared to prefer to rely on the promise of mega-projects to meet future water needs, rather than make the difficult choices required better to manage less costly renewable resources in order to extend their life and postpone for as long as possible the need to develop costly additional supplies.

⁶ Personal interviews, 2010.

⁷ USAID, *Jordan Country Strategy 2010-2014*, March 2010, p.17.

⁸ USAID (April 2012), op.cit.

⁹ Personal interviews 2010. Some of these reservations surfaced in publications and in the media.

The policy record over two decades

The increasingly urgent question was - and still is - whether Jordan can translate commitment to reform into actions that will make a difference - whether rhetoric can be matched with deeds.¹⁰ The following discussion examines the record of the two decades to 2011 in order i) to assess whether meaningful steps were taken to meet the water-scarcity challenge - specifically whether Jordan had begun to address some of the structural distortions in the water sector, illustrated in Chapter 1, and to build the institutional capacity to catalyse a real reform process that would put it on a transition towards sustainability and ii) to identify where the attempts made fell short.

Over the past two decades Jordan's water policy has undergone important changes. First, it has evolved from one mainly focused on supply and services, with the public sector managing large investment programmes, to one paying more attention than previously to management and efficiency on both demand and supply sides. The switch was evident in the 1997 Water Strategy¹¹ and then the 2004 updated National Water Master Plan (NWMP). These had the same overall goal - to use available renewable resources as efficiently as possible through tailoring water demand to how much water could be made available at reasonable cost and with the lowest environmental impact. Specific objectives included: reducing extraction from depleting groundwater resources, curbing irrigated agriculture in the Highlands so water saved could be used for more productive sectors, using treated wastewater to increase irrigation in the Jordan Valley to avoid the higher food imports that reduced levels of agriculture would otherwise entail, improving the performance of institutions through increased private-sector participation, promoting cost recovery for the supply of services, reducing non-revenue water, and encouraging regional cooperation.¹²

¹⁰ The nature of political reform in the Arab world is thoroughly analysed in the literature. See especially various Carnegie papers, in particular Marina Ottaway, *Evaluating Middle East Reform: Significant or Cosmetic?* in M. Ottaway, and J. Chucair-Vizoso, *Beyond the Façade: Political Reform in the Arab World*, Carnegie, 2008.

¹¹ Ministry of Water and Irrigation, *Jordan's Water Strategy*, Amman, Jordan, April 1997 - approved by the Council of Ministers on April 23, 1997. The strategy was accompanied by four policies: water utility policy, irrigation water policy wastewater management policy and groundwater management policy. A full Water Demand Management policy was developed in 2002. <http://www.mwi.gov.jo/sites/en-us/SitePages/Water%20Demand%20Management/Links.aspx>

¹² For an analysis see Munther J. Haddadin, *Water Resources in Jordan: Evolving Policies for Development, Environment and Conflict Resolution*, RFF Press Book, 2006.

The second change came with the publication of the new Jordan Water Strategy (JWS) in 2009, which elevated water from a sectoral concern to a national preoccupation and priority. This shift was mainly driven by the publication, a couple of years earlier, of the ambitious National Agenda (2005) - Jordan's first comprehensive action plan for reform across sectors with timelines - which recognised the strategic importance of the water sector, since water scarcity can impede socio-economic growth and identified, as a priority, the need to upgrade water infrastructure.¹³ The new national water strategy proposed initiatives echoing those of the National Agenda. It aimed to close the deficit by 2022 through large-scale desalination of seawater (via the much talked about Red Sea Dead Sea Water Conveyance mega project) and through promoting efficiency in the sector. Proposals for the latter included: bearing down on non-revenue water; restructuring tariffs and progressively reducing subsidies; developing wastewater treatment and re-using treated water for agriculture and industry; encouraging private-sector involvement in developing the sector and reducing the operational costs of distribution, and enforcing the Kingdom's water rights.

These policy shifts were relevant and appropriate given the need to remedy adverse trends and improve water outcomes. Exceptionally-talented water ministers presided over drawing up the 1997 strategy and pushing through the 2002 Groundwater By-Law No 85. Jordanian officials and donors collaborated closely from the 1990s to implement water resource management initiatives to improve end-use and enhance supply efficiency as set out in strategy documents.¹⁴ However, despite important steps implemented and some achievements, ultimately the overall impact of these efforts was limited.

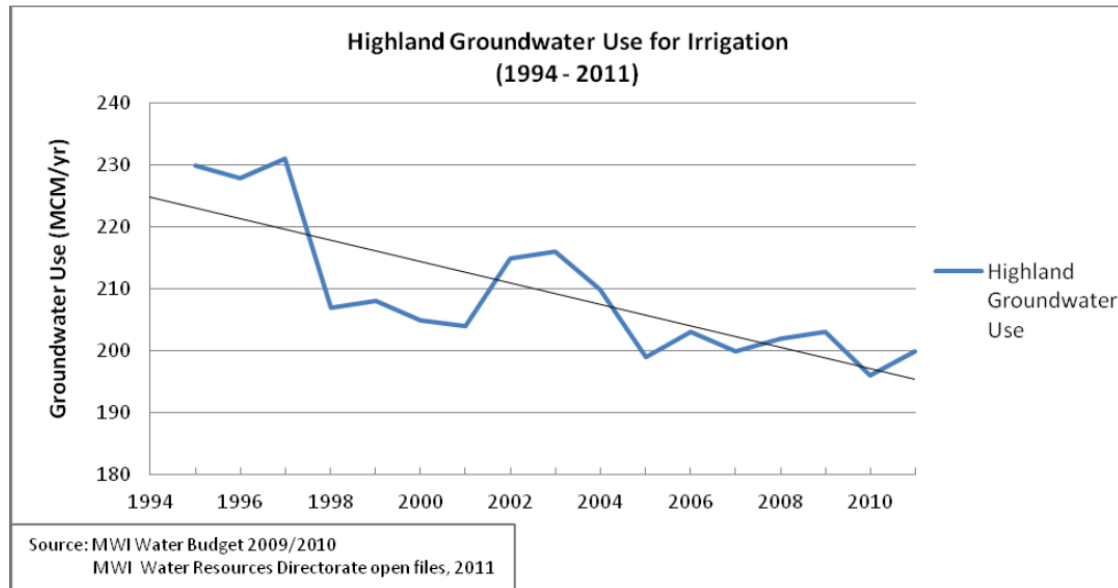
¹³ It was reportedly in response to the National Agenda (which was never approved) that the king appointed HRH Prince Feisal to head the RWC, with participants drawn from ministries, academia and the private sector and including some critical of past water-reform efforts.

¹⁴ The UN, WHO, World Bank, German Technical Cooperation (GTZ) and the French were amongst those involved. Donor initiatives to 2011 included USAID's, Promoting Water Savings and Efficiency, 2006-2012, USAID Water Efficiency and Public Information for Action Project (WEPIA) Programme, 2000-2005, Agence Francaise de Developpement (AFD), Irrigation Optimisation in the Jordan Valley, 2000-2006, USAID Instituting Water Demand Management in Jordan (IDARA) Programme, 2007-2012. See USAID (2012), *op.cit.*, p.16.

Reform efforts make limited impact

i) Regulating Highlands groundwater abstraction

Fig 6: Highland Groundwater Use for Irrigation, 1994-2011



Source: Cited in USAID, Review of Water Policies in Jordan and Recommendations for Strategic Priorities, Final Report, April 2012, p.7.

Since 1997, a recurring theme in the Kingdom's water strategies, policies and laws has been the need to reduce unsustainable groundwater abstraction in the Highlands.¹⁵ A key focus of water demand management has been the reduction of groundwater use for irrigated agriculture, since it consumes over half the abstracted water. Progress was made - by 2010 abstraction rates for irrigation had declined (Fig 6). The passing of the Groundwater By-Law No.85 in 2002 and an amendment in 2004¹⁶ represented a significant move to control

¹⁵ For analysis of water laws see Muhammed R. Shatanawi, 'Sustainable Management and Rational Use of Water Resources', pp. 190-191. Groundwater Monitoring Code No. 26 of 1977 deals with conservation of groundwater through licensing and with water extraction and use. Law No. 34 of 1983 authorises the Water Authority to regulate water rights, construction of wells, licensing and drilling. Article 25a of Law No 18 of 1988 states that none of the water resources available can be used or transported except in compliance with the law and that the transport and sale can only be done with approval of the Authority and within conditions of the arrangements agreed with the Authority. The Jordan Valley Authority Law (Law No.19 of 1988) states groundwater is a state-owned property.

¹⁶ The By-Law established a 150,000 CM / year quota of free abstraction for each well, with block rate tariffs for amounts above this level – JD0.005 / CM between 150,001 CM and 200,000 CM and JD 0.060 / CM over 200,000 CM. The 2004 amendment provided for changes in block tariffs in 2008, which were never implemented. See FOEME, *Towards a Living Jordan River: An Economic Analysis of Policy Options*

abstraction - using price as a tool, applying penalties for withdrawal beyond licensed legal amounts, shutting down illegal wells and preventing the digging of new ones. A monitoring unit, the Water Demand Management Unit (WDMU), was established in the MWI in support. However, on their own, these moves were insufficient to make the difference. In 2010, withdrawals from renewable aquifers still exceeded estimated safe yield by more than 55% - and in the case of the Amman-Zarqa basin by 176% and the Azraq basin by 215%.¹⁷

The main reason for slow progress, according to experts, has been that regulations in water laws on drilling and pumping, transport and sale by the private sector have not been implemented or enforced despite the strict remedial measures advocated and penalties for violations enshrined in legislation.

- Effective enforcement of the Groundwater By-Law proved difficult due to the lack of means provided by the Penal Code. The law had been opposed at the outset by influential farm-owners, well-owners and the agricultural union. Subsequently, vested interests, described by a former water minister as farmers in the south, resisted compliance with the new law.¹⁸ Only as a result of a Supreme Court case were they later compelled to pay for water consumed above the permitted volumetric limit.
- The 2004 By-law amendment, providing for revised block tariffs, was never implemented.
- Despite a well-closure plan over many years, only a small proportion of wells countrywide were closed by 2011, falling dramatically short of USAID's *conditions precedent*, according to officials interviewed (see BOX). Experts estimate that 2000 wells were over exploited – of which 50% were constructed illegally.¹⁹

for Water Conservation in Jordan, Israel and Palestine, Draft Report for Discussion Purposes, Eco Peace / FOEME, May 2010.

¹⁷ MWI *Water Budget 2009/10* estimates are used for total abstractions beyond safe yield. The Amman-Zarqa and Azraq figures are sourced from Deutsche Gesellschaft für Internationale Zusammenarbeit, *The Highland Water Forum*, 2011. See also http://cmimarseille.org/src/EW2_wk1/Data/Doc/D3-2.pdf. There is lack of consensus on percentages for overall over-abstraction. According to interviews (2010), the percentage was closer to 100% beyond safe yield, which aligns with Shatanawi's figure, op.cit., p.190.

¹⁸ See interview with HE Hazim El-Naser in 'In Troubled Waters', *Jordan Business*, 2007, p.2. <http://www.transglobalwater.com/articles/jordan.php>. The farmers were mainly those granted licences to farm using Disi aquifer water until 2011.

¹⁹ Personal interviews, 2010. <http://www.emwis.org/thematicdirs/news/2011/04/reuse-steps-water-poor-jordan> (accessed 24 July, 2011). For example the MWI in 2011 reported that nearly half of Azraq's working wells, some 236, were illegal. See Nour Habjoka (GIZ) and Ali Subah (MWI), *The Highland Water Forum: an Experience in Participatory Water Demand Management*, Powerpoint, December 3, 2011. http://www.cmimarseille.org/src/EW2_wk1/Data/Doc/D3-2.pdf

- According to the JWS (2009), the responsible authorities were not even collecting fees from the majority of wells that were legal,²⁰ deterred – reportedly – by lack of available means of enforcement.
- In the case of Disi’s non-renewable aquifer in the south, the enforcement measure did not contribute to reducing levels of abstraction, although it raised revenue. Farm company owners could afford the fees and their farms consumed an estimated 60 MCM / year, equivalent to around 20% of nationwide municipal water consumption in 2007.²¹

Against this backdrop and in the face of continuing groundwater depletion, the government faced mounting criticism from donors and non-governmental organisations (NGOs). Water institutions, acting on their own, evidently lacked the capacity – both the authority and the necessary back-up from relevant ministries, in particular Interior and Agriculture – to rein in over-pumping and enforce laws and regulations. Monitoring and metering therefore proved difficult. Meanwhile, although established to support demand management in both agricultural and municipal sectors, the WDMU had focused on the residential and commercial sectors rather than on agriculture where potential demand savings would have had greater impact. USAID’s Instituting Water Demand Management in Jordan (IDARA) programme likewise did not target agriculture. Education for farmers on crop diversification was insufficient and the involvement and education of women on water efficiency was not a priority. The many donor-funded initiatives were evidently inconsistent and insufficiently coordinated. However, the reality was that project focus – influenced by politics – was a matter of government preference and choice, and even subject to negotiation with donors (see BOX).²² According to a USAID engineer:

*“It’s very political. Most people agree they are over pumping. Most donors have tried to tackle the problem and with marginal success. Everybody agrees it’s a problem, but nobody would take the next step.”*²³

See Euro-Mediterranean Information System on know-how in the Water sector (EMWIS) interview with USAID’s George Harris on well closures. <http://www.emwis.org/thematicdirs/news/2011/04/reuse-steps-water-poor-jordan> (accessed 24 July 2011).

²⁰ Jordan Water Strategy, op cit., pp.2-4.

²¹ Coyne et Bellier (2010), op.cit.; Hazim El-Naser in *Jordan Business*, op.cit.

²² Personal interview, 2010. According to the 2011 US audit of USAID/Jordan, Jordan government officials requested that the mission drop the condition requiring the government to shut down 50 illegal wells. See USAID / Office of Inspector General, Audit of USAID/Jordan’s Design for Sustainability in its Water Resources, Audit Report No 6, December 22, 2011.

²³ EMWIS interviews USAID’s George Harris, op.cit.<http://www.emwis.org/thematicdirs/news/2011/04/reuse-steps-water-poor-jordan> (accessed 24 July 2011).

BOX 4: CONDITIONALITY AND CONDITIONS PRECEDENT

During 2007-2011, USAID Jordan provided around \$1 billion to pay down GOJ debts to the US, IMF and World Bank through a cash transfer programme. The cash transfers are linked to policy reform objectives (agreed with the GOJ), known as **conditions precedent**, which when completed trigger release of the cash to the GOJ for projects. Although USAID's 2007 agreement with Jordan on water and wastewater was aimed at improving infrastructure, water conservation and efficiency, the *conditions precedent* by 2011 did not require the GOJ to make any significant changes to address water use in agriculture, the largest consumer of water. This was reportedly on account of the GOJ's inability to achieve these in the face of political pressure from agribusiness. Moreover the mission had no current projects focusing on the sector's water use, although \$212m worth of projects were earmarked for the industrial and urban sectors in 2011.

In 2011 USAID / Jordan was slammed by USAID auditors for focussing on increasing the availability of water without adequately addressing demand management (specifically water consumption by agriculture), for failing to focus *conditions precedent* on agriculture and, for removing at GOJ's request, conditions relating to raising and restructuring tariffs, duties on imported products competing with home-grown water-thirsty crops and closing illegal wells - on account of political sensitivities.

In terms of the sustainability of USAID projects when USAID funding ceases, the auditors found: "If USAID/Jordan does not address water demand management in agriculture, the mission's continued water program activities may be futile. To justify continued USAID funding the mission's water projects will need to address the efficient use of water in the agriculture sector with a commitment from the Government of Jordan to participate in these efforts".²⁴

ii) Raising tariffs and correcting distorted incentives

Jordanians have for decades recognised the importance of raising and restructuring tariffs, both to encourage more efficient water use and to raise revenues for the sector. The Water Strategy (1997) and the NWMP (2004) both advocate the use of pricing and other incentives as tools to encourage efficiencies in water use and supply. The JWS (2009) set the goal of cost-reflective tariffs for the long term. Donor-backed campaigns in Jordan sought to raise awareness of both the crisis and the incentive measures required to change the way that water is valued and allocated. USAID initiatives included conditionality clauses, or *conditions precedent* (see BOX), requiring steps towards full cost recovery through raising and restructuring tariffs.²⁵ However, by 2010, the privately-expressed view of donors, NGOs and experts was that this all-important approach had not been carried through – because of a lack of capacity and poor management.²⁶ A number of factors making reform of tariffs and incentives highly political and difficult to implement explain this failure.²⁷

²⁴ See USAID / Office of Regional Inspector General, op.cit., p.8.

²⁵ Personal interview, 2010. See also USAID (2012), op.cit., p.27.

²⁶ Personal interviews, 2010.

²⁷ The following discussion draws on interviews with officials, farmers, NGOs and water specialists in 2010 and parallels arguments in academic and technical studies and published interviews: see Ross Hagan, *Strategic Management and Reform of Jordan's Water Sector*, March 2008; interview with HE Hazim El-

- The political benefit to successive governments of maintaining low tariffs was perceived as outweighing the financial costs of doing so. The government subsidy to the water sector is very low compared with those to other sectors, e.g. electricity, and was perceived as manageable.²⁸
- Authority to raise or restructure water tariffs and to remove import tariffs on water-thirsty crops lies outside the water sector - with the cabinet.
- Historically, a system of distorted incentives has worked in harmony with Jordan's agricultural way of life and Jordanians' identification with the land and the culture and traditions that go with this. These incentives, it is argued, protect the poor and farmers working at the margins, and keep sizeable populations - who would otherwise migrate to overcrowded cities - on the land. At the same time, they have also benefited wealthy and politically-influential land and property owners.
- Access to 'virtual water', which effectively disguised the depth of the water crisis, and the government's continuing emphasis on securing new supplies to deliver water security 'silenced' debate on the need to change attitudes towards water-use and to allocate water more efficiently and fairly.

Thus, despite MWI plans to adjust the 1997 tariff system,²⁹ tariffs remained more or less unchanged during the period, apart from the changes introduced by the 2002 Groundwater By-Law. Urban and rural water-users, rich and poor, continued to receive subsidies, encouraging the view amongst users - according to donors - that water is not valuable. "Scarce water is treated as if it were abundant", reported the USAID in 2006.³⁰

Consider the record to 2011 in agriculture. Under the 1997 tariff system, with its Groundwater By-Law revisions, agriculture pays less for water than the municipal and

Naser, *Jordan Business*, op.cit.; USAID, 'Responding to The Water Crisis in Jordan', 2007; USAID, 'Securing Jordan's Prosperity through Improved Water Management', Sabeq Project, 2008.

²⁸ Calculated as the difference between operating revenues and full cost recovery, USAID reports the water subsidy at 0.4% of GDP compared with around 5% of GDP for electricity. See USAID (2012), op.cit., pp.31-2.

²⁹ In 1997 the tariff system was changed in order to generate higher revenues and increase cost recovery.

<http://dx.doi.org/10.1080%2F09614520701778355>

³⁰ USAID/Jordan, *Strategic Statement: Jordan 2007-2011*, p. 21.

industrial sectors,³¹ although national policy prioritises the latter. It produces less than other sectors per cubic metre used, accounts for a mere 3.5% of GDP and less than 3% of local employment, but for nearly two thirds of water use.³² The price paid is insufficient to cover operational and maintenance costs, i.e. below the cost of delivery. In the Jordan Valley, where farming depends on costly irrigation water, farmers buy water at an average tariff of JD 0.012 per CM – lower than the average paid by private farmers in the Highlands - which, say experts, suggests there is scope for upward adjustment.³³ Yet farmers have resisted the idea.³⁴ Farmers pumping from private wells pay nothing for the first 150,000 CM and then JD 0.005 per CM between 150,000 CM and 200,000 CM and JD 0.060 per CM thereafter.³⁵ Most admit that low prices have led in turn to waste and inefficiency - encouraging the over-use of irrigation water³⁶ - and do not incentivise farmers to switch to appropriate less water-intensive, more productive crops. Moreover, import tariff levels on bananas, apples and grapes compound the problem, encouraging farmers to continue to grow these water-thirsty crops, which generate poor income per unit of water used.³⁷

The sector nonetheless made some progress - increasing efficiency in on-farm management and irrigation and in the use of treated wastewater.³⁸ Some enterprising farmers in the Valley, keen to make agriculture sustainable, demonstrated through good management and appropriate water-use practices that agriculture can pay its way and make a profit. One such farmer has invested in small desalination and purification plants to re-use brackish water and sell to foreign markets with stricter health regulations where profits are made.³⁹ These reform-minded farmers blame the government for its failure both to raise prices and to

³¹ Industrial water tariffs range from JD 0.250 / CM pumped from private wells up to JD 1.800 / CM within Qualifying Industrial Zones and for the Potash Industry. Domestic water tariffs, also based on the rate block system, average about JD 0.480 / CM. See FOEME (2010), op.cit.

³² Nicholas Seeley, 'No Water? No problem for these Jordanian farmers', *Christian Science Monitor*, February 19, 2010.

³³ WRG / MWI, op.cit.; R. Hagan, op.cit., p.18.

³⁴ H. El-Naser in *Jordan Business*, op.cit.

³⁵ This structure was established by the Groundwater By-Law No. 85, 2002.

³⁶ Personal interviews, 2010. See Mark W. Rosegrant, 'Dealing with Water Scarcity in the next Century', A 2020 Vision for Food, Agriculture and the Environment, Brief 21, 2020, IFPRI, Washington, June 1995.

³⁷ R. Hagan, op.cit., pp. 28-29.

³⁸ In the Jordan Valley, wastewater accounted for 56% of irrigation water in 2010 compared with 34% in 1995. See USAID (2012), op.cit., p.12. See also S. McIlwaine, op.cit, p.72.

³⁹ Personal interviews, 2010. See also N. Seeley, op.cit.

<http://www.csmonitor.com/layout/set/print/content/view/print/279446>

require, and assist with, the introduction of appropriate practices. Others, including Friends of the Earth Middle East (FOEME), also muster strong arguments for price rises.

The fact is that over the period to 2011, it was the government's inaction - reflecting a choice not to change policy direction in regard to tariffs and distorted incentives - that was notable: following the 2002 Groundwater By-Law, water tariffs increased very little, fees were often not collected, and protection of agriculture - through import duties - was maintained. With the government thus foregoing the use of the pricing tool and, with it, the chance to increase awareness of the value of water, farmers would not be incentivised to conserve to the extent necessary, or to switch to higher-value water-efficient crops, or to move out of agriculture to more productive sectors.⁴⁰ Nor were most likely to understand how subsidised water reduces capital available to operate and maintain reliable water-delivery systems. Positive incentives to achieve these outcomes also received insufficient attention at the time.

Meanwhile, political pressure to keep water prices low also benefited domestic users, although unevenly. All householders pay low flat rates, although the water costs account for only a small proportion of their budgets.⁴¹ However, the volumetric block system (with low and high-use determining amounts billed) has unfairly benefited wealthy, small-family households using less water while poorer large households using more water receive a lower subsidy. Industry, however, was charged more than the full cost of delivery.⁴²

The continuation of subsidies and distorted incentives thus worked against efforts to improve end-use efficiency, reduce waste and increase conservation, distorted allocations and contributed to environmental degradation.⁴³ No significant shift in water use and allocation took place during the period. Overall, the area of Highlands irrigation increased.⁴⁴ Meanwhile, the volumetric block tariff did not, and was unlikely to alter municipal and

⁴⁰ USAID (2007, 2008), op.cit.

⁴¹ USAID, Jordan: Kap Household – Baseline Survey, April 2010 puts the proportion at 1-1.5%. Privately-trucked water costs are high at JD4 / CM.

⁴² USAID (2012), p.6.

⁴³ R. Hagan, op cit., p.14.

⁴⁴ See R. Hagan, op.cit., p.32. Between 1994 and 2006, there was a slight decrease in irrigated field crops but this was more than offset by large increases in tree crops and vegetables.

industrial water use per head, which is in any case low by international standards, and remained steady during the period at 50-60 CM.⁴⁵

At the same time, therefore, the idea of raising revenues for the sector through the restructuring of tariffs came to nothing. Although the Water Authority of Jordan (WAJ) and its companies covered operating costs from tariff revenues during the period, the financial situation was insufficiently robust, for example, to absorb electricity price rises in 2011. To cover capital spending - estimated at \$1.3 billion in 2005-10⁴⁶ - WAJ was supported by government subsidies, donor funding and national and international loans, thereby building up indebtedness as well as representing a significant drain on the Kingdom's exchequer.⁴⁷ With the prospect of hefty rises in the cost of bulk water – with the arrival of Disi water in 2013 – and in electricity, the failure to implement tariff reform to increase revenue to levels that would meet at least part of these future costs did not augur well for financial sustainability. In the short term the already financially hard-pressed government is likely to increase budget support to WAJ in order to maintain subsidies and meet capital costs. For the medium to longer term, however, there is recognition that central government and the water sector will need together to step up to the politically-sensitive challenge of raising revenues.

iii) Reducing non-revenue water (NRW)

One factor in the dire financial performance of the WAJ was the high level of non-revenue water – water supplied by the sector that raises no revenue. Studies agree that a high average of 43-45% of water annually pumped nation-wide through the municipal supply networks is lost to NRW, with the JWS citing the higher 55% figure.⁴⁸ At these rates, an overall estimated loss for 2009 would have been 137 MCM of the total municipal allocation of 320

⁴⁵ MWI Water Budget 2009/2010.

⁴⁶ USAID (2012), op.cit., p.24. Donors provided 46% of this amount, of which nearly three quarters from USAID.

⁴⁷ *Global Water Intelligence*, November 2010.

⁴⁸ See press report on conference attended by Minister Najjar, *The Jordan Times*, June 18, 2010. http://menafn.com/qn_print.asp?StoryID=1093348874&subl=true; Jordan Water Strategy, op.cit., p.3-2. <http://jordan.usaid.gov/upload/keydocs/Attachment%20J1%20-%20Royal%20Water%20Committee%20National%20Water%20Strategy.pdf>; Elias Salameh, *Towards a Water Strategy for Jordan*, Paper presented to the RWC March 2008; See *Jordan Business*, op.cit., p.2.; A 45% figure is also cited by Elaine Denny et al, *Sustainable Water Strategies for Jordan*, Gerald R. Ford School for Public Policy, p.10. Accessed July 8, 2011.

MCM.⁴⁹ The reasons for the extent of loss are multiple, with 25 percentage points due to *physical losses* through leakages caused by ageing water networks and technical deficiencies in gauges and the rest due mostly to illegal pumping from the grid, but also to meter inaccuracies.⁵⁰ The need to reduce NRW has been reiterated in MWI strategies and recognised by decision-makers over many years. The JWS (2009) committed to reducing NRW to 25% of water supplied – and specifically *physical losses* to below 15 percentage points - by 2022.⁵¹

NRW has persisted at a high level despite efficiency improvements resulting from the corporatisation of three utilities, from massive sums spent on water infrastructure modernisation, and the implementation over the past decade of donor-funded programmes including USAID's Instituting Water Demand Management (IDARA) (2007-2012).

