

Julie Trottier

HYDROPOLITICS

**in the West Bank
and Gaza Strip**

PASSIA

Palestinian Academic Society for the Study of International Affairs

PASSIA, the Palestinian Academic Society for the Study of International Affairs, is an Arab, non-profit Palestinian institution with a financially and legally independent status. It is not affiliated with any government, political party or organization. PASSIA seeks to present the Question of Palestine in its national, Arab and international contexts through academic research, dialogue and publication.

PASSIA endeavors that research undertaken under its auspices be specialized, scientific and objective and that its symposia and workshops, whether international or intra-Palestinian, be open, self-critical and conducted in a spirit of harmony and cooperation.

Julie Trottier is currently a post-doctoral fellow at McGill University and the University of Montreal. This book is the English translation of her Ph.D. thesis successfully defended in December 1999 for the degree of Political Science/International Relations at the Université catholique de Louvain, Louvain-la-Neuve (UCL), Belgium. She holds Masters degrees in Chemistry and Political Science/International Relations from the UCL. Ms. Trottier first visited Palestine in 1994. She spent her most recent visit, between March 1998 and November 1999, researching for her Ph.D.

This book represents the free expression of its author and does not necessarily represent the judgement or opinions of PASSIA. It is presented as part of the PASSIA Research Studies Program of 1999, which is kindly supported by the Friedrich Ebert Foundation (FES), Jerusalem.

Cover Photos: Artas Village near Bethlehem, taken by Julie Trottier.

English Editing: Galit Gelbort
Layout and Design: Deniz Altayli

Copyright © PASSIA Publication
December 1999

Tel: 972-2-626 4426 ♦ Fax: 972-2-628 2819
E-mail: passia@palnet.com
Website: <http://www.passia.org>
PO Box 19545, Jerusalem

Contents

PREFACE	1
INTRODUCTION AND OVERVIEW OF THE LITERATURE	3
Overview of the Literature	5
Hydropolitical Analyses	6
Technical Analyses	28
Models/Proposals	29
Conclusion	30
RESEARCH METHOD	32
General Methodology	32
Methodology of this Study	35
CHAPTER 1: HISTORICAL OVERVIEW AND PRESENT SITUATION	39
Introduction	39
The Colonial Borders and the Partition of the River Basin	40
The Palestine Mandate and Water	43
A Hydraulic Imperative since the Time of the Mandate?	48
The Emergence of Israel	49
The Infrastructure Works of the 1950s and the Johnston Plan	56
The War of 1967	58
The Occupation of Southern Lebanon	61
The Expansion of Israel and Water	61
The Price of Water	62
The Madrid Process and Water	63
The Declaration of Principles of 13 September 1993	63
The Cairo Agreement of 4 May 1994	64
Sharing the Water - The Taba Agreement	66
The Israeli-Jordanian Peace Treaty of 26 October 1994	68
The Present Situation	70
Conclusion	71
CHAPTER 2: CONFLICTS AND CONFLICT ANALYSIS	73
Introduction	73
Dura and the Water Thief	74
The Water Profit-Maker of Anabta	78
The Jordanian Water Crisis of the Summer of 1998	80
The Conflict Opposing the Jerusalem Water Undertaking to the Jerusalem Municipality	82
The Conflict Concerning the Ein Sultan Spring	85
The Competition between the American and German Pipelines	94
Conclusion	97

CHAPTER 3: LOCAL HYDROPOLITICS	99
Introduction	99
Case Studies	103
The Hydropolitical Constellation of Irrigation from Wells	105
The Hydropolitical Constellation of Spring Fed Irrigation	112
The Hydropolitical Constellation of Water Distribution	117
The Hydropolitical Constellation of Water Tankers	122
Conclusion of Section 1 - Case Studies	123
Discussion	124
Water Control in Israel: A Modern System	127
The Control of Irrigation Water: A Pre-Modern System	128
The Domestic Water Control: A Nearly Modern System	130
A Firm and Fragmented Social Control	131
A Second Order Scarcity	132
A Structurally Induced Social Scarcity	133
Conclusion	134
CHAPTER 4: NATIONAL HYDROPOLITICS	135
From Madrid to Cairo	135
The Oslo Agreement	137
The 4 May 1994 Cairo Agreement	141
The Role of Water in Palestinian State Building	150
A Change in Property Regime	150
National Actors Interacting with Local and International Actors ...	155
Two Contradictory Dynamics	160
Parallel Sanctioned Discourses	164
The Palestinian Water Authority: Between Strategy and Tactic	166
Water and National Interest	175
Conclusion	177
CHAPTER 5: INTERNATIONAL HYDROPOLITICAL CONSTELLATION	178
Fabricating the Enemy	179
The Political Constraints	183
The Economic Constraints	189
The Financial Constraints	194
Conclusion	208
CONCLUSION	209
BIBLIOGRAPHY	212
APPENDICES	240
Annex 1: Agreement between Anabta Municipality and Rameen Village Council	241
Annex 2: Decree No. 38	243
Annex 3: Palestinian Water Authority – Water Supply Verification Form ..	244
Annex 4: LEKA - Palestinian Water Authority Brochure	245

Annex 5: West Bank Water in Picture	246
Maps	250

FIGURES AND TABLES

Introduction:

Figure 1 - Homer-Dixon's Model of Environmental Change and Acute Conflict	18
---	----

Chapter 1:

Table 1 - Percentage of Water Consumption in the West Bank, 1990 ...	66
Table 2 - Percentage of Water Consumption According to Article 40, Protocol Concerning Civil Affairs, Taba, 28 September 1995 ...	66

Chapter 2:

Map 1 – Area Served by the JWU	83
Table 1 – Dura and the Water Thief	78
Table 2 – Anabta and Rameen	80
Table 3 – Water Resources from Springs in the Jericho Area, 1998	86
Table 4 – Irrigated Surface in the Jericho Area, 1998	86
Table 5 – Conflict Opposing Irrigation and Domestic Use in Jericho ...	94

Chapter 3:

Table 1 – Average Cost of Water, 1990	100
Table 2 – Summarizing the Case Studies	104
Table 3 – Wells and Quotas	107
Table 4 – Wells and Shareholders	108
Table 5 – Crop Irrigation	110
Table 6 – Summary of Hydropolitical Constellations	124
Figure 1 – Battir	113
Figure 2	133
Figure 3	134

Chapter 4:

Table 1 – The Four Types of Property Regimes	152
Figure 1 – Structure of the Legislative Power	145
Figure 2 – Systemic Diagram of Various Spatial Levels and of their Embedment	156
Figure 3 – Two-Level Institution-Building Model	158
Figure 4 – The Centrifugal and Centripetal Dynamics	162

Chapter 5:

Figure 1 – Number of Irrigated Hectares in the World since 1950	190
Figure 2 – Israeli Water Consumption by Sector, 1947-1993	191

A c k n o w l e d g m e n t

I would like to thank all of those who have shared their time with me and have given me their friendship. Their support made this book possible.

Julie Trottier
November 1999

Preface

The writing of this thesis draws to an end just as final status negotiations begin between the Israelis and Palestinians. Water is one of the five issues that will be discussed. The topic has already been extensively written about; so much so that a sanctioned discourse has slowly emerged within the research community. Facts repeated in so many publications came to be held as unquestionable truths. These publications, however, generally kept silent on the mechanisms allowing for the water control they were describing. How can a state extend such a complete control over a resource that lies within the reach of so many actors? This question sparked my initial curiosity. I did not, however, expect the passionate reactions received once my findings became public.

Whoever has studied water in semiarid areas will recognize here many similarities in the manner in which water, the source of competition among so many actors since time immemorial, had occasioned the development of complex customary laws that insured a strict social control of its use and distribution. The persistence of such institutions after over thirty years of occupation eloquently reveals the stratification of social control in the West Bank and Gaza Strip. These oral institutions are functioning and determine, on a daily basis, the distribution and use of water from hundreds of wells and springs in the West Bank and Gaza Strip, in spite of Israeli Military Orders which prevail to this day notwithstanding the emergence of the Palestinian Authority.

A relatively positive picture of Palestinian society emerges through this research, as native institutions--some recent and some ancient--continue to ensure social control. This contrasts with the perception of a Palestinian people totally crushed by thirty years of military occupation. These results show that the social fabric has not totally dislocated itself, which should be reassuring at first glance. This fact, however, offers the Palestinian Authority an enormous challenge since it must face a multitude of local institutions that already control the water whose management the Authority was granted, in principle, by the 1995 Israeli-Palestinian agreement.

We are used to reading about *the* water conflict pitting Israelis and Palestinians against each other. The existence of this conflict is unquestionable, yet this research has shed light on the existence of many other conflicts that fit within this international competition for water. The pages that follow will detail the interactions between the local, national and international hydropolitical constellations that affect the West Bank and the Gaza Strip today. First, the book will present a critical overview of the existing literature dealing with this topic. Chapter 1 will provide an historical overview of the evolution of the water situation in the Jordan Basin. Chapter 2 will detail a few conflicts concerning water that will allow us to identify several categories of actors whose role is often kept silent both in legislative texts and in most studies devoted to hydropolitics in the Jordan Basin. Chapter 3 will examine the local hydropolitical constellations. Four categories were identified: the constellations regulating irrigation from springs, those regulating irrigation from wells, those regulating water distribution for domestic use and those regulating water distribution via water tankers (cistern trucks). Chapter 4 will examine the national hydropolitical constellation. The constraints weighing on the Palestinian Water Authority will be examined as well as its challenges, strategy and tactics. Finally, chapter 5 will deal with the international hydropolitical constellation. It will investigate the water conflict between Israel and the Palestinian Authority, the constraints imposed by the world economy and the impact of donor activities.

Introduction and Overview of the Literature

This study deals with hydropolitics in the lower Jordan Basin, more specifically in the West Bank and Gaza Strip. The term 'hydropolitics' will be used as defined by René-Georges Maury.¹ He used the investigation of water conflicts in order to uncover the tensions among competing interests, as well as the types of political, imaginary and symbolic relations which the issue of water mobilizes. Conflicts are used as a mode of approach to uncover the cooperation and competition among various actors. This study will not only cover conflicts regarding water use, but also conflicts regarding its access, regulation, pollution and use as a media and propaganda tool as well as a means of pressuring or blackmailing another actor.

Water in the Jordan Basin offers us a useful substrate because it is scarce. It is the limiting production factor in agriculture, as fertile land lies unexploited for want of water. Controlling water has therefore constituted one of the bases of the structure of local power for centuries. This control became important for supra-local authorities only lately.² Twentieth century modern technology allowed states to undertake massive hydraulic infrastructure that restructured the local society and extended state power to new domains. This phenomenon started in the region only during the period of the British Mandate. It developed with the emergence of Jordan and Israel.

Throughout this research, water will be used as a means of revealing conflicts and power struggles currently being waged in the lower Jordan Basin. Water allows us to identify the actors involved in these conflicts. These various actors' relations to water then facilitate an investigation of the power constellations and conflicts existing at the local (village) level, the national level and, finally, at the international level between Israel and the Palestinian Authority (PA).

¹ René-Georges Maury, "L'hydropolitique, un nouveau chapitre de la géographie politique et économique", in *Grands appareillages hydrauliques et Sociétés Locales en Méditerranée, Actes du séminaire de Marrakech*, edited by Ahmed Bencheikh and Michel Marié, October 1993, Presses de l'école nationale de ponts et chaussées, Paris, 1994, p. 123.

² National, colonial and military occupation authorities are gathered under the term 'supra-local authorities'.

At present, an abundance of literature deals with water in the world, especially with water in the Near East. The quality of this literature highly fluctuates due to the high editorial demand as well as the many contributions put forth by researchers specializing in various fields. This research will attempt to provide a critical overview of the existing literature dealing with water in the Near East, classifying this literature into three main categories: the hydropolitical analyses, the technical studies and the models/proposals of water management in the area.

Many researchers now use the term hydropolitics without defining it. The word thus often becomes emptied of any real meaning. The definition that was given earlier shall be rigorously kept throughout the research. But, as far as the review of the existing literature is concerned, gathered under the heading *Hydropolitical Analyses* will be all the studies dealing with the political and legal issues of water in the Jordan Basin. This category will necessarily lead us beyond the strict limit of the definition.

Under the heading *Technical Analyses* will be grouped the natural science and applied science studies that describe the quality of the aquifers, the problems of pollution, the infrastructure and its problems, etc. This research clearly belongs to the first category, but nevertheless relies upon numerous studies of the second category in order to determine the actual context within which the actors evolved. Let the need to rigorously examine the method used by each report be mentioned here, for publications proliferate, repeating previously published data that are questionable.

The section *Models/Proposals* will gather the studies that propose national and international management methods in the area. The studies belonging to this third category were little used during the research. Modelizing often results out of a purely mathematical exercise, which is of no practical interest when dissociated from the political reality. Such studies will be used in the research only when they allow the detection of the perceptions or intentions of the actors that order them. Thus, for example, the Palestinian Water Authority (PWA) wanted, in September 1998, to use the services of a World Bank funded consultant mission to develop a strategy of hydraulic development in the Jordan Valley. Did this request reflect, on the part of the Palestinians, a mistaken perception of the Israeli occupation plans? This is improbable. Did the Palestinians answer to World Bank demands by making the Bank's water strategy politically instrumental? Such were the types of questions the models and proposals essentially raised during this research.

The proposals for regional water management were often the products of research efforts rather remote from field realities. Yet, their funding

sources or the contexts that brought about their emergence has made for an enlightening contribution. Political scientists sometimes believe they are invested with a normative mission and develop what they believe to be viable or ideal solutions to conflicts in which they are not protagonists. This is especially true of the Arab-Israeli conflict. This research shows that decision-makers do not make much use of these academic studies when developing a solution. So, such proposals were only used within this research when they were ordered or brandished by one actor or another. This would then allow for a greater understanding of the particular actor's intentions.

The following research focuses on the hydropolitical constellations involving the West Bank and the Gaza Strip since 1995. As these constellations are the product of an historical evolution, this historic process will be examined in as much as it affects the present situation. The interaction among local hydropolitics, national hydropolitics and international relations will be investigated. In this respect, some space will be devoted to the national hydropolitics in Jordan and Israel, but the fieldwork at the local level will only cover the West Bank and Gaza Strip. This is justified by the fact that scientific studies have already dealt with the Israeli and Jordanian situations, while the local Palestinian situation has largely been ignored. This study does not claim to be exhaustive, as the topic is very wide. The aim is to investigate these interactions using an original method that will shed new light on the topic.

Overview of the Literature

Three bibliographies already exist, which may be of interest to this topic. One was edited in the Gaza Strip by Pietro Ingresso, Mohammed Abu Jabal and Benedetta Oddo and focuses on technical issues as well as water management issues in the West Bank, the Gaza Strip, Israel and the Sinai.³ It covers mostly Israeli and Palestinian authors. Another bibliography was edited in Hamburg and covers water issues in North Africa and the Middle East.⁴ Irrigation in Jordan is also covered in a bibliography devoted to agriculture in Jordan.⁵

³ Pietro Ingresso, Mohammed Abu Jabal and Benedetta Oddo (eds.), *Groundwater in Israel, Palestine and Sinai: Selected Bibliography (1985-1996)*, Water Research Center, Al-Azhar University, Gaza Strip, 1997.

⁴ German Overseas Institute, *Water in the Middle East and North Africa: Literature Since 1985 - A Selected Bibliography*, Near and Middle East Documentation Service, Series A, 23, Hamburg, 1995.

⁵ A.B. Zahlan, *Agricultural Bibliography of Jordan 1974-1983: Selected, Classified and Annotated*, published for the Abdul Hameed Shoman Foundation, Amman, Ithaca Press, London, 1984.

► *Hydropolitical Analyses*

A pioneer in the field of research on water in the Near East, Miriam Lowi published in 1993 what now stands as the classical study devoted to this issue.⁶ Her approach would deeply influence the scientific community. Numerous studies would later follow the same approach, admitting it more or less openly. A fair amount of attention will be devoted to Lowi's analysis because it stands as a major contribution but also because it largely shaped most of the later research on the Jordan Basin.

Lowi tried to address two main questions. First of all, which factors guide the behavior of states sharing a river basin? Second, which factors determine the cooperation potential among the protagonists in the use of scarce water resources? Lowi used three approaches in her study. She first undertook a reconstruction of history. She then developed an analytical framework, which identified and isolated the following main factors:

- The state's dependence on the resource.
- The state's relative power resources (economic, military and political).
- The character of the relations among the riparian states, including the protracted nature of the conflict, the values of the decision-makers and the perceptions of the protagonists.
- The efforts to solve the conflict and to involve a third party.

Finally, Lowi used her case study to address five questions:

- How did the larger political conflict influence the dispute concerning water?
- Which factors lead a state to consider an issue as a source of conflict?
- Supposing, as the functionalist theory does, that regime formation is a first step to solve the conflict, how can this be achieved?
- Is it possible to unlink a dispute among riparian states from a larger conflict in order to solve this dispute?
- Which factors characterize the occasions when states have achieved cooperation arrangements in spite of the protracted conflict situations?

⁶ Miriam R. Lowi, *Water and Power: The Politics of a Scarce Resource in the Jordan River Basin*, Cambridge University Press, Cambridge Middle East Library, 31, 1993.

We notice that Lowi sets the state as a central actor and that her analysis proceeds entirely from a state security logic. Water is deliberately considered the object of an interstate competition and the last question reflects a normative preoccupation that sets all possible solutions of the water problem within the framework of interstate relations. Lowi's approach is pertinent and offers the advantage of perceiving water as a means and an end of state policies. However, the very logic that underlies this approach prevents the understanding of several crucial factors at work in the Jordan Basin. The development of hydraulic policies at the national and local levels, and the relations in that respect between local, national and international actors, so well studied in the case of Morocco, are not tackled here.⁷

Lowi carried out her study before the emergence of the PA, before the Madrid conference and before the arrival of massive foreign aid in the Occupied Territories. The conflicts and competitions that emerged since then allow for a much easier identification of the role of numerous actors at the local and national levels. But, Lowi's approach has influenced the scientific community in such a way that these aspects of the competition for water in the Jordan Basin have yet to be investigated.

After having first proceeded with a reconstruction of history, Lowi shows that the need for water resources in the Jordan Basin was perceived as very important by both Israel and Jordan as early as the 1950s. However, it was perceived as much less important by Syria and Lebanon, which had access to other, much more abundant resources.⁸ Lowi emphasizes the cognitive rigidity within which decision-makers evolved up to 1967. Imprisoned in a system of closed beliefs, decision-makers had an image of the enemy that corresponded to a Manichean vision. Their perceptions of power relations were therefore often distorted.⁹

According to Lowi, the dispute among riparian states changed dramatically after the summer of 1967. It then entered a pragmatic and technocratic phase. A situation of 'rival partners'¹⁰ arose, the basis of which went back to the first direct contacts, in 1963, between King Hussein and the Israeli prime minister Levi Eshkol. These contacts had led as early as 1970 to cooperation arrangements. According to Lowi, Jordan preferred not to cooperate formally, but rather to pursue an implicit and clearly de-

⁷In this case, no international dimension distracted the researchers from those issues. See for example Lekbir Ouhajou, *Espace hydraulique et société; les systèmes d'irrigation dans la vallée du Dra Moyen (Maroc)*, Ph.D. thesis in geography, University of Paul Valéry-Montpellier III. See also the numerous studies directed by Paul Pascon.

⁸M. Lowi, *Water and Power*, op.cit, pp. 106-018.

⁹*Ibid.*, pp. 138-142.

¹⁰*Ibid.*, p. 165.

limited cooperation, accompanied by a contradictory discourse. These contacts were also described elsewhere by Adam Garfinkle¹¹ and Daniel Pipes.¹² Garfinkle investigated the functional ties he calls 'low-level' between Jordan and Israel in order to determine whether or not such collaboration could have political results, as functionalist theory hypothesizes. Garfinkle wrote in 1992 that his study was the only published description concerning low-level Israeli-Jordanian ties. He explained the apparent lack of interest for the topic by the fact that Israelis and Jordanians worried about the possible failure of such contacts, which publicity would inevitably bring. Moreover, Jordan feared discontent on the part of the PLO, Islamist militants and Syria. Finally, American researchers have a tendency, according to Garfinkle, to concentrate on public and legal aspects. Those who tackle informal diplomacy are more interested in what the great powers can do to facilitate contacts rather than in the contacts that already exist in the field.

Garfinkle's approach, based on field trips and interviews, shows the immense merit of being original and of leaving behind legal texts devoid of any link to reality. However, he asks us to trust him blindly because he says he cannot reveal his sources. The few mistakes identified then cast doubt on information that is impossible to verify.¹³

Lowi concludes that Israel does not perceive a conflict with Jordan regarding water whereas Jordan perceives one. She determines that the perception of a conflict concerning water is linked to two factors. On the one hand, we find the relative power resources of a state. Here Jordan is less endowed than Israel. On the other hand, there has to be a need for an unlimited access to the water resource.

"If the security of a state could be threatened by denial of access to a particular body of water, the latter would be considered a (potential) source of conflict. In contrast, when the security of a state cannot be threatened, either because the water resources are not vital and indispensable, or because the state is hegemonic in the basin insofar as power and capabilities are concerned, the very same body of water will not be considered a potential source of conflict."¹⁴

¹¹Adam Garfinkle, *Israel and Jordan in the Shadow of War, Functional Ties and Futile Diplomacy in a Small Place*, St. Martin's Press, New York, 1992.

¹²Daniel Pipes, "The Unacknowledged Partnership", *The National Interest*, 10 (Winter 1987/88), pp. 95-98.

¹³For example, he evokes Syrian bulldozers attempting to deviate the Yarmouk in 1964. He is mistaken on the river and should refer to the Hasbani. See A. Garfinkle, *Israel and Jordan in the Shadow of War*, op.cit., p. 38.

¹⁴M. Lowi, *Water and Power*, op.cit., p. 170.

Lowi concludes in agreement with the realist critics of the functionalist theories. States involved in a political ‘high-level’ diplomatic conflict rarely cooperate in the social and economic fields. The spillover effect rather seems to work in the other direction: social and economic collaboration is delayed by high-level interstate conflicts.

This research will draw much inspiration in one of Lowi’s final remarks.

“Needless to say, states do seek to satisfy their domestic needs and national interests. What is more important to understand, though, is that interests emerge within the context of a particular belief system and historical experience. Both the neo-realists and neo-liberals fail, in general, to take sufficient account of this. Indeed, national interests and foreign policy behavior are responses to environmental constraints that are normative and ideational in nature, as well as being structural and material. They are not based simply on a rational calculus of utility maximization.”¹⁵

The issue of the national interest will be elaborated upon after the section devoted to the overview of the literature.

Micha Bar’s work follows the same global approach as Garfinkle and Lowi.¹⁶ He investigates the issue of cooperation among riparian states sharing an international hydrographic basin and tries to explain the emergence and evolution of international regimes in river basins. He bases his work on the theory of international regimes, which he modifies according to the hypotheses of constructivism. He therefore studies the social process whereby political, physical, social or normative circumstances model the behavior of states, and are then in turn modeled by the practices and the interactions of these states. Bar focuses on norms and addresses three questions: Why do states cooperate in the management of international river basins? Which types of cooperation then emerge? Finally, what is the role of norms in the establishment and the evolution of regimes concerning international river basins given the political and physical realities? He uses the cases of the Nile, the Jordan and the Colorado Rivers in an attempt to answer these questions.

Bar’s study is interesting because it shows simultaneously the evolution of International Law concerning water, the manner in which the latter influenced state cooperation and the manner in which these cooperation efforts have influenced the law. The approach allows us to perceive water other than the mere object of a zero-sum game, yet it restricts its scope of

¹⁵Ibid., p. 198.

¹⁶Micha Bar, *Cooperation and Regime in International River Basins: The Role of Norms*, unpublished Ph.D. dissertation (in Hebrew), August 1998, Hebrew University.

analysis to the states as objects and producers of these norms. Moreover, Bar's concentration on the role of norms leads him to observe successful interstate cooperation where the practical implementation of the cooperation was not necessarily as successful as the treaties suggest.¹⁷

Aaron T. Wolf provided several studies concerning water in the Jordan Basin with an approach comparable to that used by the preceding authors.¹⁸ Focused on the role of water within the Arab-Israeli conflict,¹⁹ Wolf attempts to develop an interdisciplinary analysis framework that calls upon the physical sciences, law, political science, economy, game theory and alternative dispute resolution, in order to examine the historical development of the hydropolitical constellation before going on to conflict resolution proposals.

Wolf offers a very interesting historical overview of the hydropolitical situation. His clearly Zionist vision of history²⁰ focuses on the relations between the colonial authorities and the Transjordanian (and later Jordanian) and Jewish (and later Israeli) authorities concerning water. Local actors do not figure in his analysis even though they are included in his normative prescriptions.²¹ Wolf recognizes the integration of the West Bank and Gaza water networks into the Israeli one²² but refutes what he calls the theories of the hydraulic imperative and that of hydro-nationalism. The first maintains that Israel's territorial conquests were motivated

¹⁷For example, Bar describes the evolution throughout the 1980s of water exchanges between Jordan and Israel. The Israeli-Jordanian treaty of 1994 made official these exchanges while mentioning water quantity alone, with no precision concerning the water quality. In 1995 and 1998, the difficulties that arose concerning water quality after Israel released water to Jordan are not taken in consideration.

¹⁸Aaron T. Wolf, *Hydropolitics Along the Jordan River: Scarce Water and Its Impact on the Arab-Israeli Conflict*, United Nations University, Tokyo, 1995; Aaron T. Wolf, "Water for Peace in the Jordan River Watershed", *Natural Resources Journal*, vol. 33, 3 (Summer 1993), pp. 797-839; Aaron T. Wolf and Ariel Dinar, "Middle East Hydropolitics and Equity Measures for Water-Sharing Agreements", *The Journal of Social, Political & Economic Studies*, vol. 19, 1 (Spring 1994), pp. 69-94; and A. Dinar and A. Wolf, "International Markets for Water and the Potential for Regional Cooperation: Economic and Political Perspectives", in *Middle East: Economic Development and Cultural Change*, 43 i (1994), pp. 43-66.

¹⁹Wolf emphasizes the importance the American administration granted this issue in the course of the 1980s as is illustrated by the Defense Intelligence Agency ordering in 1984 a study from Naff and Matson concerning the links between water and politics in the Middle East. See Aaron T. Wolf, *Hydropolitics Along the Jordan River*, op.cit., p. 2.

²⁰One can question his statement: "[...] both Jewish and Arab population began to swell in turn-of-the-century Palestine, the former in waves of immigration from Yemen as well as from Europe, and the latter attracted to new regional prosperity from other parts of the Arab world." In *Ibid.*, p. 16.

²¹*Ibid.*, p. 104 and pp. 128-131. See as well Aaron T. Wolf, "Water for Peace in the Jordan River Watershed", op.cit.

²²Aaron T. Wolf and Ariel Dinar, "Middle East Hydropolitics and Equity Measures for Water-Sharing Agreements", op.cit., p. 77.

by a search for additional water resources.²³ In his arguments, Wolf discusses the immediate causes of the occupation and does not mention the remote causes. The focus on the immediate causes allows for an evacuation of the issue of water.²⁴ Wolf's well-researched study admits, however, that the planning department of the Israel Defense Forces includes one officer whose responsibilities include the evaluation of the strategic importance of water resources.

The theory of hydro-nationalism maintains that Israeli water security depends on the continuation of the occupation of the West Bank and the Golan Heights. Wolf refutes this second theory by putting forward a map drawn in 1977 by the water commissioner, Menahem Cantor, which delimited the portion of the West Bank whose control was necessary in order to ensure Israel a stable water provision.²⁵ Yet, Wolf published in 1995, the same year that the Taba Agreement produced an allocation scheme concerning the West Bank aquifers and attributed 82% of its water to Israel.

Regretfully, Wolf does not push his political analysis as deeply as he does his geographic and historical analyses. This problem is fairly widespread, especially in French language literature.²⁶ The question must also be raised whether a certain confusion between analysis and normative prescriptions does not handicap the analytical capacity. Such confusion is widespread in the literature concerning water in the Near East. These two problems are also found among many Palestinian authors²⁷ whom, nevertheless, will often be retained for their useful contribution to the category of technical analysis.

²³Aaron T. Wolf, *Hydropolitics Along the Jordan River*, op.cit., p. 70-72.

²⁴Ibid., p. 73-78.

²⁵Ibid., p. 79.

²⁶For illustration see Bishara Khader, "La géopolitique de l'eau en Méditerranée", *Les cahiers du Monde Arabe*, 113, Centre d'Etudes et de Recherches sur le Monde Arabe Contemporain, Louvain-la-Neuve, 1994; Habib Ayeb, *Le bassin du Jourdain dans le conflit israélo-arabe*, Les Cahiers du CERMOC, no. 6, Amman, 1993; and J. Sironneau, "L'eau au coeur du processus de paix entre Israël et l'OLP Propositions", *La Houille Blanche*, no. 1, 1995, pp. 21-33.

²⁷For illustration see Leonardo Hosh and Jad Isaac, "Roots of the Water Conflict in the Middle East", paper submitted at The Middle East Water Crisis: Creative Perspectives and Solutions Conference, May 7-9, 1992, University of Waterloo, Canada; and Odeh Rashed Al-Jayyousi and Mohammed Rashid Shatanawi, "An Analysis of Future Water Policies in Jordan Using Decision Support Systems", *Water Resources Development*, vol. 11, 3 (1995), pp. 315-330.

David Brooks and Stephen Lonergan also follow a path analogous to that of Lowi, Garfinkle and Wolf.²⁸ Their study includes a solid historical overview, a geographical appreciation and economic and legal considerations. Especially focussed on Israel, as were Lowi and Wolf, Brooks determines that the probability of a water war is weak²⁹ as opposed to what other authors had feared earlier in the course of the 1980s.³⁰

Arnon Medzini devoted his doctoral thesis to the influence of the regional limits' demarcation in the area of the Jordan sources at the time of the Mandate on the relations between Israel and its neighbors.³¹ He also investigated the capacity of conflict theories to predict a military conflict, the stake of which would be water. Medzini used British, American and Israeli archives to complete a painstakingly detailed historical account of the emergence of borders between the French Mandate in Lebanon and Syria and the British Mandate in Palestine in 1920. He also provides a detailed historical account of the emergence of the armistice line in 1949 and considers how much attention was paid to water every time. He concludes that water played a negligible role when the borders and the armistice line were demarcated as well as when the Wars of 1956 and 1967 broke out. Medzini's analysis is very well documented and emphasizes the role played by claims over water within the internal and interstate Arab political competition. He thereby concludes that the Arab states posed as defenders of the right to water within the framework of the competition for the leadership of the Arab world. Regrettably, as with Wolf, the lack of distinction between immediate and remote causes exists. Using the concepts developed by Foucher and Renouvin could usefully fuel his analysis and bring it further.

Medzini focuses only on states as actors in the competition for water and only on war as a form of conflict among states resulting from that competition. This is a consequence of the method he follows. He mentions, however, the fact that Hays, who was invited by the American Zionist

²⁸Stephen Lonergan and David D. Brooks, *The Economic, Ecological and Geopolitical Dimensions of Water in Israel*, Center for Sustainable Regional Development, University of Victoria, Victoria, BC, 1994.

²⁹David Brooks, "Between the Great Rivers: Water in the Heart of the Middle East", in *Water Management in Africa and the Middle East, Challenges and Opportunities*, edited by Eglal Rashed, Eva Rathgeber and David Brooks, International Development Research Center, Ottawa, 1996, p. 89.

³⁰For illustration see John K. Cooley, "The War Over Water", *Foreign Policy*, vol. 4, no. 5, (1984), pp. 2-3; or John Bulloch and Adel Darwish, *Water Wars: Coming Conflicts in the Middle East*, London, Victor Gollancz, 1993.

³¹Arnon Medzini, *The River Jordan: The Struggle for Frontiers and Water: 1920-1967*, unpublished Ph.D. thesis, University of London, October 1997; and Arnon Medzini, "Water Conflicts in the Middle East", in *Water Policy: Allocation and Management in Practice*, edited by P. Howsam and R.C. Carter, London, E & FN Spon, 1996, pp. 267-274.

Organization to develop a plan to deviate the Jordan to the Negev in 1946, had been an engineer at the Tennessee Valley Authority (TVA).³² We will see in the section of this chapter devoted to water law, an analysis of the role played by the TVA in the history of conflicts pitting the state and the water users against each other. The introduction of plans copied on the model of the TVA introduced into the area new and complex conflicts within which the states would be confronted with a variety of actors, whether states or not. These conflicts would rarely take the shape of a war. Unfortunately, such actors and conflicts escape Medzini's analysis because of the methodological approach he follows.

Sharif S. Elmusa produced several studies on water in the Arab-Israeli conflict.³³ He also uses an approach that draws from history, law and political science to examine the situation of water in the Occupied Territories and Israel. Elmusa also clearly places the issue of water as an interstate competition and focuses his attention on devising ways to achieve equitable water sharing.³⁴ Once again, it is regrettable to see the confusion between prescriptive norms and political analysis. The distinctly Palestinian nationalist slant of the author hinders his analysis just as much as the Zionist slant found among several of the authors reviewed earlier impedes their analysis.

J.A. Allan has produced numerous articles on water in the Near East.³⁵ He centers his analysis on food security. Observing that the area will lack

³²Arnon Medzini, *The River Jordan*, op.cit., p. 61.

³³Sharif S. Elmusa, "Dividing the Common Palestinian-Israeli Waters - An International Water Law Approach", *Journal of Palestine Studies*, vol. 22, 3 (1993), pp. 57-77; Sharif S. Elmusa, "The Jordan-Israel Water Agreement: a Model or an Exception?", *Journal of Palestine Studies*, vol. 24, 3 (Spring 1995), pp. 63-73; Sharif S. Elmusa, "The Israeli-Palestinian Water Dispute Can Be Resolved", *Palestine-Israel Journal of Politics, Economics and Culture*, 3 (Summer 1994), Jerusalem, pp. 18-26; Sharif S. Elmusa, "The Land-Water Nexus in the Israeli-Palestinian Conflict", *Journal of Palestine Studies*, 25 (Spring 1996), pp. 69-78.; Sharif S. Elmusa, *Negotiating Water: Israel and the Palestinians*, A Final Status Issues Paper, Institute for Palestine Studies, Washington, 1996.

³⁴Sharif S. Elmusa, *Water Conflict: Economic, Politics, Law and the Palestinian-Israeli Water Resources*, Institute for Palestine Studies, Washington, DC, 1997.

³⁵J. A. Allan, "Watersheds and Problemsheds: Explaining the Absence of Armed Conflict Over Water in the Middle East", *Middle East Review of International Affairs*, vol. 2, 1 (March 1998), pp. 1-4; J. A. Allan and M. Karshenas, "Managing Environmental Capital: the Case of Water in Israel, Jordan, the West Bank and Gaza, 1947 to 1995", in *Water, Peace and the Middle East: Negotiating Resources in the Jordan Basin*, Library of Modern Middle East Studies, vol. 9, Tauris Academic Studies, New York, 1996, pp. 121-133; J. A. Allan, "The Political Economy of Water: Reasons for Optimism But Long-term Caution", *ibid.*, pp. 75-119; J. A. Allan, "Water Deficits and Management Options in Arid Regions with Special Reference to the Middle East and North Africa", in *Water Resources Management in Arid Countries*, Ministry of Water Resources, Muscat, Oman, 1995, pp. 1-8; J. A. Allan, "Water in the Middle East and in Israel-Palestine; Some Local and Global Resource Issues", in *Joint Management of Shared Aquifers*, Harry S. Truman Center for Peace and Palestine Consultancy Group, Jerusalem, 1995; J. A. Allan, "A Transition in the Political Economy of Water and the Environment in Israel-Palestine", in *Joint Management of Shared Aquifers*, Harry S.

water only if every state aims for self-sufficiency in food production, Allan postulates that a regional water crisis will be averted so long as states can import the food they are incapable of producing. He calls the water contained in the food imported into the area every year 'virtual water'. The latter does not only refer to the water physically contained in the food; it also refers to all of the water that was necessary to produce that food. Allan thus remarks that the quantity of virtual water imported yearly into the Middle East exceeds the quantity of Nile water used yearly in Egyptian agriculture.³⁶

According to Allan, governments in the area have, up to now, managed to use virtual water to ensure the food security of their population. This success is explained by the fact that the United States and the European Union have generated surpluses of cereals at a subsidized production cost throughout the last 50 years, which has led the price of cereals to keep dropping until the beginning of 1995. The fluctuation of the cost of wheat observed in 1995-1996 showed the vulnerability of the states that rely on its importation. The entrance of cereal exporting states into the World Trade Organization (WTO) could thereby threaten the use of virtual water in the future as a way to avert a water crisis in the Near East.³⁷

Allan has thus pleaded in the last few years for a concerted policy regarding cereal imports by the states of the Middle East. These states can use their weight as the main collective importer of cereals in the world in

Truman Center for Peace and Palestine Consultancy Group, Jerusalem, 1995; J. A. Allan, "Economic and Political Adjustments to Scarce Water in the Middle East", in *Water and Peace in the Middle East*, edited by J. Isaac and H. Shuval, Elsevier, Amsterdam, pp. 375-388; J. A. Allan, "Overall Perspectives on Countries and Regions", in *Water in the Arab World: Perspectives and Progress*, edited by P. Rogers and P. Lydon, Harvard University Press, September 1994, pp. 65-100; J. A. Allan, "Water in the Arab Middle East: Availability and Management", in *Water As An Element of Cooperation and Development in the Middle East*, edited by Ali Ihsan Bagis, Ayna Publications, in cooperation with the Friedrich Naumann Foundation in Turkey, Ankara, May 1994, pp. 65-100; J. A. Allan, "Food Production in the Middle East", in *The Culinary Arts of the Middle East*, edited by Sami Zubaida and Richard Tapper, British Academic Press/I.B. Tauris, London, August 1994, pp. 19-32; J. A. Allan, "Mechanisms for Reducing Tension over Water: Substituting for Water (in the Middle East)", *MEED*, vol. 38, 4 (January 1994), pp. 12-14. J. A. Allan, "Economic and Political Adjustments to Water Scarcity in the Middle East", in *Fifth Euro-Arab Dialogue*, edited by C.A.O. van Niewenhuijze, The Hague, Rabhani Foundation, 1993, pp. 43-55. J. A. Allan (ed.) and Andrew Warren, *Deserts: A Conservation Atlas*, Mitchell-Beazley, London, 1993; J. A. Allan, "Fortunately There are Substitutes for Water: Otherwise Our Hydropolitical Futures Would Be Impossible", in *Water Resources Management*, ODA, London, 1992, pp. 13-26. J. A. Allan, "Substitutes for Water Are Being Found in the Middle East and North Africa", *Geojournal*, vol. 28, 3 (1992), pp. 375-385; and J. A. Allan, "The Importance of a Realistic Evaluation of Renewable and Non-renewable Water Resources in Arid and Semi-arid Regions", in *Techniques for Environmentally Sound Water Resource Development*, edited by R. Wooldridge, HR Wallingford, Wallingford, 1992, pp. 63-76.

³⁶J. A. Allan, "Watersheds and Problemsheds", op.cit., p. 2.

³⁷J. A. Allan, "The Political Economy of Water: Reasons for optimism...", op.cit., p. 103.

order to better control the market fluctuations. Allan has also, of course, pleaded for a sectoral reallocation of water. His economic calculation concludes that the states of the area are better off reducing the quantity of water used in agriculture in order to increase that used in the services and in industry where it generates much more added value. The resistance will be great, as was illustrated by Israel, but the rationality of the governments does not leave a doubt in his mind that the evolution will occur and that a major crisis will be avoided.

Gershon Baskin also resorts to macroeconomic analysis in order to conclude that no war will take place over water. This author examines the Palestinian-Israeli conflict concerning the West Bank's three aquifers. He estimates the price of one cubic meter of water purchased elsewhere by Israel to be \$1.00. A simple calculation thus allows Baskin to conclude that, in the case where Israel gave up its claim to West Bank water, it would need to pay \$413 million in order to buy the same quantity elsewhere. This sum represented, in 1993, only 0.67% of Israel's GNP. Is there a single state on earth, asked Baskin, that would go to war in order to secure such a relatively negligible value to its economy?