Government strategy has long favoured increased private-sector involvement in water and wastewater services with the aim of improving financial sustainability through increasing investment in infrastructure, reducing physical losses and raising revenue. However, the privatisation process has been bumpy.⁵² Until 2000, all municipal water supply and distribution services were the responsibility of WAJ, a national government authority. In 1999, a French-led company was awarded a performance-based management contract - in a form of private-sector partnership (PSP) that was the first of its kind in the Middle East - to manage Amman's water supply. Despite positive results, PSP faced politic opposition, and opponents of reform came together and, in this case, won the day.⁵³ Thus, in 2007 the private operator was substituted by Miyahuna, a company owned by WAJ with private involvement. Two similar companies owned by WAJ were established – in 2004 the Aqaba Water Company (AWC) to service Aqaba governorate and in 2011 the Yarmouk Water Company (YWC) to cover the four northern governorates. Under these three water companies, utility

⁴⁹ WRG/MWI Confidential Paper, op.cit.

⁵⁰ USAID, *Instituting Water Demand Management in Jordan (IDARA) Evaluation*, June 15, 2011, p.10.

⁵¹ Jordan Water Strategy, op.cit., pp.2-6.

⁵² Details in this paragraph are drawn from 'Annex 2. Water Sector Reform'

http://siteresources.worldbank.org/EXTSOCIALDEV/Resources/PEPR_Annex2_Water_Sector_Reform.pdf

⁵³ Some opponents cited the company's failure to reach targets in the contract for reduction of NRW. Others thought the company would use government money to private advantage. Ibid.

operations were corporatised and run as commercial entities. Meanwhile, WAJ remained in control of both bulk supply and distribution in the remaining nine governorates.

Corporatisation of the three utilities undoubtedly represented an important step towards improving supply efficiency. All three companies are contractually obliged to try to reduce levels of unaccounted for water and all have undertaken leak detection and leak repair activities.⁵⁴ Statistics indicated good performance overall by the AWC, with a reduction in losses to NRW of ten percentage points over five years to 2010, bringing the level down to an internationally-respectable 20%. However, despite some reductions, Miyahuna and YWC continued to record high losses (35.3% and 40.8% respectively in 2009, for example). Of the total estimated average annual water loss to NRW of some 80 MCM for the three companies over the 2005-2010 period, Miyahuna and YWC accounted for 77 MCM. Moreover, figures for Miyahuna included rural areas outside Amman where NRW is estimated at 80-90%, or 11 MCM / year.⁵⁵

In the case of Miyahuna and YWC, the problem is compounded by the management of the distribution of scarce water resources to urban householders through undersupply and rationing on a rotational basis. Intermittent flows aggravate network problems with pressure shocks and cause damage to gauges that in turn increase the danger of worn-out network pipes absorbing sewage, with consequent health risks. They distort meter readings and increase NRW.⁵⁶ Miyahuna demonstrated its determination to tackle the NRW problem through its support for the USAID-funded NRW reduction study in parts of Amman in 2009.⁵⁷ Analysis pointed to a series of network inefficiencies and huge variations in theft, calling for urgent remedial action in the city and attention in other governorates.

The need to end NRW from water resource losses from the national grid and from illegal wells, i.e. as a result of *theft*, is reiterated in water strategies and policy. Levels of theft vary from governorate to governorate. According to water expert Professor Salameh, the problem,

⁵⁴ USAID (2012), op. cit.

⁵⁵ USAID (2012), op.cit., p.32.

⁵⁶ Professor Salameh cited in *The Jordan Times*, August 30, 2010.

⁵⁷ <http://www.jordantimes.com/index.php?news=29621&searchFor=>

⁵⁷ Personal interview, 2010.

with regard to illegal connections, tampering with meters and water use, again, lies not with water law but rather with lenient penalties and lax enforcement of the Penal Code, which together fail to provide sufficient deterrent.⁵⁸ Attempts by water-sector officials entering areas to stop illegal water use are often met with a violent response by locals, pointing to a problem of law enforcement in the absence of coordinated action between the sector and Ministry of Interior.⁵⁹ The political influence of the tribal families involved was the reason cited for these continuing organisational and legal problems.⁶⁰

With the marginal cost of new supplies of water estimated at \$0.90-\$1.05 per CM, any reduction in NRW would sustain low-cost supply and could delay the resort to more costly non-conventional water.

Implementing institutional reform

Against the backdrop of Jordan's severe resource constraints, a growing population and the rising cost of energy, the water sector's capacity to provide the needed planning and management to ensure efficient operations of the water system is critical. The disappointing performance of the past two decades is best understood in the context of the slow pace of restructuring the sector and continuing weaknesses in its institutions that require reform.

Jordan has long recognised that institutional would be a pre-requisite to cope with the water challenge. Jordan's water strategies have inter alia advocated establishing a regulator for the sector, separating bulk supply and retail operations, increasing private-sector involvement in management and distribution as well as building the qualifications and skills of the sector's human resources. Despite donor-funded technical assistance in support of these goals, leading to some positive results, progress has been slow. The following factors shed light on the reasons why:

- With regard to regulation, the development of the Performance Management Unit (PMU) in the MWI in the early 2000s to monitor the corporatised water companies and to

⁵⁸ Violators cannot be legally held accountable unless caught stealing water, according to Professor Elias Salameh. See *The Jordan Times*, June 11, 2010.

⁵⁹ *Jordan Business*, op.cit.

⁶⁰ Personal interviews, 2010.

promote further private involvement in the sector as well as the application of commercial principles in water supply and wastewater retail activities represented a significant step.⁶¹ The PMU appeared to have the potential eventually to become a regulatory body. However, progress towards this goal was difficult in the absence of the sector sorting out the responsibilities of its institutions over operations as well as contractual issues.

- Overlapping responsibilities in the operations of the MWI and the two government-owned organisations, the WAJ and the JVA, both of which have garnered considerable political clout based on longstanding traditional ties to the public, have engendered conflicts of interest between the three entities.⁶² Thus, despite important progress made by the MWI and its dedicated staff, the ministry's full potential regarding water resource planning and project implementation remains unfulfilled. Importantly, the MWI has not been able to take over responsibility for supplies. The JVA controls dam and canal infrastructure while the WAJ is responsible for groundwater resource development, issues permits and licences, still operates nine municipal utilities and owns the three corporatised water utility companies.
- Poor communications over plans and services and the use of multiple data bases by the three entities - often working quasi-independently – have been a symptom of this overlap.⁶³ The consequent lack of coordination or basis for agreement has hindered progress toward cross-sector planning and project implementation.
- Without a widely-accepted, comprehensive, long-term approach to facilitate efficient management, there has been frequent resort to operational crisis management. The adverse consequences are evident in the interruption in operation of the NWMP and differing institutional perspectives of the role of the RWC and JWS recommendations.
- Apart from its responsibility as bulk supplier, WAJ owns the three corporatised municipal water utilities and operates the remaining nine. This traditional combination of bulk supply and a retail role complicates in-sector coordination and management but has

⁶¹ The points in this paragraph were derived from personal interviews, 2010.

⁶² The MWI was established to bring the WAJ and JVA under one Minister. It would be responsible for strategy, policy and master plans, for water resource planning and monitoring, for setting up data banks and implementing awareness programmes. With donor support, the National Water Master Plan was launched, systems developed, WDM pursued and awareness projects implemented.

⁶³ Personal interviews, 2010.

proven politically difficult to change. It has meant that the WAJ is squeezed between the rising costs of bulk supply and the inability of its retail operations to raise adequate revenue to meet operational, let alone capital costs.

- Water institutions lack human resource capacity to cope with complex challenges. On the one hand all three water institutions are overstaffed. On the other, the pressures on the water sector - compounded by insufficient funds and organisational tools for staff to cope - have encouraged a 'brain drain' of the highly skilled to the private sector or abroad, and have lowered morale.

Lack of influence in, neglect by and marginalisation from wider government

The record demonstrates that the sector's shortcomings, its institutional weaknesses and the slow pace of reforms have been inextricably linked to wider national governance and policy problems that reflect a lack of government commitment to water sector projects. Thus:

- There is an overlap of responsibilities between the MWI and other ministries involved with the water sector, for example the Ministries of Agriculture and Justice;
- The sector lacks the back up of a strong regulatory framework with enforceable penalties and thus cannot drive through reforms and more efficient allocation of resources or prevent illegal use and depletion of groundwater. In the case of NRW losses, for example, those who illegally tamper with water connections must be referred to the courts for legal action. However, penalties have been lenient and enforcement of the Penal Code lax.⁶⁴
- Water institutions have lacked influence in policy-making and have been marginalised from it. In the case of tariff reform and restructuring, for example, the Cabinet is the responsible decision-maker. Meanwhile, the Royal Diwan and Foreign Ministry have traditionally worked closely over foreign policy, but the need for water supplies has been insufficiently integrated into policy towards Jordan's neighbours or wider foreign policy, and the water sector's expertise in this regard not fully tapped. As a consequence, achieving greater access to, and protection of, shared transboundary water has received too little attention.

⁶⁴ E. Salameh, op.cit.

- There has been insufficient national-level integrated planning that recognised the critical significance and reflected the true cost of water resources. This would have made improved coordination both between and within ministries and sectors a necessity. The National Agenda, which provided an appropriate roadmap for the longer term, with milestones and benchmarks, was never implemented. It is now outdated.
- Frequent cabinet changes with rotation of ministers between posts have undermined continuity in water institutions - leading, as in other ministries, to sub-optimal performance and low morale.
- The absence of a country-wide, comprehensive administrative reform programme, as advocated in the National Agenda to develop a meritocratic system based on transparency and accountability, has weakened performances and exacerbated morale problems.

Conclusion

It is too early to say whether or not the innovative work of the Highland Water Forum since 2011 and the creation of the National Water Advisory Council signal a departure from “business as usual” and a step towards significant change. The above assessment is not promising. Despite the gravity of Jordan’s water crisis with its adverse implications for economic growth and political stability, the government has failed to follow up its commitments with the tough choices required to reduce water deficits, accelerate the reduction of groundwater over-abstraction and build the capacity of institutions to manage scarce water sustainably.

On the plus side, the record demonstrates widespread recognition of the crisis from top leadership down, strongly-articulated commitment by decision-makers and determination by ministers and officials to push through specific reforms. Some important achievements have been made on both demand and supply sides. However,, in the absence of a comprehensive approach, efforts have often been reactive, ad hoc and partial, characterised by inertia and undermined by a lack of transparency – with the risk that these will amount to ‘re-arranging the deck chairs on the Titanic’. Overall, these efforts have failed to date to translate into a real transformative reform process that will make a significant difference to water outcomes and put Jordan on the path to sustainability.

The record also shows that the water sector acting on its own lacks the capacity to manage competing demands for scarce water and realise its own policy goals. Reform-minded elites in the water-sector – even with generous donor support – have been constrained politically in the policy options they can pursue, lack the means or are insufficiently empowered to take necessary action, and operate from a weak organisational base, characterised by inter-agency competition, lack of coordination and low staff morale. They have encountered opposition from politically-powerful special interest groups with vested interests in the status quo. These entrenched groups often have a political or material interest in delaying, derailing or resisting reforms in one or more of the areas discussed – tariff reform, efficient regulation through enforcement of legislation, improved management through more decentralisation and private-sector involvement, and the strengthening of water-sector institutions. As experts and farmers point out, powerful landowners in particular benefit from: a tariff and incentive structure that perpetuates disproportionate allocations to the less productive agriculture sector; the maintenance of import tariffs protecting uncompetitive crops; and the continuing weak role of water institutions in government affairs.⁶⁵

All this suggests that the water crisis is not a supply/demand problem alone, but also one of governance. While a more energetic approach to institutional reform to address current weaknesses in planning, coordination and reform implementation is urgently required, the sector's capacity problem is not amenable to remedy by water institutions acting on their own. The inefficiencies and lack of empowerment to date are products of, and inextricably linked to, inaction and actions taken outside the water sector. International organisations, making the same observation, recognise that while their continued technical assistance to and financial support of the sector are necessary, they are not sufficient. This is because national government has lacked the political will, or as a matter of conscious choice has so far failed to prioritise water in cross-sectoral planning and investment decisions or to pursue the policies and regulatory and administrative reforms that would create conditions to optimise the use of scarce water resources as a foundation for a water-secure economic future.

⁶⁵ Personal interviews, 2010.

Understanding why this is so necessitates consideration of a wider structural problem – the organisation of political power in the Kingdom and the role water plays in it, which is the subject of the next chapter.

CHAPTER 3

AN INCONVENIENT TRUTH: PATRONAGE POLITICS AND THE RESILIENCE OF THE SHADOWSTATE

The longevity of the Hashemite monarchy and the complex governance problems Jordan faces today are linked. Both are rooted in the organisation of political power in the Kingdom, and in how it has been restructured over time.¹ The political system is hybrid. Notwithstanding a constitution and formal political structures, for decades the monarchy has depended for its security on informal neo-patrimonial² structures, which tie military and civilian elites into networks of support, and on a broad-based social contract between king and people. Underpinning the system has been the distribution of patronage in the form of privileges and benefits – including the allocation and use of water resources, which in recent decades have become increasingly scarce - in exchange for allegiance. This system of payoffs and the influence and sense of entitlement they transferred to recipients, undermine the autonomy of the regime. The strength of the king in decision-making, implicit in his formal powers over all branches of government, is neither as these would indicate, nor clear-cut.

As circumstances have changed over decades of Hashemite rule, the organisation of power, where it is located and how decisions are reached, have altered – the result of the politics of co-option and other policies pursued by the monarchy to consolidate power and maintain stability. Today, traditional elites and businessmen, enjoying a variety of privileges extended by the system, are deeply embedded in a web of power or neo-patrimonial ‘*shadow state*’,³ which operates in complex relations with formal institutions.

¹ For a discussion of the organisation of power, its restructuring and regime longevity, see Valerie Yorke (1988), *op.cit.*, pp. 3-87; Valerie Yorke (1990), *op.cit.*

² Neo-patrimonialism is a modern form of traditional patrimonial rule under which patrons use state resources to secure the allegiance of clients in the population. It is based on informal patron-client relations that can reach from high in state structures down to individuals in, say, small villages. Neo-patrimonialism may parallel or supplant state bureaucracy since those with connections often have real power. It can undermine political institutions and the rule of law, and is a corrupt (but not always illegal) practice.

³ The term was coined by Professor Charles Tripp, *A History of Iraq*, Cambridge University Press, 2008, pp.4-5. The term can be applied across the Middle East where state formation has been intertwined with the ascendancy of distinct groups, sometimes capturing state power, sometimes changed by it, but who penetrate, underpin and undermine the workings of public state institutions. These processes are evident in Jordan’s state formation analysed here and researched in literature referred to in footnotes. For general

So powerful are these elites, they can resist change and influence decision-making to advance their interests, even when this runs counter to wider state interest in reform.⁴ This pattern of power and the political role of agriculture and water allocation and use in the shaping of this power, this paper suggests, go far towards explaining the lack of political will and incapacity of successive governments to push through the policies on water that would serve the country's long-term collective interest.

Understanding the origins of these power realities and how they work and are shaped by patronage, tribalism, *wasta* (favouritism; ability to curry favour),⁵ and social identity is therefore key to identifying appropriate policies to deal with the water challenge.

The shaping of the 'shadow state'

Jordan and other Middle East monarchies differ from other authoritarian regimes in the region in terms of the legitimacy they enjoy. A majority in Jordan regard the monarchy as legitimate and, in the interest of stability, prefer its continuation to its demise.⁶ At the same time, the king himself, decision-makers and Jordanians recognise that Jordan is far from a well-functioning state and that its difficulties in meeting its challenges stem from this. On the face of it, Jordan's power structure displays some characteristics of a rational legal system of authority and the appearance of democracy.⁷ The three branches of government and formal

applicability of Tripp's term 'shadow state', see R. Springborg, 'De-Democratisation and the Apotheosis of Arab Shadow States', London Middle East Institute, November 2007.

⁴ In his powerful analysis of Jordan's rentier system, Marwan Muasher discusses the uncertainties at the highest level over how to resolve the conundrum of maintaining support for the monarchy whilst pursuing overdue reforms that risk undermining it. Marwan Muasher, 'A Decade of Struggling Reform Efforts: The Resilience of the Rentier System', *Carnegie Papers*, Carnegie Endowment for International Peace, Washington, May 2011.

⁵ For a definition of *wasta* see Markus Loewe et al, *The Impact of Favouritism on the Business climate: A Study on Wasta in Jordan*, German Development Institute, Bonn, 2007. For example, many Middle East rulers enjoy immense discretionary powers. They often favour clients through political, bureaucratic and judicial decisions and clients may depend on *wasta* rather than on legal rights or the ability to compete to achieve their ends. Having or using *wasta* has long been regarded in Jordan as a social norm with positive - not negative - connotations. But in Spring 2005, King Abdullah mentioned *wasta* as a form of corruption.

⁶ Views collected by the author support this point and are confirmed by recent studies. For example see Shadi Hamid, 'How Stable is Jordan: King Abdullah's Half-Hearted Reforms and the challenge of the Arab Spring', Brookings Doha Center, 2012, p.2, and Curtis R. Ryan, 'Political Opposition and Reform Coalitions in Jordan', *British Journal of Middle East Studies*, Vol. 38, No. 3, December 2011, p.390.

⁷ For discussion of informal and formal aspects of Jordan's political system see Valerie Yorke, 1988, op.cit. and 1990, op.cit.; Philip Robins, *A History of Jordan*, Cambridge University Press, 2004; Beverley Milton-Edwards and Peter Hinchcliffe, *Jordan: A Hashemite Legacy*, London: Routledge, 2001.

institutions play an important role. They provide legitimacy for the monarchy, some popular representation for the people and access for foreign governments and donor agencies. They have built up expertise and experience. However, political power resides elsewhere – in the personal power of the king, who under the constitution enjoys broad powers over all branches of government, and in the neo-patrimonial informal networks of power the Hashemites established. The influence of the latter permeates the core elite around the king, the military and intelligence services, the ministries, parliament, and the economy – frequently skewing, obstructing and delaying the work of formal institutions as special interest groups seek to protect their shares of state resources.

An examination beyond the formal institutions and into the power dynamics of this ‘shadow state’, to identify how it evolved and who wields influence over decision-making, is therefore key to understanding the reasons for Jordan’s poor record in water governance and thus how to address it. The analysis begins with the distinctive politico-economic circumstances surrounding the state’s formation, and the organisation of power to which it gave rise.

Political and social origins of the ‘shadow state’

In many Middle Eastern countries, where state formation has been closely related to colonial legacy and institutions are weak, personalised leadership resting on patronage politics and lubricated by rentier or quasi-rentier systems is common.⁸ However, the patronage politics deployed by rulers can take on different forms. The extent of patron-client relations, the nature of the exchange, and how they adapt over time and with what impact depend on country-specific histories and processes of state formation shaped *inter alia* by patterns of social organisation and land-ownership, resource wealth, strategic location and external dependency.⁹ Distinctive in Jordan’s case have been: relations between the ruling family and

⁸ There is an extensive literature on patron-client relations and rentierism. Regarding Jordan, see especially Anne Peters and Peter W. Moore, ‘Beyond Boom and Bust: External Rents, Durable Authoritarianism, and Institutional Adaptation in the Hashemite Kingdom of Jordan’, *Studies in Comparative International Development*, 44, (2009), pp. 256-85. Rentier states derive all or part of national revenues from rent of indigenous resources to external clients. The term can be applied to states, like Jordan, which trade strategic resources, for example by soliciting aid in exchange for political influence.

⁹ The literature on authoritarianism systems covers their use of political methods – patrimonialism and rentierism – to co-opt support. See J. Selby, ‘The Geopolitics of Water in the Middle East: Fantasies and

the tribes and landowners; the historical role of agriculture and water; the power realities of a monarchy dependent for many years on the one hand on two major constituencies and on the other on the smooth operation of a financially-burdensome 'social contract' with its people; and the special relations cultivated with the Western world and donors. Picking up these themes, the following analysis explores the origin and operation of Jordan's patronage politics; the central role that agriculture and water have played in their working; the consequences of clientelism for Jordan's capacity to make and implement decisions that affect the water sector; and the role of donors in cushioning the Kingdom from these consequences.

The creation of the Amirate of Transjordan in 1921 was essentially a strategic act.¹⁰ For British mandate authorities, the desert territory east of the Jordan River constituted a buffer between more important and richer Syria, Saudi Arabia, Iraq and Palestine. It set boundaries to French ambitions from the north and the Zionist enterprise to the West, and it provided means to reward the Hashemites – originating in the Hijaz - and the Arabs generally for joining the British in an alliance which ended Ottoman rule. For the new Amir Abdullah I, Sherif Hussein's son with an eye on the richer reward of Damascus, Transjordan fell short but was regarded as a means to achieving wider territorial ambitions. Binding the new bilateral arrangement was the British allowance to assist Abdullah to secure unstable borders and to underpin his coalition of support.¹¹

To consolidate Hashemite rule and construct a viable state, Abdullah embarked on a process of co-option which laid the basis for today's shadow state. The policies pursued were shaped by the socio-economic features of the territory inherited.¹² On the periphery of the former

Realities', *Third World Quarterly*, Vol. 26(2), March 2005. John Alterman, *Clear Gold: Water as a Strategic Resource in the Middle East*, CSIS Middle East Programme, December 2010.

¹⁰ For the foundation of the Jordanian state see Valerie Yorke (1988), op.cit. Yoav Alon, *The Making of Jordan: Tribes, Colonialism and the Modern State*, I.B. Tauris, 2009; Mary C. Wilson, *King Abdullah, Britain and the making of Jordan*, Cambridge University Press, 1987; Avi Shlaim, *Collusion Across the Jordan: King Abdullah, the Zionist movement, and the partition of Palestine*, Oxford University Press, 1988.

¹¹ In 1921 Abdullah was extended an annual subsidy of £5,000 for six months – later increased to £180,000 per year. See M. Wilson, op.cit.

¹² For a discussion of the period and elaboration of points in this para see M. Wilson, op.cit., p.57; A. Peters and P.W. Moore, op.cit., p.265, fn.9.

Ottoman Empire and its centres of power, Transjordan's social organisation revolved around family, clan and tribe. In the absence of state security, the tribes, some large and armed, had developed forms of protection based on kinship, as well as a web of social alliances across the country embracing nomads and farmers. By the 1920s, the politically powerful amongst the tribes were those who combined the status of tribal leadership with wealth derived from landownership. Lacking central power or resources to deal with the challenge they posed, Abdullah, like the Ottomans before him, courted the tribes in order to extend state authority. In exchange for payoffs and benefits, including arms and funds, exemptions from land reform, tax breaks and employment for their followers in the military, growing numbers of tribal leaders delivered allegiance. With the need for funds far outstripping his British-subsidised budget, Abdullah also extended patronage to local merchants, some of whom owned tracts of land, to cover the gap: in exchange for the funds they provided, merchants enjoyed preferential trading arrangements and tax benefits. Facilitating the process of co-optation were the British who increased Abdullah's subsidy, created the Arab Legion and pursued a trade policy benefiting Jordan's merchants.

As a result of these policies, Hashemite rule became embedded in a unique set of patron-client relations which would first permeate the army, and then formal political and administrative institutions as Amir Abdullah extended public largesse to the followers of tribal leaders in the form of employment. His Hashemite successors would adapt - as circumstances changed - to the expanding demands of these constituencies whilst also drawing others into the state.¹³ The exchange or bargain took new forms as King Hussein sought to meet the funding challenges posed by the inflow of Palestinians, modernisation, urbanisation and the era of austerity in the 1980s, through developing mechanisms to attract diverse forms of aid and trade from geo-politically motivated donors and both conservative and radical Arab states. As elsewhere in the Middle East, the Hashemites developed a 'social contract' with the people, providing cheap food and public services to encourage support for, or at least acquiescence in, their rule. However, the relationships that Abdullah developed with tribal organisations and merchants would endure to the present day, providing the regime with the security it sought.

¹³ A. Peters and P.W. Moore, *op.cit.*, pp. 20-29.

These conservative constituencies would remain key to the Hashemites as they navigated the challenges posed by the end of British mandate in 1948, the absorption of the West Bank following the 1948 war, successive waves of Palestinian refugees, radical opposition and Palestinian nationalism. King Hussein combined institution building and the extension, and introduction of new kinds of patronage, to handle cleavages in society and to control competing interests. After 1957, he accessed increasing levels of external aid to fund expanding state largesse to traditional supporters whilst meeting the needs of Palestinian refugees, and dealt with potential opposition through skilful co-option or repression (introducing martial law in 1967 to strengthen executive power).

During the 1950s, with the support of tribals in the military and government, Hussein survived riots led by radical Arab nationalists and Palestinians as well as several coup attempts. In return for his supporters' loyalty, he expanded employment in the army and civil service for their followers.¹⁴ However, Transjordanians anxious to preserve their privileges in the face of competition from the Palestinians for state resources required more. Henceforth, patronage was extended in more varied forms. East Bank tribes and minorities benefited more than others from appointments in government and administration and enjoyed access to cabinet posts. Merchants would be rewarded with prime positions in public sector industrial development and state contracts. With the growing costs of providing infrastructure and services for Palestinian refugees, Hussein turned in 1957 to the US for financial aid to replace the by now inadequate British subsidy. Unconditional US financial aid provided budget support and funded the building of water and road infrastructure, sparing the regime the need to implement institutional reforms and dismantle patronage structures. Inflows of Arab aid during the oil boom of the 1970s provided funds that could be channelled to finance the bureaucracy, state enterprises and imports, and generous subsidies, including for water. Hussein extended the role of the state in the economy and widened his support base.

In this evolving political order the Hashemites consolidated absolute power based on personal and centralised authority over the three branches of government and on informal

¹⁴ Military spending increased by 74% in 1955-60 and tripled in 1961-75. See A. Peters and P.W. Moore, *op.cit.*, p.272.

networks of power.¹⁵ Power was based on: a powerful and loyal army, much expanded, operating as a source of loyal support and control; an expanded bureaucracy and military and intelligence service that provided thousands of Transjordanians with access to the centre, opportunities for social mobility and the economic benefits of state patronage; the Hashemites' cultivation and nurturing of historical ties with tribals but also a wide tribal-merchant coalition of elite support; and a 'social compact' with Transjordanians and Palestinians under which cheap domestic services were provided in exchange for political acquiescence. In effect, Hussein ruled through a web of informal patrimonial networks, lubricated by patronage, which operated according to different rules, deriving from historical, tribal and family ties and the use of *wasta*. While Hussein's personal rule, supported by the armed forces, rested nominally on an expanded set of formal institutions which provided a semblance of legitimacy,¹⁶ in reality it depended on a carefully-choreographed patrimonial intra-elite core, working within and influencing institutions and bureaucracy – the 'shadow state'.