Allan's and Baskin's inputs are useful and original because they considered the actual hydro-economic situation in order to produce their analysis. Their observations are accurate and will be taken into account within our study. We must, however, question the economic mono-causality of a war or a major conflict in the area. To reduce the competition for water to a macroeconomic issue would yield as incomplete an analysis as would placing this issue only in an interstate framework.

Peter Beaumont joins Allan and Baskin in arguing that most of the water problems in the Near East would be solved from one day to the next via a sectorial reallocation of water from irrigation to domestic use.³⁸ Beaumont emphasizes how essential it is to study water uses before commenting on the importance of water for a social group or nation.

Greg Shapland produced one of the most recent overviews of hydro-politics in the Jordan Basin.³⁹ Also focussing on the international level, Shapland concludes that water played only a very minor role in the outbreak of the War of 1967. His book is especially interesting because of the quality of the figures it offers. A diplomat at the British Foreign

³⁸Peter Beaumont, "The Myth of Water Wars and the Future of Irrigated Agriculture in the Middle East", *Water Resources Development*, vol. 10, 1, 1994.

³⁹Greg Shapland, *Rivers of Discord: International Water Disputes in the Middle East*, C. Hurst & Co., London, 1997.

Office, Shapland could access better quality information than many researchers on the topic.

The gap between French language and English language literature concerning hydropolitics in the Jordan Basin is fairly deep. Whereas most of the authors who published in English on this topic since 1990 – such as Allan, Baskin, Homer-Dixon, Beaumont, Shapland, Medzini, Brooks, Wolf, and Dellapenna – do not foresee a war over water in the Near East, Habib Ayeb writes in 1998 that he offers “a view that is diametrically opposed to the prevalent discourse”⁴⁰ when predicting that no war over water will take place in the Near East. A typical example of a geographic description put forward as a political analysis, his work shows a lack of awareness of the English language literature. Studies published in French on the Jordan Basin seem to be much more based on secondary sources and lag behind the progress of the anglophone authors.⁴¹ French speaking researchers such as Annabelle Boutet, who spent five years in Egypt studying the hydropolitics of the Nile, and Jean-Jacques Perennes, who spent over 20 years in the Maghreb, seem as of yet absent from the Jordan Basin.

Regrettably, when viewing the literature devoted to the Jordan Basin in general, an abundance of technical studies pretending to be geopolitical are found. This trend is successful partly because of the self-perception of social scientists. Many authors believe they must use numbers and graphs in order to study a political problem seriously.⁴² This reflects a greater social value of the hard sciences with respect to the social sciences. Mathematics is but a language that serves to express concepts and the link between them. This language is appropriate when it allows for a clear expression of a concept. It becomes useless if it is used solely for the sake of including numbers in the study.

Thankfully, Joel Peters avoided this trap. Author of a very well documented study on the Madrid multilateral process,⁴³ Peters reports the evolution of the water-working group up to 1996. Precise and factual, he allows us to understand the interstate constellation such as it appeared

⁴⁰ Habib Ayeb, *L'eau au Proche-Orient, La guerre de l'eau n'aura pas lieu*, Karthala, Paris, 1998.

⁴¹ For illustration see the francophone authors quoted earlier as well as Sophie Dumont and Foulques de La Motte de Broöns, "L'eau au Proche-Orient: enjeu stratégique et instrument de paix", *Revue de la défense nationale*, February 1995, pp. 119-132.

⁴² For an example of this see Randy Deshazo and John W. Sutherlin, *Building Bridges, Diplomacy and Regime Formation in the Jordan River Valley*, University Press of America, Lanham, Maryland, 1996.

⁴³ Joel Peters, *Pathways to Peace: The Multilateral Arab-Israeli Peace Talks*, The Royal Institute of International Affairs, London, 1996.

concerning water from the beginning of the Madrid process up to 1996. The very topic of Peters' study confines us, however, to interstate relations concerning water. The author concludes that the functional spillover effects were minimal. This flaw largely contributed to preventing the multilaterals from reaching a useful momentum.

Thomas F. Homer-Dixon has devoted his efforts to studying the general link between environmental changes and violent conflicts.⁴⁴ He studied the case of the Jordan Basin water within this framework. Like Allan and Baskin, Homer-Dixon does not foresee any war over water in the near future, but he indicated that the crisis linked to water could very well fuel civil disorder, and contribute to the overthrow of regimes, political radicalization and general instability.⁴⁵ Homer-Dixon's approach centers on environmental problems before it considers states, which provides us with an original analysis. An individual specialist, however, can tackle with great difficulty such a wide variety of topics as deforestation in Central America, ethnic conflicts in Rwanda and water in the Near East while mastering perfectly the local political context of each case study.⁴⁶ We will therefore mostly use the input provided by his theoretical approach.

Homer-Dixon deliberately chooses to study acute, violent and international conflicts and he develops an analytical framework to explore the relations between the latter and environmental changes. He criticizes the realist theory because it focuses on states as rational maximizers of power in an anarchical system and thereby discourages researchers from studying cross border environmental problems because these cannot be linked to a single state. He proposes the analytical framework illustrated in figure 1.⁴⁷

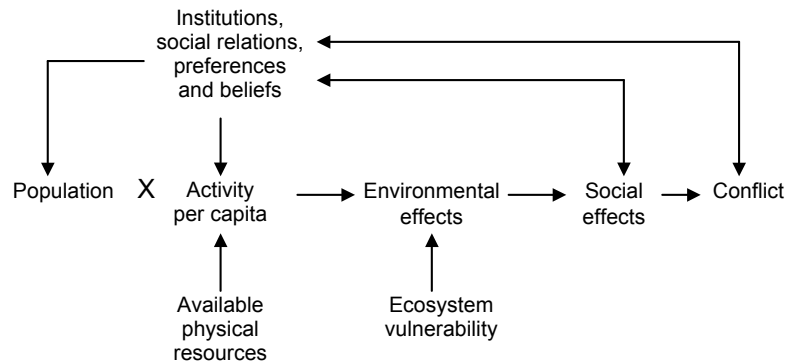
⁴⁴T.F. Homer-Dixon, "On the Threshold: Environmental Changes as Causes of Acute Conflict", *International Security*, vol. 16, 2, pp. 76-116; T. F. Homer-Dixon, J. Boutwell and G. Rathjens, "Environmental Change and Violent Conflict", *Scientific American*, February 1993, pp. 38-45; Thomas F. Homer-Dixon, *Environmental Scarcity and Global Security*, Headline Series, 300, Foreign Policy Association, Fall 1993; and Thomas F. Homer-Dixon, "The Ingenuity Gap: Can Poor Countries Adapt to Resource Scarcity?", *Population and Development Review*, vol. 21, 3 (1995), pp. 587-612.

⁴⁵T.F. Homer-Dixon, J.H. Boutwell, G.W. Rathjens, "Environmental Change and Violent Conflict", op.cit., p. 45. The fall of the Jordanian Government at the end of the summer of 1998 seems to confirm the author's hypothesis. The government fell because of the water crisis in Jordan. Later, the Minister of Water and Irrigation was under house arrest.

⁴⁶Thus a few mistakes have slipped into his appreciation of water in the Occupied Territories. He writes, for example, that the Israeli hydraulic policy has placed restrictions on Palestinian agriculture which has led the West Bank Arabs to give up agriculture (ibid., p. 45). We will see in chapter 3 that this is not totally accurate. He also writes that the multilateral talks include discussion on water rights (ibid., p. 45). Once again, this is not exact: water rights were not yet discussed within the framework of the multilaterals because of the Israeli opposition.

⁴⁷T.F. Homer-Dixon, "On the Threshold", op.cit., p. 86.

**FIGURE 1 -
Homer-Dixon's Model of Environmental Change and Acute Conflict**



This figure suggests that the effect of human activity on the environment is a function of the product of the total population and the physical activity per capita on the one hand, and of the vulnerability of the ecosystem on the other hand. This activity per capita is by itself a function of the available resources and of human factors such as institutions, social relations, preferences, etc. The effect on the environment can by itself entail social effects that will lead to a conflict.

Homer-Dixon's model offers the immense advantage of going beyond the state as the sole actor in the competition for water. The institutions the model refers to may be the state, an NGO, customary water laws, national legislation, the World Bank, etc. Much inspiration is drawn from that model even though this research does not specifically deal with acute and violent conflicts.

Leif Ohlsson has built on Homer-Dixon's work while developing the concept of first and second order water scarcity.⁴⁸ The first order scarcity is a lack of the resource itself. The second order scarcity is a lack of social capacity to manage the resource. Together with Tony Turton, he developed the concept of structurally induced social scarcity.⁴⁹ This situation results from a simultaneous combination of first order abundance and

⁴⁸Leif Ohlsson, *Environment, Scarcity and Conflict: A Study of Malthusian Concerns*, Department of Peace and Development Research, University of Göteborg, 1999.

⁴⁹Turton, A.R.; Ohlsson, L., "Water Scarcity and Social Stability: Towards a Deeper Understanding of the Key Concepts Needed to Manage Water Scarcity in Developing Countries", paper submitted at the 1999 Stockholm Water Conference, Stockholm, Sweden.

second order scarcity. Their concepts were very useful to this research and will be elaborated upon in chapter 3.

Robert Mandel has investigated the types of conflicts that may arise from competing for natural resources. He identified three types of such conflicts in 1988.⁵⁰ First of all, powerful Western states may initiate a conflict in order to ensure the growth of their consumption of resources. He gave (in 1988!) the Persian Gulf as an example where such a conflict could arise. Second of all, weak states could form collusions and initiate a conflict to achieve a redistribution of resources. Finally, transnational lobbies can oppose governments. Mandel provides the example of groups in favor of the protection of whales while opposing the government of Japan. Mandel's approach places resource access at the forefront of the analysis, which allows him to consider other actors aside from states.

The notion of productive hydraulic works and strategic hydraulic works developed by Pierpaolo Faggi were very useful in this study.⁵¹ He distinguishes two forms of logic ever present within massive hydraulic infrastructure. The productive logic, which is put forward, generally aims at increasing agricultural production. The strategic logic, which is kept silent, aims at producing space. The strategic hydraulic projects transform a region and strengthen the role of the state there. They create new environmental conditions that can only be managed by the state, such as soil salinization or the disappearance of a land locked sea. This dismantles the traditional system whereby local communities maintained this social reproduction. Such projects offer the state "new space for its own legitimization"⁵² whether it be rhetorical or symbolic. They therefore become the trump card in the territorialization process carried out by the state.

Faggi studied China and Egypt, but the same territorialization process is at work in the Jordan Basin, whether it be initiated at any single moment by Israel, Jordan or the PA. Faggi's approach focuses on the instrumentalization of the national hydraulic policy within the framework of a state's relations with ethnic or socioeconomic groups within its borders. This aspect was hardly researched so far concerning the Jordan Basin.

⁵⁰Robert Mandel, "Conflict Over the World's Resources: Background, Trends, Case Studies and Considerations for the Future", in *Contributions in Political Science* (collection), no. 225, Greenwood, New York, 1988.

⁵¹Pierpaolo Faggi, "Les développements de l'irrigation dans la diagonale aride entre logique productive et logique stratégique", *Revue de Géographie de Lyon*, vol. 65, 1 (1990), pp. 21-26.

⁵²*Ibid.*, p. 26.

Competition and cooperation among states and local actors were more often studied by researchers working in the field of development than in political science. The work carried out in Morocco by Hubert Popp concerning the social impact of irrigation techniques developed by the state⁵³ and the role of foreign companies in shaping its choices was very useful in order to tackle the relations existing between Palestinian peasants and the PA, NGOs and the Israeli occupation authorities.

A sociologist of development, Jean-Jacques Pérennes also studied water in the Maghreb. His monumental study of the hydropolitics in Morocco, Tunisia and Algeria⁵⁴ investigates the national territorialization process, as defined by Faggi, carried out by these states via their water policies. Pérennes traces back the origin of the big dam policy to a choice made in the colonial period, a choice largely influenced by the metropolitan public works lobbies.⁵⁵

He explains the relative stagnation of irrigated agriculture and its incapacity to better cater to the demand by the fact that it constitutes a battle field for two main categories of actors, the state and the peasants, who deploy antagonistic strategies around a scarce resource: water.⁵⁶ Pérennes concludes that real progress in intensified irrigation will require in the Maghreb a strengthening of the peasant societies' power structures, and not only a withdrawal of the state as is requested by the liberal ideology.

Pérennes chooses to treat engineers as a social class with its own special interests. He highlights the role of consultant firms, of 'engineers', in the constellation of actors involved in the competition for water. He then proceeds to analyze the role of financial institutions that tie their financial support to many legal and economic conditions.

Pérennes uses the work of Rémy Leveau⁵⁷ to show the manner in which the king of Morocco, initially tempted to replace traditional elites by a modern bureaucracy peopled by representatives of the urban middle class that had brought about independence, ended up reconstituting a local

⁵³Hubert Popp, "L'agriculture irriguée moderne au Maroc entre les décisions de l'Etat et celles de l'individu. Analyse socio-géographique", *Revue de géographie du Maroc*, 6, Nouvelle Série, 1982, pp. 105-113.

⁵⁴Jean-Jacques Pérennes, *L'eau et les hommes au Maghreb. Contribution à une politique de l'eau en Méditerranée*, Karthala, Paris, 1993. See also Jean-Jacques Pérennes' "Un aspect de la question hydraulique au Maghreb: La politique des barrages", *Egypte/Monde Arabe*, no. 10, 2- trimestre, 1992, pp. 37-50.

⁵⁵Jean-Jacques Pérennes, "Les politiques d'eau au Maghreb: d'une hydraulique minière à une gestion sociale de la rareté", *Revue de Géographie de Lyon*, vol. 65, 1 (1990), p. 17.

⁵⁶Jean-Jacques Pérennes, *L'eau et les hommes au Maghreb*, op.cit., p. 21.

⁵⁷Rémy Leveau, *Le fellah marocain, défenseur du trône*, Fondation nationales des sciences politiques, Paris, 1976.

power structure that was comparable to that of the protectorate. The Moroccan state then relied on this local power structure to establish its authority on agriculture. The land reform was therefore compromised and we instead witnessed “the progressive expulsion of peasants as privileged actors of agricultural development to the benefit of a new social class, the engineers and technicians.”⁵⁸ Pérennes thus depicts the engineers as fully involved in a power struggle between the state and local actors, the stake of which is the control of a natural resource. He admits, however, that these actors rarely understand the power struggles in which they interact since they have a ‘drawing board’ rationality that ignores the social and political factors.

The light shed by Pérennes on the role of international actors other than states, such as the engineers of consulting firms and the donors, was carried out in a framework – the Maghreb – where national governments did not use their water policy within their foreign policy. Should the fact that foreign policy and water policy appear to be linked in the Jordan Basin eliminate the role of similar actors? There is no reason to believe so. Pérennes’ questions will be directed toward the hydro-politics of the Jordan Basin as an attempt is made to shed light on the competition and cooperation in which these actors are involved. Jordan and Israel have massively developed their irrigation and Pérennes’ approach appears to be quite pertinent in these cases. The PA has not developed such great irrigation schemes. Engineers and donors do, however, play a key role, which will be explored.

Elinor Ostrom’s work on the relations between peasants and national irrigation authorities proved very useful.⁵⁹ In her analysis of irrigation systems, Ostrom highlights the fact that few massive irrigation projects ever yielded the results that were initially expected. Generally, hardly one-third of the surface initially planned is eventually irrigated because the maintenance of the network is never carried out, its costs having been underestimated on the one hand and vandalism having destroyed the infrastructure on the other hand. Ostrom explains this by the overwhelming importance granted to the physical infrastructure as opposed to the social organization of the irrigation network that is being built. She also explains this phenomenon by the size of the projects. The farmers involved in immense projects feel they do not control anything and the temptation of free riding is too great. So, they refuse to pay maintenance fees and/or steal water. The deterioration of the network entails a level of uncertainty

⁵⁸Jean-Jacques Pérennes, *L'eau et les hommes au Maghreb*, op.cit., p. 370 (author’s translation).

⁵⁹Elinor Ostrom, *Crafting Institutions for Self-Governing Irrigation Systems*, Institute for Contemporary Studies, ICS Press, San Francisco, California, 1992.

in the water provision, so farmers are reluctant to adopt the crops imposed by the engineers because they imply a strict respect of a precise irrigation calendar.

Ostrom uses the concept of 'working rules' used by individuals to manage specific relations among themselves. These 'working rules' make up an institution and Ostrom's experience shows that irrigation projects prove to be successful when they come together with the creation of enough adequate institutions capable of managing the irrigation network that is being set up. These

"[w]orking rules are used to determine who is eligible to make decisions in some arena, what actions are allowed or constrained, what procedures must be followed, what information must or must not be provided, and what costs and payoffs will be assigned to individuals as a result of their actions."⁶⁰

Let us notice that the working rules used and respected by all the users of an irrigation network are sometimes in flagrant contradiction with the *de jure* rules of the official legal system.⁶¹

The working rules, which rarely match the written laws, are not directly observable. Only activities organized according to these working rules can be observed. This finding of Ostrom largely guided the fieldwork of this research, allowing us to measure and observe the gap between the draft Palestinian water law and the field reality, through the observation of the relations concerning water within Palestinian villages. This finding also allows us to observe the gap between the Israeli Military Orders and the working rules used in the villages.

A good deal of social capital, as defined by Ostrom, is necessary in order to reach the coordination required by irrigation within a community.⁶² Social capital is multiform. It may consist of improving the way in which collective tasks are carried out, giving someone the responsibility of giving orders to others, and establishing rules that specify by whom, when and how specific activities must be carried out in deciding how that rule will be respected. "Social capital is not automatically or spontaneously produced. It must be crafted."⁶³ The construction or the existence of this

⁶⁰Ibid., p. 19.

⁶¹Elinor Ostrom and Roy Gardner, "Coping with Asymmetries in the Commons: Self-Governing Irrigation Systems Can Work", *Journal of Economic Perspectives*, vol. 7, 4 (Fall 1993), pp. 93-112.

⁶²Elinor Ostrom, *Crafting Institutions for Self-Governing Irrigation Systems*, op.cit., p. 30.

⁶³Ibid., p. 35.

social capital today in the Palestinian Areas reveals the cooperation and competition among various actors interested in accessing or controlling water.

Curiously enough, the relations among local actors and states concerning water have hardly ever been studied in the case of Jordan and Israel, and even less so in the case of the West Bank and Gaza Strip. Many factors contribute in explaining this phenomenon. Israel and the Occupied Territories do not belong to the Third World,⁶⁴ the focus of studies done by researchers in the field of development. On the other hand, no massive hydraulic project was ever carried out in the West Bank and Gaza Strip concerning agriculture. Finally, the international dimension of the competition for water in the Jordan Basin seems to have overshadowed all the other dimensions of that competition.

The difficulties encountered by foreign and Israeli researchers in carrying out such a study in the Occupied Territories must be mentioned. Israelis do not feel especially welcome in Palestinian villages, as the water issues are very private and can only be discussed once one has gained the villagers' trust.⁶⁵ The foreign researchers generally reside either in Israel or in the Occupied Territories with a tourist visa, which they renew regularly by spending a few days in Egypt or Jordan. Israel may decide not to allow back in whomever renews his or her tourist visa too often. So, most of the foreign researchers only spend short field trips in the Occupied Territories. They stay for a length of time too short to allow them to deeply investigate the local village situations. Thus, only Palestinian researchers have ample opportunity to study village hydro-politics. Yet, they do not, generally, show interest toward that topic for several reasons. On the one hand, there are no development studies institutes in the West Bank and Gaza Strip. Those who do undertake such studies do so abroad and in the context of international relations, as the social value given to such studies is high. Furthermore, widespread beliefs among Palestinians have made up what will be called a 'sanctioned discourse'. Though defined in later chapters, sanctioned discourse on water in Palestine is, in brief, the externalization of all the water problems on the Arab-Israeli conflict.

⁶⁴If 'Third World' is defined as meaning poor countries. Another definition of the Third World, the group of states that emerged from decolonization, would include both Israel and the Occupied Territories.

⁶⁵Of course, this is very subjective. Those Israelis who carry out research in the Occupied Territories generally thoroughly enjoy Palestinian hospitality. However, these researchers are far and few between.

Tarawneh's study of the social transformation of the Jordan Valley after the construction of the East Ghor Canal in Jordan should be mentioned.⁶⁶ Rich in information but written in the purest 'revolutionary Marxist-Leninist' style, with pre-set conclusions, this thesis provided only a relative usefulness. Let us mention, as well, the study of the same canal written by Rami G. Khouri.⁶⁷ Rich in pictures, this book is closer to a detailed advertisement pamphlet than to a critical study.

Claud R. Sutcliffe devoted his doctoral thesis to the social transformation of the east bank of the Jordan Valley by the completion of the East Ghor Canal project (now renamed King Abdullah Canal).⁶⁸ He thereby offers us a detailed description of a not-so-successful national territorialization process carried out by Jordan. Sutcliffe does not question at any time the legitimacy of the project, which sought to settle permanently Palestinian refugees from what had become Israel on to Jordanian soil. He deplors the failure of the project when he observes that Palestinian refugees persist in perceiving themselves as such and never adopt a Jordanian identity.⁶⁹ Even though his study never targets the power mechanisms involved, it constitutes a real treasure in as much as it explicitly details an attempt to transfer a population due to massive hydraulic efforts funded by the American Development Agency. This 'development engineer' perspective is also found in Joseph L. Dees' work⁷⁰ and in John S. Hauptert's work.⁷¹

The doctoral thesis of Ali Hasan Dawod Anbar, devoted to the socioeconomic description of the East Ghor Canal project, is well documented but does not investigate the power struggles the project involved.⁷²

⁶⁶Mohammed Fayez Tarawneh, *Aspects of Rural Transformation in the Jordan Valley: The Case of Deir Alla*, MA thesis in Anthropology, University of Yarmouk, Irbid, Jordan, 1989.

⁶⁷Rami G. Khouri, *The Jordan Valley: Life and Society Below Sea Level*, Longman, London and New York, 1981.

⁶⁸Claud R. Sutcliffe, *Change in the Jordan Valley: The Impact and Implications of the East Ghor Canal Project, 1961-1966*, unpublished Ph.D. thesis, Princeton University, 1969.

⁶⁹Claud R. Sutcliffe, "The East Ghor Canal Project: A Case Study of Refugee Resettlement, 1961-1966", *The Middle East Journal*, vol. 27, 4 (Fall 1973), p. 481.

⁷⁰Joseph L. Dees, "Jordan's East Ghor Canal Project", *Middle East Journal*, vol. 13 (Fall 1959), pp. 357-71.

⁷¹John S. Hauptert, "Recent Progress of Jordan's East Ghor Canal Project", *The Professional Geographer*, vol. XVIII (January 1966), pp. 9-13.

⁷²Ali Hassan Dawod Anbar, *Socioeconomic Aspects of the East Ghor Canal Project, Jordan*, Ph.D. thesis, Faculty of Science (Geography), University of Southampton, August 1983.

Water Law

As opposed to local hydropolitics, water law, especially International Law concerning water use, has been the object of many studies dealing with the Jordan Basin. Focussed on national and international law, and sometimes on Islamic Law, such research has rarely attempted to investigate the discrepancies between the practice of the working rules, as Ostrom defines them, and the rules themselves. However, these studies were useful because national and international laws set the framework within which actors and institutions competing for water evolve.

The series of publications by the FAO office of legal studies in Rome was very useful. Ludwik Teclaff carried out a study for a series on the evolution of national laws concerning water.⁷³ His research sheds light on the various actors who, over time, faced the various national governments' efforts to control the quality, sectorial allocation and distribution of water. It shows the various legal mechanisms that were developed by the states in order to acquire such control. It recounts the history of the TVA and successive valley authorities that often became states within the state, and explains why governments turned away from creating such institutions. Teclaff grants special attention to the Israeli water law of 1959 because it is the first example of a modern water law. Teclaff's study was followed by Stefano Burchi's.⁷⁴ More prescriptive, the latter is a guide for elaborating national water laws. The national water laws themselves were also published by the FAO.⁷⁵ The FAO series focuses especially on the International Law concerning water use.⁷⁶ It provides the texts of all the treaties existing on this issue.⁷⁷ J.A. Barberis carried out a specific study, within this series, on International Law concerning groundwater.⁷⁸ His work was especially useful for shedding light upon the legal status of the

⁷³Ludwik Teclaff, *Legal and Institutional Responses to Growing Water Demand*, FAO Legislative Study, 14, FAO, Rome, 1977.

⁷⁴Stefano Burchi, *Preparing National Regulations for Water Resources Management Principles and Practice*, FAO Legislative Study, 52, Rome 1994.

⁷⁵Dante A. Caponera, *The Law of International Water Resources*, FAO Legislative Study, 23, FAO, Rome, 1980.

⁷⁶Ibid.

⁷⁷Stefano Burchi, *Treaties Concerning the Non-navigational Uses of International Watercourses - Europe*, FAO Legislative Study, 50, FAO, Rome, 1993; *Treaties Concerning the Non-navigational Uses of International Watercourses: Asia*, FAO Legislative Study, 55, FAO, Rome, 199; *Systematic Index of International Water Resources Treaties, Declarations Acts and Cases by Basin*, FAO Legislative Study, 15, FAO, Rome, 1978; and *Systematic Index of International Water Resources Treaties, Declarations Acts and Cases by Basin*, FAO Legislative Study, 34, FAO, Rome, 1984.

⁷⁸Julius A. Barberis, *International Groundwater Resources Law*, FAO Legislative Study, 40, FAO, Rome, 1986.

West Bank aquifer. Other studies also deal with International Law regulating groundwater.⁷⁹

Muslim water law was extensively studied by Henri Bruno, whose doctoral thesis, although defended in 1913 and essentially carried out thanks to field work in Algeria, was very useful to guide our analysis of village systems used to share water.⁸⁰ Dante A. Caponera carried out a study of Muslim water law in which he compared the Maleki, Hanefi, Shafii and Hanbali water laws.⁸¹ Joseph Dellapenna is currently investigating this field as well.⁸²

Studies on international water law dealing specifically with the Middle East are numerous. Let us mention the contribution of Caponera who wrote the history of the treaties dealing with water in the area.⁸³ According to the theory of state succession in International Law, the provisions of conventions such as that of 1923⁸⁴ have to be respected by the successor states. However, this evolution of International Law in the Jordan Basin is more interesting from an historical point of view than as an actual basis to justify the present situation. Anette van Edig nevertheless invokes also the obligations that befall successor states.⁸⁵ Her work details the international laws applying to the Occupied Territories regarding water and criticizes the Israeli Military Orders as violating clauses of the conventions making up international humanitarian law. In 1990, Jamal Al-Hindi published an analysis of the conventions concerning belligerent occupation as they should apply to the West Bank aquifers.⁸⁶ Also very critical of the Israeli occupation, Al-Hindi deplored among other things the transfer of water from one river basin to another, as it had previously been forbidden by Jordanian Law and the obligation of an occupier is to respect the preexisting laws.⁸⁷ Dellapenna agrees with many of Al-

⁷⁹ Dante A. Caponera, "Principles for International Groundwater Law", *Natural Resources Journal*, vol. 22, 1982.

⁸⁰ Henri Bruno, *Contribution à l'étude du régime des eaux en droit musulman*, Ph.D. thesis defended April 24, 1913, Faculty of Law, University of Paris, Arthur Rousseau (publisher), Paris, 1913.

⁸¹ Dante A. Caponera, *Le droit des eaux dans les pays musulmans*, Collection FAO: Progrès et mise en valeur Agriculture, Paper No. 43, FAO, Rome, 1956.

⁸² Joseph Dellapenna (forthcoming publication).

⁸³ Dante A. Caponera, "Legal Aspects of Transboundary River Basins in the Middle East: The Al-Asi (Orontes), the Jordan and the Nile", *Natural Resources Journal*, vol. 33, 3 (Summer 1993), pp. 629-663.

⁸⁴ Signed by France and Great Britain, the multilateral convention of 9 December 1923 concerns the development of hydraulic energy affecting more than one state.

⁸⁵ Anette van Edig, *Aspects of Palestinian Water Rights*, Ramallah Center for Human Rights Studies, Ramallah, May 1999.

⁸⁶ Note, "The West Bank Aquifer and Conventions Regarding Laws of Belligerent Occupation", *Michigan Journal of International Law*, vol. 11, 4 (Summer 1990), pp. 1400-1423.

⁸⁷ *Ibid.*, p. 1414.

Hindi's arguments.⁸⁸ However, writing in 1994, after the Declaration of Principles, he considers that the Israeli position has changed and suggests scenarios that would provide solutions in agreement with International Law. Ayman H.A. Khaleq essentially takes up the same arguments while examining the Israeli-Jordanian peace treaty of 1994.⁸⁹ Safwat Ibraghith devoted his master's thesis to the status of water in the Occupied Territories and largely agrees with the previous authors.⁹⁰

Eyal Benvenisti refutes several of these interpretations of International Law arguing that natural conditions do not prescribe water allocation and that Israel does have rights over the West Bank aquifers.⁹¹ He joins Dellapenna in pleading for joint Palestinian-Israeli management of the aquifers. Benvenisti has also produced a study attempting to conciliate village customary law and International Law in the area.⁹² We regret that his article only outlines the ideas without investigating them in-depth on the field. Due to unfounded fears, this lack of fieldwork is common among Israeli researchers of the territories.

The Israeli water law has been discussed by many authors. Ariel Bin-Nun mentions it within the global Israeli legal framework.⁹³ A.M. Hirsch situates it in the framework of the Middle East.⁹⁴ But it has also been in itself investigated.⁹⁵ The Israeli legal tools to control water quality were studied by Richard Laster⁹⁶ and Elaine Fletcher.⁹⁷ The first shows the evolution

⁸⁸Joseph W. Dellapenna, "Designing the Legal Structures of Water Management Needed to Fulfill the Israeli-Palestinian Declaration of Principles", in *Palestine Yearbook of International Law*, 1992/1994, vol.7, pp. 63-103.

⁸⁹Ayman, H.A. Khaleq, "A Study of the River Jordan Legal System Prior and After Regional Peace Treaties", paper submitted for the 1999 Water Conference at the Law Institute, Birzeit University.

⁹⁰Safwat Ibraghith, *Les ressources en eau au conflit israélo-arabe*, MA thesis, Faculty of Law, University of Montpellier I, September 1997.

⁹¹Eyal Benvenisti and Haim Gvirtzman, "Harnessing International Law to Determine Israeli-Palestinian Water Rights: the Mountain Aquifers", *Natural Resources Journal*, vol. 33, 3 (Summer 1993), pp. 543-567.

⁹²Eyal Benvenisti, "Collective Action in the Utilization of Shared Freshwater: The Challenges of International Water Resources Law", *American Journal of International Law*, vol. 90, 3 (1996), pp. 384-415.

⁹³Ariel Bin-Nun, *The Law of the State of Israel: An Introduction*, Rubin Mass Ltd., Jerusalem, 1992.

⁹⁴A.M. Hirsch, "Water Legislation in the Middle East", *American Journal of Comparative Law*, vol. 8, 1959.

⁹⁵Landau, "A Problem Under the Water Law", *Israel Law Review*, vol. 2, 1966.

⁹⁶Richard Laster, "Environmental Law in Israel Today", in *Our Shared Environment: Israelis and Palestinians Thinking Together about the Environment of the Region in Which they Live*, ed. by Robin Twite and Jad Isaac, IPCRI, Jerusalem, December 1994, pp. 107-146.

⁹⁷Elaine Fletcher, "Israel's Environment: Government, Media and the Public", in *Our Shared Environment: Israelis and Palestinians Thinking Together about the Environment of the Region in Which they Live*, ed. by Robin Twite and Jad Isaac, IPCRI, Jerusalem, December 1994, pp. 22-57.

of Israeli legal institutions concerning water quality and the emergence of the Ministry of Environment. This work identifies tensions among many actors within the Israeli administration itself: the water commissioner, Mekorot, Tahal, the Ministry of Agriculture, the Ministry of Environment, etc. Fletcher details the role of the Ministry of Health and of Mekorot regarding water quality control.

► *Technical Analyses*

An attempt will not be made here to achieve a global inventory of technical publications on water in the Middle East. However, a few pertinent publications that contributed to shaping this research will be mentioned.

The study carried out by Anan Masri and Hussam Abu Faris was precious.⁹⁸ The authors described with detail the various sources of water in the West Bank, the various factors affecting per capita water demand, the various wastewater treatment systems existing in rural areas and the problems induced by the construction of adduction water networks. The authors even made an inventory of the various types of toilets used in the West Bank. This pragmatic preoccupation does not generally worry international relations theoreticians. But the work of Masri and Abu Faris, carried out with an exemplary methodology, allowed us to understand the impact of any hydraulic development on the West Bank aquifer. This impact largely determines the Israeli policy for granting permits. And that policy largely determines the infrastructure work carried out thanks to foreign aid. This topic will be returned to during the research.

The study of P. Pallas on the conjunctive use of surface and ground water details the problems involved in the global management of the recharge and discharge of an aquifer.⁹⁹ Israel was the first state in the world to establish such a global management on the totality of its territory. The elaboration of the 1959 water law aimed at establishing this global control over all of its territory.

Geographers have described with detail the water situation in Jordan¹⁰⁰ and in the region in general.¹⁰¹ Let us mention here the important contri-

⁹⁸Anan Masri and Hussam Abu Faris, *Water and Sanitation Systems in the Rural Areas - West Bank*, Catholic Relief Services, Jerusalem, West Bank and Gaza, November 1994.

⁹⁹P. Pallas, "Conjunctive Use of Surface and Groundwater", *Land and Water Integration and River Basin Management*, FAO Land and Water Bulletin, 1, 1995.

¹⁰⁰Abdullah A.Ahmad, *Jordan Environmental Profile Status and Abatement*, Amman, 1989.

¹⁰¹Micha Klein, "Water Balance of the Upper Jordan River Basin", *Water International*, vol. 23, 4 (December 1998), pp. 244-248.

butions of both the Applied Research Institute - Jerusalem (ARIJ)¹⁰² and the studies on water quality carried out at Bethlehem University by Dr. Alfred Abed Rabbo and Brother Scarpa.¹⁰³

► *Models/Proposals*

Many models, strategies, and management proposals were published concerning water in the Near East. Some were highly useful, such as those published by the World Bank. An important actor in development, the World Bank is one of the rare donors who has actively developed a general strategy concerning water and who has chosen to support only projects fitting into this strategy. The general policy of the World Bank towards water was published as early as 1993.¹⁰⁴ This very detailed document provides a blueprint for the national legislative framework that is considered desirable by the Bank for good management of water resources. We will come back to this in chapter 5. The World Bank published, in 1993, its policy towards the Occupied Territories¹⁰⁵ and, in 1995, an expert study predicting the upcoming strategy concerning water in the Middle East and in North Africa was published.¹⁰⁶ These documents offered a basis on which to start investigating the Bank's water projects, including interviews of its employees and local partners.

Most of the publications gathered under this heading were not vital for this research. Such studies hope to contribute to the shaping of a solution for the water management problems, instead of investigating the existing reality, which is the topic of this research. They therefore interested us mostly when they were put forward by one actor or the other. However, the important contribution of H. Shuval to this field must be acknowledged.¹⁰⁷ Many decision-making tools were published such as the study

¹⁰²Applied Research Institute – Jerusalem (ARIJ), *Water Resources and Irrigated Agriculture in the West Bank*, ARIJ, Bethlehem, March 1998; Walid Sabbah and Jad Isaac, *An Evaluation of Water Resources Management in Ramallah District*, ARIJ, Bethlehem, 1996; Jad Isaac (ed.), *Environmental Profile for the West Bank, Vol. 1: Bethlehem District, Vol. 2: Jericho District, Vol. 3: Hebron District*, ARIJ, 1995; *Environmental Profile for the West Bank, Vol. 6, Jerusalem District*, ARIJ, Bethlehem, 1996.

¹⁰³For illustration see D. J. Scarpa, "The Quality and Sustainability of the Water Resources Available to Arab Villages to the West of the Divide in the Southern West Bank", paper delivered at the Special Workshop: Palestinian Water Problems, International Conference, Environmental Challenges for the Next Millennium, Bethlehem University, 18 June 1999.

¹⁰⁴World Bank, *Gestion des Ressources en eau, Document de politique générale de la banque mondiale*, World Bank, Washington, DC, 1993.

¹⁰⁵World Bank, *Developing the Occupied Territories. An Investment in Peace, Vol. 1: Overview*, A World Bank Publication, September 1993.

¹⁰⁶Jeremy Berkoff, *Une stratégie pour la gestion de l'eau au Moyen-Orient et en Afrique du Nord. Collection: Le développement en marche*, World Bank, Washington, DC, 1995.

¹⁰⁷Hillel Shuval, "Le problème du partage de l'eau entre Israël et les Palestiniens. A la recherche d'une solution équitable", *Monde arabe Maghreb Machrek*, 138 (October-De-

by J.W. Moore.¹⁰⁸ Observing correctly that water allocation schemes such as the Johnston Plan do not represent a long-term solution for the area, Moore advocates an increase in water provision thanks to desalination and to a restructuring of the demand due to the introduction of market conditions. Game theory was used by many authors.¹⁰⁹ The introduction of market mechanisms was often put forward.¹¹⁰ Palestinians¹¹¹, Jordanians¹¹² and Israelis¹¹³ contributed to this type of models/proposals, sometimes within Israeli-Palestinian co-authored publications.¹¹⁴

Conclusion

This overview of the literature does not claim to be exhaustive. However, it should provide an illustration of the main trends existing in the literature dealing with water in the Near East. It also acknowledges the authors that fuelled this research.

Water in the Near East was most often tackled in an international dimension and according to the realist perspective where only states were com-

ember 1992), pp. 27-37; Hillel Shuval, "Towards Resolving Conflicts Over Water Between Israel and Its Neighbors: The Israeli-Palestinian Shared Use of the Mountain Aquifer as a Case Study", in *Water, Peace and the Middle East: Negotiating Resources in the Jordan Basin*, Library of Modern Middle East Studies, vol. 9., Tauris Academic Studies, New York, 1996, pp. 137-168; Karen Assaf, Nader Al-Khatib, Elisha Kally and Hillel Shuval, *A Proposal for the Development of a Regional Water Master Plan*, prepared by a Joint Israeli-Palestinian Team, IPCRI, October 1993; Hillel Shuval, "Approaches to Resolving the Water Conflicts Between Israel and Her Neighbours - A Regional Water for Peace Plan", *Water International*, vol. 17, pp. 133-143; and Hillel Shuval, "A Water-for-Peace Plan", *Palestine-Israel Journal*, vol. III, 3/4, pp. 74-83.

¹⁰⁸J.W. Moore, "Parting the Waters: Calculating Israeli and Palestinian Entitlements to the West Bank Aquifers and the Jordan River Basin", *Middle East Policy*, 3 ii (1994), pp. 91-108.

¹⁰⁹For example, Mohammed R. Shatanawi and Odeh Al-Jayousi, "Management Options of Water Resources in Jordan", (publication forthcoming).

¹¹⁰Mohammed R. Shatanawi and Odeh Al-Jayousi, "Evaluating Market-Oriented Water Policies in Jordan: A Comparative Study", *Water International*, 20 (1995), pp. 88-97. And Nir Becker and Naomi Zeitouni, "A Market Solution for the Israeli-Palestinian Water Dispute", *Water International*, vol. 23, 4 (December 1998), pp. 238-243.

¹¹¹For example, Walid Sabbah and Jad Isaac, *Towards a Palestinian Water Policy*, 26-28 July 1995, Amman, Jordan, ARIJ, Bethlehem, West Bank.

¹¹²For example, Odeh Rashed Al-Jayousi and Mohammed Rashid Shatanawi "An Analysis of Future Water Policies in Jordan Using Decision Support Systems", *Water Resources Development*, vol. 11, 3 (1995), pp. 315-330.

¹¹³For example, E. Kally and G. Fishelson, *Water and Peace: Water Resources and the Arab-Israeli Peace Process*, in cooperation with the Armand Hammer Fund for Economic Cooperation in the Middle East, Tel Aviv University, Praeger, Westport, 1993; and Nurit Kliot and Deborah Shmueli, "Real and Ideal Institutional Frameworks for Managing the Common Arab-Israeli Water Resources (Israel)", *Water International*, vol. 23, 4 (December 1998), pp. 216-226.