Restructuring the 'shadow state' post-1989

In the twenty-plus years since 1989, the process of co-option has continued to play a key role in underpinning Hashemite rule, as has US willingness to extend aid to underpin it. However, this aspect of the political system has come at a high price to the state in terms of the pay-offs required and the challenges they posed to long-term social and economic stability.

From 1989, against the backdrop of regional uncertainties and widespread popular unrest at home, triggered by austerity measures imposed in line with an IMF structural adjustment programme, King Hussein had no choice but to initiate political and economic reforms to shore up support. Ostensibly liberalising the system, these amounted to an elaborate repositioning of the throne vis-à-vis key constituencies and the public at large – a new political bargain to buttress legitimacy and consolidate the state – for the rentier system

¹⁵ For a discussion of Hussein's consolidation of power and of the development of patrimonial structures, see Yorke (1988), *op cit.*, pp. 16-46, and Yorke (1990), *op.cit.*

¹⁶ Despite long periods of martial law, government - ostensibly based on formal institutions - provided a measure of legitimization: thus in 1978 the National Consultative Council was created; in 1979 Abdul Hamid Sharaf was appointed to conduct an advance in political and economic fields and in 1984 the elected parliament was re-activated and by-elections held.

underpinning the past political compact had come under strain. Regional economic recession had diminished the government's ability to maintain an extensive public sector and finance state enterprises and imports, whilst austerity measures were eating into the privileges of the elite and standard of living of the general public. As a result of depriving the leadership of means to buy support, the downturn opened the way to protest against the lack of democracy, and exposed both the limited nature of the bond between ruler and ruled and the underlying grievances of Transjordanians and Palestinians.

Political reforms began with national elections in late 1989. Presented as part of a liberalisation process, the re-introduction of electoral and parliamentary life effectively represented a new kind of patronage politics – a new partnership with the people to compensate them and ensure continued loyalty.¹⁷ Jordanians were given a political voice and space to compete for seats and a share of the state. However, the 1991 National Charter, the 1992 Political Parties Law and the 1993 amendment to the electoral law established a framework for these political activities that ensured they were conducted in a way that supported rather than challenged the regime and permitted the Hashemites a place in the new political order. As a result, the 1993 and 1997 elections, by contrast with the 1989 poll, duly returned parliaments dominated by pro-regime traditionalists rather than leftist and Islamists. East Bank tribal representatives in parliament now benefited from unprecedented political space to defend their interests and lobby for services and public employment for their followers. Political restructuring thus appeared to deliver the results sought by the regime, re-establishing the stake of all-important East Bank tribes in the political system, and reducing the scope for the expression of opposition to foreign policy, in particular the 1994 Peace Treaty with Israel and the structural adjustment programme – both policies required to secure much needed budget support.

¹⁷ For discussion of the developments touched on in this paragraph, see Valerie Yorke, 1990, op.cit., pp. 27-31. <http://www.jstor.org/page/info/about/policies/terms.jsp>; Scott Greenwood, 'Jordan's "New Bargain:" The Political Economy of Regime Security', *Middle East Journal*, Vol. 57, No 2, Spring 2003; S. Alissa, *Rethinking Economic Reform in Jordan: Confronting Socioeconomic Realities*, Carnegie Endowment for Peace, Washington, August 2007. <http://www.carnegieendowment.org/publications/index.cfm?fa=view&id=19465>

The second part of the new bargain was economic liberalisation, which was implemented in a manner to benefit the business community - the monarchy's other key constituency. Compliance with the IMF programme of fiscal stabilisation was a pre-requisite for the monarchy's continued stability.¹⁸ For maintaining the goodwill of the IMF and international donors was essential for debt re-scheduling and for access to loans and grants required both to lubricate patronage structures and to fund the infrastructure and provision of services on which the regime depended. Although interrupted by the 1991 Gulf War, economic reforms were steadily implemented and shaped where possible to balance the requirements of the IMF, the preferences of business communities and the needs of poorer Transjordanian and Palestinian communities.¹⁹ However, IMF demands took priority.²⁰

The two sets of reform would have consequences. Although essentially defensive, they took on their own logic. The very success of the manipulation of the electoral mechanism and economic reforms in a way that strengthened all-important traditional ties with the throne and secured US budget support, altered the balance of power within the 'shadow state' and thus how it would work in future. The new conditions loosened ties of mutual dependence between the throne and its key constituencies. While parliament's revival distanced the monarchy from responsibility for the unpopular decisions implicit in distributing a smaller patronage cake, it also represented a loss of autonomy and control. Powerful families, already part of the informal web of power, now acquired access to parliament and new political space to exert leverage in favour of policies serving their self-interest - those delivering services and jobs for constituents, access to resources and benefits, and exemptions for their businesses. There was no guarantee that incumbent prime ministers, appointed by the throne, would be politically able or willing to counter tactics of obstruction, delay, and amendment deployed by self-interested parliamentarians in the house or in committee. Incentivised to stay in power, prime ministers sometimes simply did not pursue a reform and / or focused energies elsewhere.²¹

¹⁸ <http://lnweb90.worldbank.org/oed/oeddoclib.nsf/DocUNIDViewForJavaSearch/68FDCFD2217BF3D852567F5005D8CE6>

¹⁹ The new sales tax was a case in point. P. Robins, *A History of Jordan*, Cambridge University Press, 2004.

²⁰ As in the case of the controversial bread subsidy reduction in 1996 which led to riots.

²¹ M. Muasher, op.cit.

Thus over the years, the monarchy's political restructuring was a game changer. It brought into sharp relief the contradiction between centralised power and the popular demand for democratisation, as well as the difficulties inherent in reconciling policies to maintain regime support with those serving state interest. The changed nature of patronage dispensation and political and commercial pay-offs aggrandised the power of the 'shadow state'. Having acquired political or business influence (sometime both), often occupying prominent positions in cabinet, in ministries, in parliamentary committees, or at the head of industries, members of special interest groups – whether landowners or merchants - could exert influence in different ways. These members could do so as individuals, through their ties to the military, bureaucracy or business, or they could mobilise their networks of ties when interests were shared, subordinate differences and join in tactical unity in order better to compete for resources, involve themselves in state activity, or fend off government intervention to protect their gains. The prospect of the political reforms required to push through policies to resolve socio-economic challenges was thus set back. Yet, without political reform and more political say in the distribution of state resources, ordinary Jordanians would not be persuaded to back painful economic reforms that dismantle the patronage state on which their livelihoods depend.

Water provision, patronage and the shadow state

It is within the context of this evolving organisation of power that the central *political* role of water provision for agriculture and domestic purposes must be understood. At one and the same time, water provision has served as an asset and source of personal wealth, privilege and influence for the elite to be acquired and / or defended, and a free or cheap service or entitlement for the public as part of the Hashemites' social contract with the people. From the start, the co-option of powerful tribal and merchant landowners played a crucial role in underpinning Hashemite rule. The process would in turn put agriculture at the heart of patronage structures. An early indication of the key role of land and water in Hashemite policy was the success of the British-designed land programme implemented in 1927-52.²²

²² These points are drawn from literature on state-society relations and the socio-economic roots of Hashemite durability. See Michael R. Fischbach, *State, Society and Land in Jordan*, Leiden; Boston, 2000, pp. 209-212. Fischbach concludes that the Hashemites' ability to consolidate rule was linked to the landowners' perception that the equitable land tenure system served their interests. Yoav Alon, *The Making of Jordan: Tribes*,

These reforms benefitted King Abdullah I's key land-owning constituency – tribal leaders and peasants, and merchants alike – putting land at the core of stable state-society relations, thereby paving the way to landowner acquiescence in the consolidation of Hashemite rule. The reforms gradually settled legal title and partitioned land hitherto commonly held by tribal confederacies, but also inadvertently worked in favour and reinforced the influence of the larger landowners.²³

In the volatile post-1948 period, as King Abdullah and then King Hussein adapted co-option policies to cope with and take advantage of new regional realities, more complex political exchanges around water were introduced and other constituents were drawn in. In the turbulent 1950s, US readiness unconditionally to fund and implement water infrastructure projects through USAID, for example, enabled King Hussein to meet the competing demands of his constituencies on the exchequer - to continue to make pay-offs to tribal farming supporters whilst also funding the costs of development, urbanisation and domestic services for a growing population. Water projects played a central role. They were part of the plan to settle Palestinian refugees in the Jordan Valley. However, by the mid-1950s, USAID infrastructure projects, including the repair of 75 cisterns, the digging of 180 new wells, the construction of the East Ghor Canal Project (1958-1967), and a vast land redistribution and irrigation programme in the Jordan Valley, were also benefitting the tribes. While the latter project, as intended, increased numbers of small farmers, 'they were mostly Palestinian sharecroppers working large tracts of land bequeathed to tribal favorites'.²⁴

Following pressures on the regime from pan-Arabists in the 1950s and Palestinian nationalists in 1970-71, as the Hashemites distributed *political rewards* to consolidate loyalties, representatives of a dozen or so powerful land-owning and merchant families were prominent amongst appointees rotated early on through key posts in the army, political institutions and administration and those granted special privileges. Powerful landowners, for

Colonialism and the Modern State, I.B. Tauris, 2009; Eugene Rogan and Tariq Tell, *Village, Steppe and State: The Social Origins of Modern Jordan*, London: British Academic Press, 1994.

²³ The land policy secured the pre-existing rights of the sheikhs and helped many increase the size and value of their holdings. They benefited from government assistance, bought land from poorer tribesmen as well as state land when offered. See Y. Alon, *op.cit.*, pp.127-8.

²⁴ See A. Peters and P.W. Moore, *op.cit.*, p.271.

example, held the post of prime minister and defence minister; and key water governance posts at the Ministry of Water, Ministry of Agriculture and Ministry of Planning would be held by representatives of influential families.²⁵

As a consequence of this privileged access, these traditional elite groups became entrenched. Embedded in the political and administrative systems of the state, they could better compete for scarce water resources and defend and advance their interests and policy preferences with regard to water provision and management in the Jordan Valley and Highlands. Then, with the Hashemites seeking to compensate them for the impacts of the faltering boom in the 1980s and the post-1989 structural adjustment programme, the traditional elite groups acquired yet more leeway and benefited from new payoffs, with serious implications for the water sector.

Powerful constituents were provided with opportunity to consolidate their stakes in farming and in access to renewable and fossil groundwater. Farming in the northern Highlands and in Disi in the south provide examples of how special interest groups were able to use their personal positions to lobby for access to water for their farms - which provided employment for their followers, to manipulate political ties to the centre, and, when it suited on the basis of shared communal identity, to forge coalitions with citizens who would likely otherwise oppose them.

i) Northern Highlands

The farming activities in the northern Highlands, which have led to the over-exploitation of the area's rain-fed aquifers over recent decades, date from before the state's formation and have socio-economic importance. In this area where Jordan's population has historically been concentrated and is mostly rural, cultivation was important and government invested early on in farming. The political exchanges around land were key to binding Transjordanian landowners and merchants to King Abdullah I in a web of mutual interest and dependence,

²⁵ Hazza Al-Majali was twice prime minister (1955, 1959) and minister of agriculture (1950-51) and Field Marshall Habis Al-Majali, his cousin, was chief of staff (1958-75), defence minister (1967-68) and member of the Upper House 1967, 1984, 1989, 1993, and 1997. Adnan Badran was prime minister in 1989.

and thus were crucial to underpinning early consolidation of the state. These exchanges laid the groundwork for today's patronage state and took on a logic of their own.

Over time, wealthy Transjordanian landowners came to wield disproportionate political influence and to dominate land ownership and in due course agricultural markets. Early on, the larger landowners such as the Majali and al Faiz benefited the most from the British-led land programme and thereafter from the evolving patronage system.²⁶ Highlands landowners still maintain today the legal rights to their land acquired under the British. With land the main source of their wealth, tribal leaders and merchants cemented ties, working together to fend off government intervention and cooperating in the Legislative Council to influence government to weight competition for state resources in their favour – both behaviours that continue today.²⁷ Moreover, the regime's policies in the face of pan-Arab and Palestinian nationalism and the subsequent latent divide between Transjordanian and Palestinian constituencies – would translate into generous privileges for this key Highland constituency and light government regulation of its farming affairs. During the 1950s, Highland farmers benefited from government investment in agriculture to provide jobs and food security for the growing population. Extensive well fields were established to exploit groundwater and aquifer draw-downs began.²⁸ Then, during the 1960s and 1970s, government investment in the consolidation of agriculture and the well programme as well as the settlement of local Bedouin from the arid east brought more opportunities. The stage was set for a massive expansion of irrigated crop production using more and more precious groundwater pumped from fast-depleting aquifers and local Bedouin labour to work the farms. The area under irrigation in the Highlands increased by almost half between 1994 and 2006.²⁹

In 1997, faced with a growing water crisis and with high rates of over-abstraction that threatened vital renewable resources, the government launched a groundwater strategy to protect sustainability. However, while the new strategy established pricing policies to

²⁶ See Y. Alon, op. cit. p.126. During the 1930s and 1940s, the British overhauled the land tenure system to encourage agriculture and raise revenue. The partitioning of the land benefited many. Others were well-positioned through influence in the Legislative Council to frustrate aspects of the land programme – as they did over proposed water distribution.

²⁷ Y. Alon, op. cit., p.127.

²⁸ R. Hagan, op.cit., p.16.

²⁹ R. Hagan, op.cit., p.32.

encourage farmers to shift to high-value crops and to use water more efficiently, scant progress was made in reducing the over-abstraction rate because this ran against the interest of powerful landowners. Proposed groundwater management measures encountered stiff resistance, laws passed were difficult to enforce, and farming practices difficult to change:

- Although the Groundwater Control By-Law No 85 was passed in 2002, this was only with the personal intervention of the then minister of water.³⁰ Ultimately parliamentary leaders, unwilling to disappoint their constituents, made their agreement to the law conditional on written support from farming groups.
- Under the 2002 By-Law, illegal wells were supposed to be shut down, but under a 2004 amendment, these wells could register for inclusion in the Ministry of Water and Irrigation's monitoring programme.
- The 2002 By-Law introduced quotas and bulk rate tariffs and the 2004 amendment called for a revision of the block tariff in 2008. However, rates today still reflect those of 2002 and fees are often not collected, even from legal wells.
- Additionally, farmers would appear to be using groundwater to enhance land values (by as much as five times) through planting olive trees, although research indicates that olive trees produce low value per cubic metre of water used.³¹

The depletion of aquifers has continued as a consequence.

ii) Disi aquifer in the southern Highlands

Large-scale farming around the Disi aquifer is a more recent phenomenon. In the early 1980s, inspired by Saudi Arabia's agricultural projects and motivated to make Jordan self-sustainable in wheat, barley and animal feed, the government began a 50,000-dunum (50 million square metres) farm in Wadi Rum, in the south.³² However, government deals providing landowning and commercial elites with opportunities to engage in lucrative farming in the Disi area soon entered the repertoire of co-option mechanisms.³³ The government sold its farm to the influential Al Masri family and offered cheap land near the

³⁰ See Chapter 2 of this study.

³¹ USAID (2012), op.cit.; R. Hagan, op.cit. p.32.

³² For details see http://www.jo.jo/index.php?option=com_content&view=article&id=1903%3Athis-is-farmland&catid=39%3Aland&Itemid=150&limitstart=2h

³³ [http://www.thefreelibrary.com/Disi%27s+\\$600m+water+project+finally+running.-a0183560997](http://www.thefreelibrary.com/Disi%27s+$600m+water+project+finally+running.-a0183560997)

Disi aquifer to three privately-owned companies to start the Mudawarra farms.³⁴

Shareholders included former government officials, among them the former Prime Minister, Adnan Badran.³⁵

By the mid-2000s, the farms' operations had become the subject of growing political controversy. Criticisms widely reported in the press, many shared by Jordanian and international water experts, government officials, members of the Royal Water Committee and donors, focused on the inefficient use of precious non-renewable drinking water.³⁶ It was time, the argument went, to stop large-scale farming in Disi, which siphoned off more than 65 MCM / year of drinking water, the equivalent to almost one third of annual municipal supply (*as of 2007*), and preserve the same for conveyance to Amman by the future Disi water conveyor. Furthermore, the companies were costing the Kingdom JD 30 million / year, since they were not paying for water services. Grains which farms were contracted to produce could, it was argued, be grown more efficiently in the north using recycled water. Furthermore, the farms were violating their contracts by employing mostly expatriate workers rather than locals, and producing water-intensive fruit and vegetables for large-scale export to the EU and Saudi Arabia, rather than cereals and fodder for home consumption.

Privately-articulated criticism was aimed at the 'shadow state'.³⁷ Disi farming was seen as symptomatic of the political power exercised by vested interests and the erosion of the government's political will and ability to act in the state interest to curb corruption. Concerns focused on rent-seeking by political and business elites around the farm operations through their ability to secure policies that would serve their interests and immunity from those that would harm them. A number of examples were cited:

³⁴ 25-year contracts involved provision of cheap land and allowance of 1,000 CM / dunum / year to the companies, which in return would use 50% of land to grow wheat and barley which the government would buy.

³⁵ Sufyan Alissa, *op.cit.*, p.12.

³⁶ Personal interviews, 2010.

³⁷ Personal interviews, 2010.

- Former government officials benefited from involvement in the farming companies and, reportedly, one serving prime minister used his public office to freeze the implementation of a government tax claim on an agricultural company of which he was shareholder.³⁸
- The government had reportedly turned a blind eye to violations of farm contracts, and had extended immunity to the farms both from the limits placed on irrigation during dry years elsewhere in Jordan and from bans on growing certain water-thirsty crops.

A test case for critics – and impatient donors – would be the government’s failure to face down special interest groups over the continuation of farms in the Disi area. In 2002, company licences were renewed by the finance ministry for a further period to 2011. Farming continued, despite the signing of a contract between government and GAMA (the Disi water conveyor contractor) which undertook to end large-scale farming before project start - and despite US support for the project (a \$250 million loan guarantee to GAMA). In 2011, with the licences due to expire, would the government take the all-important step to close the farms in the national interest? Or would it succumb to the influence of a powerful interest group able to manipulate decision-making through its close ties to ruling circles and to key ministries and to mobilise dependent farm workers to lobby parliament? By late 2011, the finance ministry had allowed the licences to expire and the Anti-Corruption Committee (ACC) had begun investigations into who had granted the licences in the first place, and why³⁹ – important steps on which to build. Nevertheless, in 2012 the companies were reportedly still pumping – the decision not to renew the companies’ contracts had yet to be enforced.⁴⁰

How resilient is the patronage state?

What this analysis shows is that the water governance problem is a reflection of, integral to, and in large part a consequence of the wider structural problem - the evolving organisation of political power on which the regime built its security, which controls the economy and the allocation of resources and which is dominated today by entrenched anti-reformist forces. It

³⁸ Personal interview, 2010. According to Jordanian media, former water minister Hazim El Naser claimed former prime minister Adnan Badran froze the tax claim worth JD 12 million. While not uncommon in Jordan’s patronage state, these practices today incur deep resentment, in particular when excessive and profits large and when conducted in violation of contractual obligations and against state interests. Sufyan Alissa, op. cit. p.12.

³⁹ Personal interview, December 2011.

⁴⁰ For former water minister Hazim El Naser’s comments, see Hana Namrouqa, ‘Southern agricultural companies still operating despite cancelled contracts – former minister’, *The Jordan Times*, 6 June, 2012.

follows that the water problem will not be amenable to remedy through improved water governance and technical solutions alone. Political reforms are required, under which shadow state networks and their influence over Jordan's institutions, administration, economy and policies give way to more inclusive political and economic systems and more transparent and accountable government that all Jordanians, including 'shadow state' elites, can support. This will not be easy. The complex web of power that the Hashemite monarchy has choreographed over time as it sought to protect its longevity has also proven remarkably resistant to change.

It might be assumed, given the king's formal executive powers, that a *top-down effort* to push through significant political reform would deliver results. Post-1999, King Abdullah II promised political reform and launched several initiatives.⁴¹ All stalled or were ignored.⁴² Trapped within the political architecture created by the Hashemites' past policies, the king found his reformist moves obstructed by an entrenched conservative elite and his prime ministers either insufficiently motivated or without enough support to take them on. When thus tested, he chose to back down and revert to the old political rules of the game, opting for the traditionalists and their policy preferences, and averting the risk of losing their loyalty. Analysts differ over the king's motivations, some pointing to a loss of autonomy, others to a reluctance to implement reforms lest they lead to an elected parliament in favour of amending the constitution and reducing the king's executive powers. Both may apply. However, other political and economic realities – domestic and international – contribute to the power structure's resilience and slow the pace of reform.

Society-wide discontent, often cutting across ideological and communal divides, has been frequent over the past twenty-five years, but there has been a lack of effective 'bottom up' pressure for reform. Jordanians across the political spectrum have regularly articulated

⁴¹ For a discussion of these initiatives and reasons for their failure, see M. Muasher, *op.cit.*, pp.7-23. They included: Jordan First in 2002, the National Agenda for Reform in 2005 and We Are All Jordan in 2006.

⁴² Analysis elsewhere of the reasons for this points *inter alia* to security concerns following the second Palestinian *intifada* in 2000, the US invasions of Afghanistan and Iraq in 2001 and 2003, and the terrorist attacks in Amman. However, those citing such concerns are often the anti-reformists embedded in the shadow state, especially in the security services, who wish to preserve the status quo to protect their privileges.

diverse economic and social grievances and unrest has flared into riots.⁴³ Post-1989 economic liberalisation profoundly affected ordinary Jordanians regardless of origin, and frustrations over unemployment, price rises, poverty and growing corruption amongst self-serving elite groups spiralled as a result. Protests have often begun in the poor rural south amongst the monarchy's tribal support base - benefiting most from past state largesse. With neo-liberal policies eating into the patronage state, it was these East Bank communities who would most suffer the consequences. Quasi-privatisation moves that reduced state-sector employment, but which reportedly benefited those linked to the palace, were a particular bone of contention. Nonetheless, longstanding political activism has failed to translate into effective demands for accelerated political reform or the greater economic equality aspired to, because it has been hampered by political, social and cultural factors.

Jordan's political parties are historically weak due in part to colonial legacy, in part to decades of martial law (1967-1989) and the banning of secular political parties (1957-1993),⁴⁴ and in part to the Hashemites' skilful co-option and divide-and-rule policies that perpetuate communal divisions, which in turn adversely impact party activity. Political acquiescence in Hashemite rule was achieved through subordinating the Transjordanian traditional elite to the state and providing the Palestinians with a stake in prosperity. By welding the two communities to the state, the throne effectively increased competition over resources and perpetuated inter-communal differences, hampering organised political activity on a national basis. Post-1989, the king's new partnership with his people resulted in the National Charter that paved the way for legalisation of parties, but it did so in return for acceptance of the constitution and the powers of the Hashemite monarchy, thereby setting boundaries to permitted political activity and marginalising the opposition of the Islamic right and secular left. From 1993 the gerrymandering of electoral districts resulted in parliamentary overrepresentation of East Bank rural areas and the 'one-person-one-vote' system ensured voters cast ballots based on family and tribal ties rather than ideology - both working against nationwide party politics. Representation of opposition parties in parliament

⁴³ There were riots in 1996 when the government lifted subsidies on wheat. Bread prices doubled. Riots in Karak lasted two days until the army imposed a curfew on the town. Since 2011, unrest has been frequent.

⁴⁴ The Muslim Brotherhood has enjoyed legal status and early on, following its establishment in the Kingdom, enjoyed a 'modus vivendi' with the throne.

was thus curbed and with it the potential to challenge those policies required to attract budget support to sustain the political order. As a consequence, over the next twenty years, electoral law reform would be a key demand for opposition groups and reformists alike. Nonetheless, when amended in 2010, the electoral law retained the unpopular one-person-one-vote system.

Proponents of political change have thus withheld their support from parties they regarded as weak, ineffective, and lacking in credibility. However, they are also influenced by the political culture of the patrimonial state. Some party members are known for their links to the regime and others for their interest in rotation into public office. The Muslim Brotherhood, concentrated in urban centres and with a mainly Palestinian following, comes closest to a mass movement. However, its permitted existence is rooted in a *modus vivendi* with the Hashemites that circumscribed until recently what it chooses to protest about. Meanwhile, the newer reform movement, the Jordanian Campaign for Change, has also been defined in terms of identity – as Transjordanian – and could be socially divisive. Thus, despite two decades of legalised party activity, many Jordanians either opt out of politics – remaining silent, in line with sanctioned discourse – or, in the case of the politically active, continue to pursue their activities through professional associations, civil society groups or non-governmental organisations. The new National Front for Reform, bringing groups with overlapping interests together, shows the greatest potential to galvanise reformists and activists into a mass reform movement. In general, however, the youth activists who took to the streets in 2011-12, remain independent of the parties.

Jordan has a history of opposition and reform activity dating back over decades and has witnessed unprecedented pro-reform protests over the past two years. However, political activists come from a plurality of groups – consistent with a fragmented society. They often share goals but have distinct orientations, and have achieved only a small part of the reforms they advocate. Thus far, they are an unequal match with the anti-reformists, who are wired into a centralised shadow state permeating the Royal Palace, security apparatus, government and parliament.

Key to this continuing resilience of the pattern of Hashemite rule has been the role of allies – in particular the US and Arab Gulf – in funding the military underpinnings and patronage networks on which it is based. The Kingdom's strategic location has ensured Hashemite success in securing flows of financial and technical assistance to lubricate state largesse. The Kingdom was thus able to secure development without painful economic and governance reforms and was cushioned from the adverse socio-economic consequences of overspending which it faces today. In this role donors were knowingly complicit in a situation, which served broad strategic objectives, but which, in sustaining centralised political and economic power structures and delaying economic reforms, carried long-term risks and costs. Donors therefore bear some responsibility for the consequences. A crisis in the water sector - to which much US and other donor aid has been directed but whose difficulties are symptomatic of the inefficiencies of the patronage state - carries the potential to trigger the dislocations and dangers to state cohesion and its monarchy that donor aid was intended to prevent.

The unprecedented popular protests of the latter part of 2012 would rekindle widespread Jordanian and international concern that the present monarchical dispensation may not be as resilient as the above factors suggest, and that it was time for the monarchy and people to make political adjustments, as they did in 1989, to consolidate the state.

Crises of monarchy and state

Behind these concerns lay the sense that the kinds of policies so skilfully evolved to underpin Hashemite rule now carry unaffordable socio-economic costs, which, if left unattended, could threaten the state's stability and undermine the monarchy itself. The combined effects of the Arab Spring, the global financial crisis and economic downturn have exposed the weak foundations of the political compact between throne and people and the contradiction between centralised power and the popular demand for democratisation.

Concern has not been for the immediate future. The growing restlessness and demand for political change has not, for the majority of Jordanians, implied a wish to do away with the King but for a greater say in the direction of policies that affect them and for more

representative government. Amongst Palestinians a large number favour the monarchy for the protection it affords and the stability it provides. The army's loyalty is not in doubt.