¹¹⁴Eran Feitelson and Marwan Haddad, "A Stepwise Open-Ended Approach to the Identification of Joint Management Structures for Shared Aquifers (Israel, Palestinian Authority)", *Water International*, vol. 23, 4 (December 1998), pp. 227-237.

peting; this was often not spelled out since many of the authors are engineers and geographers disinterested in international relations theory. Water was thus most often shown within the framework of states' foreign policies, within a zero-sum game or within an attempt to verify functionalist theory.

Many authors studied water as a stake of local competition. The relations among irrigating farmers, municipalities, water shareholders, etc. were the object of in-depth studies. But hardly any were situated in the West Bank and Gaza Strip.

Alison Burrell deplored in 1986 the absence of studies concerning the elaboration and adoption of measures and policies in the field of agriculture in Jordan.¹¹⁵ Thirteen years later, this deficiency still persists. This observation is also valid concerning hydropolitics in Jordan and in the West Bank and Gaza Strip.

¹¹⁵Alison Burrell (ed.), *Agricultural Policy in Jordan*, published for the Abdul Hamid Shoman Foundation, Amman, Ithaca Press, London and Atlantic Highlands, 1986, p. 9.

Research Method

General Methodology

This is a research in political science and international relations as it aims at understanding the manner in which local hydropolitics, national hydro-politics and international relations affect each other in the West Bank and Gaza Strip within the context of the lower Jordan Basin. We will, however, use many approaches common in development studies.

This research followed a rather rare path. I personally worked for some of the actors in this constellation. The understanding of power struggles, and of the cooperation and competition that is centered around water which I acquired allowed me to return to my initial role as a researcher and to lead my investigation in the Palestinian Areas using both participant observation techniques and rapid rural appraisal techniques. I tried to observe and listen to all of the identifiable actors, to meet them in their working place and to visit with them in the infrastructure they were working on.

The post-modernist trend maintains that the truth remains forever elusive, for we never observe objectively a situation because our very observation interferes with this situation. Ernest Gellner's criticism of post-modernism, especially pertaining to social sciences is welcomed as his notion of 'enlightened rationalism' will be followed.¹ It will be noted, however, that my role as an actor fuelled this research only with information. Some of it could not have been obtained otherwise. The researcher, however, rather than the development actor, must analyze this information. This is what this thesis attempts to do. Earlier, the authors that contributed to the elaboration of this research's theoretical framework were presented. A rigorous examination of the analytical framework and hypotheses underlying this research will prevent the weaknesses of the sources used from influencing this work.

The initial approach was field observation. However, the claim of having followed solely an inductive approach is not being made. Theory was used when it proved to be useful in conceptualizing an observation or in

¹Ernest Gellner, *Postmodernism, Reason and Religion*, Routledge, London and New York, 1992.

formulating new questions. There was a conscious refutation to follow only one theory, which would have inevitably blinded us to other topics. Just as Keohane defends the complimentary relation of constructivism and realism,² this research considers that various approaches allow us to observe reality at various angles and that these observations are complementary. Decision-makers will be considered as rational beings as they are considered by the realists. However, their perceptions of the situation will be taken into account as understood by the constructivists.

An attempt to determine the role of ignorance will be made as much as possible. Ignorance plays a crucial role in power relations and yet it remains hardly studied. According to Robert McNamara, the complete ignorance the American administration showed concerning Asia played a crucial role in the outbreak of the Vietnam War.³ Woodrow Wilson deplored a few years after the settlement of the First World War that he didn't know at the time that one million Germans lived in Bohemia. This fact brought Abba Eban to comment on the lack of consideration paid to ignorance in decision-making.⁴ In the Jordan Basin, small and big decisions are made in ignorance. This includes ignorance of the irrigating farmers concerning the draft water law prepared by the PA; ignorance of Palestinian villagers concerning the real origin of water shortages in their adduction networks; ignorance of the settlers concerning the situation in neighboring Palestinian villages; ignorance of the donors concerning the territorialization processes achieved via water infrastructure by Israel, Jordan and the PA; and ignorance of the engineers concerning the political, social and economic impact of their work. Many authors have emphasized the difficulty in obtaining exact data concerning water in the area. The Water Data Bank Project even renamed itself Water Data Banks as the data kept-on being jealously guarded by the respective governments involved in the project. Reaching exact data will not be of primary concern. However, there will be great interest in the data in which the actors believe in order to understand their strategy and their positions.

The water users are all actors in the hydropolitical constellation and the degree of their involvement will vary according to how much they value that use. Water may be put to many uses, endowing it with varying value. We must distinguish the various uses made of water in order to determine how valued it is by the actors involved in the competition for water in the

²Peter Katzenstein, Robert O. Keohane and Stephen D. Krasner, "International Organization and the Study of World Politics", *International Organization* 52, 4, (Fall 1998), pp. 645-685.

³Robert S. McNamara, with Brian Van De Mark, *In Retrospect: The Tragedy and Lessons of Vietnam*, Vintage Books, Random House, New York, 1996, p. 32.

⁴Abba Eban, *Diplomacy for the Next Century*, Yale University Press, London, 1998, p. 38.

Near East. This approach will allow for the identification of these actors as well as the cooperation and competition that exists among them. These relations among actors located at all levels, whether local, national or international, determine whether or not a conflict will break out over water. The first approach thus consisted of identifying the water uses within every constellation.

Water use greatly varies around the globe. Thus, 60% of water used in France goes to cooling power stations, whereas nearly 70% of water used in Israel and in Jordan goes to irrigation.⁵ The constellation of actors will therefore vary from one place to another and the analysis, which will be carried out concerning the lower Jordan Basin cannot therefore be transposed elsewhere. The method, however, could prove useful to study another geographic context.

Domestic, irrigation and industrial use clearly appear in this constellation. The rhetorical use (in the political discourse), the commercial use (in the sale of water by a well owner, the abstention of a contract for an engineering firm, etc.), and the political use (in the territorialization process as defined by Faggi, the intervention of another state via a development fund, etc.) will be elaborated upon as well.

These uses will allow us to identify both the users and how much the use is valued. This analysis proceeds from the hypothesis that the control of a natural resource confers power. Like the realists, this research hypothesizes that the actors will act rationally in order to maximize that power, within the limits set by their ignorance and their position in the constellation of actors. Like the constructivists, the state will be considered as an actor, as will the NGOs, municipalities, well owners, and donors. The perceptions, goals and values of every actor will also be discussed.

Conflicts concerning water in the Jordan Basin will be investigated, ranging from wars to stolen water meters. These conflicts reveal the competition and cooperation among the actors. Therefore, a better understanding of the place occupied by water in the foreign policy of the entities existing in the lower Jordan Basin will be reached.

All of the fieldwork was carried out in the West Bank and Gaza Strip. Participant observation and rapid rural appraisal techniques were both used. It was quite clear at every village visit that this was the first time a foreigner came to ask questions concerning the control, access and cus-

⁵ Jacques Lecomte, *L'eau: usages et conflits d'usage*, Que Sais-Je? collection, 266, P.U.F., Paris, 1998, p. 67.

tomary regulations concerning water. Local NGO engineers often told me there existed no water law in the village. The water users themselves were however generally happy to be questioned and could speak to no end on all the rules existing in the village.

Pascon's influence on the investigation technique must be acknowledged.⁶ He insisted on the fact that the researcher should return several times to a village and should above all earn the trust of the villagers. The 'close encounter of the third type' between the researcher and the villager could yield useful results depending on the level of trust that was established between the two persons. We should note here the importance of walking the fields with the villagers. The word 'well' in dialectal Arabic (*bir*) is the same as the word 'cistern'. It was thus necessary to check every time a villager said he owned a well.

Each irrigating Palestinian village is socially stratified according to water. There are those who may access the water and those who are excluded from it. The first group includes the shareholders of the springs and the well owners who sell water to the irrigating farmers. Those excluded from water access include women in general, the owners of land plots without a water share who must pay the shareholder to irrigate, and the farmers who depend on a well owner to buy their irrigation water. None of these categories exist in the draft legislation of the PWA, but they exist in every village that has a well or spring.

We will identify the various social categories in the villages according to their use of water, access to water, control exerted on the hydraulic development and the benefit acquired from projects of water development.

The investigation of urban water institutions and of national and international actors was carried out largely through participant observation techniques and the usage of the abundant literature that these actors produce.

Methodology of this Study

This research started with the following observations:

States all attempt a territorialization process, as defined by Faggi, through their water policies. This process targets the populations living inside the state and thereby implies a change in the power distribution among local

⁶Pascon, Paul, "Méthode d'Etude des structures agraires au niveau villageois", *Bulletin Economique et Social du Maroc*, 128/129, 1976, pp. 117-134.

and national actors.⁷ The conflicts that emerge when this process takes place allow us to understand which actors try to gain power through the water relation they attempt to set up and which actors try to preserve their power through the relation they already have with water. In the course of the process, national actors as well as local actors will be pitted one against the other. For example, ministries will compete with each other to extend their jurisdiction over water.

Hydraulic development was used in the past in Israel and Jordan within the framework of state territorialization. It is now a potentially crucial tool that the PA may use in its attempt to set up state control over the Palestinian Areas.

Riparian states sharing an international river basin inevitably affect each other when they undertake the application of a water policy, no matter what the nature of the latter is. The water policy thus constitutes an indisociable element of the foreign policy of these riparian states. This interaction between water policy and foreign policy is especially sensitive in areas where riparian states experience a scarcity of good quality water.

While riparian states are positioning themselves towards each other when applying a water policy, they are simultaneously positioning themselves towards the local actors they try to control within their borders. Though water does contribute, in varying degrees, to shaping the foreign policy, the foreign policy itself is an important albeit not necessary element in determining the construction of a water policy.

The actors involved in the competition for waterpower⁸ will not necessarily cooperate with actors of the same nationality in order to promote their cause. A local actor belonging to state A may very well rely on a policy led by state B in order to avoid more or less consciously a territorialization process that would ensure state power over him. This phenomenon is especially visible today in the West Bank and Gaza Strip as local actors attempt to preserve their independent control of water while facing a growing PA competing for that power.

⁷'Local actors' are defined here as those whose competition, cooperation and other activities entailed by their relation to water are entirely circumscribed within a village or city and its immediate surrounding area. Thus, local actors may be members of national ministries. The geographic scope of their activities determines whether they are local actors. *National* actors are defined as those actors whose competition, cooperation and other activities entailed by their relation to water are circumscribed by the national territory. The PWA is, thus, a national actor, notwithstanding the fact that the PA is not a state.

⁸'Water power' is defined here as the power an actor gains when he acquires control of water use, distribution, access or allocation.

Moreover, we observe that the funding of hydraulic development by a donor, no matter which one, inevitably takes place within a political agenda even though the donor himself remains sometimes unaware of that agenda.

Some donors have clearly set political agendas and chapter 5 will detail the political aspect of American aid. However, some donors do not necessarily have a political agenda. They are maybe the most dangerous for they fund territorialization efforts without understanding their finalities. They fuel cooperation and aggravate competition without even knowing these exist. They are often used by actors who have their own agenda.

It is therefore impossible to reduce the issue of water in the Jordan Basin to a zero-sum game among riparian states. The hydropolitical scene gathers farmers, municipalities, civil servants, bilateral donors, international donors and states. Each has its own goals and seeks cooperation according to these goals.

Chapter 1

Historical Overview and Present Situation

Introduction

This chapter will provide a historical overview and will depict the present situation concerning water in the Jordan Basin.¹ The approach will essentially focus on state and interstate aspects and will demonstrate how states have tackled the challenge of water control. The first section will describe how the Jordan Basin came to be split among the various riparian states. The next section will describe the evolution of the water situation under the British Mandate over Palestine, when a first attempt was made to develop comprehensive water control. The following section will discuss the notion of a 'hydraulic imperative' since the British Mandate. The fourth section will discuss the change in water control brought about by the creation of the State of Israel. Attention will especially be paid to the changes brought about by the 1959 Israeli Water Law. This was the first time in the region that a state set up a centralized, conjunctive water management over all of its territory. The next section will discuss the evolution brought about by the major water infrastructure developments of the 1950s and 1960s in both Israel and Jordan. The sixth section will examine the impact of the War of 1967 on the water situation. The seventh section will look at the occupation of southern Lebanon and water. The eighth section will discuss the territorial expansion of Israel in relation to the hydraulic situation. The ninth section will briefly look at the price of water. The remaining sections will examine how the Madrid conference and later the Cairo and the Taba Agreements affected Palestinian water control. Finally, the water content of the Israeli-Jordanian Peace Treaty will also be examined as it provides an illustration of the type of arrangement that is accepted by the Israeli Government.

¹A small portion of this overview has already been published, see Julie Trottier, "L'eau, la Jordanie et l'entité palestinienne naissante: analyse d'un enjeu déterminant de la politique étrangère hachémite", *Les Cahiers du Monde Arabe*, 121-122, 1995, pp. 1-25. See also Julie Trottier, "Welke hydraulische strategieën voor de Palestijnse autoriteiten?", *Safer*, Year 2, 1997, pp. 19-33.

The Colonial Borders and the Partition of the River Basin

Water as a political stake is not new to the Near East. The story in the book of Genesis of Isaac's clash with the herdsmen of Gerar and his journey to Beersheva provides an often-quoted example of water conflict.² The Jordan Basin - the site of a recent water conflict - was entirely located inside the Ottoman Empire at the start of World War I. Its division among riparian states is a modern phenomenon that was initiated at the end of the war.

When the Great War drew to an end in 1918, Emir Faisal, the son of Hussein the Sharif of Mecca, moved to Damascus expecting to rule Syria. He wrote to the Zionist leader Chaim Weizmann hoping to agree with him on a common position before having to face France and Great Britain during the peace conferences, when the territory of the Ottoman Empire was to be redistributed. The Hashemite emir expected to remain king of Syria and evaluated that Arab demography, together with Jewish capital, would allow for the establishment of enough of a state embryo in order to obtain the withdrawal of the Europeans, ensuring the independence of the Semites. Faisal committed himself to support the settlement of Jews and to allow them to freely cultivate the land so long as the Arab world was freed from colonialism. Thus, Faisal and Weizmann signed a treaty of nine articles on 3 January 1919, which was supposed to ensure a common position, shared by both Jews and Arabs, in the upcoming peace conference in Paris.³

From all of the parties attending this peace conference only the Zionist delegation had given water a priority during its border proposals.

The Sykes-Picot Agreement concluded between France and Great Britain during the war had foreseen a territorial division that did not attempt to gather water resources within national borders. The Litani and the upper Jordan were supposed to lie in the territory controlled by the French. Lake Tiberias was supposed to be divided into an international zone and a French zone. The Yarmouk valley was supposed to go part to the British and part to the French while the present day West Bank was to be an international territory and present day Jordan was to go to the British.⁴ The

² Genesis 26:20 and 26:32-33.

³ Adam Garfinkle, *Israel and Jordan in the Shadow of War: Functional Ties and Futile Diplomacy in a Small Place*, St. Martin's Press, New York, 1992, p. 19.

⁴ Aaron T. Wolf, *Hydropolitics Along the Jordan River: Scarce Water and Its Impact on the Arab-Israeli Conflict*, United Nations University, Tokyo, 1995, p. 18. It is worth noting that the maps used by the French and the British in all of the documents, reports, interpretations and studies linked to the Sykes-Picot Agreement had a very big scale of 1:2,000,000 and the lines drawn were thick. This added a lot of imprecision to the Franco-British Agreement,

French and the British did not worry about a division of the river basin that would prevent its management by a single national water policy. The extension of their authority over this territory mattered to them for foreign policy reasons, not for developing local agriculture.⁵

Faisal was likewise not preoccupied by the division of the Jordan River Basin as he was about to negotiate the control of a huge territory that was to include Syria, Mesopotamia, the Hijaz and the Arab Peninsula. This territory was so extensive that the water resources of the Jordan Basin represented very little.⁶ Faisal did not seek an alliance or a common platform with the Lebanese, who had a separate delegation. The Palestinians did not have any representation at the conference. The fact that Faisal struck an agreement with the Zionists may be explained by a tribal vision of political relations, which was to be clearly illustrated by his brother Abdullah a few years later. The enemies of the Hashemite family were the Husseinis in Palestine and the Saudis, who took the Hijaz away from them after 1924. The Zionists, however, did not make up a tribe and were thus not perceived as enemies competing for the same stakes.

Zionist ideologues had thought about water long before the creation of the State of Israel. In 1902, Theodor Herzl had suggested a canal that would carry Nile water through the Sinai and wrote that "the real founder of the new-old country were the hydraulic engineers."⁷ In 1920, Chaim Weizmann defended the idea of the Litani as the northern border of Israel. He was not putting forward any religious reason, but rather a very practical consideration: Israel would need water to develop its agriculture.⁸ The Zionist team responsible for preparing the border proposals at the peace conference was driven by economic considerations. The British chemist Chaim Weizmann, the Yishuvi agriculturalist Aaron Aaronsohn and the former justice of the American Supreme Court Louis Brandeis used economic criteria while preparing the border proposals. They placed as a pri-

especially concerning the early tributaries of the Jordan River. See Arnon Medzini, *The River Jordan: The Struggle for Frontiers and Water, 1920-1967*, unpublished Ph.D. thesis, University of London, October 1997, p. 33.

⁵ Great Britain wanted to control the routes to Mesopotamia and India; the protection of the sea lines required an occupation of the coast around the Suez Canal and the protection of the land link required the control of the roads through the Arab Peninsula. By ensuring their control over the Yarmouk valley, which was going to be the unavoidable path of the railway connecting Haifa and Baghdad, the French attempted to curtail British control as much as possible.

⁶ The Jordan is a very small river compared to others in the region. It is only 212 m long and its flow is only 2% of the Nile's. See Natasha Beshorner, "L'eau et le processus de paix israélo-arabe", *Politique Etrangère*, 4, Winter 1992, p. 839.

⁷ Theodor Herzl, *Pays ancien, pays nouveau*, Stock, Paris, 1980, p. 256.

⁸ John Bulloch and Adel Darwish, *Water Wars: Coming Conflicts in the Middle East*, Victor Gollancz, London, 1993, p. 37.

ority economic security and defined it in terms of water resources, as water was necessary for irrigation and for generating electricity. They therefore proposed to locate the three tributaries of the Jordan - the Dan, Banyas and Hasbani - as well as the Litani River, Golan Heights, the Yarmouk and its tributaries and the Jabbok inside the territory of Palestine, which was now to rise over the remains of the Ottoman Empire. They declared openly that the only scientific and economic demarcation lines were the limits of the river basins.⁹

At the conference, political realism dominated among the Zionist delegates. They feared alienating both the French and the British if they respected their previous agreement with Faisal. So they did not intervene when his hopes were dashed. Syria was not going to be independent, but was rather going to be made into a French Mandate. Worse, the French were going to chase Faisal from of his throne in 1920.

Chaim Weizmann, who chaired the Zionist delegation at the peace conference, saw French and British interests dominate in the final agreement of the borders signed in London on 4 December 1920. The French delegation promised that Jewish settlements could use water freely from the upper Jordan and from the Yarmouk but these rivers would remain under French control, just like the Litani. Lake Tiberias and the rest of the Jordan River would be located in the British Mandate. From then on, the river basin would be divided and the British Mandate over Palestine would be a downstream riparian state.

The bilateral treaty signed by France and Great Britain on 23 December 1920, therefore became the second treaty to determine the use of water in the Jordan River Basin.¹⁰ It spelled out two principles. First of all, according to Article 8, the needs of the territories lying in the French Mandate would receive “prior satisfaction”. Priority was therefore granted to the upstream riparian state. Second of all, the treaty stipulated that the French Government would give its representative “the most liberal instructions concerning the use of the surplus of these waters for the ad-

⁹ Wolf, pp. 20-21.

¹⁰ The Jordan River was the object of an international treaty for the first time in 1840. Ibrahim Pasha had conquered Syria in 1831-1832 and villages in the area had been deserted until the withdrawal of the Egyptians in 1841. See Eugene L. Rogan, *Tariq Tell, Village, Steppe and State: The Social Origins of Modern Jordan*, British Academic Press, London, 1994, p. 27. The ‘Convention for the Pacification of the East’ obtained this withdrawal. It was a multilateral treaty signed by Austria, the United Kingdom, Prussia, Russia and the Ottoman Empire. A separate act signed in London on 15 July 1840 and annexed to this convention determines the demarcation line and the regime of Lake Tiberias and the Jordan River. See *Systematic Index of International Water Resources Treaties, Declarations, Acts and Cases by Basin*, FAO, Legislative Study, 15, Rome, 1978.

vantage of Palestine.”¹¹ The same treaty was determining simultaneously the regimes of the Yarmouk, Tigris, Euphrates and Jordan, thus illustrating the territorial division that had just taken place.¹²

The Franco-British Agreement of 1920 located the Banyas, one of the three main tributaries of the upper Jordan, inside the Mandate over Palestine. But when the border with the Mandate over Syria was demarcated in 1923, the Banyas ended up one kilometer inside of Syria. Thus arose as early as 1923 the division of the Jordan Basin that was eventually going to lead to the localization of two main tributaries of the upper Jordan outside of Israel, therefore making the Jewish state a downstream riparian state.¹³ The Dan was located inside the British Mandate over Palestine and the Hasbani was located inside the Mandate over Syria and Lebanon.¹⁴

The Palestine Mandate and Water

In 1922, Great Britain officially declared that its policy concerning Jewish immigration towards the Palestine Mandate would be determined by the absorptive capacity of that territory. The British focused on the agricultural sector in order to determine the number of immigrants allowed in.¹⁵ During the 1940s this led the Zionists to seek to have water recognized as a key factor for determining the absorptive capacity of a Jewish state.¹⁶

¹¹ Dante A. Caponera, "Legal Aspects of Transboundary River Basins in the Middle East: the Al-Asi (Orontes), the Jordan and the Nile", *Natural Resources Journal*, vol. 33, Summer 93, 3, p. 643.

¹² *Systematic Index of International Water Resources Treaties, Declarations, Acts and Cases by Basin*, FAO, Legislative Study, 15, Rome, 1978.

¹³ Arnon Medzini details extensively the demarcation process concerning the border separating the French and the British Mandates. See Medzini, *The River Jordan*, op. cit., pp. 37-45. He shows that the border was demarcated on the field by a Franco-British committee led by Lieutenant Colonel Paulet, representing France and S.P. Newcombe representing Great Britain. The latter gave out a few directions concerning the precise demarcation. Thus, native tribes and villages were not to be split by this border. The latter could not run between a village and the land it cultivated, nor could it deprive a village of the roads linking it to an urban center. South of the Banyas, the border determined by the Franco-British convention crossed the territory of the Bedouin tribe named Arab Al-Fadel. Newcombe himself suggested placing the Banyas inside the Mandate over Syria in exchange for another territory to be granted to the Palestine Mandate.

¹⁴ Medzini also details the demarcation of the border separating Lebanon and Syria. See *ibid.*, pp. 45-50. In this case, the border ran inside the territory controlled by the French. It was drawn geometrically, crossing the Hasbani rather than following its bank as it would have done had it been demarcated by the Paulet-Newcombe team. As the same Mandate authority controlled the Mandates upstream and downstream of the Litani, this division did not seem problematic at the time.

¹⁵ Shalom Reichman, Yossi Katz and Yair Paz, "The Absorptive Capacity of Palestine, 1882-1948", *Middle Eastern Studies*, vol. 33, 2, April 1997, p. 339.

¹⁶ *Ibid.*, p. 358.

The acquisition by Jews of 453,140 dunums¹⁷ of land in the most fertile region of the Palestine Mandate between 1920 and 1939¹⁸ contributed largely to the creation of a social class of landless Arab peasants and to a lack of farmable land. Small landowners who had farmed their plots themselves had been the first to sell their land to Jewish immigrants between 1926 and 1936. As the market for food products had collapsed after World War I and as the region suffered a major earthquake, many small landowners had fallen into debt. Once their land had been sold, these peasants had great difficulty finding employment as farm laborers. Young Jewish immigrants who came from Europe since the beginning of the century generally belonged to the middle class. Yet, many volunteered to live a proletarian life. They sought the edification of a classless society while founding the Jewish nation.¹⁹ This phenomenon contributed to the exclusion of a portion of the population from the economic production process. A new social class of marginalized people emerged who would soon protest its exclusion.

Violent social clashes shook the Palestine Mandate in 1929, opposing Jews and Arabs. The Shaw Commission, set up to investigate the roots of this violence, identified the source as the Arab fear of growing Jewish immigration and land acquisition and concluded that agricultural development had to be undertaken in order to solve the problem of landless Arab peasants.

In the report following his visit to Palestine in May 1930, Hope-Simpson, who was sent to investigate immigration, land tenure and development, pleaded in favor of the promotion of intensive agriculture through irrigation. The Mandate could thereby fulfill both of its obligations by supporting the settlement of Jews in Palestine without harming the Arabs.²⁰ The Jewish Agency reacted well to this proposition. Developing intensive agriculture allowed for the increase of the economic absorptive capacity of the country, which was the very criterion determining the quota of Jewish immigration. The Jewish Agency then attempted to set up an irrigation and colonization company that was to irrigate the land of Palestinians in exchange for part of that land.

Hope-Simpson recommended the completion of a hydrographic study and the development of an irrigation law in order to control water wastage.

¹⁷ One dunum is equal to one quarter of an acre or to 1000 square meters.

¹⁸ Roza I.M. Al-Eini, "The Implementation of British Agricultural Policy in Palestine in the 1930s", *Middle Eastern Studies*, vol. 32, 4, October 1996, p. 213.

¹⁹ Alain Dieckhoff, *L'invention d'une nation; Israël et modernité politique*, Gallimard, Paris, 1933, p. 106.

²⁰ Roza I.M. Al-Eini, "The Implementation", *op.cit.*, p. 215.

When the Irrigation Committee, responsible for drafting the irrigation bill, submitted its report in November 1929, it pointed at the dangerous drop of the hydrostatic level around Haifa and Tel Aviv, and at the growing salinization of the water table brought about by urbanization, the cultivation of citrus fruit and Jewish farms that pumped intensively in order to irrigate.²¹ The same report deplored the undefined nature of water rights in Palestine.²² It noted that capitalists often owned the water, to the detriment of poorer farmers. Speculators owned water and no land while others owned more water than they could use. Some spring owners let their water flow into marshes in spite of the needs of neighboring farmers. The Ottoman civil code, the *Mejelle*, provided in principle the basis of law in Palestine. It specified that the surface water that did not flow entirely within an allodial private land belonged to the state. Yet, no law existed that would allow this principle of the *Mejelle* to be implemented. Numerous private users believed they had absolute ownership of the water they used, in full independence from the land. The holders of water rights in a spring often sold their rights separately from the land this water irrigated, which led globally to much water wastage.

Water laws that literally varied from one village to another understandably exasperated the British committee. This phenomenon persists to this day in the West Bank and Gaza Strip, as will be detailed in chapters 2 and 3. Faced with the absence of a real definition of water rights and of land tenure deeds, the Mandate authorities were reluctant to invest in hydraulic infrastructure development and in land reclamation. This attitude stands in sharp contrast with that of the various international donors 70 years later.²³ The Irrigation Committee therefore requested the completion of a study on groundwater in order to allow the control of its development and development and implementation of a law that would submit wells and pumps to the acquisition of a permit and would control the drilling of wells. Finally, the Committee requested that the global control of hydraulic development, adduction and water use be granted to a Central Water Board and that a decree turn water into a state property.²⁴ Seventy years later, these requests still remain pressingly urgent concerning the West Bank and Gaza Strip. We will see, for example, in chapter 5 that the

²¹The phenomenon is due to the proximity of the sea. As the water table is pumped faster than it can renew itself naturally, seawater seeps into it because of the pressure difference. The groundwater therefore becomes more and more saline.

²² Al-Eini, *ibid.*, p. 235.

²³ The World Bank, Norway and Germany funded projects aiming at developing a water law and a water development strategy. Yet, they also spent much funds on infrastructure projects, just like the rest of the donors since the conclusion of the Oslo agreements, in spite of the fact that no water law yet exists.

²⁴ Roza Al-Eini, "The Implementation", *op. cit.*, p. 236.

European Union funds the Water Data Banks Project in order to allow the governments of the area to know their water resources and be able to develop them in a sustainable manner. We will also see in the following chapters that these goals remain elusive.

The main concept the British adopted concerning irrigation was that of government control of water use, not government property of water. The irrigation consultant in Palestine, D.G. Harris, restructured the numerous Orders-in-Council concerning irrigation issued after 1922, using irrigation laws existing in India, Cyprus, Australia and the United States. The importation of legislative concepts concerning water thus appeared in the region, a phenomenon that is very much present today. Harris suggested three ordinances on irrigation, which spurred strong opposition among Jewish leaders. They were opposed to the continuous studies of the groundwater for they feared this would bring the British to limit the quantity of water they were pumping. They also opposed the idea of a government monopoly over the right to drill wells in the Well Registration Area, arguing that it was not necessary. The General Attorney H.H. Trusted answered that their argument was fallacious as Palestine exploited its groundwater much more intensively than any other country.²⁵

The Jewish community in Palestine developed at that time its own water network linking the Jewish settlements. The Zionist leaders had understood the importance of global water control in the state building process. Indeed, a map of that first network is nowadays on display at the Haganah museum in Tel Aviv, where a caption explains the strategic importance of such a network.²⁶ The same Zionist leaders who opposed Harris were to become later the initiators of the first modern water law in 1959, when Israel was to transform into law the very principles the British had advocated. In fact, the Zionists had opposed British control over water, not the principle of state control over water.

The British were facing two main obstacles. First of all, they were the first to attempt to develop an agricultural policy. In that respect, the Ottomans had always practiced a *laissez-faire* policy. Thus, every Arab village had developed its own customary law concerning water and irrigation. The phenomenon prevented the Mandate authorities from following a uniform policy over all of the territory of the Mandate. Second of all, the British were facing the Jewish community, which was investing in

²⁵ Ibid. p. 237.

²⁶ The Haganah was the paramilitary group considered by the Israelis to be the forerunner of the Israeli Armed Forces. This is thus a military museum and the map of the water network linking the settlements appears among grenades and machine guns. This shows the strategic importance the Israeli authorities granted to water development.

agriculture development and especially in irrigation development while resisting the development of a Mandate agricultural policy. The Jewish community was therefore creating the phenomenon of landless Arab peasants while impeding British efforts to solve this problem identified as the source of the social troubles.

The importance of a uniform hydrographic study was made even more crucial from a political point of view as the British and the Jewish Agency had widely differing estimations of the country's absorptive capacity. The British expected 1,800,000 dunums to be irrigable while the Jewish Agency estimated that number to be 2,150,000. The Jewish Agency therefore denounced an unfairly low quota for Jewish immigration.²⁷

British efforts could have succeeded, had the great march of history not decided otherwise. They undertook a study in 1933 but did not succeed in providing a global picture of the hydraulic situation as no legislation forced well owners to provide information concerning their wells. Arab farmers were all the more reluctant as no imperial authority, either Mandate or any other type, had ever interfered with water sharing, an issue they deemed belonged only to the village itself. Jewish irrigators were also reluctant as was explained earlier.

Harris nevertheless succeeded in 1937 in acquiring an ordinance that submitted the drilling of a well to the prior obtainment of a permit, at least in zones called "public water supply area". Another ordinance granted the government in 1938 the right to drill bore holes in order to carry out hydrographic studies. These studies started in February 1938 in the south and in the Jordan Valley in order, among other things, to instruct the department responsible for the Partition Plan.²⁸ But the Arab Revolt broke out in 1936 and the settlement of water rights was interrupted in October 1938 because of these troubles. The World War and the local war that followed, until the emergence of the State of Israel, prevented the British from completing their work.

At the time of the Mandate, irrigation was essentially carried out using wells located on private lands. Springs were less used and rivers were used even less than springs. The British therefore concentrated their infrastructure efforts on rivers and on those springs whose great overflow allowed farmers to accept a governmental interference without feeling cheated. Only two perennial rivers existed: the Auja and the Jordan. The Mandate Government granted the Palestine Electric Corporation, a Jewish

²⁷ Al-Eini, "The Implementation", op. cit., p. 237.

²⁸ Ibid., p. 238.

company owned by Pinhas Rutenberg, a first concession to build a hydroelectric station on the Auja and a second one to develop irrigation over 4,850 dunums of land.²⁹ The British also set up a management of Ein Sultan spring that was centralized at the municipal level in Jericho. This system persists to this day and provides the background to the present conflict opposing the PA and the Jericho farmers. We will come back to this topic in the following chapters.

A Hydraulic Imperative since the Time of the Mandate?

Numerous authors, especially Israeli ones such as Wolf, Medzini, and Baskin now argue that accessing water never determined the wars nor the territorial expansion of states in the area. Medzini detailed with much care how water played a negligible role in the determination of the limits between the Syrian and Palestinian Mandates. The fact that water became a crucial political stake once the Mandate was set up is nonetheless undeniable. The British never managed to control the access to water in a comprehensive fashion inside their Mandate and they identified this as a major obstacle preventing the resolution of the troubles between Jews and Arabs during the 1930s. This bestows upon water control the role of a deep driving force of history, a *force profonde* as defined by Renouvin.³⁰ Deep driving forces of history include widespread evolutions whose control escapes political leaders. Industrialization, the emergence of modern means of communication such as the railway or internet, and widespread literacy all constitute deep driving forces that determine and limit the actions of political decision makers. In the Jordan Basin, water was a scarce and sought after resource, considered to be essential for economic development. In agriculture, water was the limiting production factor as there was much more cultivable land than water allowing for its cultivation. The relation to water also structured social relations within villages. It contributed to structuring the relation between the Jewish community and state power over the territory that was to become Israel. This is illustrated at the Haganah museum by the importance given to the development of a water network in the national struggle as well as by the fact that Israel proclaimed, as early as 1959, the first modern water law in the world, thereby turning every drop of water into public property. The attitude later adopted by Israel in the Occupied Territories, which consisted of letting local institutions control water from wells and springs, now complicates the institutional construction of a Palestinian state, as will be examined in

²⁹Leonardo Hosh and Jad Isaac, "Roots of the Water Conflict in the Middle East", Paper submitted to The Middle East Water Crisis: Creative Perspectives and Solutions, 7-9 May 1992, University of Waterloo, Canada, p. 3.

³⁰Pierre Renouvin, *Histoire des Relations Internationales*, Hachette, Paris, 1994, pp. 7-14.

the following chapters. The intricate web of relations of power, competition and cooperation woven around water access and water control, which we call a hydropolitical constellation, undoubtedly constitutes a deep driving force that participates in determining political decision-making today.

Many authors, such as Wolf and Medzini, underline the fact that water did not play any role when states in the area decided to go to war. Greg Shapland argues that the tensions surrounding water participated in fuelling an aggressive climate that culminated with the War of 1967, but he only grants water a negligible role in this process.³¹ John A. Allan and Gershon Baskin both argue, as we saw in the *Introduction and Overview of the Literature*, that water cannot bring about a war. But all of these authors have a common focus on war as the only form of expression of a water conflict and on water as an immediate cause of that conflict.

Our overview of the role played by water at the time of the British Mandate showed that the Mandate authorities' incapacity to control water contributed to fuelling social troubles that led to the Partition Plan. In the same period, the development of a hydraulic network linking Jewish settlements contributed to the emergence of a Jewish state. The fragmentation of water control among Palestinian villages has participated in a process that has prevented a Palestinian state structure to arise. All of this happened even though water only played a negligible role during the negotiation of the borders between the Mandates. The role of deep driving force played by water became clear when Ben Gurion refused the separate peace Syria offered in 1949. As we will see in the next section, Ben Gurion's refused because that peace proposal meant that Syria would have received half of Lake Tiberias. The control of water gives power and no political leader accepts an agreement that causes him to lose power, even when he is coming out of a war whose goal was not water control.

The Emergence of Israel

After the emergence of Israel in 1948, the new state's limits were determined by the cease-fire agreement in 1949. King Abdullah had struck a secret agreement with the Zionist leaders before the war, whereby the Palestine Mandate territory was to be shared by the Jewish state and the Hashemite Kingdom.³² Transjordan occupied from then on the West Bank and changed its name into Jordan. The armistice line, known as the

³¹ Greg Shapland, *Rivers of Discord: International Water Disputes in the Middle East*, C. Hurst & Co., London, 1997.

³² Avi Shlaim, *Collusion Across the Jordan: King Abdullah, the Zionist Movement and the Partition of Palestine*, Clarendon Press, Oxford, 1988.

'Green Line', which separated Israel from Jordan had been negotiated before the armed struggle took place and granted important aquifers to Jordan, as we will see later. This territorial division also granted most of the Jordan River, downstream of Lake Tiberias, to Jordan, which would now occupy both banks.

Lake Tiberias lied entirely within the limits of Israel. But two of its three main tributaries ended up outside of the Jewish state. During the armed struggle, Syria had acquired territory west of the border of the British Mandate over Palestine. It now controlled the east bank of the lake, which granted it an advantageous upstream location to control water flowing into Lake Tiberias and into the Jordan River. The sources of the Hasbani lied in Syria and in Lebanon, and those of Banyas lied in the Syrian Golan. Only the Dan flowed entirely inside of Israel. However, its sources were partially located in Syria. The three rivers joined six km inside of Israel. The Yarmouk River joined the Jordan River 10 km downstream of Lake Tiberias after having flowed from Syria, along the border between Jordan and Syria and through the Adisiyeh triangle.

The cease-fire negotiations started between Syria and Israel in April 1949. Husni Zaïm, who had taken over Syria thanks to a state coup two weeks earlier, offered a separate peace to Israel on 16 April 1949, on the condition of having half of Lake Tiberias and a common army.³³ Zaïm's offer was especially interesting for the Israelis as he proposed to settle 300,000 Palestinian refugees in Syria permanently. Yet, Ben-Gurion refused to meet Zaïm unless the Syrians withdrew first to the Mandate's border. The United States pressured Israel into accepting the Syrian offer³⁴ and the Israeli Government had to justify itself on 2 May 1949 in front of the Foreign Affairs and Security Committee of the Knesset. The government then clearly specified that the stake was the shore of Lake Tiberias, the Jordan River's east bank and the Mey Marom. Israel absolutely wanted to keep these waters inside the national territory without having Syria as a partner in the control of these waters.³⁵ According to Rabinovich, the Israeli leaders knew that the lake's basin was the key factor in any national development of Israeli irrigation and in the development of the Negev. So

³³ Itamar Rabinovich, *The Road not Taken*, Oxford University Press, New York, 1991, p. 69.

³⁴ Zaïm had explained his plans for a coup d'état to the American military attaché, Meade, six weeks beforehand. He had also warned the French and British military attachés. Zaïm wanted to set up concentration camps for Syrian communists, and he and Meade had exchanged their information concerning the communists and their activities in Syria. The United States therefore viewed Zaïm's regime quite favorably, especially since the McGhee plan, put out by the State Department in 1949 in order to solve the Arab-Israeli conflict, foresaw the settlement of half of the Arab refugees in the surrounding Arab states. The Syrian proposal thus pleased the United States. See Rabinovich, *ibid.*, pp. 85-90.

³⁵ *Ibid.*, pp. 96-97.

they were not willing to sacrifice their sovereignty over these waters even at the cost of a separate peace with Syria, which would have changed the course of the Arab-Israeli conflict.³⁶

The cease-fire agreement reached by Syria and Israel in 1949 specified that a strip of land 100 meters east of the Jordan River between Lake Tiberias and Huleh Lake be transformed into a demilitarized zone controlled by Syria. The same was to apply to a ten-meter wide strip of land along the east shore of Lake Tiberias, which had belonged previously to the Palestine Mandate according to the Anglo-French Agreement of 1923.³⁷ Sovereignty over that area was to be decided within the framework of a peace agreement between the two states. Yet, Israel claimed part of that area as his in spite of the clauses of the armistice agreement and proceeded to undertake hydraulic works there.³⁸

Israel occupied as early as 1949 the small territory of Al-Baquara and Naharayim³⁹ which allowed the control of the Jordan and Yarmouk water that fed the artificial lake of Naharayim and allowed the operation of a hydroelectric station built by the Electric Company in 1926.⁴⁰ The status of this 2 km²-portion of land as determined by the Israeli-Jordanian Peace Treaty in October 1994 (see *infra*) seems to indicate that water alone motivated this occupation. In 1949, Israel shared the upper section of the Jordan River with Jordan as the river was used as a limit by the armistice agreement. Only 3% of the Jordan Valley lied inside the Jewish state. However, the water it contained was to become crucial for Israel, as one third of the water it consumes now comes from Lake Tiberias.⁴¹ Israel could already access the Jordan River's best quality water since it becomes increasingly salty as it nears the Dead Sea.