Nonetheless, King Abdullah II, like his father, is aware that in Jordan there is potential for change and that he cannot afford to standstill if the Kingdom is to weather uncertainties. Historically, the Hashemites have risen to challenges to state and monarchy, making dramatic decisions to deal with them. King Hussein severed legal and administrative ties with the West Bank in July 1988. In response to economic austerity in 1989, he reinstated parliamentary life after more than two decades. Both steps were part of a process to legitimise the political system and consolidate the state through forging a new partnership with the people. By end 2012 it was evident that the political bargain forged twenty years earlier was no longer sustainable. Achieving levels of economic growth that could meet the aspirations of a fast-expanding population would depend on well-functioning political and economic systems that *inter alia* prioritise and manage the strategically-important water sector efficiently and productively. For these to develop, a change in attitude and approach to the organisation of political and economic power – by the monarchy, amongst elites and grassroots and by long-standing allies - would be required. A restructuring of political relations between the throne and Jordanians that could serve the long-term interest of the state needed to be forged.

To be successful, the leadership, elites and ordinary citizens will need collectively to identify and put their weight behind a difficult-to-implement transition – involving the dismantling of patronage state in its current form and the empowerment of citizens - in which they all recognise they have a stake. Notwithstanding the challenging regional environment, robust support from allies for such a change of course and firmer conditionality on material assistance will be pre-requisites for Jordan's future stability and security.

CHAPTER 4

BUILDING A WATER-SECURE FUTURE: RECOGNISING THE IMPORTANCE OF POLITICAL REFORM

“The choice in Jordan seems to be similar to that of other countries around it: either lead a reform process from above in a gradual, orderly, and serious way, or watch it take place in the streets below with uncontrolled consequences” (Marwan Muasher, 2011)

Global water bodies, donors and Jordanian policymakers all recognise that developing water security will be a pre-requisite for the economic growth needed to meet the financial, food, energy and health challenges the country faces and thus for domestic stability. The linkages between these challenges are *publicly* debated and commitment to water reforms is evident. Yet, efforts have not delivered the improved water outcomes expected or required. The irony is that despite this shared interest in pre-empting the water catastrophe towards which Jordan, on present trajectory, is headed, international leaders and their Jordanian counterparts avoid public discussion of ‘the elephant in the room’. What is missing is frank discussion about *how* the Kingdom’s distinctive power dynamics i) contribute to distorted allocations and unsustainable use; ii) foster a culture of competition for, rather than conservation of, scarce water resources; and iii) inhibit efficient and democratic water governance necessary for economic growth, for putting in place adaptive capacity to deal with climate change and laying the foundation for regional cooperation over shared water resources and new supplies.

In short Jordan’s current water strategy is *politically challenged* and its water crisis cannot be remedied through improved management and technical solutions alone. It follows that the path to sustainable water management, capable of supporting economic growth, prosperity and human security, also involves understanding and addressing the political factors that adversely affect water allocations, use and governance and exploiting opportunities to improve the political context for sequencing implementation of effective water solutions. This paper’s analysis suggests that success will be contingent on meeting the following interlinked criteria:

- Recognising that the water crisis reflects and is part of a wider political problem – the organisation of political power. If Jordan is successfully to pursue solutions to its water challenge, it will be important for the political dynamics to change. Stronger, more representative parliaments and, in due course, elected governments would give Jordanians the political say in policy-making and the parliamentary scrutiny over implementation that they seek. With a stake in the political process, the public are more likely to accept difficult water, tax, and subsidy reforms and privatisation. The record shows that for as long as unaccountable centralised structures dominated by ‘shadow state’ elites shape policy, in the absence of consultation, water reforms will likely continue to reflect gaps and imbalances as well as invite popular rejection. People are unlikely to change their behaviours or lend support for reforms when the privileged are perceived to benefit disproportionately (privatisation) from them, to be least affected by them (volumetric water tariffs), or to be exempt (quotas).
- Recognising the impact of non-water national policies on water outcomes and the implications of water governance for finance, health, energy, environment and foreign policy. It will be important for national leaders to put water at the top of their agendas and evolve an integrated planning process that prioritises water and aligns its management with sectoral policies for economic growth. With improved inter-agency coordination, more coherent decision-making can lead to additional reforms to remedy the gaps and imbalances in water governance. For non-water senior policymakers to act effectively, they will need to achieve a full understanding of how water management affects their areas of responsibility, engage in regional and local water issues and take advantage of the expertise of water institutions. This calls for a centralised knowledge base founded on a single set of water data to be made available to all and for an end to the quasi-marginalisation of water institutions from national governance.
- Recognising good governance is a pre-requisite for improving water outcomes at home, laying foundation for regional cooperation over shared resources, and attracting foreign investment for projects across the board as well as for the water sector. It will be important to improve accountability and transparency, encourage meritocracy and curtail corruption throughout government. If government agencies are to be held accountable for performance, transparency is key so that the public understands why decisions are made

and can evaluate results. People must know, for example, when the prime minister fails to rein in inter-agency rivalry or acts to ensure coordination, and when government fails to apply anti-corruption measures effectively, and why. Stronger, accountable parliaments and a media - less restricted and inclined to self-censorship – have key monitoring roles to play. Furthermore, if parliamentarians and civil society are to fulfil scrutiny roles responsibly, improved public access to water data is required. Accountable governments have incentive to implement comprehensive administrative reform, as the National Agenda advocated, and develop merit-based resources to improve performance and deliver higher-quality services in line with public and foreign investor expectations.

- Using modern communications and social media as widely and efficiently as possible to ensure reforms can be supported by all. Communications must be deployed by government to encourage an inclusive consultative process. Only when the national purpose of reforms is understood by those affected and reforms are seen to be shaped in a manner that reflects social justice, is fair and can deliver benefits to all are they likely to be accepted. At the same time, the public and civil society must empower themselves, through exploiting the opportunities that communications offer, to build their knowledge on water issues so they can use their proven skills to contribute to the reform debate and play their part in shaping policies that can put Jordan on a path to prosperity.
- Recognising that reforms must be results-oriented, with benchmarks to measure progress. If Jordanians can perceive the long-term benefits of reforms on which they have been consulted, they will be more prepared to stay the course. At the same time, if reforms are to secure the ‘buy in’ to make them successful, they must be perceived as capable of delivering tangible shared benefits. The process must therefore be inclusive, comprehensively planned and uninterrupted, if it is to lead to significant water reforms that would make a difference – that is i) to extend the medium-term period before more expensive supplies are required and until these can be developed and ii) to provide a foundation for the trust that will be required for indispensable regional cooperation over shared resources and new resources.
- Recognising the importance of restructuring the framework of collaboration with donors. If donors are to support the reform agenda over the long-term and extend cash flows for projects, in particular for expensive water infrastructure, they will need

reassurance that national leaders are shouldering responsibility and engaging with sectoral heads to ensure reform-related conditions are implemented and within timeframes agreed. In this regard the US State Department has made clear its expectation that USAID/Jordan agree on a plan to revise cash transfers *and conditions precedent* in order to better leverage sustainable development results – in particular through addressing water use in the agriculture sector.¹

To meet these criteria, a bold new approach spearheaded by senior decision-makers - that links political and governance reforms to a mix of water solutions - is needed. Given the rules of Jordan's past political game and the influence of the 'shadow state' over water management, this has not been a realistic prospect over the past decade. However, circumstances driving the politics of water are changing in ways that, if played well, could facilitate water solutions and improve outcomes.

Towards dismantling the patronage state and empowering citizens

Jordan's political transition, accelerated by King Abdullah's response to the Arab uprisings, provides an unprecedented opportunity for Jordan, supported by donors, to work on parallel domestic, regional and international tracks to make all of the above happen. Jordan is embarked on a roadmap of political reform - constitutional changes implemented in 2012 and elections in January 2013 – to be followed by changes in the electoral law and by the formation of governments comprising elected parliamentarians.² At this moment of political change, the real challenge will be to ensure the political and economic transitions generated by a national reform agenda, yet to be agreed, are *capable* of producing both the democratic freedoms and sustainable water-secure economic future Jordanians aspire to – the two are linked. In this regard, this paper's analysis and the criteria for reforms set out above point to the importance of a gradual implementation of an historic and politically-

¹ USAID Office of Inspector General, Audit, December 2011, op.cit. pp.1-8.

² There is a growing body of literature on Jordan's political reform. M. Muasher's article offers the most up to date analysis of the patronage system and adverse socio-economic consequences, op.cit. See also Marina Ottaway and Marwan Muasher, *Arab Monarchies, Chance for Reform, Yet Unmet*, Carnegie Endowment for International Peace, December 2011; Shadi Hamid, *How Stable is Jordan? King Abdullah's Half-hearted Reforms and the Challenge of the Arab Spring*, Brookings Doha Centre, 2012; M. Ottaway and J. Choucair-Vizoso, op.cit.

difficult process of structural change, away from the rentier system and the unaffordable patronage state it supports towards a participatory democracy based on the rule of law, transparency and accountability, and good governance.

The challenge will be to build on and not be swallowed by the Arab Spring. How Jordan responds will be a matter of conscious choice. At bottom it will be about whether or not the Hashemites are prepared to seize the moment, adapt and drive through a further historic evolution in their approach to Hashemite rule in the national and in their own interest. It will be about restructuring the political system, placing it on a more inclusive and representative foundation (based on the 1952 Constitution), devolving some executive power, and reintroducing checks and balances. The risks are that in the absence of irreversible steps in this direction, the promised change will either not materialise, or be too slow, or, alternatively, that meaningful steps - if introduced before either elites with vested interests or the broader public affected can be won over to a reform agenda - may trigger a period of prolonged instability as 'shadow state' interests and Islamists seek to promote their policy preferences. However, a continuation of the patronage state, on the present scale and as currently constituted, no longer represents a viable alternative. It has drained the state of the resources to meet development needs and generate employment, lacks access to sufficient external rents to deliver services and benefits that in the past delivered political acquiescence, and is blocking attempts to make governance effective and functional. How long the patience of poor and disaffected social groups will endure the consequences cannot be known, but time is running out.

The remainder of this paper sets out ideas for parallel political and cross-sectoral water reforms. Consideration is given to how the forthcoming political transition might be structured and what conditions would need to be met to ensure it secures 'buy in' from all Jordanians (traditionalists and reformists, across diverse social groups and with their competing agendas) and wins the international community's backing, and does so in a manner that also meets the criteria for sustainable water management set out above. All will be essential to ensuring sustained progress and eventual success of *interdependent*

political and water reforms. Options for a potential mix of water solutions that could be sequenced appropriately are proposed in the next chapter.

i) ‘Top-down’ leadership key to ‘bottom up’ reform:

Against the backdrop of the region’s uprisings, two broad overlapping schools of thought emerged over how Jordan might respond. One argued that Jordan, like other monarchies in the region, has a degree of legitimacy that fallen dictators did not have, which would enable Jordan to adjust and move more gradually.³ The other suggested that Jordan is not as stable as previously thought and should not delay introducing overdue reforms.⁴ Both schools agreed that genuine political reforms were needed, if Jordanians were to be persuaded to rally behind difficult economic reforms and adjustment. However, Jordan’s partial and cautious response over two years fell short of popular demands, fuelled frustration and highlighted the fact that although Transjordanian and Palestinian communities, and groups within them, want political change, they do not want the same. As a consequence of growing restlessness in 2012, King Abdullah accelerated Jordan’s political transition, seeking ways to move further and faster towards more inclusive and representative government in a process commanding the necessary ‘across-the-board’ support.

The January 2013 elections were intended to mark a new phase in the transition toward parliamentary government. However, there is broad consensus that only the king can credibly lead a process of transforming the political system to a more representative and inclusive alternative which could deliver a well-functioning government and plan for fairer access to and more efficient use of resources.⁵ Most protestors want to keep the monarchy, but they also want a representative legislature with more power - more in line with the Constitution⁶ – and they want or expect the king to take the lead on this because there is no alternative. For many: i) The political system has lost credibility since successive

³ M. Ottaway and M. Muasher, op.cit.

⁴ S. Hamid, op.cit.

⁵ See for example S. Hamid, op.cit.; M. Muasher (May 2011), op.cit.

⁶ Press reports 2011-12. Collective feeling on this issue transcends Jordan’s social divides: Jordanian / Palestinian, traditionalist / reformist, privileged and economically marginalised Jordanians of all political stripes – reformists, traditionalists and military retirees – are united behind the demand for an end to corruption.

governments failed to deliver promised political reform, and introduced economic reforms that were perceived to benefit the privileged elite rather than ordinary Jordanians; ii) entrenched anti-reformist elites, who regularly engage in corrupt practice mostly with impunity, cannot be trusted to pursue or refrain from blocking reforms that might erode their privileges; and iii) a 'bottom-up' push for reform, though politically more attractive, appears unfeasible without the king's guidance and authority on account of the divisions between and within Transjordanian and Palestinian communities, including over the timing and substance of electoral and constitutional reforms.⁷ Most Jordanians recognise that the key to significant political reform will be a new election law, although some East Bankers are wary lest a revised law results in greater parliamentary representation of Jordanians of Palestinian origin and the ascendancy of Islamists.⁸ However, unless the law is changed to encourage the development of a party system that can deliver elected representative parliaments - based on parties and their national programmes, not patronage - no basis will exist for the king to appoint future prime ministers according to election results to which he remains committed.⁹

Thus, until there are elected party-based parliaments that Jordanians across the political spectrum accept as representative, a leading role by the king in the reform process will be a pre-requisite if it is to be credible and sustained. The king has the support of the army and commands the legitimacy to play a unifying role. He can provide ideas and inducements to engage different constituencies, close the gap between conflicting aims, and build the confidence required for the difficult political trade-offs that need to be made. Faced with regional crises and domestic tensions, the king can count on the support of the international community as he tackles the most difficult of tasks.

At this historic moment of change, the king appears determined that Jordan will meet the unprecedented challenge and has taken a lead. In late 2012, royal circles reportedly

⁷ For a discussion of the opposition's weakness, see C. Ryan, *op.cit.* For a theoretical discussion of the difficulties facing opposition elements in an authoritarian framework and their responsibilities in bringing about significant reform, see M. Ottaway (2008), *op.cit.*

⁸ The national identity issue remains sensitive and, in the absence of a resolution of the Israeli-Palestinian conflict, such a change in representation, many fear, would play into the hands of those claiming "Jordan is Palestine". This perception partly explains the tentative nature of the 2012 amendments to the law.

⁹ This point is made by M. Muasher, *op.cit.*, p.8.

recognised there was no alternative to a further evolution in the basis of Hashemite rule if the imperatives of regime maintenance and national interest were to be met.¹⁰ As in 1989, the need was to move away from tradition, patronage and state largesse towards a new partnership between monarchy and an empowered citizenry, one that could in due course result in a reduction of the king's executive powers, but enacted well would ensure the Hashemite monarchy a place in the future political order. With his call for an inclusive process of "self-transformation" through political reforms¹¹ and the publication of discussion papers on how he envisaged the new relationship evolving,¹² the king delivered the same message, pointing the way forward - through uncharted waters. There will be difficulties ahead, given the contradictory pulls of political forces around the regime, some wishing to preserve the status quo, some Transjordanian elites wishing to take back executive powers from the king without sharing them, and opposition groups, often dominated by Palestinians, who want more say in the political system. The debate between these forces will take place post-elections, when the king will work on the reform process with a prime minister proposed by parliament and a government likely in due course to comprise some elected representatives – both developments to which he is committed. Whether agreement can be reached - on how differing demands might be accommodated and on policies to rein in spending through restructuring subsidies and to generate the growth required to deliver a decent standard of living for all - will depend to a great extent on the king's guidance in seeing through a strategy for change.

The king may have bought time to forge a new political bargain to underpin Hashemite rule. However, if this is to happen, there will be plenty to prove, with scant time to spare.

¹⁰ Interviews. Also see HRH Prince Hassan's speech to the Central European Union, in which he spoke of the need to move away from tradition and patronage and focus on the enablement of citizens.

¹¹ In 2012, the king outlined the goals of what he described as "self-transformation and progressive reform": fair parliamentary elections, a law guaranteeing the broadest representation, a Parliament based on political parties and governments drawn from that Parliament. Cited in Stephen Farrell, 'Demonstrations Whisper of an Arab spring in Jordan', *New York Times*, February 9, 2012.

¹² The King distributed three papers on the next phase of political transition in early 2013.
http://kingabdullah.jo/index.php/en_US/pages/view/id/244.html

ii) National debate on comprehensive reforms

If the reform process is to get off the ground and win the required coalition of public support, it will be important for the demands and concerns of Jordan's divided communities to be seen to be addressed in a range of 'win-win' outcomes.¹³ If reformists are to lend support, the process would need to have the potential to go beyond promised political reform towards implementation. For reformists, anything less than a transition capable of leading to positive, significant and durable change would lack credibility and feed scepticism, and numbers with a stake in protecting it would be reduced. If traditionalists and anti-reformists are to be won over, the process would need to have the potential to deliver new opportunities and advantages - sufficient to produce 'champions of reform' from amongst their number, who are ready to rally support.

Advancing the political transition therefore will depend *inter alia* on Jordanians engaging in a national consultative process in order to reach a politically-difficult consensus around controversial political, administrative, economic as well as water reforms. All will involve hard-fought trade-offs as social groups lobby to acquire or defend influence over policymaking and shares of diminishing state resources. Success is not guaranteed, given the current rules of the political game.

The king has identified the way forward, urging Jordanians to engage in broad national debate¹⁴ in order to identify and agree a vision for the future. He has called for government, through consultation, to develop strategies to advance comprehensive reform, and action plans and a publicly declared timeline - in order to realise them. He has urged parliamentarians to develop their knowledge of the issues in order better to serve the national interest and all citizens to engage with civil society institutions in order to contribute ideas for the transition. However, he has also provided leadership in setting out key national issues to be addressed including: moving toward inclusive and

¹³ This section has benefited from M. Muasher's discussion on national dialogue, see op.cit.

¹⁴ National dialogues are part of Jordan's political landscape, though they have often been exclusivist and a self-serving mechanism for elites. The most wide-ranging was in 1992 resulting in the National Charter. The 2005 National Agenda, setting a ten-year plan - never implemented, was the product of broad national dialogue involving traditional and reformist strands of opinion. In March 2011, the king set up a National Dialogue Committee to discuss the controversial one-person-one-vote voting system.

representative parliaments and parliamentary governments with the majority leader becoming prime minister; the need for a 'white revolution' in public work through consolidating transparent and accountable institutions and fighting corruption and *wasta*; and the pursuit of economic policies to generate growth and prosperity that reflect a greater degree of social and economic justice including fair and equitable access to resources.

In short, the king has ostensibly put his weight behind a push for meaningful reform. His call for all strands of society to engage in unprecedented debate to identify a course for transition away from the unsustainable patronage state towards a stable, democratic and prosperous future is an historic move. Repeated suggestions that the process could lead after a decade to Jordan becoming a constitutional monarchy appear intended to convey seriousness of purpose. If the reform process is to gather pace, the government's challenge will be to agree, with public consultation, on a set of integrated cross-sectoral reforms in the collective interest, and a national strategic agenda for implementation of political, economic, legal and institutional aspects in which water is prioritised - with a timetable with milestones.

iii) Transitional management with phased steps

It won't be easy or quick for Jordanians to reach common understanding. To maximise chances for success, careful transitional management will be essential. If Jordan – its leadership, elites and people - accept realities and begin now, there is still time to manage a stable transition with political and economic outcomes that capture the collective interest and can be owned by all, and which also meets the above criteria. The following would need to be taken into account:

Progress will depend on building 'win-win' outcomes into the process to create the necessary confidence for the required trade-offs and concessions. Most protestors appear willing to consider a transitional phase provided serious steps are initiated, signalling milestones on a path to a better future, rather than continued pretence of reform. For their part, Transjordanians, many of whose families depend on state-sector jobs, will need

reassurance that they will not suffer unbearable hardship from public spending cuts and that they will share the benefits of future privatisation. If 'shadow state' elements are to be persuaded to join the reform coalition, they, too, must be persuaded they have more to gain from supporting governance reforms that serve the national interest rather than undermining them – because they stand to benefit. Thus, securing sufficient 'buy-in' to see the transition through to a post-rentier system will require carefully-engineered consultation, planning and implementation to ensure that agreed strategic objectives are targeted over the short, medium and long term through actions that can be widely supported. While goals for political transformation, social integration and economic development would be set through the consultative process outlined earlier, steps to achieve them will necessarily be gradual. The transition's success will therefore depend on careful phasing. Even if progress towards the agreed destination of Jordan's transition is pursued in stages, such an approach will keep up the pressure and be more credible than the half-hearted and piecemeal reforms pursued to date - and more likely to succeed.

Early evidence post-elections of genuinely inclusive and representative exchanges involving government, parliament and civil society would help to build confidence amongst reformists and political activists that reforms are intended to tackle problems head on with the prospect of significant change. This would in turn encourage them to engage in shaping the national agenda.

A priority issue to be addressed by the new government and parliamentarians, in consultation with the people, will be a frame and timeline for the development of party politics to pave the way to party-based parliaments and governments, and prime ministers who are leaders of the parliamentary majority. This will require early discussion of the electoral law and a redrawing of districts, and the forging of an environment conducive to party organisation and activities and political discourse, including relaxation of restrictions on the media and NGOs. However, the king has hinted that the road to parliamentary government could take as long as a decade, delivering irreversible results, but gradually - as Jordanians adjust to the new rules of the game of winning rights and fulfilling new responsibilities.

Thus, until reforms produce governments that the public can accept as fully accountable, the king will need to work with them to demonstrate the credibility of the process he has initiated. Measures will need to be implemented straightaway to address widespread discontent with the regime. More transparent, accountable, efficient and fairer government is required: *inter alia* levels of corruption must be reduced; the rule of law equitably applied; and resources more fairly distributed.

International engagement will be required at bilateral and regional levels over the short to longer term to support sustainable political and economic transitions. Major responsibility falls to the king to forge a framework of collaboration with key allies. Given international appreciation for Jordan's generous hosting of over half a million Syrian refugees, its contributions to the MEPP and anti-terrorism, and its efforts to improve human rights and implementation of historic reforms, the king is well-placed to secure flows of assistance and reassurances that Jordan's allies will pursue policies on these issues with the country's long-term stability in mind.

iv) Fighting corruption and enhancing good governance

The pursuit of political and economic transitions is unlikely to be successful without demonstrable evidence early on that Jordan is dealing with corruption.¹⁵ Through protests and polls, Jordanians from all walks of life, regardless of origin and ideological division, have made clear their grievances and are demanding steps to put an end to it. The country has fallen in Transparency International's Index over the years;¹⁶ scepticism has grown over the Anti-Corruption Commission (ACC)'s level of effectiveness on account of the low number of investigations involving senior officials and large government projects;¹⁷ and Jordanians have long been sceptical of, if not opposed to,

¹⁵ In 2008, the Anti-Corruption Commission published the National Anti-Corruption Strategy 2008-2012 comprising strengthening the ACC, simplifying the business environment, reforming the public sector, training officials, awareness raising and revising anti-corruption legislation.

¹⁶ *Transparency International's 2011 Corruption Perception Index* ranks Jordan at 56 of 183 countries, with a score of 4.5 on a scale of 10 (very clean) to 0 (highly corrupt).
<http://cpi.transparency.org/cpi2011/results/#CountryResults>

¹⁷ Scepticism grew despite an increasing number of cases under review. During 2011, scandals over the mismanagement of public funds led to publicly-expressed discontent over the perceived increase in

privatisation since the process is perceived to permit the capture of assets by privileged elites. Improving transparency and accountability, therefore, will be critical to building public trust in - and therefore momentum behind - the transitions being promoted, of which the transformation of the water sector discussed below will be part.

For many Jordanians, speedy actions in support of anti-corruption measures in place will be an early litmus test for the reform process. However, for others – ‘shadow state’ elites with past involvement in corrupt practice, for example – the prospect of such actions would likely provide spur to undermine it. The issue, though critical, is not straightforward and must be astutely dealt with in order to maximise the numbers with a stake in advancing overall reforms. A combination of immediate and more gradual actions aimed at strengthening public trust in state institutions without engendering paralysis in daily life and providing time for anti-reformists to identify with the reform effort, offers a way forward.

The decree creating the Royal Committee to Enhance the National Integrity System, mandated to draw up a charter of principles and standards to regulate work in the private and public sectors, has effectively made fighting corruption and nepotism a national priority and sends an important message.¹⁸ It is too soon to assess what impact the Committee’s work might have, but it provides an opportunity and mechanism to build on and render more effective measures already introduced. Immediate steps to reassure the public might include: strengthening the ACC’s powers and status and providing its members with support through the provision of guarantees in order to strengthen the body’s capacity to implement its action plan and public confidence in it; tightly enforcing the existing Code of Conduct, applicable to government ministers; implementing a merit-based scheme for appointments to senior civil service posts – starting with the water sector, as a first step to reducing the adverse impact of *wasta* on governance efficiency;¹⁹ and, in parallel, undertaking a nation-wide inquiry into the

corruption levels in government. See US Department of State, Human Rights Report 2010, April, 8, 2011 and Austrian Development Agency, Business Anti-corruption Portal, accessed March 12, 2012.

<http://www.business-anti-corruption.com/country-profiles/middle-east-north-africa/jordan/initiatives/public-anti-corruption-initiatives/>

¹⁸ The Council was established in December 2012.

¹⁹ The ACC Law 2006 includes actions related to *wasta* (see Ch 3 of this study), but its use is generally not considered a form of corruption. Over time, with the introduction of merit-based practices throughout the public sector, the traditional use of *wasta* will become less prevalent.

roots of opposition to privatisation coupled with an awareness campaign regarding the collective interest in transitioning from subsidised and inefficient providers of public services to commercial providers of the same, e.g. water services.

More accountability and transparency in public life will be a pre-requisite if the reform process is to succeed. Ordinary Jordanians will expect an inclusive process, one that distributes benefits as well as painful adjustments fairly, if they are to support it. Foreign investors are only likely to invest at the levels Jordan requires if they have confidence in the business environment. Furthermore, the level of support from the public and business elites required to sustain progress is only likely to be forthcoming if anti-corruption measures are universally applied and address the roots of corruption: including complicated legislation, weak investigation procedures and political interference in anti-corruption agencies.

v) Compliance with international law

The reform process must reflect the weight of international legality because this will affect the chance for durability of the course chosen and the related acceptance of the new bargain between the throne and people driving it forward. This is not merely for reasons of law but because those who know their rights are infringed will not remain quiet for long. There exists strong incentive for the monarchy to work for outcomes that satisfy the rights of all by persuading influential elites that it is in their own interest to curtail those actions that may violate them.