The Groundwater

In 1949, Israel included two large renewable aquifers. A coastal aquifer stretched from Mount Carmel to Gaza over a width varying from 10 km in the north to 20 km in the south. It offered a maximum potential of 280 million cubic meters (mcm) per year. It was, however, quickly overused

³⁶ *Ibid.*, p. 98.

³⁷ Medzini, *The River Jordan*, op. cit., p. 89.

³⁸ Frederic C. Hof, "The Water Dimension of Golan Heights Negotiations", *Middle East Policy*, vol. V, May 1997, 2, p. 131.

³⁹ Pascal Fenaux, *Moyen-Orient. Les Dossiers de la paix*, no. 175-176 in the *Dossiers du GRIP* collection, November-December 1992, p. 64.

⁴⁰ Daniel Hillel, *Rivers of Eden: The Struggle for Water and the Quest for Peace in the Middle East*, Oxford University Press, 1994, p. 158.

⁴¹ John Kolars, "Les ressources en eau du Liban: le Litani dans son cadre régional", *Monde arabe Maghreb Machrek*, October-December 1992, 138, p. 21.

and nowadays suffers from seawater intrusion as well as from pollution. A second aquifer, the Yarkon-Taninim, stretched from Mount Carmel to Beersheva and from the mountains in the east to the coastal plain. It was mostly fed by precipitation over the West Bank of what was then Jordan. Water fallen west of the Green Line would reappear in Israeli wells and springs. A cross section of the territory explains clearly this natural phenomenon: Israel lies at an altitude lower than most of the West Bank and the latter's western part receives more precipitation than the eastern part. This indirect use of West Bank water by Israel long before 1967 provides the basis for the Israeli argument of 'established historical use' to continue using water from this occupied territory.

Israel was thus, upon its birth, a downstream riparian state both in terms of surface waters from the Jordan Basin and in terms of groundwater flow as the Israeli aquifer was fed via a recharge area located in Jordan (present day West Bank).

The 1951 Clashes

The spring of 1951 saw Syrians and Israelis clash militarily after Israel drained Huleh Lake and the marshes of upper Galilee in order to increase the flow of the Jordan. Part of these works took place in the Syrian demilitarized zone as defined in the armistice agreement.⁴² Syrians then occupied the Al-Hamma strip, a narrow, five km long canyon stretching between the Syrian-Jordanian highland which was granted to Israel according to the 1949 cease-fire agreement.⁴³ Occupying this small, 1,5-km² territory allowed the Syrians to control the Yarmouk, the main tributary of the Jordan River. The exchange of shots starting in 1951 led the Israelis to give up their first attempt at deviating water from Lake Tiberias at the site of the Jacob's Daughters' Bridge.⁴⁴ Yet, Israel took up similar deviation works again in 1953 further south along the lake, at a location that was less favorable from a technical point of view because it lied at a lower altitude and meant that water had to be pumped up from the lake. This location, however, was safely remote from Syrian artillery range.

The Relation to Water within Israel

During the 1950s, Israel built its institutions in order to control and manage water within its territory. The construction of the National Water Carrier, so often shown as an integral component of the defense or foreign

⁴² Bulloch and Darwish, *Water Wars*, op. cit., p. 33.

⁴³ Fenaux, *Moyen-Orient*, op. cit., p. 60.

⁴⁴ Medzini, *The River Jordan*, op. cit., p. 91.

policy, is intimately linked with the institutional construction via which Israel developed conjunctive water management over all of its territory.⁴⁵ The expansion of infrastructure and the development of institutions made each other possible as each dynamic fed upon the other.

Israel succeeded where Harris had failed: Law No. 5719-1959 of 3 August 1959 was to unify water law over the whole territory. This is the first occurrence in the world of a modern water law. This Israeli success was due to several causes. First of all, the opposition the Jewish leaders had shown to the British project had essentially targeted the fact that the Mandate authorities could have restricted the development of Jewish agriculture. This nationalist opposition had disappeared with the emergence of the State of Israel. Second of all, the creation of Israel had induced an enormous population displacement. When the United Nations General Assembly had adopted Resolution 181 on the partition of Palestine in November 1947, the Palestinian population numbered 1.3 million inhabitants. But the armed struggle led to the displacement of 700,000 Palestinians, and at the end of the war only 150,000 Arabs were left inside the State of Israel.⁴⁶ The departure of this minimum of 700,000 Palestinians meant that numerous wells and springs had lost all or nearly all of their users and operators. People had left together with the unwritten institutions that had regulated the access, distribution and use of water since centuries. As opposed to the British, Israel was not going to face the distrust and reluctance of Arab villagers who did not wish interference with their springs. The newly arrived inhabitants who took over their homes accepted easily a centralizing water law because they had not participated previously in any other institutional system regulating that water.

The Zionist Organization of America had invited Hays to propose a hydraulic development plan before the State of Israel was even born. Hays had imagined as early as 1946 a deviation towards the Negev and a channel linking the Dead Sea and the Mediterranean Sea, a plan which he published in 1948.⁴⁷ Many authors have underlined the impact of that plan, soon executed by Tahal, on international relations. The Arab states were opposed to it because it sought a transfer of as much water as possible to the Negev, thus deviating water that should normally have fed the Jordan River.

⁴⁵ 'Conjunctive water management' means that both the recharge and discharge of the aquifer are simultaneously managed. Both surface and groundwater are thus managed in a comprehensive fashion.

⁴⁶ Laurie A. Brand, *Palestinians in the Arab World: Institution-Building and the Search for State*, Columbia University Press, New York, 1988, p. 6.

⁴⁷ Medzini, *The River Jordan*, op. cit., p. 61.

Hays, however, also had a deep and little studied impact on the relation between the state and local actors concerning water in Israel. He was an engineer at the Tennessee Valley Authority (TVA) and the plan he drew up, however technical, implied a very centralized water control, in the fashion it was carried out by the TVA. The Hays plan thus implied a very precise institutional construction that was to accompany the infrastructural development throughout the 1950s.

The idea of using the river basin as a planning and management unit was popular at the beginning of the century. The TVA was created in 1933 and was among the first basin authorities built on that concept. It received from the start a broad mandate for social and economic development that included flood control, irrigation, energy production, water distribution, urbanization, etc. States who have experienced such a river basin development authority rarely wish for a second one. Such authorities tend to ignore other national policies concerning the remainder of the country. In the worst cases, such authorities became a state within the state, so other basin authorities with much more modest goals eventually replaced them.⁴⁸

The Israeli peculiarity consisted of the fact that only one river basin exists in that small national territory. The Tahal Company was set up in order to execute the Hays plan. Although the 1959 Water Law did not define any function for Tahal, it continued drafting water development plans and now also fulfills similar contracts abroad. Tahal has thus become a governmental planning agency while remaining a joint stock company.⁴⁹

The 1959 Water Law

The 1959 Water Law withdrew water once and for all from the private sphere. Every spring, surface and underground watercourse, and artificial reservoir became public property.⁵⁰ Section 1 specifies “[T]hey are subject to the control of the State and serve the needs of the inhabitants and the development of the country.”⁵¹ This law was the culmination of a legislative construction that had started with the proclamation of Law 5715-1955 concerning drilling in 1955, Law 5716-1955 on water metering in 1955 and Law 5718-1959 on drainage and flood control in 1957.⁵²

⁴⁸ Ludwig Teclaff, *Legal and Institutional Responses to Growing Water Demand*, Legislative Study, 14, FAO, Rome, 1977, pp. 12-13.

⁴⁹ *Ibid.*, pp. 39-40.

⁵⁰ Note that we are dealing here with public property, not state property.

⁵¹ Ariel Bin-Nun, *The Law of the State of Israel: An Introduction*, Rubin Mass Ltd., Jerusalem, 2nd edition, 1992, pp. 93-94.

⁵² Richard Laster, "Environmental Law in Israel Today", in *Our Shared Environment. Israelis and Palestinians Thinking together about the Environment of the Region in Which they Live*, edited by Robin Twite and Jad Isaac, IPCRI, Jerusalem, December 1994, p. 116.

Harris' dream had become a reality. From now on, the state could proceed with any expropriation it deemed necessary for infrastructure construction. It could create protected areas and restrict land uses in order to protect water sources. Article 4 of the Law of 1959 stipulated that property of land did not confer any right over any water in that land.

The Law of 1959 granted a 90-day grace period to anyone who produced or provided water on the day of the law's proclamation or within a year before that date. After these 90 days expired, all preexisting uses were assimilated into the new system.⁵³ Thus, in 90 days, the control of water completely switched from a totally fragmented situation where every well and every spring had its own law, to an extremely centralized situation. Israel was to adopt a policy of granting yearly production licenses. This was to apply to all types of water consumption, whether it be irrigation, industrial or domestic use. Once the one-year period was expired, the Water Commissioner could stipulate any new condition it judged necessary in order to conserve water stocks and to improve the efficiency of water management and use. Whoever had a water license thus had no guarantee of having the same water quantity granted to him, once again, for the same use once his one-year permit had expired. Therefore, every Israeli municipality obtained a new production license every year which would determine the quantity of water it was entitled to. This quantity is reevaluated every year in relation to a fixed water quota per capita.⁵⁴

This nationalization of water resources was to allow Israel to develop conjunctive water management over all of its territory once the construction of the National Water Carrier was completed. Thus a chapter concerning the recharge of the aquifers was added to the water law in 1965. Since then, the Water Commissioner grants yearly permits to Mekorot, the national water company, in order to recharge the coastal aquifer from Lake Tiberias via the National Water Carrier. The recharge permits specify both the quantity and the quality of the water that has to be transferred.

The control of water access seems to have been much better developed than that of water quality. The Ministry of Health and Mekorot are both responsible for control of domestic water quality. Until 1999, no law had requested that they publish the results of the water quality tests that they carried out. This situation changed only very recently.⁵⁵

⁵³ Section 26 of Law No. 5719-1959, Israel.

⁵⁴ Teclaff, *Legal and Institutional*, op. cit., p. 20.

⁵⁵ Elaine Fletcher, "Israel's Environment: Government, Media and the Public", in Twite and Isaac, op.cit., p. 44.

The Infrastructure Works of the 1950s and the Johnston Plan

Israel began its attempts at the cultivation of the Negev in 1948. Its land was considered fertile so long as water was added to it. The state dug wells and deviated the Yarkon towards the Negev. As this remained insufficient, Israel undertook in 1953 the construction of its National Water Carrier. This gigantic artificial river was to feed the Negev from Lake Tiberias thanks to 130 km of underground drains entirely located inside the Green Line.⁵⁶

Although this project represented a great development for Israel⁵⁷, according to Amman it constituted a dangerous deviation of the Jordan River.⁵⁸ An acute crisis arose quickly and President Eisenhower sent Eric Johnston to lead a mediation among the four riparian states in the Jordan Basin. He achieved a plan for water sharing among Jordan, Syria, Lebanon and Israel after two years of negotiations. Although technical committees accepted it, this plan was rejected by all of the states involved for political reasons.⁵⁹ Lebanon, Syria and Jordan were reluctant to conclude an agreement with a state they did not recognize diplomatically and Israel wanted more water and also wanted the Litani to be included. All four states accepted the agreement *de facto*, however, and respected its quotas until 1967.

The Hydraulic Development in Jordan

In 1958, Jordan undertook the construction of the East Ghor Canal, now called King Abdullah Canal. It brings water from the Yarmouk 69 km along the Jordan Valley, east of the Jordan River and was meant initially to provide only water for irrigation. This canal was meant to be the first phase of a greater irrigation system that was to provide water on both sides of the Jordan River.⁶⁰ This constituted a second deviation of the Jordan, which, this time, worried Israel. Only the East Ghor Canal had been completed when the War of 1967 broke out. The construction of the West Ghor Canal was never executed.

⁵⁶ Roger Cans, *La bataille de l'eau*, Paris, Le Monde Editions, 1994, p. 189.

⁵⁷ As Lake Tiberias lies 212 meters under sea level, water must be pumped up in the first section of the national water carrier. In the early years of the carrier, this activity used up to 15% of the energy consumed yearly in Israel. See Hillel, *Rivers of Eden*, op. cit., p. 162.

⁵⁸ Nowadays, 35% of Israel's renewable resources come from the Jordan Basin and Lake Tiberias through the National Water Carrier according to Beshorner, "L'eau et le processus", op. cit., p. 840. This has reduced the flow of the lower Jordan River to a trickle.

⁵⁹ Nasser accepted it but Egypt was not involved in the plan's water sharing.

⁶⁰ Sara Reguer, "Controversial Waters: Exploitation of the Jordan River, 1959-1980", *Middle Eastern Studies*, vol. 29, 1, January 1993, p. 572.

The East Ghor rural development project was funded by USAID and constituted, at that time, the largest development project ever undertaken by Jordan as well as the largest American investment in the field of development in the Arab Middle East. The project aimed at completing the population displacement that had occurred during the War of 1948 by making it permanent. It was meant to settle the Palestinian refugee population from what is now Israel onto Jordanian land. The United States had identified the issue of the refugees as early as 1949 as a major obstacle to the settlement of the Arab-Israeli conflict. The United States had indeed attempted pressuring Israel in 1949 into accepting a separate peace with Syria partly because Husni Za'im was offering to settle permanently 300,000 Palestinian refugees in Syria.

In 1958, Jordan shared many common points with Israel. It was undertaking gigantic hydraulic infrastructure works thanks to massive international funding supporting the development of irrigated agriculture and the expectation of settling upon its territory a newly arrived population. However, the similarities end here. Whereas Israel had almost emptied itself from its former Arab population, Jordan had kept all of its previous population. The latter therefore continued using its own institutions regulating the access and the control of land and water. Whereas Israel could impose centralizing laws on a memory free population, Jordan had to proceed with a land tenure reform in the east of the Jordan Valley. The additional water provided by the canal should have been sufficient for the inhabitants to accept the social upheaval. At least, this was what the project designers hoped for. Finally, whereas Israel was building all of its institutions in relation to the National Water Carrier as a river basin authority would do, Jordan limited its institutional construction to the project zone on the east bank of the Jordan Valley. The towns and villages of the West Bank were therefore not affected by any kind of alteration to their institutions regulating water. There, the fragmentation of water control deplored by the British went on. Thus, when Israelis invaded the West Bank in 1967, they found a water control situation identical to that which had existed there in 1949.

Claud R. Sutcliffe devoted his Ph.D. thesis to studying the impact of the East Ghor Canal project.⁶¹ He identified the failure of the land tenure reform as the reason for the project's failure as a method designed to root the refugees into a new Jordanian identity. Indeed, in 1973, 52% of the farmers involved in the project declared they were more concerned by the

⁶¹ Claud R. Sutcliffe, *Change in the Jordan Valley: the Impact and Implications of the East Ghor Canal Project, 1961-1966*, unpublished Ph.D. thesis, Princeton University, 1969.

problem of Palestine than by any other national problem.⁶² According to Sutcliffe, this meant that these farmers persisted in defining themselves as Palestinians instead of Jordanians in spite of the project. Very few Palestinians involved in the project had been owner-operators. The majority were sharecroppers or farmers. Sutcliffe showed that the Palestinian owner-operators were much less concerned by the problem of Palestine than the sharecroppers and farmers.

In principle, the land tenure reform should have granted land priority to tenants who themselves could exploit the land lying in the canal zone. In fact, the authorities did not distinguish between owner-exploiters and absent landowners.⁶³ As a consequence, Palestinian refugees did not dissolve themselves into a social class of Jordanian small landowners.

Most of the project's farmers fled the area after the Battle of Karameh in March 1968 and became refugees once again. No Palestinian or Jordanian farm laborer can now be found on the Jordanian side of the Jordan Valley except for a small proportion of very poor women. The male laborers are either Egyptian, Pakistani, Filipino or other. The failure observed by Sutcliffe in the late sixties is now complete. The Jordan Valley landowners live in Amman, where their proximity to power allows them to work at maintaining their irrigation rights.

The construction of the East Ghor Canal was therefore not accompanied by an institutional construction in Jordan that would have allowed a state centralized control of water.

The War of 1967

The construction of the National Water Carrier in Israel amounted to a deviation of the Jordan River and had allowed Israel to develop its economy. Of course, Arab states had protested against it. The competition among them led some to adopt extreme stands in order to appear more nationalistic than the others. Thus Syria long challenged Nasser who was kept busy by the war in Yemen and did not want to go to war against Israel so long as he knew he did not have the means to win such a war. As the National Water Carrier was soon to be completed, Syria called for a military struggle against Israel at the Cairo summit in December 1963. Nasser then managed to convince his colleagues not to follow Syria.⁶⁴

⁶² Claud R. Sutcliffe, "The East Ghor Canal Project: a case study of refugee resettlement, 1961-1966", *The Middle East Journal*, vol. 27, 4, Fall 1973, p. 481.

⁶³ *Ibid.*, p. 476.

⁶⁴ Medzini, *The River Jordan*, op. cit., p. 125.

These events illustrate the issue that will be raised in chapter 4 concerning water as a national interest. Water was brandished in 1964 as a national interest, but this discourse was essentially aimed at cornering Egypt. This participated in exacerbating the aggressive climate that culminated in 1967.

The Arab states decided at the January 1964 Cairo summit to deviate the Hasbani and the Banyas towards the Yarmouk in order to strike back at the coming inauguration of the Israeli National Water Carrier.⁶⁵ According to Israel, these deviations were going to prevent it from extracting 35% of the water which it wanted to draw from the Jordan and which were granted to it by the Johnston Plan.⁶⁶ The Arab states started their works in November 1964 in spite of Israeli threats. Israel bombed the works in April.⁶⁷ Nasser refused to go to war “for a few Syrian bulldozers” and the deviation works ceased after further bombing in August 1965.⁶⁸

The Consequences of the War of 1967

The Golan

At the end of the War of 1967, Israel was occupying the Al-Hamma territory and the Golan Heights. The first territory allowed Israel to control the Yarmouk while the second one, much larger with its 1,750-km² area, allowed the Israelis to control the Banyas in the north and the Yarmouk in the south.⁶⁹ Acting as a water tower, the Golan Heights was going to provide 35% of Israeli used water in 1987.⁷⁰ Israel also acquired the control of the East Ghor Canal because its inlet faced from then on a bank occupied by Israeli soldiers. This territory was annexed by the Knesset in 1981, after its population had changed dramatically. Some 160 of the 170 Syrian settlements present in 1967 were destroyed and 34 Israeli settlements had been built by 1992.⁷¹ Some 26,000 Israelis lived there in 1990 and the water of Ram Lake had been deviated toward the Israeli settlements.⁷²

⁶⁵ Egypt and Saudi Arabia committed themselves to funding the infrastructure works at the September 1965 summit.

⁶⁶ Bulloch and Darwish, *Water Wars*, op. cit., p. 49.

⁶⁷ Reguer, “Controversial Waters”, op. cit., p.75.

⁶⁸ Medzini, *The Jordan River*, op. cit., p. 137.

⁶⁹ Muhammad Muslih, “The Golan: Israel, Syria and Strategic Calculations”, *Middle East Journal*, vol. 47, 1993, 4, p. 621.

⁷⁰ Fenaux, *Moyen Orient*, op. cit., p. 60.

⁷¹ *Ibid.*, p. 60.

⁷² Beshorner, “L’eau et le processus”, op. cit., p. 844.

The West Bank and the Gaza Strip

The West Bank and the Gaza Strip also were occupied by the Israelis at the end of the War of 1967. The West Bank contains three aquifers. The western aquifer's water flows toward the Mediterranean Sea and is thought to amount to 350 mcm per year. The eastern aquifer's water flows toward the Jordan River and the Dead Sea and is thought to amount to 200 mcm per year. Finally the northern aquifer's water flows toward the north of Israel and is thought to amount to 130 mcm per year.⁷³ Israel had previously benefited from part of the western aquifer.⁷⁴ It then extended its control over the resources of the other two aquifers. The West Bank is thought to be able to provide 850 mcm per year if brackish water is included and 620 of these are easily usable. This amounts to half the water capital available to Israel before 1967.

Military Order 158 of October 1967 submitted the drilling of any well in the Occupied Territories to the previous obtainment of a license.⁷⁵ Israel delivered only 23 of these to Palestinians between 1967 and 1990⁷⁶ and developed the West Bank water resources to the point that on the eve of the Taba Agreement's conclusion in 1995, Israelis were consuming about 82% of the water pumped in the West Bank. Israel also occupied the valley of Wadi Arraba, south of the Dead Sea. Water was also a stake there as the Israeli-Jordanian Peace Treaty was to show in 1994.