The advantage of upholding the principles enshrined in the UN Charter – the observance of human rights, democratic principles and political and economic freedoms - is clear. A reform process that more closely aligns Jordan with these internationally-accepted principles is likely to be perceived by Jordanians as just and as a result more likely to win majority approval. Moreover, while the international community can, for now, be expected to support the king's reforms – even if these fall short of its own declared expectations on human rights, Jordan cannot afford to be complacent and rely on this ambiguity. Over the longer term, outside powers are more likely to be forthcoming with political, financial and technical support to see through an arduous reform process, if it is

perceived to be sustainable locally. Aware of the levels of international support and private investment Jordan requires to underpin its reform process and to ensure a sustainable water-secure future, the king will want to identify the throne with policies compatible with the international community's declared sense of responsibility towards human rights in the region since the onset of the Arab Spring, rather than risk the consequences of testing it.

To meet the expectations of the public and the publicly-articulated standards of the US and other international players, and to attract investment, it is important that Jordan improves its record on civil, political and workers' rights as set out in the United Nations Declaration of Human Rights.²⁰ Significant outstanding problems identified for attention include: the inability of citizens to change government peacefully; abuses committed with impunity by the security services; restrictive legislation and limits on the freedom of speech and press; the impunity from prosecution or punishment of officials involved in corruption; and lack of transparency in government appointments and procurement.²¹

The Constitutional Court's formation in 2012 represented an important step to address these problems. The Court is charged with monitoring the constitutionality of laws and regulations free from influence from vested interests and its activities could potentially ensure the separation of powers. However, on the basis of their response in the wake of the 2012 constitutional amendments, protestors are likely to regard the Court's creation as significant only if further steps are taken in due course: to consolidate the separation of powers; to redistribute power from the executive to legislative and judicial branches; to curb interference by the security services in political life; to facilitate the work of NGOs working to provide society with a safety-net following reductions in the free or cheap services that the patronage state previously delivered; and to relax curbs on the media.

²⁰ According to Transparency International Corruption Perceptions Index, Jordan fell in ranking from 37 (of 180 countries) in 2003 to 56 (of 183) in 2011; in terms of level of freedom (free, partly free and not free) Jordan fell from a rank of partly free in 2001 to not free in 2010, see Freedom House, *A Closer Look at Freedom in the World, 2009*, <http://www.freedomhouse.org/article/closer-look-freedom-world-2009> For a discussion see M. Muasher, op.cit., p.21.

²¹ For an analysis of Jordan's record in human rights see the US State Department's 2011 report on Human Rights Practices. <http://www.state.gov/j/drl/rls/hrrpt/humanrightsreport/index.htm#wrapper>

The current phase of political transition offers different segments of the population - with their diverse perspectives on these themes - opportunity to build their knowledge, exchange views and reach consensus on what actions could be taken and how they might be sequenced as part of the fulfilment of a future vision for the country.

vi) *International involvement:*

Jordanians must make their own choices on the pace and timing of political transition, but a successful transformation will not be possible without the collaboration and sustained assistance of international players. Fortunately, that support is likely to be forthcoming. Jordan's western allies have historic responsibilities in the region. Moreover, they and regional actors have a strategic interest in assisting Jordan's rulers and people to move towards the prosperous and stable future they aspire to and can play a crucial role in ensuring the conditions for a stable transformation are established and not foreclosed by developments. To this end, it will be important that Jordan's western allies maximise the influence at their disposal through working coherently together as well as independently – implementing policies in parallel, at bilateral and regional levels.

In responses to the Arab uprisings, the US and EU member-states sent reassurances to Jordan on their willingness to see through a comprehensive reform process.²² They are contributing generous financial and / or technical assistance – to support the budget, fund infrastructure and technical programmes and underpin economic growth - to ease the Kingdom's transformation, enhance its adaptive capacity in the face of multiple challenges and to enable it to cope with the influx of hundreds of thousands of Syrian refugees. However, it was also made clear in statements and strategy documents that reforms should address pro-democracy aspirations if they are to lead to positive, significant and durable change, and should be accelerated – building on steps taken.

Donors have demonstrated inconsistency and ambiguity in the past over holding Jordan to reform-related conditionality related to aid disbursement; and this has not been cost free. As the Arab Spring has shown, Jordan's delays in implementing overdue reforms

²² For example, see the UK's strategy *Building Stability Overseas Strategy* (FCO, DFID, MOD), July 2011.

have fed dangerous discontent. It would be wise for outside players to combine their strong political support for Jordan with a more consistent and finely-tuned approach to democratic governance and water reforms: i) Using political, technical and financial instruments to full effect, donors and international organisations should ensure they target support to nudge all Jordanians, whatever their stakes and influence in the political status quo, towards the desired outcome of a shared, sustainable, post-rentier system future; and ii) conditionality, or *conditions precedent*, should be used more widely and effectively than previously to ensure this happens – specifically to ensure a higher degree of involvement by national decision-makers in improved water governance.

Regional pressures, in particular the stalled Israeli-Palestinian peace process, complicate the political reform process. Meanwhile, the lack of transparent and accountable government in Jordan and neighbouring states impedes regional cooperation over shared resources. Western countries and international organisations have a delicate path to tread when planning and implementing their policies on MEPP, Syria, anti-terrorism, human rights and anti-corruption. They will need to keep a strategic eye on how short-, medium- and long-term outcomes of their policies might affect Jordan's political transformation, water security and longer-term stability, and adjust accordingly.

Jordan's rulers and public now face an historic choice on transforming the political system and whether to move steadily away from patronage politics towards a more inclusive, merit-based politics in a manner consistent with the criteria and conditions set out above. Flows of financial assistance from Western and Gulf states, which have their own national interests in shoring up the status quo and assisting Jordan to cope with its fiscal crisis, might appear attractive to the monarchy and political elites as a means to delay this important move. However, if political reforms are postponed as has been the case in the past, there is a risk of potential upheavals threatening the security of both monarchy and state. Realistically, only a political transition based on a new political bargain between throne and people will pave the way to the institutional, legal and economic reforms required for Jordan successfully to pursue a mix of local and regional solutions to its water challenge to underpin future growth and prosperity.

CHAPTER 5

TRANSFORMING THE WATER SECTOR: IDENTIFYING A MIX OF SOLUTIONS

“Jordan shall protect and defend the rightful shares of the Kingdom’s water resources through bilateral and multilateral contacts, negotiations, and agreements. Opportunities for development of projects that provide multilateral or bilateral benefits shall be accorded special attention for construction, operation and maintenance. We will continue to give due respect to the provisions of international law as applicable to water sharing, protection and conservation, and those applicable to territorial waters. Bilateral and multilateral cooperation with neighbouring states shall be pursued through a Regional Water Charter.”¹

Jordan needs to undertake a fundamental transformation of its water sector to meet its water challenge. If the water deficits projected in this paper of the order of 300 MCM in 2015, 470 MCM in 2020, and 630 MCM in 2025 (see Chapter 1) are to be narrowed and the foundation for a sustainable water future laid, ‘business as usual’ is not an option. Current water governance shortcomings would render any goals for a sustainable water future unachievable. Reforms need to move further and faster than hitherto planned and considered realistic. Ideally, such a transformation will be facilitated by and integral to political, bureaucratic and economic transitions that Jordan’s new politics and national debate will generate. For these could gradually free water institutions from the power politics, discourse and attitudes of the patronage state and empower them to act effectively. However, it cannot wait. A start needs to be made straightaway – and this could put momentum behind the parallel political and economic reforms on which success will depend.

To bring about this transformation, Jordan needs to accelerate its integrated cross-sectoral approach to water, incorporating a mix of solutions that would support the drive for economic growth, narrow the projected water deficit in the most cost-effective way that also takes account of social impacts, and provides foundation for a sustainable water sector (Table 6).² These solutions, it is suggested, would target a) improving efficiency of

¹ Jordan Water Strategy (2009), op.cit., pp.3-9.

² This mix of solutions draws on ideas presented to NCCR Trade Regulation workshops in November 2009 and January 2013 ([http://www.nccr-trade.org/events/water-trade-and-sustainable-development/?tx_nccr_pi1\[filter\]\[eventdate\]=all&tx_nccr_pi1\[filter\]\[wp\]=5&cHash=ae478d2c7378fd59042425c7d84ba0c7](http://www.nccr-trade.org/events/water-trade-and-sustainable-development/?tx_nccr_pi1[filter][eventdate]=all&tx_nccr_pi1[filter][wp]=5&cHash=ae478d2c7378fd59042425c7d84ba0c7)) and from interviews with stakeholders in Jordan in September 2010 and in the UK. It has benefited from papers written during the period including Coyne et Bellier, *Red Sea-Dead Sea Water*

water supply and use; b) increasing adaptive capacity through the way agriculture is managed and reducing disproportionate water allocation to the sector; c) investing in complementary, financially-feasible and risk-manageable mega projects; d) building a basis for future regional cooperation on water issues and shaping international diplomacy in support of this water management effort. These policies would be pursued in parallel, planned by national decision-makers in consultation with civil society, coordinated inter-ministerially to provide coherence, and implemented with an eye to the short-, medium- and long-term with an agreed time-line, deploying the full range of available levers.

Paving the way through integrated planning

The new approach would require as a starting point the formal adoption of integrated planning across government and sectors – as suggested elsewhere.³ In this planning process, water as a scarce resource would be given strategic significance and prioritised, its true cost properly accounted for⁴ and its management aligned with the implementation across sectors of the policies chosen to make efficient and effective use of funds to fulfil growth aspirations. The resulting plan – with timeline and benchmarks - would provide the framework for the required ‘step change’ in water management across the sectors.

The reasons for switching to integrated cross-sectoral planning are persuasive. As discussed in Chapter 2, the water sector is affected by many decisions and inefficiencies outside the sector (agriculture, industry, energy, trade and finance) and thus solutions to the water challenge are likely to be found in these sectors. Interconnecting water management at an institutional level will enhance inter-ministerial coordination and prospects for effective decision-making. However, implementation could be politically daunting if resisted by vested interests. It will also be technically challenging. Decision-makers will be faced with difficult choices when reallocating water within and between

Conveyance Study Program Feasibility Study, Draft Report on Sub Studies B & D, Summary, Report No 12 147 Rp 02, June 2010; WRG / MWI Confidential Paper (2011), op.cit.; USAID (April 2012), op.cit.

³ The idea was frequently brought to the author’s attention by water experts and NGOs in Jordan and is discussed in the literature. See for example R. Hagan op.cit., E. Denny et al, op.cit. The need for integrated planning was also addressed by MWI international consultants.

⁴ USAID suggests that the true value of water must account for alternative economic uses of water and environmental implications as well as seeking to balance the needs of future generations with the needs of the present. See USAID, *Responding to the Water Crisis in Jordan*, 2007.

sectors, given the pressures of a growing population and accompanying higher demand for food and energy, the need for higher levels of economic growth and climate-change impacts on water availability. Planning must also take account of the needs of the poor and of reliability of services and will therefore need to be knowledge-based and adaptive.

A switch to integrated planning - reportedly ongoing – will therefore be complex and take time. If it is to be credible and effective, the process will require the support of political leaders, elites, the public and donors – with their different expectations and agendas. The political transition underway provides context for the following steps to help this happen:

- Post-elections, the king, prime minister and new cabinet to lead by formally committing, as part of the national programme, to adopt integrated planning involving a fundamental change to the way water is managed. A ‘game-changing’ mandate would thus be provided for the prioritisation of scarce water resources in investment decisions and the optimisation of its use as a foundation for a water-secure future, thereby also signalling to members of ‘shadow state’ networks that new ‘rules of the game’ will henceforth apply to water allocation and helping to dilute public scepticism with regard to intentions behind the move.
- The national debate underway to cover the goal of developing a vision and charting a course for *water-secure* economic development. This would provide context for stakeholders to engage in reformist discourse on a range of water solutions - using improved comprehensive data when made available, and to identify ‘win-win’ outcomes that take water availability, costs and the needs of the poor into account. Once consensus is reached, outcomes could be fed into the planning process.
- Foreign donors to signal their support for the process by preparing with the government a collaborative effort to develop institutional capacity and resources to roll out an integrated plan, and programmes in support. In this context, donors to support existing and new projects in order to prepare: i) an analysis of the true value of water; ii) comprehensive and reliable data, bringing knowledge from different water institutions and across sectors into a single centralised source;⁵ iii) options for a) a restructured tariff system that targets subsidies more fairly – thereby protecting

⁵ Personal interview, 2010.

the poor, raises levels of revenues collected and is consistent with WTO law and b) a potential property tax on the wealthy to improve water sector finances; and iv) options for trade policy adjustments, including the lifting of import tariffs on appropriate water-thirsty crops.

- Communications to be improved to ensure the two-way flow of information, with the prime minister becoming a member of the Water Council and technical experts from the MWI and WAJ to be attached to the Royal Diwan and Ministries of Planning and Foreign Affairs.

Identifying a mix of water solutions

Assuming Jordan pushes ahead with a political transition that meets the criteria set out earlier, and commits to integrated planning with water prioritised, combinations of solutions proposed in this chapter offer a realistic way forward for Jordan to tackle its water crisis (Table 6). Jordan will be constrained in its choices, since some options, on account of their political, financial, technical, social or environmental costs, are less feasible. Others, though difficult to implement, will be imperative, and, in the author's view, indispensable to any future package, which should focus on:

- exploiting scope for improvements in supply and demand-side efficiency;
- developing affordable projects to provide new water supplies; and
- concerted diplomacy to prepare the ground for regional cooperation over the management, operations and protection of shared water resources that can lead to broader cooperative efforts over virtual water, food and energy issues.

Power realities and attitudes will change only gradually. The following discussion considers how implementation of solutions might be i) accommodated and facilitated by the wider political transition which will help drive them through; ii) sequenced over time to neutralise resistance of opponents and provide 'win-win' outcomes in order to maximise stakeholder co-operation; and iii) supported by international and regional players to contribute to their success.

Table 6: Options for Domestic and Regional Water Solutions, 2015-2025/2026(a) (b)
(additional supplies; MCM)

	2015	2020	2025/2026
A. Exploiting scope for demand/supply side efficiency improvements			
1. NRW reduction measures (c)	15	35	40
2. Cross-sectoral Highlands water strategy (to conserve water/no additional supply)			
3. Increased wastewater treatment (excluding As Samra extension – 45 MCM / year) / for re-use in Highlands agriculture to allow aquifers to regenerate and in long term to replace surface water used in irrigation	30	60	85
4. Dams (excluding supplies from Kufranjeh dam – 5 MCM / year) (d)	10	10	20
5. Water harvesting and other measures (e)	3	4	5
B. Pursuing affordable new water supply projects			
1. Desalination plant at Aqaba (northern site)		100	100
2. Desalination of brackish water (f)	15	15	15
3. Additional non-renewable fossil water from Jafr and Lajjoun (g)	7	7	7
C. Regional initiatives to manage shared resources sustainably			
1. Bilateral accords on transboundary waters			
a. Israel (reflecting terms of 1994 Peace Treaty)	50	50	50
b. Syria (to be negotiated with a new Syrian government)		110	110
2. Regional accord:			
Inward transfer of Turkish water, lest RSDSWC idea fails			
a. Ceyhan Seyhan pipeline (trans-Syria): further study			
b. Underwater Mediterranean pipeline			400
c. Tanker or bag(400 MCM / year current export capacity)		400	400
D. Desalination Mega Projects			
1. Red Sea Dead Sea Water Conveyor			370
2. Med-Dead Water conveyor (h)			370
E. Strategic Reserve (i)			
1. Additional water pumped to Aqaba from Disi (on top of current 22 MCM / year) (based on new model for extraction / discussions with Saudi Arabia)			
MIX 1: Additional supplies incl. RSDSWC option (A1+2+3/B1+2+3/C1a+b /D1)	130	391	802
MIX 2: Additional supplies incl. Turkey import option (A1+2+3/B1+2+3/C1a+b+2b or c)	130	391	832
MIX 3: Additional supplies assuming no increase in current levels of Yarmouk water and without a regional bulk-supply option for the long term (A1+2+3+4+5/B1+2+3/C1a)	130	281	322
Projected water balance without additional supplies	-300	-469	-630
Projected water balance taking account of additional supplies – MIX 1.	-170	-78	172
Projected water balance taking account of additional supplies – MIX 2.	-170	-78	202
Projected water balance taking into account some additional supplies but with no increase in current levels of Yarmouk water and before a regional bulk-supply option for the long term has come on stream – MIX 3.	-170	-188	-308

Notes:

- The figures in this table reflect the assumptions on which this paper has based its projections, which are set out in Chapter 1. The figures for additional supplies reflect those over and above volumes from projects for which funds have been committed (Disi, As Samara Extension, Kufranjeh dam and small wastewater plant).
- It is highly possible that a long-term bulk supply option, whether RSDSWC or imports from Turkey, could not be implemented to deliver water as early as 2026 as shown in Mix 1 and Mix 2, but could do so later.
- At 2010 production levels. A reduction in theft from municipal networks would significantly increase these volumes.
- Derived from MWI Water Budget, 2012 (financing required).
- Derived from MWI Water Budget, 2012 (financing required).
- Derived from MWI Water Budget, 2012 (financing required).
- Derived from MWI Water Budget, 2012 (financing required).
- This study does not cover this option. It is assumed it could deliver the same volume of water to Jordan as the RSDSWC option.
- This study suggests that this option be treated as a last resort.

Towards sustainable water-use: scope for demand and supply-side improvements

“Jordan’s water management may have notched up achievements, but it is also a story of missed opportunities and mistakes” according to a Jordanian expert.⁶ This is a harsh verdict. However, officials, experts and donors recognise that several opportunities to improve the efficiency of water use on supply and demand sides do exist and should be exploited as a priority. Together they would make additional water available at lower cost than from the expensive development of new sources, enhance adaptive capacity in the face of climate change, augment agriculture’s productivity, arrest the depletion of groundwater aquifers and raise additional revenues.

i) Reducing non-revenue water (NRW) losses

One such opportunity, also recognised in recent studies, lies in addressing inefficient water supply in the municipalities where demand is growing strongly and high water costs are due to increase. Overall, NRW losses through supply networks are estimated at an average annual 43% – or some 137 MCM of total municipal allocation of 320 MCM in 2009. As Chapter 2 demonstrated, unexploited scope exists for Miyahuna and YWC to improve performance to standards that would reduce water loss, contribute to sustaining low-cost supply and raise revenue.⁷

Economically, there are strong reasons to exploit the opportunity to reduce NRW, and to do so swiftly. Investment in supply networks would deliver a good return. Reportedly, leakage reductions and pressure controls would be among the most cost-effective of available options to increase water supply,⁸ with the unit cost of water saved equivalent to half that of future water from Disi, currently projected at JD 0.85 / CM. Moreover failure to rehabilitate networks would have implications for the cost of Disi water. If annual NRW losses in Amman remain at an estimated 35%, then Disi supplies will be subject to equivalent physical loss. The projected cost of Disi water at Amman’s

⁶ Personal interview, 2010.

⁷ Miyahuna services include those to rural areas outside Amman where NRW is estimated at an unthinkable 90% level.

⁸ WRG / MWI Confidential Paper (2011), op.cit.

periphery would effectively rise to an estimated JD 1.75 / CM, with the cost of an annual 100 MCM rising from the currently projected JD 85mn to JD 175mn.⁹

Politically, implementation of NRW reduction projects poses few problems. Jordan is committed to all aspects of NRW reduction – maintaining infrastructure, project monitoring and performance, cost recovery, tackling theft and improving meters (despite past protests over their introduction). All parties understand that the political cost of failure to address leakages and the danger these pose to public health could be felt in public unrest. Moreover, USAID is re-designing conditions for future cash transfers to projects, and expects the government to make progress on NRW reduction.¹⁰

Technically speaking, reduction of leakages would be a low cost-high volume and relatively easy-to-implement efficiency move.¹¹ Around half the water lost to NRW is due to *physical losses* (technical leakages as opposed to illegal extraction), according to experts. Rehabilitation and restructuring of water-supply networks and optimisation of operations and management could, over time, be expected to reduce these losses by 50%, potentially reducing estimated annual physical losses of 76 MCM by 38 MCM - based on 2010 water demand.¹² As suggested elsewhere, a start could be made at Miyahuna and YWC where physical losses account for 39 MCM / year.¹³ If a 50% reduction of physical leakage is technically possible, then, at current annual production levels for the two companies, an annual saving of 19.5 MCM could be made. As reduction programmes are rolled out across country, water volumes saved – projected here at around 40 MCM / year by 2025 (based on 2010 production) - would make a significant contribution to projected requirements.

However, a country-wide reductions programme will take time in part because planning reduction measures is complicated by variations in leakage patterns across the governorates and will depend on further analysis of cost-benefit potential. In addition

⁹ Personal interview, 2010.

¹⁰ Personal interview, 2010. See also USAID *Jordan Country Strategy 2010-2014*, March 2010, p.18, fn.8.

¹¹ E. Salameh, op.cit., p.9.

¹² Personal interviews, 2010. WRG / MWI Confidential Paper (2011).

¹³ USAID (2012), op.cit.,p.32.

efficient implementation of selected measures will depend on extending private-sector involvement to utility operations in more governorates.

A successful municipalities-led effort to reduce overall NRW would comprise short- and long-term components, requiring coordinated planning and implementation between WAJ and the Ministries of Finance and Interior, public involvement as well as donor backing - in particular from USAID - where appropriate. The following steps provide a path forward:

- In the short term, an Amman-focused leakage reduction project is urgent, given the imminent arrival of expensive Disi water. NRW reduction programmes need to be developed - first for Miyahuna, and then for YWC.¹⁴ Given the AWC's success in reducing NRW, the company's water experts could be consulted on programmes and drawn into technical assistance exchanges.
- The USAID-supported IDARA initiative to promote water efficiency, which chalked up success in assisting Miyahuna to overcome management and operational issues,¹⁵ could be extended. The project is well placed to support WAJ in developing appropriate NRW reduction plans for different governorates, taking costs and benefits into account, in order to bring about a Jordan-wide average annual reduction of *physical losses* closer to the 10-15% level - over a ten-year period.
- Efforts to tackle theft should be pushed in parallel with leakage reduction projects in order to maximise cost recovery. This will require close coordination between WAJ, MWI, the Ministry of Interior and police to implement and enforce new regulations.
- An education programme could be built with communities around sharing knowledge on the benefits in terms of service quality and public health that network rehabilitation and improved monitoring and performance would bring. This would help incentivise the public to stop illegal withdrawals and accept metered sales, and would assist in changing attitudes on the need for tariff increases and more privatisation.
- Although it is widely recognised that Jordanians should in due course pay higher tariffs for water, municipal demand is already suppressed and tariff reform is

¹⁴ Personal interview, 2010. USAID (2012), op.cit., pp. 31-32.

¹⁵ Personal interviews, 2010.

politically difficult. Meanwhile, rapidly increasing bulk water and energy costs are complicating financial sustainability for WAJ and the utility companies. In view of the central government's budgetary need to cut back on overall subsidy levels and the unintended benefit that the wealthy derive from volumetric water tariffs, this study supports the USAID proposal that assistance be extended to MWI/WAJ to study additional acceptable methods to raise revenue - including through the capital recovery charge suggested, which would be based on property valuation.¹⁶

- USAID could be expected to contribute to covering initial funding for NRW reduction programmes and the design of measures to raise revenue.
- A new USAID-GOJ understanding should be reached according to which future USAID cash transfers to infrastructure projects and rehabilitation, will depend, as intended, on government fulfilment of the reform-related conditions agreed between them.¹⁷ These conditions should include successful inter-ministerial moves to enforce measures against theft and the politically-difficult closure of illegal wells (see below). In the medium term, transfers would need to be tied to phased steps towards extending PSP to more utility companies and tighter performance-based management contracts, and to restructuring of water tariffs.

ii) Cutting abstraction of Highlands groundwater through re-thinking agriculture

A second unexploited opportunity lies in increasing farming productivity and water use efficiency in the Highlands as a means to reduce groundwater extraction and end over-abstraction. Jordan's new politics offer government and stakeholders unprecedented scope to build on and accelerate current efforts in order to maximise positive long-term outcomes.

The current MWI 'cap' for overall irrigation water use at 700 MCM / year may be politically do-able, but is arguably set too high.¹⁸ Agriculture country-wide uses nearly

¹⁶ See USAID (2012), op.cit., p.31.

¹⁷ The USAID Audit (2011), op.cit. found USAID/Jordan had not developed *conditions precedent* to ensure sustainability of its programme activities since 2010. Criticism focused on the failure to address agricultural water use. Parallel views were expressed to the author in 2010. See also USAID, *Jordan Country Strategy: 2010-14*, March 2010, p.18, fn.8.

¹⁸ Ministry of Agriculture strategy aims at 2% growth for the sector based on an expansion of rain-fed areas to drive increased crop production, improved crop productivity overall, whilst maintaining current levels of irrigation water – at the time 510 MCM / year.

two thirds of available water supplies – over recent years around 500-600 MCM / year - and accounts for little more than 3% of GDP.¹⁹ Of this water, 400-500 MCM has been sourced from good-quality surface and ground water and around 100 MCM by treated wastewater.²⁰ Rethinking agriculture in *the Highlands* could make a significant contribution to reducing groundwater abstraction to levels within safe yield and thus to the conservation and sustainable use of precious renewable, potable resources.

For, it is Highland agriculture's use of groundwater which is most controversial. As discussed elsewhere,²¹ water productivity in the Jordan Valley is three times greater than in the Highlands. Strategically-located along the Israeli and West Bank borders, Jordan Valley farming supports large communities and generates activities in the services and goods sectors. By contrast, irrigated agriculture in the Highlands is less profitable and accounts for over half (207 MCM / year) of abstracted renewable groundwater, or nearly 25% of total resources allocated to the country in 2010.²² Although groundwater abstraction levels have reportedly declined,²³ abstraction still exceeds safe yield (Table 2)²⁴ - leading to yearly declines in aquifer levels and water quality. The combination of high-volume water use and low productivity suggest there is scope – through improved management - to increase Highland agriculture's efficiency and contribution to national wealth whilst arresting the depletion of aquifers and the deterioration of the quality of water in them. Reforming Highlands agriculture to reap these benefits becomes the more urgent given the sector's contribution to food security and social stability in rural areas. Continuation of 'business as usual' is not an option since it is costly and unsustainable and threatens vital renewable resources.

¹⁹ Jordan Water Strategy, op.cit., p. 4-2.

²⁰ MWI, *Water Budget Projected Demands and Resources, 2010-25*, 2012. USAID (2007), op.cit., p.8.

²¹ USAID (2012), p.11.

²² Ali Subah (MWI) and Nour Habjoka (Giz), December 3, 2011.

http://www.cmimarseille.org/_src/EW2_wk1/Data/Doc/D3-2.pdf

²³ According to a United States Geological Survey (USGS) report cited in USAID (2012), op.cit., p.7.

²⁴ Out of Jordan's 12 groundwater basins (ten renewable and two fossil), six are over exploited, four are balanced and two under exploited. See Strategic Foresight Group, op.cit. The Amman-Zarqa and Azraq Basins are heavily overused - see note on "The Highland Water Forum" provided by MWI, March 2012.

In view of the strategic importance of protecting Jordan's aquifers and conserving its sources of renewable potable groundwater and given the low cost of groundwater compared with potential alternative supplies, addressing inefficient water use in Highlands irrigation agriculture is an urgent priority. Re-thinking policy and transitioning to more efficient and productive farming techniques will be critical to any mix of water solutions. Governments have been reluctant to press for demand management in the past because this would have involved confronting politically-influential landowners.²⁵ Water management efforts, whether to raise tariffs, enforce relevant laws or curtail abstraction rates were resisted, obstructed or ignored with impunity, or implemented to benefit the privileged few (Chapter 2). Fortunately, the politics driving these outcomes are changing.

In a post-election political transition with the features discussed in Chapter 4, national leaders will be on notice to pursue policies in the collective interest rather than those serving self-interested groups. These will be debated amongst the public and in time scrutinised by more accountable parliaments. In this changing political context, the Prime Ministry and governing institutions will acquire more political space to intervene with the required strategic approach to managing Highlands groundwater in order to deliver the desired outcomes. The following steps and components are proposed:

- *An ambitious cross-sectoral Highlands Water Strategy*, maximising the use of available but so far under-exploited legal, financial, administrative and technical levers, is required to ensure groundwater is used sustainably and efficiently through reducing abstraction rates and maximising value per drop of water used. Driven by national leaders, the strategy would build on the 2002 Groundwater By-Law and the Highland Water Forum (HWF) initiative – mandated several years ago by the Prime Ministry to build consensus amongst stakeholders to the same end. It would need to involve stakeholders – from the privileged to the rural poor, and representatives of key ministries, donors and NGOs – in its design, organisation and implementation and secure donor funding for its parts. To fulfil its goals, the strategy would adopt a

²⁵ See Ch 3 above. Through their ties to political leaders, penetration of decision-making, influence over lobbyists in parliament and ability to mobilise support, these elites have resisted reforms they perceived would disadvantage them. Ministry of Agriculture conservative policy is better understood in this context.

‘carrot and stick’ approach to include the following component programmes and reforms, which should start straightaway. They would be shaped to incentivise and win the cooperation of landowners and farmers, or to cajole them, in order to change their behaviour, and to assist the poor to adapt:

- *A new approach to communications with Highland farmers to ensure they understand the implications of over-abstraction and the need for appropriate remedies to cut consumption will be critical to the strategy’s success.* Donors have funded many awareness-raising programmes. Political leaders, former and serving ministers, and tribal farmers all confirmed with the author their understanding of the dangers of over pumping for farm profitability and public health, and of future competition between sectors for scarce water and aquifer sustainability. Yet, awareness-raising has produced mixed results.²⁶ One influential landowner attributed wasteful behaviours to wrongheaded communications methods, which bypass political networks to which rural farmers belong.²⁷ What was needed, he said, was a direct approach by respected tribal interlocuteurs to explain the situation and solutions to water users in a socially- and culturally-sensitive manner. The new politics provides opportunity to co-opt powerful ‘shadow state’ members, who in the past made talk of cutting back groundwater irrigation water ‘taboo’ but who may now perceive an interest in identifying with democratic reform. They would make excellent political champions to encourage collective actions to optimise water use and agricultural productivity in order to accelerate reductions in extraction.

When reshaping communications with rural communities, the HWF participatory initiative would be well-placed to harness the energies of those influential landowners inclined to associate with the national interest in reducing over-abstraction. Donor support will be required i) to assist the HWF to expand its drive to hold discussions around solutions, and ii) to fund the development of the cross-sector programme of

²⁶ A 2010 USAID study, *Jordan: Kap Household – Baseline Survey* found 80% of Jordanians regarded the water shortage as ‘very critical’, but the percentage of those demonstrating knowledge of the reasons why was smaller.

²⁷ Personal interview, 2010.

incentives and persuasion, with timelines, that would lead to on-farm efficiency improvements and increase government revenues from abstraction, whilst avoiding socially-unacceptable hardships. Proposed measures include:

- *Incentive schemes to encourage farmers voluntarily to shift crop patterns and production methods or to cease farming altogether in order to reduce groundwater consumption.* There has been political opposition to changing crop patterns in the past, but this author found support for the idea amongst political elites wired into ‘shadow state’ circles.²⁸ Royal Commission members favour robust action to discourage water-intensive crop production.²⁹ The HWF, whose stakeholders include large landowners, has identified ‘more suitable cropping patterns’ as an area for intervention to reduce groundwater abstraction.³⁰ Water experts and NGOs have long been in favour. To build momentum, early intervention by influential landowners, as discussed above, may help turn those who resist the idea of switching crops and whose privileged positions give little incentive to reconsider.

What crop changes should comprise is still open to debate.³¹ Further cost-benefit analysis of differing returns on irrigated crops and of water-use levels, factoring in marketing, balance-of-payments, social and environmental issues, is required to guide transition.³² Crop transition will be a long-term process requiring a package of mechanisms designed to minimise socio-economic costs and provide ‘win-win’ outcomes for wealthier and poorer farmers, workers and government alike.

Reassurances, guarantees and incentives to encourage, facilitate and ease the transition thus require further study, but promising intervention measures include:

²⁸ Personal interview with landowner, 2010. Some in the Jordan Valley have on their own initiative diversified away from bananas.

²⁹ Personal interview, 2010. The Jordan Water Strategy, op.cit. calls for robust regulation in this regard.

³⁰ Note on the Highland Water Forum, op.cit., p.4.

³¹ The Water Resource Group’s recommendation for a shift from water-intensive olive and fruit trees to low-water high-return vegetables to produce greater water savings and higher returns has raised questions on account of marketing difficulties. See USAID (2012), op.cit., p.34. For further discussion see J.P. Venot and F. Molle, *Groundwater Depletion in the Jordan Highlands: Can Pricing Policies Regulate Irrigation Water Use?*, Springer Science, 2008.

³² Ibid.

i) Subsidies, loans and debt forgiveness.³³ For those farmers whose enterprises are profitable, the offer of loans, subsidies or debt forgiveness to ease the cost of changing crops and guarantees of an alternative source of income during transition plus retraining could provide incentive. Although potentially expensive, these incentives could be funded by the donor seed fund under consideration by HWF stakeholders. This would be deployed to benefit those who can demonstrate a planned behaviour shift that will reduce groundwater use and in due course increase farm productivity.

ii) Retirement and alternative income opportunities. Farmers unable to turn a profit or approaching retirement could be compensated for the closure of their wells and / or provided with additional retirement benefits. A proportion of Jordanian labourers set to lose jobs could be absorbed through the expansion of rain-fed agriculture. In addition, provision of alternative income opportunities, e.g. in planned eco-tourism or solar and wind energy projects, could provide reassurance for those who risk losing their jobs and flexibility for others in the future, as irrigated agriculture becomes less labour-intensive or is cut back.

The development of agribusinesses, and solar energy and eco-tourism projects could provide opportunities for landowners to diversify their investment and an alternative for those tempted to engage in land speculation – planting olive trees and supplying water to increase land value.³⁴ The former could provide opportunity to add value to agriculture while the latter two could provide alternative sources of income.

- Inducements to encourage farmers to reduce groundwater abstraction.

Once the above or similar initiatives are in place to assist farmers through a difficult transition, the following parallel and essential measures *to induce* reductions in abstraction could be expected to arouse less controversy:

³³ For a discussion, see E. Denny et al, op.cit. pp. 11-12.

³⁴ USAID (2012), p.34.

i) Phased introduction of increased extraction charges to reflect the value of water consumed.³⁵ Higher tariffs would likely encourage farmers to respond to the above

incentives to shift to higher-value, water-efficient crops and more efficient farming methods or to move to alternative employment. They would also raise revenue.

ii) Removal of quantitative restrictions and customs duties on imported crops.

Making imported water-intensive fruit and vegetables more competitive on the Jordanian market would encourage farmers to shift to higher-value, less water-intensive crops, where they have comparative advantage.³⁶

iii) Ending illegal extractions and enforcing restrictive limits. Although the GOJ is committed to ending groundwater over-abstraction by 2025,³⁷ this paper proposes that, in line with suggestions of experts, the deadline be brought forward. An accelerated effort to enforce the Groundwater Control By-law (No.85) 2002 – which calls for closure of an estimated 1,000 unlicensed wells and regulation of extraction from some 2,799 licensed wells³⁸ - could reduce over-abstraction (estimated officially at 76 MCM in 2010, but probably significantly higher as a result of unreported abstractions) more quickly. The new government should provide mandate, means and political support to empower water institutions to enforce the law.

- USAID support for the design and implementation of the Highlands Strategy is required. USAID water conservation projects have not focused on agriculture, but this report is consistent with and agrees with USAID audit findings that this should change.³⁹ The above proposals suggest that in a collaborative approach with the government USAID should i) together with other donors, provide financial support for cross-sector studies on crop-pattern diversification and the implementation of the

³⁵ USAID (2007), pp. 12-15. USAID reported prices were sufficiently low for farmers to continue to grow low-return, high-water use crops. This suggests appropriate price setting would help optimise crop patterns and water use, and augment agricultural production. The restructuring of and increases in pumping tariffs, suggested USAID, 'should reflect at a minimum, the full cost of delivery of government-supplied surface and groundwater' whilst free pumping from private wells should be eliminated'.

³⁶ For example, water is wasted growing *inter alia* bananas and apples, which can be imported more cheaply than they can be produced at home.

³⁷ MWI *Water Balance 2010-2025*, 2012, op.cit.

³⁸ For a discussion see J. Fitch, *Curtailment of Groundwater use for Irrigated Agriculture in the Amman-Zarqa Basin Uplands*, USAID/ARD, March, 2001. For statistics on wells, see USAID, *Responding to Jordan's Water Crisis*, 2007, p.8. fn.xxiv.

³⁹ See USAID Audit, op. cit., pp. 1-8 <http://transition.usaid.gov/oig/public/fy12rpts/6-278-12-002-p.pdf>

above incentives to encourage water conservation and agricultural productivity; and
ii) make increases in extraction charges, closure of illegal wells and tighter regulation of licensed wells, and the removal of duties and quantitative restrictions on certain imported products *conditions precedent* for cash transfers.⁴⁰

iii) Wastewater treatment and re-use

A third well-recognised opportunity lies in increasing levels of treated wastewater for industry and agricultural use, which would reduce demand for groundwater in the medium and long term. The MWI projects increases in the levels of treated wastewater from 117 MCM (2010) to 223 MCM (2020) and 247 MCM (2025). A proportion of these additional supplies would be sourced from the As Samra Extension (45 MCM / year) and existing unused plant capacity.⁴¹ USAID consultants have recommended that the agency support further wastewater treatment through funding infrastructure projects in support of developing medium-sized wastewater treatment plants (WWTPs) over the next five years.⁴² Apart from its financial feasibility, the option is politically attractive since it would bring public health and environmental benefits and is also technically feasible. Careful consideration would need to be given to the location of future plants, targeting areas where wastewater treatment capacity is needed and high-value end-use of treated wastewater in irrigation activities is available nearby.

An expansion of wastewater treatment for agricultural water use can play an important role in reducing Highlands groundwater use. Moreover, it could facilitate longer-term planning for the phased release of *surface water* currently used in Highlands irrigation for municipal use. Donors should ensure funding is tied to measurable steps toward improving irrigation efficiency and its uncontrolled expansion, and to evidence of decreases in aquifer over-abstraction. With regard to this paper's projections and the assumptions on which they are based, the option could produce around 60 MCM / year

⁴⁰ Ibid. Personal interviews, 2010. Donor pressure on the government to end illegal extraction and impose restrictive limits was relaxed in the past, but should now be tightened.

⁴¹ This would require pipeline connections to and from existing plant. End users would include agriculture and industry.

⁴² USAID-funded WWTPs have performed successfully and there is need for further wastewater treatment capacity. USAID (2012), op.cit.,p.xvi.

additional treated wastewater by 2020 and 85 MCM / year more by 2025, provided USAID and other donor funding is sufficient to support current government plans. More generous donor funding could raise this level to more than 100-150 MCM / year by 2025, a significant contribution to the projected deficit.

Regional desalination: the changing context

Jordan's government has long recognised that water solutions cannot be exclusively national but must be regional and global too. Developing bulk supply projects, establishing foundations for regional cooperation on water resource management and the pursuit of international diplomacy will be key to the mix. This is because: i) improved supply and demand management at home, even if successfully implemented, can only cover a small part of the projected deficits; ii) of the few national *new* water-supply options that remain, those that are feasible (treated wastewater and desalinated brackish water) could only contribute towards narrowing the remaining deficits; and iii) collective responsibility assumed by states in the region for the management of shared resources will help to pre-empt tension over allocations and to ensure existing water accords are respected and new ones can be reached. The analysis above suggests that when demand and supply efficiency improvements are taken into account, very significant additional supplies will still be required to narrow remaining deficits of around 280 MCM (2015), 360 MCM (2020) and 465 MCM (2025) (Table 6) - whether from mega desalination projects, regional conveyance or transboundary solutions. If such projects are to succeed, similar to local strategies, they will require international involvement – through diplomatic support, financial backing, provision of information and data, and legal frameworks and guarantees.

Today, international and regional developments are transforming Jordan's political landscape, presenting opportunities but also altering its room for manoeuvre on all aspects of water management. Importantly, climate change, the global financial crisis and the Arab uprisings are pushing international players to re-shape their Middle East policies, in turn changing the context for Jordan's current water coalitions, and for new ones. Key donors support their strategically-important Jordanian ally. However, there are signs that they want to see significant *quid pro quos* - in terms of overdue political reforms, more transparent

and accountable governance, greater efficiency in water management and expanded regional cooperation – for political, technical and financial assistance rendered. Meanwhile, flows of funds from Gulf states to support the budget are less reliable.⁴³ How Jordan uses its political imagination, will and capacity to navigate these changing circumstances – to find a balance that exploits global and regional opportunities, meets international and domestic expectations, manages financial constraints, minimises risk and recognises the need for trade-offs – will ultimately shape policy choices and water outcomes.

In brief the circumstances that underpinned Jordan's rentier-state system are falling away and unilateral 'business as usual' approaches based on that system are no longer sustainable. This paper suggests, therefore, that national leaders need to undertake radical re-thinking, and urgently, on how Jordan addresses mega-supply projects, regional cooperation and international diplomacy - and the linkages between them. More focus on regional cooperation is required if Jordan is to narrow the water deficit in the medium term and find a path to long-term water security.

It is widely accepted nationally and internationally that by the early 2020s Jordan will require additional bulk supplies, if it is to secure sufficient water to develop in line with its economic aspirations. A number of alternative options – including desalination, inward transfer of bulk water by pipeline, canal, tanker or bag, or a mix of these, have been studied over the years and are the subject of a World Bank-funded study.⁴⁴ Most arouse controversy on account of size and costs, or political, technical, financial and

⁴³ Press reports 2012 e.g. 'Jordan's King pinched by Gulf aid', *Reuters*, November 16.

⁴⁴ Extensive literature exists on alternative options. Publication is imminent of the World Bank-financed Study of Alternatives, part of the Bank-funded Red Sea Dead Sea Study Programme. For consideration of the Med Dead Canal options and others involving transfer of water from Turkey, see Strategic Foresight Group, op.cit., pp. 36-44; IPCRI, 'Water Imports – An alternative Solution to Water Scarcity in Israel, Palestine and Jordan?', Fact Sheet 2, January 2010. <http://www.ipcri.org/files/waterimports.pdf>. G.E Gruen, 'Turkish Water Exports: A Model for Regional cooperation in the Development of Water Resources', in *Water Resources in the Middle East: Israel-Palestinian Water Issues – From conflict to Cooperation (Ch 15)*, Berlin, Springer, 2007; M. Rende, 'Water Transfer from Turkey to Water-Stressed Countries in the Middle East', in *Water Resources in the Middle East: Israel-Palestinian Water Issues – From Conflict to Cooperation (Ch 16)*, Berlin: Springer, 2007; B. Wachtel, & A. Liel, 'The Turkey to Jordan River Basin Countries 'Peace Canal on the Golan' Proposals: Benefits and Risks for Regional Water Cooperation in the Middle East' in C. Lipchin et al (eds), *The Jordan River and Dead Sea Basin: Cooperation Amid Conflict*, Springer Science Business Media, 2009.

environmental risks. Jordanian decision-makers, mainly for political reasons, abandoned past interest in the inward transfer of water across the territory of powerful neighbours (for example, as in Med-Dead projects to transport across Israel either sea water for desalination at the Dead Sea or desalinated water for urban centres) – both could deliver water more cheaply than the Red Sea Dead Sea Water Conveyor (RSDSWC) option under consideration. However, international projects and environmental NGOs have long advocated regional diplomacy and cooperation to promote further study of the feasibility of these and other options.

The government's preferred long-term supply solution, like other Middle East countries, is desalination on its own coastline. Following a recent decision to 'scale down'⁴⁵ the national Jordan Red Sea Project (JRSP)⁴⁶ in favour of desalinating the much lower volume of 70 MCM / year at Aqaba, Jordanian attention has refocused on the parallel RSDSWC project (see BOX)⁴⁷ to which it has remained committed.⁴⁸ However, the regional project with Jordanian, Israeli and Palestinian participation, under discussion for more than two decades and the subject of a World Bank-funded feasibility study (RDS), is also controversial and faces considerable challenges.

Prospects that the much-delayed RSDSWC will ever be built will depend on the political support it gathers, for this will be key to raising funds from development banks, commercial lenders and private investors. Much depends on the US position, as other

⁴⁵ See Hana Namrouqa, 'Red Sea project to be scaled down', *Jordan Times*, 21 November 2012. In scaling down the proposed \$8-10 bn JRSP in late 2012, Jordan heeded its consultants' warnings on the project's potential to become an unmanageable economic burden and part of a wider crisis that would undermine long-term security. The project's economic viability depended on a significant 40% of revenues originating from public improvement fees and land sales, with the remaining 60% from water fees. This structure made long-term water supply depend on potentially unreliable non-water revenues: Insufficient investor interest during project implementation leading to lower-than-expected development could have resulted in revenue shortfalls, imposing an unmanageable financial burden on the economy. In the words of FOEME's director Munther Munqueth the project could "bankrupt the state".

⁴⁶ See brochure, Ministry of Water and Irrigation, *Jordan Red Sea Project (JRSP)*, July 2010; Ministry of Water and Irrigation, *Jordan Red Sea Project*, Information Presentation, Power Point, January 6, 2011.

⁴⁷ Coyne et Bellier, *Red Sea-Dead Sea Water conveyance Study Program Feasibility Study, Draft Report on Sub Studies B & D*, Summary, Report No 12 147 Rp 02, June 2010.

⁴⁸ Jordan's position was always that if the World Bank's feasibility, technical and environmental studies are positive and approved, then the JRSP's first phase would effectively become the first phase of the larger RSDSWC project. See *inter alia* *Jerusalem Post*, 'Raising the dead – Is the 'Red-Dead Sea Conveyance Project viable?', 27 July 2010.

donors and regional governments would likely follow suit. US strategic interests in advancing Middle East peace and stability have long pointed to likely political and

BOX 5: RSDSWC and JRSP

The Red Sea Dead Sea Water Conveyor (RSDSWC) is intended to convey water from the Red to the Dead Sea - generating hydro-power, desalinating water mainly for Jordan – with smaller volumes earmarked for the region, and raising Dead Sea water levels with brine. The \$10bn multilateral project, which would deliver up to 310 MCM / year to Jordan, plus a proportion of a further 170 MCM / year to be shared with Israel and the Palestinians, has the additional aim of providing a ‘peace dividend’. Public consultations on the RSDS feasibility studies are due in January 2013.

The ‘scaled down’ JRSP will desalinate 70 MCM / year to be distributed to Aqaba and surrounding development projects – at no cost to the Jordanian treasury.⁴⁹ The original \$8-10bn JRSP,⁵⁰ as proposed, was to deliver 200 MCM / year in a first phase to Aqaba, rising to 930 MCM / year by end project with water to be channelled to Amman and brine into the Dead Sea.⁵¹ The project plan also linked delivery of new water supplies to an economic development plan to generate economic growth and provide power and housing needed for a growing population. The planned establishment of resorts, industries and gated communities would also have brought financial and commercial opportunities to Jordan’s elite business class – a key factor in view of the shrinking patronage state.

financial support for the RSDSWC, provided a positive RDS feasibility study transpires and public consultations come out in favour. The RSDSWC has had the advantage, some argue, of providing a ‘peace dividend’ - with cooperation with Israel advancing the cause of peace. However, an international decision will be influenced by technical, environmental and financial considerations – all of which have fuelled opposition.

The RSDSWC faces technical difficulties and raises environmental concerns.⁵² RSDSWC consultants have recommended a combination of engineering solutions, technical safety measures and construction materials that they regard as sufficient to cope with moderate seismic activity and to prevent or contain damage to the environment and resources from

⁴⁹ See *Jordan Times*, op.cit.

⁵⁰ See GOJ, *Jordan Red Sea Project (JRSP)*, 2010, op.cit.; GOJ, *Jordan Red Sea Project*, 2011, op.cit.

⁵¹ The project faced privately and publicly-articulated criticism from governments, the World Bank, the PA and NGOs. Reportedly, the French supported a multilateral project, not a unilateral one, the PA would have insisted on a regional mandate for Jordan’s plan to dump brine into the Dead Sea (an international water body), the World Bank was irritated at Jordan’s surprise introduction of a parallel project about which it was neither informed or consulted.

⁵² The Wadi Arab / Arava valley, the water conveyor route for both projects, is an active seismic zone and planned pipelines will cross several active faults. The risk of saline water leaking from pipelines and contaminating valuable groundwater is another concern. For technical points raised here, see Coyne et Bellier, op.cit., pp.15-16, 22.

potential leaks. These are not accepted as safe by some environmental experts and organisations such as Friends of the Earth Middle East (FOEME).

A further potential legal-technical difficulty lies in the possible impacts on coral reefs and currents when extracting such huge volumes of water from the Red Sea. Assuming the RDS feasibility produces clear positive guidance on these issues, the project still requires a favourable outcome from public consultations and then a regional mandate from participants and neighbours since the project would impact the shared resources and eco systems of the Red and Dead Seas - both international water bodies (resources shared by neighbours).⁵³

Moreover, funding any development project – even one receiving international support - is problematic given the global financial crisis. The RSDSWC's projected cost of up to \$10 bn (2013) represents a huge investment even in global terms. Regional instability and the current global financial climate point to likely delays in fundraising.

Finally, if the necessary international political and financial support for the RSDSWC is to be forthcoming, a legal and institutional framework must be set up to govern, develop, own and operate the project before it proceeds. Such a framework would need: a) to recognise the multi-national character of the endeavour given that the Red and Dead Seas are international water bodies, and provide for a level of cooperation over impacts on the Dead Sea including undertakings by the parties regarding management of Jordan River water flows; and b) be based on applicable international law and good practice.⁵⁴ A structure, where all three beneficiary parties jointly establish, own and operate the undertaking in full partnership is recommended by RSDSWC consultants. This kind of framework would likely appeal to international and regional governments.

⁵³ With regard to the Gulf of Aqaba, Jordan, Saudi Arabia, Egypt and four other riparian states are members of PERSGA (Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden), which is committed to conservation of coastal and marine environments. PERSGA is founded on Article XVI of the Jeddah Convention of 1982. <http://www.persga.org/inner.php?mainid=1>

⁵⁴ Personal interview, 2012. See Coyne et Bellier, op.cit.

Given these uncertainties and the prospect of delay in any decision on the RSDSWC, the following approach, which may serve Jordan's interests given the new politics of the Middle East, is proposed:

- A full, publicly-articulated commitment by Jordan to RSDSWC, subject to public consultations. This could play well in regional and international diplomacy (discussed next), strengthening Jordan's potential leverage in terms of political as well as water trade-offs. For example, international players could press for the parallel designation of the Jordan River along with the Dead Sea as a future World Heritage site (see below) or for Jordan to receive more favourable access to trans-boundary water shared with Israel – through releases from Lake Tiberias.
- Design and development by the government of a less ambitious and more sustainable project to build a 100 MCM / year desalination plant near Aqaba.⁵⁵ This would contribute to medium-term requirements and serve as an insurance policy against delay in the development of a Red Sea Dead Sea water conveyor, or the project's abandonment. In the view of experts, an Aqaba facility of this size is feasible from a technical (including seismic risk) perspective and could be built north of the airport.⁵⁶ Supplies generated would meet requirements for growth in the south, and could potentially serve transboundary demand in Israel and Palestine – a bargaining chip for the inward transfer of water from Israel in exchange, in the north for example, through releases from Lake Tiberias. When presented as a regional project, funding should be feasible.⁵⁷ However, the project would need a positive environmental assessment on the impact of discharging brine from the desalination process into the Gulf of Aqaba and a regional mandate from riparian states, which along with Jordan are collectively committed to coastal and marine environment conservation.⁵⁸ The alternative option of discharging brine in the desert requires study. Jordan's announced plan to desalinate up to 70 MCM / year in Aqaba (see BOX) - would

⁵⁵ Personal interviews 2010-12. The idea of a desalination plant in Aqaba has been mooted for several years. *Inter alia* see Coyne et Bellier, op.cit.

⁵⁶ Personal interview 2010, 2012. Any larger facility would be politically problematic since concentrated brine disposal in the Red Sea would be of concern to Gulf of Aqaba riparians and environmental groups.

⁵⁷ USAID consultants have suggested the agency support a pre-feasibility study. See USAID, op.cit.

⁵⁸ See earlier discussion and footnote in this chapter.

suggest it is moving in the direction of a smaller Aqaba desalination plant. The prospect of USAID funding for scoping and pre-feasibility studies is encouraging.⁵⁹

Whatever the outcome of the Red Sea-Dead Sea mega project controversy, there is growing imperative for increased regional cooperation. If any variant of the RSDSWC is approved by the parties, international support will depend on a level of cooperation not hitherto achieved amongst the Jordan River's riparians to manage its flows more sustainably. Without a conveyor project, the existing imperative for enhanced regional cooperation over shared resources and joint projects to secure additional water supplies, discussed next, becomes the more evident. Furthermore, with regard to bulk water for the long term, Jordan needs a Plan B.

Regional cooperation and international diplomacy

Jordan's water policy has long reflected asymmetry of power with its neighbours. Downstream from Israel and Syria on the Jordan River and from Syria on the Yarmouk, its leverage in terms of policy towards or enforcing its rights over these surface waters is limited. At the same time, although enjoying wide international support, the Kingdom is small and lacks the power and resources to insulate itself from regional instability, reacting to its consequences as they occur. The unresolved Arab-Israeli dispute and the suspicions it generates amongst Jordanians towards Israel, means that further normalisation of relations that pursuit of cooperation with Israel implies, would likely meet opposition 'on the street'.⁶⁰ From the early 1990s, therefore, when Jordan began to look for new water supplies, its preferred path to secure these was a costly, unilateral one - the Disi project and more recently the JRSP, now scaled down. Significant flows of donor aid and rents from the Gulf provided a cushion for the economy - permitting 'business as usual' with regard to funding the patronage state and postponing reform of centralised structures, and indirectly supported the government's unilateral effort to implement the unaffordable JRSP idea, though it lacked popular support.

⁵⁹ USAID consultants recommended agency funding for such a plant. USAID (2012), op.cit., p.xvii.

⁶⁰ Protests took place in Amman in May 2012 against the 1994 Israel-Jordan Peace Treaty. They were attributed to the appointment of Prime Minister, Fawez Tarawneh, who was prime minister when the agreement was signed. The treaty is perceived by many to be unfair, in particular regarding water.

Nonetheless, Jordan, like its neighbours has always had a strong self-interest in increasing regional cooperation to reap benefits where possible and to pre-empt water and other resource crises spreading across borders by addressing these effectively before they do. It has recognised that unilateral approaches must be complemented by regional collaboration on supply- and demand-side solutions. Stated objectives include:⁶¹ i) *to protect and conserve the region's shared surface and underground waters; ii) to protect and defend Jordan's rightful shares of water resources through bilateral and multilateral cooperation; iii) to reach understandings on how to use water efficiently and to transfer knowledge and technology on how to manage water and maximise the use of every drop; iv) to give special attention to projects providing multilateral and bilateral benefits; v) to respect applicable international law with regard to water sharing, protection and conservation and territorial waters; vi) to pursue bilateral and multilateral cooperation with neighbours through a Regional Water Charter.*

This paper agrees with non-governmental organisations and experts that finding ways to fulfil these objectives is a priority. Increased regional cooperation can no longer be treated as an aspiration. It is a pre-requisite for, intertwined with and therefore critical to, the success of Jordan's overall mix of short-, medium- and long-term water solutions. Jordan needs to be pro-active in adopting a multi-pronged regional approach – alongside its local strategies – in order to facilitate and boost cooperation and thus to mitigate the dangers to the volume and quality of transboundary water flows, and to find new resources. The urgency is the greater because the global nature of climate change means international players are increasingly likely to make support for both local and regional projects contingent on Jordan and its neighbours taking action themselves, individually and collectively, to protect resources, enhance governance and promote water security.

Some may say that regional tensions associated with the failure of the Middle East Peace Process (MEPP) and the Arab uprisings render the pursuit of increased regional

⁶¹ See Jordan Water Strategy, op.cit., pp.3-9. In April 2012, then water minister Mousa Jamani called for greater cooperation amongst Arabs to protect the region's shared surface and underground resources, 85% of which are controlled by non-Arab countries, to reach understanding on how to use water and share it equally, and to transfer knowledge and technology on how to manage water and maximise the use of every drop. See *The Jordan Times*, April 16, 2012.

cooperation impractical. However, the arguments in favour of supporting initiatives where politically feasible are strong because, as history shows, political dynamics in the Middle East change. Jordan scored some success in 1994 when it secured a water agreement as part of its Peace Treaty with Israel.⁶² Recent regional engagement over the World Bank-led RSDSWC study programme demonstrated that regular discussions can enhance the spirit of cooperation. Current political instability provides added rationale lest ongoing collaboration with neighbours, however modest, gives way to suspicion and distrust.

Others argue that Jordan has scant bargaining leverage vis-a-vis its powerful neighbours, pointing to Israel's infringements of its water agreement with Jordan as well as Syria's persistent violations of bilateral water-sharing agreements concerning storage in the Wehde Dam and exploitation of Yarmouk waters. However, Jordan may not be exploiting all available opportunities to maximise what leverage it has. Played cleverly, efforts to advance regional and transboundary cooperation could lead to broader cooperation and beneficial trade-offs in the water-food-energy-transport nexus. Meanwhile, insufficient attention to transboundary differences or inequities risks allowing these to feed broader tensions.

For Jordan, climate-change impacts could exacerbate the severe water scarcity it already faces. Maintaining patterns of cross-border cooperation, such as they are, but also enhancing them, is a must. The task, therefore, in preparation for more promising political contexts, is to identify areas for regional coordination that would contribute to sustainable management of the region's resources – within and inter-basin. The following four strategies are briefly discussed because they would individually and collectively serve Jordan's interest, as well as those of participating neighbours. These strategies offer promise. Taken together, they are regional and national in approach - requiring action at both levels. They touch upon demand- and supply-side aspects, and could be effective in the immediate or longer term. They are based on ideas that, while in some

⁶² See Treaty of Peace between the State of Israel and the Hashemite Kingdom of Jordan Article 6 and Annex II. http://foeme.org/www/?module=regional_data&record_id=3

cases bold, would be considered feasible as political dynamics change. All are in the public domain. Some have captured the imagination of high-level, influential thinkers who are taking them forward. Now is the time for Jordan to explore these ideas and harness support for indispensable regional cooperative efforts to manage resources sustainably, for it is in the region where long-term water security must be negotiated.

i) Towards a Regional Authority - dialogue and cooperation:

The Strategic Foresight Group (SFG) recently promoted the idea of a Cooperation Council for Water Resources in the Middle East constituted by Heads of Governments and supported by an institutional framework.⁶³ The Council is perceived as a mechanism which could support Iraq, Jordan, Lebanon, Syria and Turkey to develop a shared and cooperative vision and implement political decisions around water. It would do so by promoting the objectives of evolving a consensus on principles of cooperation, drawing guidelines for common standardising measurements, interpretation and exchange of data, developing means to combat climate change, and setting goals for restoring water bodies and sustainably managing water resources. The intention behind the Council's work is to lay foundations for a future regional community of water and environment. The first step towards this goal came in 2012 with the formation of an independent High Level group, chaired by HRH Prince Hassan bin Talal, with the mandate to develop a vision for cooperation on water resources between the five countries.⁶⁴

Politically, the group should be able to make headway. All countries, including Iraq and Syria which will in due course be represented, have in the recent past demonstrated political will for cooperation in trade, transit and telecommunications. High Level Group members are independents, have significant collective experience and moral authority, and reflect regional ownership of the idea. Furthermore, the mandate of the High Level group - to take into account existing agreements and efforts between governments - should be acceptable from respective national perspectives when taking into account that

⁶³ Strategic Foresight Group, op.cit., p.20.

⁶⁴ Prince Hassan has promoted the idea of a regional community of water for some years. Initially comprising a former Turkish foreign Minister and a former Lebanese finance minister, the group will in due course include representatives from Iraq and Syria. See Press Release, 'Regional group on water, led by Prince Hassan', April 10, 2012, Global Leadership Foundation, Bern, Switzerland.

the group is specifically not a negotiating body. Turkey's participation is key: Since water resources crucial to Turkey's southern neighbours flow from Turkish territory, its involvement will be a pre-requisite for the success of a future cooperation mechanism. Moreover all group members are likely to enjoy good access to relevant political elites, including government ministers, in order to draw in national views on a regional mandate for a future Council, and suggestions for eventual trade-offs.

The recent founding of the High Level group is important and timely because it provides a voice and platform for innovative thinking on the region's interdependencies. It can drive valuable preparatory work for when Jordan's political leaders and counterparts are ready to raise such regional interactions to an institutional level, giving substance to the idea of a Regional Water Authority. Interactions could stimulate cooperation that would positively influence the transboundary and multilateral strategies discussed below, which, if played right, could contribute significantly to Jordan's water future.

ii) Forging transboundary cooperation:

A significant proportion of Jordan's water supplies (see Chapter 1), is transboundary - shared with Syria, Israel, and Saudi Arabia. If Jordan is to narrow projected water deficits, it will need to maintain the quantity and quality of water it receives from shared sources and ensure that in future it receives its rightful shares and fully explores opportunities to augment them.

These needs provide incentive for improved bilateral cooperation, since uneasy political relations between Jordan and its neighbours have prevented even cross-border supervision, which is the minimum shared water resources require. Where agreement has been reached over allocations, suspicions and misinformation abound (see BOX). Today's regional instability and uncertainties, and climate-change impacts aggravate the risk that existing fragile understandings with neighbours will be upset.⁶⁵

⁶⁵ It was not surprising that Jordanians, when recently protesting the peace treaty with Israel, cited Israeli water infringements as a major complaint. Understandable was the then water minister's visit to the Yarmouk River in April 2012 to check whether instability in Syria might have affected river flows and his

However, moments of political change also bring fresh opportunities. As the new Middle East takes shape, it will be important for Jordan to maximise unprecedented scope for fresh diplomacy over management of transboundary resources that could stimulate future cooperation with Syria, Jordan and Israel. Exchanges of technology, collaboration over

BOX 6: BILATERAL WATER-SHARING ACCORDS AND TALKS

Jordan and Syria signed a water-sharing agreement in 1987, which superseded the 1953 Johnston Plan under which Jordan was allocated 375 MCM / year. However, Jordan alleges Syrian infringements of the 1987 accord and complains it receives only 50-100 MCM / year from the Yarmouk instead of the 208 MCM / year share stipulated. This is because the River's flow has fallen, due to the construction by Syrians of ditches and pumps enabling storage of river water. For the same reasons storage in the Wehde Dam downstream in Jordan, is far below the storage capacity jointly agreed in a 2001 agreement.⁶⁶

Jordanian-Saudi communications over the Disi fossil water aquifer deteriorated during the 1990s and in 2002 Jordan declared Disi aquifer a national security issue.⁶⁷ Matters improved by 2008, but talks fizzled out, as both countries developed independent plans. No adequate data about the aquifer's use is available.⁶⁸ Since the Disi pipeline to Amman, due for completion in 2013, is to provide the capital with future water supplies – 100MCM / year for around fifty years - there are understandable concerns about maintaining water quality. A recent USAID-funded report suggested Jordan should alter its extraction model and increase volumes withdrawn.

The 1994 Jordan-Israel Peace Treaty contains a water-sharing agreement under which Jordan is to receive 50 MCM / year of Jordan River water. However, Jordanians complain that Israel's commitment under the Treaty with regard to cooperation through the Joint Water Committee on finding ways to augment water supplies to Jordan by a further 50 MCM / year⁶⁹ have come to nothing.

information and data in the water sector, or wider transit, energy, resource and trade deals could all be expected to attract outside support.

Syria's political transition will be drawn out and it is too early to say what form it will take, but it could be a positive game changer. Syrians will need to re-build their country and Jordan, when renewing bilateral relations, has strong incentive to make water a priority and to press as soon as practical for a resolution of differences over use of

subsequent call for political action to end violations of the water-sharing accord. See 'Yarmouk water-sharing violations require political solution', *The Jordan Times*, 28 April 2012.

⁶⁶ For a discussion see D. E. Rosenberg, op.cit., pp.23-29.

⁶⁷ See G. Shapland, *Rivers of Discord: International Water Disputes in the Middle East*, Hurst & Company, London, 1997 and F. Degreco, 'The securitization of the Disi Aquifer: a silent conflict between Jordan and Saudi Arabia'. *SOAS Water Issues Group*, 2005.

http://www.soas.ac.uk/research/our_research/projects/waterissues/papers/38415.pdf

⁶⁸ Jordan and Saudi Arabia appear to have chosen to keep data on capacity secret. See Degreco, op.cit.

⁶⁹ See Treaty of Peace, op.cit. Annex II. http://foeme.org/www/?module=regional_data&record_id=3

Yarmouk River resources. Neither country can sustain current high levels of water use for irrigation. So, any water cooperation accord would need to be linked to understandings of each country's respective efforts to curb water use for agriculture. As the SFG suggests, early commissioning of a joint hydro-geological study of the Yarmouk River Basin would be a first step.⁷⁰ Data collected on quantity and quality and levels of water consumed up and downstream for crop cultivation could then provide the basis for agreement on water sharing and joint cooperation over maintenance of water quality and pollution prevention and developing irrigation technologies and water-efficient cropping. Provided the two countries can together identify the benefit in moving forward with a study and agreeing findings, there is every reason to open channels for discussions at prime ministerial and inter-ministerial levels as in the past. The Jordanian and Syrian governments, if they so decide, could then launch discussions on water sharing, water quality, Wehde dam operations and technical cooperation. Improved bilateral cooperation could deliver Jordan an additional proportion - say up to 10 MCM/year - of its due share.

Concerns over Iran's political ambitions and the Arab uprisings have focused Saudi Arabia's attention on Jordan's value as a strategically-located monarchical state. Whether or not Jordan eventually joins the Gulf Cooperation Council (GCC),⁷¹ Jordan and Saudi Arabia have a shared interest in consolidating the stability of their countries through building on a history of collaborative ties - flows of skilled Jordanian labour to Saudi Arabia, military and security coordination, trade links and generous Saudi aid flows to Jordan. As Jordan exploits what leverage this provides, it would do well, in any bilateral talks, to make water a priority - in particular relating to Disi aquifer waters, given their critical importance for Amman's water supply, and the potential for Jordan to extract more than the 122 MCM / year planned in order to increase supplies to Aqaba. Jordan could initiate follow-up on past work of the Joint Saudi Arabia-Jordan Aquifer Management Committee. Jordanian and Saudi decision makers, if they so decide, could then finalise and

⁷⁰ For some of the following points see Strategic Foresight Group, *op.cit.*, p. 27.

⁷¹ For many years Jordan has lobbied for membership of the six-state GCC, established in 1980 following the Iranian Revolution. The issue is not decided and may hang on whether or not Jordanian political reform leads to change of power structures, with the Jordanian monarchy handing some power to elected governments. This would likely be unwelcome to Saudi Arabia. See Fares Braizat, 'Jordan Joining the GCC: Strategic Regional Realignment', Doha Institute, May 2011.

sign an existing draft bilateral agreement on information sharing.⁷² Provided the two countries jointly make a request, outside technical support for joint activities - *inter alia* on information-gathering and exchange, monitoring and common management plans - would likely be forthcoming.⁷³

Effective dialogue on the politically-sensitive Disi issue would provide a promising basis for widening Jordanian-Saudi cooperation on desalination technologies, information-sharing on climate change and a range of related energy and trade issues. Eventual Saudi support for a Red Sea Dead Sea water conveyor project, or other bulk supply alternatives discussed below, could provide an unprecedented cornerstone for promoting a strategic regional framework for water and energy arrangements for the long term.

With regard to Israel, the Joint Israeli-Jordan Water Committee has failed to deliver on the 1994 Treaty commitment to augment water supplies to Jordan by 50 MCM / year. Jordan has strong incentive to press Israel on this and could use what bargaining leverage it has with the United States during President Obama's second term. If USAID were to agree to assist with aspects of funding an Aqaba desalination plant that would provide Israel and the PA with some desalinated water, then a swap with Tiberias water could perhaps be secured (see below).

iii) Engaging in joint projects

a) Shared desalination and storage

Jordan, like its neighbours, is looking to desalinate seawater to supplement inadequate freshwater supplies. Both Syria and Lebanon will want to forestall unmanageable water deficits from developing and Israel is unilaterally pursuing desalination on a grand scale. Levels of distrust so far have rendered the idea of joint desalination less attractive but politics are changing. Approval by Jordan and Israel of the RSDSWC feasibility study,

⁷² For a discussion of past bilateral contacts on shared transboundary groundwater, see USAID, *Advancing the Blue Revolution Initiative: Activity 1.3 Trip Report: Assessing Transboundary and Domestic Aquifer Opportunities for Joint Action in Jordan and Saudi Arabia*, March 2008.

http://pdf.usaid.gov/pdf_docs/PNADY209.pdf

⁷³ Ibid.

despite differences over its eventual legal framework, suggest further cooperation will be possible. Moreover, experts across the Jordanian-Israeli political divide acknowledge that joint projects carry advantages that make them attractive long-term options.⁷⁴ These include:

- i) enhanced security of infrastructure and resources where partners have a shared stake;
- ii) easier access to funding from the international community, reducing the costs that a party acting alone would have to shoulder;
- iii) a 'peace dividend', resulting from joint management and information and technical exchanges, that generates international goodwill and support for related activities;
- iv) exchange of technologies resulting in expanded private-sector involvement;
- v) provision of additional water supplies that would reduce pressure on shared freshwater resources and increase motivation for cooperation (e.g. Jordan River, Lake Tiberias, and Yarmouk River).

These advantages suggest Jordan has an incentive to consider a cooperative dimension should it opt to proceed with the 100 MCM / year Aqaba desalination plant proposed earlier. The plant could provide some water for Israel and the PA and in turn smooth the way to an Israeli-Jordanian agreement on augmentation of supplies to Jordan – in line with the Peace Treaty - through release of additional supplies from Lake Tiberias. However, in the absence of an Israeli-Palestinian peace accord, such an agreement would face opposition both in Jordan and Palestine.

In the event that the idea of a Red Sea Dead Sea water conveyor is abandoned as a result of the opposition it generates as well as any technical difficulties, then Jordan, Israel and the PA, with the support of the international community, might once again look at the cheaper Med-Dead options, despite the political difficulties attached.⁷⁵

b) Application for World Heritage status for the Dead Sea and Jordan River

⁷⁴ Personal interviews with water experts and NGOs, 2010-12.

⁷⁵ See earlier discussion on page 111 and footnotes.

There has been talk in Amman's official circles of the possibility of applying to UNESCO for recognition of the Dead Sea as a World Heritage site.⁷⁶ Such an application, if carefully developed, could complement strategies discussed here, need not constrain the RSDSWC project, and could bolster its prospects. An application would need to specify exactly what aspects of the Dead Sea are to be recognised and propose how they would be sustained and managed. Drawing up an application would require close consultation – at a minimum between Jordan, Israel and the PA - to ensure that its stated objectives i) are compatible with, and do not cut across, those of a Red Sea-Dead Sea conveyor, and vice versa; and ii) are consistent with their countries' interests as Jordan River and Dead Sea riparians. The two Arab parties, who are party to the Jordan River Initiative for Cooperation (JRIC) initiative, would need to rally their partners in support.⁷⁷

The prospect of international support for a World Heritage aspiration could spur unprecedented cooperation rather than competition amongst riparians over future use of Jordan River resources. If, given the multiple benefits that success would bring, the riparians agreed to own and drive an application for World Heritage Site status for the Dead Sea, this would imply prior acceptance of and agreement on the joint responsibilities they would be expected to bear in maintaining and preserving what is to be protected. Before an application is submitted, therefore, the parties would need to agree on how they would cooperate and jointly manage the shared Jordan River watercourse flowing into the Dead Sea and on respective plans for sustainable use of water resources allocated.

Levels of trust vary, but this degree of cooperation should be feasible, given the channels of communications established among the parties. For the idea of a World Heritage Site application to gain momentum, the parties would need to propose and support a mandate - acceptable from their own national viewpoints - for a consultative mechanism to

⁷⁶ Personal interview, 2010.

⁷⁷ Four Arab parties, Jordan, Lebanon, Syria and the PA launched the initiative in 2009. All are committed to the Convention on the Law of the Non-Navigational Uses of International Water Courses. See details of workshop on the Jordan River Initiative for Cooperation, 'Exploring an Arab Riparian Jordan River Basin Initiative, Stockholm International Water Institute, 2010' World Water Week 2009.

address the challenging issue of shared water resources. International donors could be expected to respond positively to requests for technical and financial support for projects mandated by the three authorities as part of their effort to build agreement for a formula for equitable and reasonable allocations of shared Jordan River resources.⁷⁸

Successful development of an application and the necessary consultative process, leading to the site's eventual recognition, could provide unimaginable 'win-win' outcomes for Dead Sea riparians including:

- i) obligations undertaken by the international community to act to protect the Dead Sea;
- ii) a politically-feasible approach to fulfil conditions regarding improved water management likely to be required by potential investors in a Red Sea-Dead Sea project and to be part of a future multilateral agreement;
- iii) a mechanism for water-stressed countries to cooperate over rather than compete for precious shared water resources of the River Jordan;
- iv) means to protect the Lower Jordan River environment leading to improved health and human security, and attracting economic investment;
- v) means to access international political and financial support for projects aimed at protecting the Dead Sea and Jordan River flows, including the transfer of technologies for the collection and exchange of data, and monitoring;
- vi) employment opportunities for Jordanians with knock-on effects for economic growth; and
- vii) a 'peace dividend', encouraging broader outside investment in the three economies.

It would seem advisable, therefore, for the GOJ to engage in active diplomacy in support of the preparation of an application for World Heritage Site status for the Dead Sea, if it has not already done so. The potential benefits are evident and the financing of the

⁷⁸ Following requests for support, technical assistance and technologies might be provided for individual and joint information gathering and exchange, monitoring and joint management. There is significant literature suggesting that to reach agreement on potential 'equitable and reasonable allocations', water rights, or 'rightful allocations', need to be established through a process of quantification, water use and water trading, and 'new sources' developed while ensuring that more sustainable use of existing sources is agreed. See, for example, David Phillips et al, 'The Water Rights of the Co-Riparians to the Jordan River Basin', pp. 1-20, 2006. <http://www.nad-plo.org/userfiles/file/Reports/wrr.pdf>. Accessed December 2012.

RSDSWC project, if approved, would likely depend on the three parties coordinating comprehensive water management of Jordan River waters.

c) 'Virtual water' trade

Through importing larger shares of food needs, countries such as Jordan can save groundwater resources and reduce pressure on aquifers. More generally, 'virtual water' trade practised between countries which are well endowed with water and those that are not, could contribute to real water savings among these countries. So far the regional market in the Levant is not sufficiently developed. Moreover, balance of payments constraints and regional instability are further impediment. However, the role of agricultural trade in Jordan's water security has grown inexorably over twenty years, and can only grow further. The future contribution of 'virtual water' trade to Jordan's food and water security therefore requires further analysis. The subject is a serious candidate for detailed inquiry as groups of countries in the region assemble economic and scientific information with regard to future use of the region's water resources.

iv) Transfer of bulk water from Turkey

Turkey has long been a potential candidate for the export of high-quality potable water to the Levant region.⁷⁹ Though not water-abundant in global terms, it is far better endowed than its Middle Eastern neighbours, and does have export capacity. Taking into account Turkey's plans for development and potential climate-change impacts, the combined export capacity of the Seyhan and Ceyhan Rivers - projected until recently at 1,000-1,500 MCM / year to 2020 - may no longer be reliable.⁸⁰ In the case of the Manavgat area, export capacity of existing plant is only 200-400 MCM / year, although this could be developed.⁸¹

⁷⁹ The extensive literature on the subject includes Strategic Foresight Group, op.cit., pp.39-43. G.E. Gruen, op.cit.; M.Rende,op.cit.;B. Wachtel and A. Liel, op.cit.; IPCRI, op.cit.
<http://www.ipcri.org/files/waterimports.pdf>

⁸⁰ See Strategic Foresight Group projection, based on Turkey's State Hydraulic Works (DSI), op. cit., p.41.

⁸¹ It is estimated that up to 1,800 MCM / year could be available for export. Strategic Foresight Group, op.cit., pp. 39-41.

Turkey would like to export water to the extent it has capacity and has historically supported plans to export to the Middle East in order *inter alia* to strengthen its political status. Proposals date to President Ozal's 1986 Peace Pipeline plan, which aimed to transport water from the Seyhan and Ceyhan Rivers to Syria, Jordan, Palestine and the Gulf states. In the past Turkey and Jordan discussed possible Turkish exports to Jordan. A proposal to export water from the Manavgat River by tanker to Israel, though never finalised, was discussed.⁸² However, other Mediterranean countries are also interested in purchasing Turkey's water.⁸³ If Turkey were to reach long-term agreements with them, Jordan and its neighbours would lose the chance that the purchase of Turkey's water offers to help mitigate the threat of water scarcity in the Levant in the longer term.

Thus, Prince Hassan's initiative to build cooperation around water issues between Turkey and Arab states in the first instance, and later Israel, is critically important. It taps into past interest of all parties. By highlighting the mutual benefits to Turkey, Jordan and other regional players of cooperating over water and other issues, the initiative could keep open the option of water transfer to the region, adding relevance to the idea of a Regional Water Authority. Furthermore, such hydro-diplomacy could stimulate wider cooperation and studies among the parties, leading potentially to linked deals on the transport of gas, oil and electricity all of which would boost economic growth.

Since the potential availability of potable water from Turkey could make all the difference to Jordan's ability to meet long- and even medium-term demand, the following options should be kept on the agenda.

a) Land pipeline via Syria to Jordan:

Several options for the transfer of Seyhan and Ceyhan River waters have been discussed. Of these, the idea of a pipeline from Turkey via Syria to Jordan attracted interest in the past. But it appears to have lost support amongst Turkish officials, since industry and

⁸² M.Rende, op.cit., pp.12-14; Strategic Foresight Group, op.cit., pp.39-40; IPCRI, op.cit.

⁸³ Northern Cyprus already receives some water. Greek Cyprus, Malta and Libya have expressed interest. See *Turkish Weekly*, 'Turkey Willing to Resume Water Export Talks with Libya', 12 August 2009.

agriculture development around the rivers has eroded export capacity.⁸⁴ Technically, export capacity of 1,000-1,500 MCM / year would be available to 2020, but, due to Turkey's local demand during dry months, would mainly flow over eight months of the year. Supplies would not be continuous and pipelines subject to corrosion.

For now, with Jordan's attention focused on the RSDSWC project and Turkey's interest firmly shelved, the option does not appear realistic. Keeping the idea on the table in some modified form, as part of potential collaboration with Turkey and Syria when politics permit, would seem wise, however. A modified pipeline might appear politically feasible later on, for example in the context of a Marshall-type plan for Syria's reconstruction and with appropriate international guarantees and legal framework. Scientific analysis would be required to identify the scale of future export capacity, if any. To overcome identified technical problems, storage reservoirs could be established along the rivers to ensure steady export flows throughout the year.⁸⁵ Moreover, the plan could be self-sufficient in terms of energy required to convey the water. Out-of-date projections for the original Peace Pipeline put costs at today's prices above those for a Med-Dead conveyor option to supply bulk water, say experts.⁸⁶ However, a modified pipeline would cost less and the political imperative might be sufficient to draw in the necessary financing, which would also depend on the governments of Turkey, Syria and Jordan meeting specific commitments and responsibilities on joint monitoring and management of the project.

Water supplies by land pipeline from Turkey to Syria could be expected to provide some flexibility in Jordanian-Syrian sharing of Yarmouk River resources. Israel, which expects to depend on desalinated sea-water, would have no reason to object.

⁸⁴ The idea draws on, but is less ambitious, than the earlier Ozal Peace Pipeline and Wachtal pipeline. The former, which excluded Israel, was not supported by the Gulf States, who opted for desalination. The latter attracted serious interest during Israeli-Syrian peace talks but was buried with them. For details of the idea in its various forms and for arguments in this para see Rende, op.cit. pp. 16-19, Strategic Foresight Group, op.cit., G.E Gruen, op.cit., IPCRI, op.cit., and B.Wachtel and A. Liel, op.cit.

⁸⁵ Personal interview, April 2012.

⁸⁶ Personal interviews, 2010, 2012. Turkey-Jordan pipeline costs were put at \$5bn in 2003, IPCRI, op.cit.

b) Future undersea network of pipelines through the Mediterranean

A second option from which Jordan could benefit is the idea discussed recently between Turkey and Israel of a potential network of pipelines to carry natural, gas, oil, water and fibre-optics / electricity.⁸⁷ The 450-km pipeline would extend from the Ceyhan Basin south through the Mediterranean and could deliver up to 1,000 MCM / year to Israel's coastline to be distributed as agreed. Costs, which compare favourably with other mega project supply options, could, it is suggested, be met by public and private sectors wanting to use the pipelines.⁸⁸ A major technical difficulty is posed by the Mediterranean's depth and the potential adverse impact of water pressure on pipelines and contents.⁸⁹ Feasibility studies are required to assess how to overcome this difficulty; to assess more precisely the likely exportable surplus from the Ceyhan / Seyhan Basin; and to compare the cost of undersea pipeline transport of water with alternative transport by tanker or bag from the Manavgat area in Turkey (see below).

c) Transfer by tanker or bag from Turkey's Manavgat river

A third more feasible option for consideration would be the purchase of Turkish water transferred from the Manavgat facilities in southern Turkey by tanker or floating bag to Israel's coastline. Exports from Manavgat of some 400 MCM / year – the terminal's existing capacity - even if shared with other beneficiaries, would be significant for Jordan. Israel rejected this option in favour of developing less-costly desalinated water, but it remains potentially attractive to Jordan either as part of a package of bilateral arrangements with Turkey, or as part of a regional package involving Israel, or as a medium-term source of potable water pending a longer-term bulk solution. The option requires further study of political, financial and contractual issues. Technically, tanker transport is considered more reliable than conveyance by floating bag.⁹⁰

The Arab uprisings, unpredictable Turkish-Israeli relations and the ongoing Israeli–Palestinian conflict, make it difficult for Jordan publicly to support exploring these ideas.

⁸⁷ For analysis of the idea, see Strategic Foresight Group, op.cit., pp. 42-43. and IPCRI, op.cit.

⁸⁸ IPCRI, op.cit., p.3.

⁸⁹ Personal interview data. IPCRI, op.cit.

⁹⁰ For remarks on Spragg bag technology, see www.internationalwaterlaw.org/blog/category/middle-east

An improvement in Turkish-Israeli relations and an end to the Israeli-Palestinian conflict would, however, be ‘game changers’ with regard to the feasibility of Turkish water transfer options. The two latter projects discussed above could significantly benefit Lower Jordan River riparians, including Jordan. Given Israeli plans to meet its own water needs through desalination, a volume of Turkish water could, with Israel’s agreement and with a quid pro quo to be negotiated, be transported directly to Lake Tiberias. Jordan and Palestine could then benefit from augmented supplies released from the Lake - with agreed quantities to flow into the Dead Sea. Regional cooperation involving Israel and the PA and contributing towards replenishing the Jordan River and Dead Sea – both clear ‘peace dividends’ - could be expected to attract international financial support for the required investment in conveyance from coast to lake.

- In view of significance for Jordan of potential water imports from Turkey, the above options should be kept high on the agenda. It is proposed the government provide diplomatic support for, extend technical cooperation to, and rally international support behind the work planned by the Strategic Foresight High Level Group. Studies need to be commissioned and scientific and economic data collected to evaluate the feasibility of these options. This would depend on Turkey’s likely export capacity from 2020, taking into account its national needs, long-term climate-change impacts on and seasonal variations of river flows and costs of transporting water via land or sub-marine pipelines or tanker. Armed with reliable scientific and economic data, Jordan’s decision-makers and their regional counterparts would be ready to make responsible choices when political circumstances are right.

Conclusion

The options for water solutions discussed in this study could, in various combinations, help Jordan to address the severe medium- and long-term water crises it faces. Success will depend on whether national leaders are *politically willing* i) to exploit the opportunities the political transition provides to introduce a ‘step change’ in water reforms through a frame of integrated planning in which water is prioritised and its management aligned with economic policies geared to economic growth and ii) to sequence actions in a manner that captures a constituency of support. Critical too, at a

time when Jordan must navigate difficult regional and international circumstances, will be the need to place the goal of regional cooperation over water issues high on the list of priorities in regional and international diplomacy.

Two combinations of options are offered, Mix 1 and Mix 2 (Table 6), that could narrow unmanageable projected deficits in the medium term, protect low-cost renewable resources for medium- and long-term use, improve flexibility for dealing with climate change and set Jordan on a path to a water-secure future. Mix 1 assumes that demand- and supply-side domestic improvements are combined with access to higher volumes of surface water as a result of negotiations with Israel and Syria, and that the RSDSWC is developed in time to deliver bulk water by 2025/26. Mix 2 is similar, but assumes that future bulk supplies are conveyed from Turkey, rather than accessed through desalination - as in the RSDSWC option. However, a third combination of options, Mix 3, reflects a more pessimistic scenario, where i) regional instability prevents Jordan from reaching an improved arrangement with Syria for additional Yarmouk water and ii) no regional bulk supply option, neither via desalination nor via transfer from Turkey, is developed by 2025/26.

It would be unrealistic to conclude from this study that there is a set of local and regional policies to be adopted by Jordan that can *guarantee* water supplies at reasonable prices through to the long term that would enable the country to fulfil its economic aspirations. Outcomes will be influenced by factors beyond Jordan's control; and whatever the future demand-supply scenario, access to water will remain a political matter. What is clear, however, is that if a path to a sustainable water future is to be found, a proactive nationwide coordinated approach to parallel political, economic and water reforms at home combined with imaginative and successful regional diplomacy that boosts cooperation over water and related economic and trade issues will be indispensable. The two are interlinked. Given the international donor community's recognition of the threat that water scarcity poses to its strategic ally's security, it can be expected to play a constructive role in supporting Jordan's efforts with legal, financial and technical assistance. The policy options discussed in this paper could make additional water

available, improve the sector's sustainability and relieve the pressures on Jordan that severe water scarcity poses until a long-term bulk-supply option is identified. In this context the need to find a solution to the Arab-Israel dispute and assist Syria to move beyond violence to peaceful transition, both of which would remove dangerous sources of tension between regional states, including over water, cannot be overstressed.

BIBLIOGRAPHY

Alon, Yoav, *The Making of Jordan: Tribes, Colonialism and the Modern State*, I.B. Tauris, 2009.

Allan, J.A., *The Middle East Water Question: Hydropolitics and the Global Economy*, I.B. Tauris, London, 2002.

Allan, J.A., *Virtual water eliminates water wars? A case study from the Middle East*, Chapter 9 in Hoekstra, A.(Ed), *Virtual water trade*, Delft (Netherlands): IHE, 2003, pp.137-145.

Alissa, S., *Rethinking Economic Reform in Jordan: Confronting Socioeconomic Realities*, Carnegie Endowment for Peace, Washington, August 2007.

<http://www.carnegieendowment.org/publications/index.cfm?fa=view&id=19465>

Alterman, John, *Clear Gold: Water as a Strategic Resource in the Middle East*, A Report of the CSIS Middle East Programme, December 2010.

<http://susristube.com/2011/01/25/introducing-clear-gold-csis-report-on-water-scarcityjon-alterman/>

Berman, Ilan, 'Water and Turkish Security', *Turkish Policy Quarterly*, December 1, 2002.

Braizat, Fares, 'Jordan Joining the GCC: Strategic Regional Realignment', Doha Institute, May 2011.

Chapagain, A., and Hoekstra, A., *Globalisation of Water*, Blackwell Publishing, Oxford, 2008.

Choucair-Vizoso, J., *Illusive Reform: Jordan's Stubborn Stability*, Carnegie Paper No. 76, Carnegie Endowment, Washington, December 2006.

Coyne et Bellier, *Project Flow Rates, Flow configurations and Potable Water Demands*, Work in Progress paper, 2010.

Coyne et Bellier, Red Sea - Dead Sea Water Conveyance Study Program, Feasibility Study, Draft Report on Sub Studies B and D, Summary, Report No 12 147 RP 02, June 2010.

Coyne et Bellier, Red Sea - Dead Sea Water Conveyance Study Program, Draft Final Feasibility Study Report (12 147 RP 04), Summary of Main Report October 2011.

Darley, P., Red Sea Study Programme: Project Overview, Amman, August 2008 (Private communication).

Degreco, F, 'The securitization of the Disi Aquifer: a silent conflict between Jordan and Saudi Arabia'. *SOAS Water Issues Group*, 2005.

http://www.soas.ac.uk/research/our_research/projects/waterissues/papers/38415.pdf

Denny, Elaine, et al, *Sustainable Water Strategies for Jordan*, Gerald R. Ford School of Public Policy, April 2008.

<http://www.umich.edu/~ipolicy/IEDP/2008jordan/IEDP%20Jordan%20-%20Water%20Strategies.pdf>

Deutsche Gesellschaft für Internationale Zusammenarbeit, *The HighlandWater Forum*, 2011.

Economist Intelligence Unit, *Jordan Country Forecast*, April 2012.

Economist Intelligence Unit, *Jordan Country Report*, April 2012.

El-Naser, Dr Hazim, *Virtual Water in the MENA Region – Political factors*, presented by Mohammad Abbadi, International Expert Seminar, German Development Institute, Bonn, December 12, 2005.

Emmerson, Charles, 'Worlds of Water', *World Today*, Vol. 67, No 7, pp.4-6.

Fischback, Michael R., *State, Society and Land in Jordan*, Leiden; Boston, 2000.

Fitch, James, *Curtailment of Groundwater Use for Irrigated Agriculture in the Amman-ZarqaBasin Uplands*, USAID/ARD, March, 2001, USAID.

http://pdf.usaid.gov/pdf_docs/PNACP592.pdf

Foreign and Commonwealth Office, *Building Stability Overseas Strategy*, 2011.

<http://www.fco.gov.uk/resources/en/pdf/publications/annual-reports/bsos-july-11>

Friends of the Earth Middle East (FOEME), *Climate change: A New Threat to Middle East Security*, Prepared for the United Nations Climate Change Conference, Bali, Indonesia, 2007.

Friends of the Earth Middle East (FOEME), *Towards a Living Jordan river: An Economic Analysis of Policy Options for Water Conservation in Jordan, Israel and Palestine*, Draft Report for Discussion Purposes, Eco Peace / FOEME, May 2010.

Government of Jordan, *Jordan Water Strategy, Water is Life, 2008-2022*, 2009.

http://www.idrc.ca/uploads/user-S/12431464431JO_Water-Strategy09.pdf

Government of Jordan, *The National Agenda, 2006-2015: The Jordan We Strive For*, 2005.

<http://ebookbrowse.com/englishbooklet-pdf-d21112160>

Greenwood, Scott, 'Jordan's "New Bargain:" The Political Economy of Regime Security', *Middle East Journal*, Vol 57, No 2, Spring 2003.

Gruen, G.E., 'Turkish Water Resources: A Model for Regional Cooperation in the Development of Water Resources', Columbia University Press, New York, 2005.

Gruen, G.E., 'Turkish Water Exports: A Model for Regional Cooperation in the Development of Water Resources', in Shuval, H. and Dweik, H., *Water Resources in the Middle East: Israel-Palestinian Water Issues – From conflict to Cooperation*, Chapter 15, Springer, Berlin 2007.

Gruen, G.E., 'Turkish Waters: Source of Regional conflict or Catalyst for Peace?', *Water, Air and Soil Pollution*, Vol.123, Kluwer, The Netherlands, 2000, pp.565-579.

GTZ, A multi-stakeholder dialogue for sustainable groundwater management in Jordan, Background note, GTZ, 2011.

Haddadin, Munther, J., *Water Resources in Jordan: Evolving Policies for Development, Environment and Conflict Resolution*, RFF Press, 2006.

Hagan, R., *Strategic Reform and Management of Jordan's Water Sector*, USAID, March 30, 2008.

Hamid, Shadi and Freer, Courtney, *How Stable is Jordan? King Abdullah's Half-hearted Reforms and the Challenge of the Arab Spring*, Brookings Doha Center, Policy Briefing, November 2011.

http://www.brookings.edu/~media/Files/rc/papers/2011/10_jordan_hamid_freer/10_jordan_hamid_freer.pdf

His Majesty King Abdullah II of Jordan, Discussion Papers 2012-2013

http://kingabdullah.jo/index.php/en_US/pages/view/id/244.html

Hoffman, Tyler, *A strategy to build a freshwater pipeline from Turkey to Jordan*, Monterey Institute of International Studies, California, Unpublished MA, Spring 2003.

International Crisis Group, 'Dallying with Reform in a Divided Jordan', Crisis Group Middle East/North Africa Report No 118, March 12, 2012.

IPCRI, 'Water Imports – An alternative Solution to Water Scarcity in Israel, Palestine and Jordan?', *Fact Sheet 2*, IPCRI, January 2010. <http://www.ipcri.org/files/waterimports.pdf>

Jaber, Hana, 'Jordan Awaits Its Own Spring', *Le Monde Diplomatique*, August 2012.

Johnstone, Sarah and Mazo, Jeffrey, 'Global Warming and the Arab Spring', *Survival*, Vol 53, No 2, April-May 2011.

Jordan Business, 'In Troubled Waters', 2007.

<http://www.transglobalwater.com/articles/jordan.php>

Keulertz, Martin, *The Political Economy of Water in Jordan*, MSc dissertation, SOAS, September 2008.

Khatib, Ahmed, 'Mahadin starts visit to Turkey for talks on purchasing water', *Jordan Times*, January 17, 2000.

Khoury, Rami, *The Jordan Valley*, Longman: New York, 1981.

Koldertsova, A., *Unequal Transitions from Above: An analysis of Political and Economic Liberalization in the Middle East*, MSc Dissertation, London School of Economics, 2006.

Lee, Bernice, 'Rio+20: This time politics must not be ignored', *World Today*, June & July 2012.

Lipchin, C. et al (Eds), *The Jordan River and Dead Sea Basin: Cooperation Amid Conflict*, Springer Science, 2009.

Loewe, Markus et al, *The Impact of Favouritism on the Business climate: A Study on Wasta in Jordan*, German Development Institute, Bonn, 2007.

[http://www.die-gdi.de/CMS-Homepage/openwebcms3.nsf/%28ynDK_contentByKey%29/ENTR-7BMBLJ/\\$FILE/Studies%2030.pdf](http://www.die-gdi.de/CMS-Homepage/openwebcms3.nsf/%28ynDK_contentByKey%29/ENTR-7BMBLJ/$FILE/Studies%2030.pdf)

Luomi, Mari, *Managing Blue Gold: New Perspectives on Water Security in the Levantine Middle East*, The Finnish Institute of International Affairs, 25/2010.

Murakami, M., *Managing Water for Peace in the Middle East: Alternative Strategies*, United Nations University Press, Tokyo-New York-Paris, 1995.

McIlwaine, S., 'Managing Jordan's Water Budget: Providing for Past, Present and Future Needs' in *The Jordan River and Dead Sea Basin: Cooperation Amid Conflict*, NATO Science for Peace and Security Series, Springer, 2009.

<http://www.springerlink.com/content/g40hu167223x4403/abstract/>

Milton Edwards, B. and Hinchcliffe, P., *Jordan: A Hashemite Legacy*, Routledge: London, 2001.

Ministry of Environment, *Jordan's Second National Communication to the United Nations Framework Convention on Climate Change (UNFCCC)*, 2009.

Ministry of Water and Irrigation, *Jordan's Water Strategy and Policies*, April 1997.

Ministry of Water and Irrigation, *Jordan's Water Strategy and Policies*, 2008.

Ministry of Water and Irrigation, *Jordan Red Sea Project (JRSP)*, MWH and Arabtech Jardaneh Engineers and Architects, July 2010.

Ministry of Water and Irrigation / Water Resources Group Confidential Paper, 2011.

Ministry of Water and Irrigation, Subah, Ali (MWI) and Habjoka, Nour (GIZ), *The Highland Water Forum: an Experience in Participatory Water Demand Management*, Powerpoint, December 3, 2011.

http://www.cmimarseille.org/_src/EW2_wk1/Data/Doc/D3-2.pdf

Ministry of Water and Irrigation, *Water Budget: Projected Demands and Resources 2010-2025*, 2012.

Muashar, Marwan, *A Decade of Struggling Reform Efforts in Jordan: The Resilience of the Rentier System*, Carnegie Endowment for International Peace, May 2011.

Muasher, Marwan, *Jordan's Proposed Constitutional Amendments - A First Step in the Right Direction*, Carnegie Endowment for International Peace, August 17, 2011.

Muasher, Marwan, Ottaway, Marina, Alterman, Jon, *Arab Monarchies Confront the Arab Spring*, Carnegie Endowment for International Peace, November 22, 2011.

Namrouqa, H., 'Regional Cooperation Needed to Protect Shared Water Resources – Jamani', *Jordan Times*, April 16, 2012.

Namrouqa, H., 'Yarmouk water sharing violations require political solution', *Jordan Times*, April 28, 2012.

Obaidat, Sufian, *Jordan: A Flowerless Spring*, Arab Reform Initiative, No 61, August, 2012.

Ottaway, Marina, *Evaluating Middle East Reform: Significant or Cosmetic?* in Ottaway, M. and Chucair-Vizoso, J., *Beyond the Façade: Political Reform in the Arab World*, Carnegie Endowment for International Peace, 2008.

Ottaway, Marina and Muasher, Marwan, *Arab Monarchies: Chance for Reform, Yet Unmet*, Carnegie Endowment for International Peace, December 2011.

Peters, Anne Mariel and Moore, Pete W., 'Beyond Boom and bust: External Rents, Durable Authoritarianism, and Institutional Adaptation in the Hashemite Kingdom of Jordan', *Studies in Comparative International Development*, Springer Science, 44, July 24 2009.

Phillips, D. et al, 'The Water Rights of the Co-Riparians to the Jordan River Basin', pp. 1-20, 2006 <http://www.nad-plo.org/userfiles/file/Reports/wrr.pdf>. Accessed December 2012.

Ravid, B., 'Israel and Turkey agree bilateral ties back on track', *Haaretz*, December 12, 2009.

Rende, M., *Water Transfer from Turkey to Water-Stressed Countries in the Middle East* in Shuval, H. and Dweik, H., *Water Resources in the Middle East: Israel-Palestinian Water Issues – From Conflict to Cooperation*, Chapter 16, Berlin, Springer, 2007.

Rende, M., *Turkey's Water Resources Management and Transboundary Waters Policy*, 4th Biennial Rosenberg International Forum on Water Policy, Power Point, September 7-8, 2004.

Rende, M., Interview with America Abroad Media, www.escriptionist.com

Robins, Philip, *A History of Jordan*, Cambridge University Press: Cambridge, 2004.

Rogan, Eugene and Tell, Tariq (Eds), *Village, Steppe and State: The Social Origins of Modern Jordan*, London: British Academic Press, 1994.

Rosegrant, M. W., *Dealing with Water Scarcity in the Next Century*, 2020 Vision, June 1995.

Rosenberg, David E. 'The Yarmouk River Agreements: Jordan-Syrian Transboundary Water Management, 1953-2004', *The Arab World Geographer*, Vol 9, No 1, 2006, pp.23-29.

Ryan, Curtis, 'Political Opposition and Reform Coalitions in Jordan', *British Journal of Middle Eastern Studies*, Vol 38, No 3, December 2011, pp.367-390.

Sadek, A., *Virtual Water Trade as a Solution for Water Scarcity in Egypt*, Water Resources Management Program, College of Graduate Studies, 2010.

Sadek, A., *Virtual water trade as a policy option*, WANA Forum 2011, <http://www.slideshare.net/WANAforum/el-sadek-virtual-water-7044452#btnNext>

Sadek, A., *Virtual Water Trade*, WANA Forum, 2011, <http://www.slideshare.net/WANAforum/virtual-water-trade-alaa-el-sadek>

Salameh, Professor Dr Elias, *Towards a Water Strategy for Jordan*, Royal Committee on Water, 2007.

Selby, J., 'The Geopolitics of Water in the Middle East: Fantasies and Realities', *Third World Quarterly*, Vol. 26(2), March 2005.

Schwedler, Jillian, 'Jordan's Risky business As Usual', *MERIP*, June 30, 2010. <http://www.merip.org/mero/mero063010>

Shapland, Greg, *Rivers of Discord: International Water Disputes in the Middle East*, Hurst & Company, London, 1997.

Shatanawi, M.R., *Sustainable Management and Rational Use of Water Resources*, pp.187-195.

Shuval H., and Dweik, H., *Water Resources in the Middle East*, Berlin: Springer, 2007.

Smith, Dan, 'Water, peace and security', in J. and Dr David Tickner, *Tackling the World Water Crisis: Reshaping the Future of Foreign Policy*, Foreign Policy Centre, May 2010.

Strategic Foresight Group, *The Blue Peace: Rethinking Middle East Water*, January 2011.

Strategic Foresight Group, *Water Security in the Middle East*, Montreux Report, February 15-16, 2010.

Strategic Foresight Group, Montreux, Meeting on Water Security in the Middle East, Keynote speaker Prince Hassan, February 2010.
http://www.strategicforesight.com/focus_areas.htm

Strategic Foresight Group, The Blue Peace Roundtable at Westminster, Report on Meeting in London, November 2012.

Tripp, Charles, *A History of Iraq*, Cambridge University Press, 2007.

Tutundjian, Setta, *Water Resources in Jordan*, 2000.

United Nations General Assembly, UN Millennium Declaration, September 18, 2000.
http://unstats.un.org/unsd/mdg/Resources/Static/Products/GAResolutions/55_2/a_res55_2e.pdf

UNESCO, Jordan Case Study in *Fourth World Water Development Report*, Vol. 3, Chapter 39, pp.793-797, Paris, March 2012.
<http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/pdf/WWDR4%20Volume%203-Facing%20the%20Challenges.pdf>

USAID, *Responding to the Water Crisis in Jordan*, 2007.

USAID, *Securing Jordan's Prosperity through improved Water Management*, Sabeq Programme, 2008.

USAID, *Jordan Country Strategy, 2010-2014*, March 2010.

USAID, *Strategic Statement: Jordan 2007-2011*.

USAID, *Jordan: Kap Household – Baseline Survey*, April 2010.

USAID, *Instituting Water Demand Management in Jordan (IDARA) Evaluation*, June 15, 2011.

USAID, *Audit of USAID/Jordan's Design for Sustainability in its Water Resources Program*, Audit Report No. 6-278-12-002-P, December 22, 2011.
<http://transition.usaid.gov/oig/public/fy12rpts/6-278-12-002-p.pdf>

USAID, *Review of Water Policies in Jordan and Recommendations for Strategic Priorities*, Final Report, April 2012.

USAK, 'Turkey Willing to Resume Water Export Talks with Libya', *Turkish Weekly*, August 12, 2009.

Varis, Olli, 'Right to Water: the Millennium Development Goals and Water in the MENA Region' in *Water as a Human Right for the Middle East*, Routledge / IDRC, 2008.

Venot, J.P. and Molle, F., *Groundwater Depletion in the Jordan Highlands: Can Pricing Policies Regulate Irrigation Water Use?* Springer Science, 2008.

Wilson, Mary, *King Abdullah, Britain and the making of Jordan*, Cambridge University Press: Cambridge, 1987.

Wolf, Aaron T., *Hydropolitics along the Jordan River: scarce water and its impact on the Arab-Israeli conflict*, United Nations University Press, 1995.

Wachtel, B. and Liel, A., "Peace Canal on the Golan" Proposal: Benefits and Risks for Regional Water Cooperation in the Middle East in C. Lipchin et al (eds), *The Jordan River and Dead Sea Basin: Cooperation Amid Conflict*, NATO Science for Peace and Security Programme, Springer, 2009, pp. 235-253.

Wachtel, B., 'Peace Canal on the Golan Heights': A peace plan integrated with a water import project from Turkey to Syria, Jordan, Israel and the Palestinian Authority, A collaborative effort with Freedom House, New York.

Wachtel, B., *The Peace Canal Plan – Peace plan/water import project from Turkey to the Middle East*, Notes supplied to the author, 2010.

World Bank, *Making the Most of Scarcity: Accountability for Better Water Management in MENA*, MENA Development Report on Water, 2007.

http://siteresources.worldbank.org/INTMENA/Resources/WaterSummary_ENG.pdf

For brief description, see <http://go.worldbank.org/WDPAMJ5290>

Yorke, Valerie, *Domestic Politics and Regional Security: Jordan, Syria and Israel: The End of an Era?* Gower Press: IISS, 1988.

Yorke, Valerie 'Exploding Jordan's demographic myth', *Middle East International*, No 323, April 16 1988.

Yorke, Valerie, 'A New Era for Jordan?', *The World Today*, Vol. 46, No. 2, February, 1990, pp. 27-31. <http://www.jstor.org/page/info/about/policies/terms.jsp>

Yorke, Valerie, *Jordan water scarcity, strategy and alternative solutions*, NCCR-Trade Regulation Workshop, Bern, November 27, 2009.

[http://www.wti.org/research/publication/?tx_nccr_pi1\[show\]=66&cHash=98df13d833f36343e13a451bb9759a4d](http://www.wti.org/research/publication/?tx_nccr_pi1[show]=66&cHash=98df13d833f36343e13a451bb9759a4d)

Yorke, Valerie, *Seizing the Moment: A Step Change in Jordan's Water Management in the Context of Political Transition*, Water, Trade and Sustainable Development Workshop, NCCR-Trade Regulation, Bern, January 24, 2013, [http://www.nccr-trade.org/events/water-trade-and-sustainable-development/?tx_nccr_pi1\[filter\]\[eventdate\]=all&tx_nccr_pi1\[filter\]\[wp\]=5&cHash=ae478d2c7378fd59042425c7d84ba0c7](http://www.nccr-trade.org/events/water-trade-and-sustainable-development/?tx_nccr_pi1[filter][eventdate]=all&tx_nccr_pi1[filter][wp]=5&cHash=ae478d2c7378fd59042425c7d84ba0c7)

Yorke, Valerie, *Post-elections, Jordan's new national leaders must prioritise and accelerate water reforms*, NCCR Trade Regulation, Press Release, 24 January 2013. <http://www.wti.org/media-information/#download-112>

Mark Zeitoun, Water: 'Ducking the issues', *Middle East International*, Vol 2, Issue No. 13 – 30, April 2010

Zeitoun, Mark, *Power and Water in the Middle East: The Hidden Politics of the Palestinian-Israeli Water Conflict*, I.B. Tauris, London, 2008.

Zeitoun, Mark, "The Political Economy of Water Demand Management in Yemen and Jordan: A synthesis of Findings," WAD1mena Water Demand Management Research Series, October 2009, 29-30. http://www.uea.ac.uk/polopoly_fs/1.147019!Zeitoun_PE_WDM_Yemen_and_Jordan.pdf

Treaty Document

Treaty of Peace between the State of Israel and the Hashemite Kingdom of Jordan (including texts of Annex II – Water and Annex IV - Environment), October 26 1994: http://foeme.org/www/?module=regional_data&record_id=3