The Gaza Strip was never very attractive from a water point of view. The overpopulation of the territory has now led to the deterioration of underground water there, a phenomenon that was taken into account in the conclusion of the Cairo Agreement in May 1994.

As opposed to the Golan Heights, which was annexed as well as submitted to the Israeli Water Law, the West Bank and the Gaza Strip were submitted to military orders. The Israeli authorities barely interfered with the control of spring water. They simply limited the drilling of Palestinian wells and limited the quantity of water the existing irrigation wells could pump by imposing yearly quotas on them. They never imposed quotas on

⁷³ Hillel I. Shuval, "Le problème du partage de l'eau entre Israël et les Palestiniens. A la recherche d'une solution équitable", *Monde arabe Maghreb Machrek*, 138, October-December 1992, p. 29.

⁷⁴ Some 60% to 80% of the flow of the Yarkon-Taninim comes from precipitation that falls inside of the West Bank.

⁷⁵ Beshorner, "L'eau et le processus", op. cit., p. 843.

⁷⁶ Hisham Awartani, *Artesian Wells in Palestine, Present Status and Future Aspirations*, Palestinian Hydrology Group, Jerusalem, 1992.

drinking water wells and granted drilling permits almost solely for drinking water wells.⁷⁷

The Occupation of Southern Lebanon

Israel invaded Lebanon for the first time in 1978 and a second time in 1982 before partially withdrawing and establishing a 'security zone' in southern Lebanon that reaches the Litani River.⁷⁸ Ever since, contradictory reports have been accumulating concerning the use of water by Israel. Whether Israel has withdrawn water and how much remains a mystery. The geological structure of this zone could explain by itself the importance of its occupation by Israel according to John Kolars. Indeed a synclinal runs under the Litani valley from Jabal Abu Rayata, west of the river, to the Hasbani valley. This synclinal could bring 100 mcm per year of Litani water to the Wazani and Hasbaya springs which feed the Hasbani.⁷⁹ The Israelis fenced and prevented access to parts of the Hasbani region. According to Kolars, they could be using this geological structure as a natural canal, the flow of which they increase by placing pumps and pipes along the Litani. Arnon Soffer, however, denies any Israeli water withdrawal from the Litani, yet without mentioning the existence of the synclinal.⁸⁰

The Expansion of Israel and Water

Even before the creation of the State of Israel, Zionist ideologists hoped to include in a state the sources of the Jordan River as well as the Litani. After the War of 1948, Israel only included the Dan springs and received otherwise the fragile position of a downstream state. Since then, Israel has extended its control over territories that now grant it an upstream position. In 1967, the Israelis acquired the control of the Banyas and in 1978, they acquired the control of the Hasbani. Finally, since 1982, Israel occupies a strategic location along the Litani. This hydrographic expansion did not concern the sources of the Jordan alone. In 1967, Israel acquired the control of the East Ghor Canal's inlet as well as a greater control of the Yarmouk. The War of 1967 also allowed Israel to control the three West Bank aquifers.

⁷⁷ Only two irrigation well drilling permits were granted to Palestinians between 1967 and 1990 whereas 20 permits were granted to Palestinians in the same time span for producing drinking water only.

⁷⁸ Beshorner, "L'eau et le processus", op. cit., p. 852.

⁷⁹ Kolars, "Les ressources", op. cit., p. 24.

⁸⁰ Arnon Soffer, "The Litani River: Fact and Fiction", *Middle Eastern Studies*, vol. 30, 1994, 4, pp. 963-974.

The Price of Water

The price of water is subsidized inside Israel and for those Israelis who live as settlers in the Occupied Territories, but not for the Palestinians. The price difference was always large. For example, in 1988, an Israeli settler paid \$0.15 per cubic meter while that same year a Palestinian paid \$0.35 to \$0.80.⁸¹ The price of water is determined by a parliamentary committee in Israel and water management is carried out within the Ministry of Agriculture. This situation was severely criticized by the Israeli Comptroller General in January 1991. The comptroller requested the water commission be withdrawn from the agriculture ministry in order to escape the influence of Israeli farmers.⁸² Jordanian farmers also benefit from subsidized prices. In 1990, they only paid a tenth of the real price of irrigation water in spite of a first increase in the water price following IMF pressures.⁸³ The strategic importance long attributed to agriculture in the area discouraged the governments in the past from demanding a price increase. This situation is changing rapidly, however, as was illustrated by the fact that severe cuts in irrigation water quotas were announced during the Israeli election campaign in 1999.⁸⁴

The Ministry of Economic Planning undertook a struggle at the time of the last Rabin Government to raise the price of irrigation water and to reduce the quantity of water allocated to agriculture. Expecting a population of 19 million inhabitants west of the Jordan River in 2040, this ministry foresaw a water shortage starting in the year 2003 unless water desalination was started in 1995. It foresaw a domestic water shortage for the year 2040 even when assuming that all water recycling plans and water desalination plans were executed.⁸⁵ When the Netanyahu Government succeeded to the Labor Government, the Ministry of Economic Planning disappeared. Its powers were given to the Ministry of Infrastructure directed by Ariel Sharon.

⁸¹ Beshorner, "L'eau et le processus", op. cit., p. 843.

⁸² Marcia Drezon-Tepler, "Contested Waters and the Prospects for Arab-Israeli Peace", *Middle Eastern Studies*, vol. 30, 1994, 2, pp. 295-296.

⁸³ Beshorner, "L'eau et le processus", op. cit., p. 846.

⁸⁴ Danna Harman and Liat Collins, "Emergency Water Cutbacks Ordered", *The Jerusalem Post*, Monday, April 12, 1999.

⁸⁵ Raphael Bar-El, *The Long Term Water Balance East and West of the Jordan Rivers*, report published by the Israeli Ministry of Economy and Planning, May 1995, p. 16.

The Madrid Process and Water

The importance of water in the peace process was recognized at the Madrid conference in 1991 when one of the five multilateral commissions was devoted to the water issue. During these discussions, Israel claimed the control of the sources of the Jordan and the main aquifers in the area. Israel declared this control to be a minimal necessity for its security.⁸⁶ It proposed to build desalinization plants for seawater and to share the costs among Israel, Jordan and Syria. It raised again Herzl's old dream of a canal linking the Nile and Gaza.

Israel especially sought, within the working group on water, to separate the political aspects of water from the technical aspects. Israelis argued that the working group should focus only on technical issues and on water management aiming at increasing the overall water resources of the area. What mattered, they maintained, was to develop technical and functional links among experts and civil servants of the area.⁸⁷ The question of water rights being a political issue must, they said, only be discussed during bilateral negotiations. This position long stalled the working group's efforts because the Arab states held the resolution of water rights as a prior condition to cooperation and to regional water management.

The Madrid process soon stalled and another parallel process, secretly started between Palestinians and Israelis in Oslo, led to the Declaration of Principles of 13 September 1993.

The Declaration of Principles of 13 September 1993

Article 7, paragraph 4, of the Declaration of Principles of 13 September 1993 stated that

“[...] the [elected Palestinian] Council will establish, among other things, [...] a Palestinian Water Administration Authority [...] in accordance with the Interim Agreement that will specify their powers and responsibilities.”

Annex III of the Declaration of Principles contains a protocol on Israeli-Palestinian cooperation in economic and development programs according to which

“[t]he two sides agree to establish an Israeli-Palestinian Continuing Committee for Economic Cooperation, focusing, among other things, on the

⁸⁶ Beshorner, “L'eau et le processus”, op. cit., p. 848.

⁸⁷ Joel Peters, *Pathways to Peace: the Multilateral Arab-Israeli Peace Talks*, Royal Institute of International Affairs, London, 1996, p. 17.

following: 1. Cooperation in the field of water, including a Water Development Program prepared by experts from both sides, which will also specify the mode of cooperation in the management of water resources in the West Bank and Gaza Strip, and will include proposals for studies and plans on water rights of each party, as well as on the equitable utilization of joint water resources for implementation in and beyond the interim period.”

Water comes up again in Annex IV, which contains a protocol on Israeli-Palestinian cooperation concerning regional development programs. Article II, section B of this protocol specifies that the regional development program may consist of “Mediterranean Sea (Gaza) - Dead Sea Canal” (paragraph 3), “Regional Desalinization and other water development projects” (paragraph 4) and “[a] regional plan for agriculture development, including a coordinated regional effort for the prevention of desertification” (paragraph 5).⁸⁸

The 1993 Agreement therefore took up in its Annex III the principle of equitable utilization of resources, which entails a wide variety of interpretations and consequences.⁸⁹ The term ‘equitable’ does not mean ‘equal’. The definition of an equitable use of water has already been the topic of numerous publications. It will unavoidably still be the topic of long discussions and negotiations. The old project of a canal linking the Dead Sea and the Mediterranean was brought back on the table and the prior Israeli propositions at the Madrid conference of desalinization funded by the neighboring states came up again. These articles were supposed to guide the development of the clauses concerning water that were later found in the Cairo Agreement of May 1994.

The Cairo Agreement of 4 May 1994

According to Jonathan Kuttab,⁹⁰ the principles of the 1993 Declaration were stretched and twisted during the later negotiations. We must agree with him when examining the clauses concerning water laid in the 4 May 1994 Agreement.

Article V, paragraph 1, of these agreements concerns the territorial jurisdiction of the PA:

⁸⁸ The Declaration of Principles can be found on the website of the Israeli Foreign Ministry. It has also been published. See *Israeli-Palestinian Interim Agreement on the West Bank and the Gaza Strip, Washington DC, 28 September 1995 - Declaration of Principles on Interim Self-Government Arrangements, Washington DC, 13 September 1993*, Occasional Document Series, August 1996, 7, Jerusalem Media & Communication Center.

⁸⁹ This principle is taken up by the draft treaty on freshwater use developed by the I.L.C.

⁹⁰ Jonathan Kuttab, "How the Israelis manipulated us", *Yediot Aharonot*, July 7, 1994.

“The territorial jurisdiction covers the Gaza Strip and the Jericho Area territory, as defined in Article I, except for Settlements and the Military Installation Area. Territorial jurisdiction shall include land, subsoil and territorial waters, in accordance with the provisions of this Agreement.”

The settlements thus escape the PA’s jurisdiction together with their wells. As the jurisdiction of the PA includes the subsoil within the territory it received, it could seemingly control the groundwater. However, other clauses in the agreement limit this jurisdiction. The first limitation is found in Article VII which deals with the PA’s legislative powers. According to Article VII, paragraph 3, all legislation proclaimed by the PA must be communicated to a subcommittee by the joint committee for coordination and cooperation in civil affairs, the C.A.C. In other words, the PA must submit the rules and regulations it develops to a committee composed of Israelis and Palestinians. According to paragraph 3, “Israel may request that the legislation subcommittee decide whether such legislation exceeds the jurisdiction of the Palestinian Authority or is otherwise inconsistent with the provisions of this Agreement”.

We find the details concerning water in Annex II of the Agreement, the protocol on civil affairs. Its Article II describes the transfer of powers and responsibilities from the civil administration. Section B of Article II lists them and specifies the clauses according to which the transfer must be effected. Thus the Article II, section B, paragraph 31 of Annex II deals with water and sewage. According to paragraph 31a,

“[a]ll water and sewage (hereinafter referred to as ‘water’) systems and resources in the Gaza Strip and Jericho Area shall be operated, managed and developed (including drilling) by the Palestinian Authority, in a manner that shall prevent any harm to the water resources”.

However, paragraph 31 specifies that all of the water distribution systems of the settlements and the area of military installations, as well as the hydraulic systems and the resources located inside, escape the authority of the PA and continue being managed by Mekorot Water Company. Thus the power of the PA, which was already limited in a general way by Article VII, paragraph 3, of the agreements, is further limited by paragraph 31a, section B, Article II, Annex II which adds that the PA must manage the water without causing harm to the water resources, the term ‘harm’ not being defined anywhere in the agreement. Finally, paragraph 31b, section B, Article II, Annex II removes settlements’ water from PA control.

Paragraph 31c, section B, Article II, Annex II commits the PA “not to harm the existing water quantities” and commits Israel to provide settlements’ water data to the PA. Paragraph 31d commits the PA to allow Me-

korot to provide water to Gush Katif and Kfar Darom and to maintain its pipes that go through the area of Jericho. Paragraph 31e finally commits the PA to pay Mekorot the full cost of water that the latter delivers to it.

In conclusion, the Cairo Agreement may have granted the PA the right to receive settlements' water data, but it did not grant it any real power over the groundwater, while committing it to pay water at its full cost when it buys it from Mekorot. In fact, the Cairo Agreement provided Israel with a legal basis for controlling water in Gaza and Jericho via their veto over Palestinian made legislation, while discharging Israel from having to fund a sewage network for Gaza since according to paragraph 35c, section B, Article II, Annex II, the PA is responsible for wastewater treatment in order to prevent pollution of both surface water and groundwater.

Sharing the Water - The Taba Agreement

The agreement signed in Washington on 28 September 1995 became famous for the Annex 10, paragraph 20, Article 40 of the Protocol Concerning Civil Affairs which lists the quantities of water from each of the three West Bank aquifers that will be used by Israelis and Palestinians during the interim period. The lionine sharing (82% of the West Bank water is used by Israelis and only 18% by Palestinians) simply makes official the situation that already existed before the agreements as is illustrated by the following tables. The Israelis consumed already about 82% of West Bank water at the beginning of the 1990s.

TABLE 1 - Percentage of Water Consumption in the West Bank, 1990

	Palestinians	Israelis	Settlers
Western aquifer	5%	95%	
Northeast aquifer	15%	85%	
Southeast aquifer	64%	-	28%

Source: Miriam Lowi, *Water and Power: The Politics of a Scarce Resource in the Jordan River Basin*, Cambridge Middle East Library 31, Cambridge University Press, 1993, p. 189.

TABLE 2 - Percentage of Water Consumption According to Article 40 of the Protocol Concerning Civil Affairs, Taba, 28 September 1995

	Palestinians	Israelis
Western aquifer	6%	94%
Northeast aquifer	29%	71%
Eastern aquifer*	57.4%	42.6%

The treaty specifies that 78 mcm of water are still to be developed from this aquifer for Palestinian use. This figure is now being contested by the PWA, which says the potential of the eastern aquifer is overestimated and thereby reduces the Palestinian percentage.⁹¹

The sharing of the aquifers described in the Taba Agreement allows for a bleak future as far as Palestinian agricultural development is concerned. Article 40 of the Protocol Concerning Civil Matters also contains two other elements worth noticing.

First of all, "Israel recognizes the Palestinian water rights in the West Bank. These will be negotiated in the permanent status negotiations and settled in the Permanent Status Agreement relating to the various water resources"⁹² and "[b]oth sides recognize the necessity to develop additional water for various uses."⁹³ These principles provide the Palestinians with a thin lever to attempt escaping Israeli water control. If they have recognized water rights, then their Water Authority may coherently pose as the depository of these rights and as consequently responsible to develop a hydraulic policy. This does not correspond to the Water Authority as it emerges from the Israeli-Palestinian agreements, since the 1993 and 1994 agreements had foreseen it without granting it legislative powers and since the 1995 agreement only grants the Palestinians a tiny share of the water. However, this recognition of Palestinian water rights allows the PA to play the role of a state when facing the various donors, an attitude encouraged by paragraph 2, which recognizes the necessity of a hydraulic development.

Finally, Article 40 called for the creation of a permanent Joint Water Committee⁹⁴ made up of an equal number of Palestinians and Israelis⁹⁵ who would reach their decisions by consensus.⁹⁶ The Joint Water Committee will deal with all water and sewage related issues in the West Bank.⁹⁷ Its agreement will be necessary for any well drilling, well exploitation permit issuance⁹⁸ and water development.⁹⁹ The Joint Water Committee is therefore the real water Authority in the West Bank. It is

⁹¹Communication given by Dr. Fawzi Naji, political advisor of the PWA, PASSIA Roundtable, 4 February 1999.

⁹²Israeli-Palestinian Agreement, Washington, 28 September 1995, Protocol Concerning Civil Affairs, Article 40, paragraph 1.

⁹³Ibid., paragraph 2.

⁹⁴Ibid. paragraph 11

⁹⁵Ibid. paragraph 12

⁹⁶Ibid., paragraph 14

⁹⁷Ibid., paragraph 12.

⁹⁸Protocol Concerning Civil Affairs, Annex 8, paragraph 1a.

⁹⁹Ibid., paragraph 1b.

active and meets regularly. But it is not the partner of the numerous international donors interested in water.

The Israeli-Jordanian Peace Treaty of 26 October 1994

The Israeli-Jordanian Peace Treaty deserves to be examined, for its clauses concerning water are quite innovative and illustrate the type of agreements that Israel would accept to conclude with the Syrians or with the Palestinians in the final status settlement. We will see that Israel accepted to give back territory to Jordanian sovereignty so long as it could retain access to its water and control over its water.

Article 6 of the Israeli-Jordanian Peace Treaty of 26 October 1994 is entirely devoted to water. Article 6, paragraph 2, specifies that each party will manage and develop its water without harming the other's resources. Article 6, paragraph 3, "acknowledges the water scarcity and the need to find additional resources, including through regional and international cooperation projects."

The Annex II of the treaty details the sharing of the water from the Jordan River, the Yarmouk River and from the Arava (Arraba) aquifer. Article 1, paragraph 1, describes the sharing of Yarmouk water. Israel pumps 12 mcm during the summer and Jordan gets the rest of the flow. During winter, Israel pumps 13 mcm. However, Jordan allows Israel to take 33 mcm in winter so long as Israel transfers to Jordan 20 mcm from the Jordan River directly upstream from Deganya gates in summer. This means that a 'water exchange' now takes place every year: Israel obtains winter flood waters which it stocks in Lake Tiberias and 'gives back' to Jordan in summer.

Article 1, paragraph 2, describes the sharing of the Jordan River water. Equal quantities will be used by either states but Jordan can receive an additional 20 mcm during summer so long as it allows Israel to receive the winter flood water as stated earlier and so long as Jordan funds the water transfer. Article 1, paragraph 3, adds that Jordan and Israel will cooperate to find an additional 50 mcm of water for Jordan.

The treaty surprises especially because it does not mention water quality. Yarmouk water is of fairly good quality because of the near absence of industrialization upstream and because of the relatively low natural salinity of the water. Lake Tiberias water, however, contains water that is more polluted and more saline. Thus, it is impossible to 'stock' the Yarmouk's winter flow in Lake Tiberias and then 'give back' the same quality water to Jordan. The quality of water transferred from Lake Tiberias to

the King Abdullah Canal in the summer of 1998 was to spur the Amman water crisis that year as will be shown in chapter 2.

Wadi Arraba

Occupied in 1967 by Israel, the Wadi Arraba area is treated in Article IV of Annex II. Article IV, paragraph 1, stipulates that Jordan has sovereignty over the wells and over the hydraulic systems that were set up there by Israel. However, Israel will retain their use and will even be allowed, according to Article IV, paragraph 3, to increase its pumping by 10 mcm a year. The role played by water in Israel's occupation becomes obvious here. If Israel may retain control over the water while withdrawing, the occupation is no longer justifiable to the Israelis.

The Territory of Al-Baqura

Occupied by Israel since 1949, the territory of Al-Baqura is the object of Article 3, paragraph 8 of the 26 October 1994 Treaty. This paragraph states that the parties took into account the 'special circumstances' of this small area that is now under Jordanian sovereignty, although private property there only belongs to Israelis, in order to develop the clauses of Annex 1b. These describe a 'special' regime (Article 1) applying to this area. Although Articles 2 and 3 state that Jordan exerts its sovereignty there, Article 4 institutes a regime that reminds of the Capitulations. Thus, according to Article 4, paragraph a, "[s]ubject to this annex Jordanian Law will apply to this area." But according to Article 4, paragraph b, "Israeli Law applying to the extra territorial activities of Israelis may be applied to Israelis and their activities in the area, and Israel may take measures in the area to enforce such laws." Finally, according to Article 4, paragraph c, "[h]aving regard to this Annex, Jordan will not apply its criminal laws to activities in the area which involve only Israeli nationals". Article 2, paragraph e specifies indeed that Jordan will allow uniformed Israeli policemen to maintain law and order in that area. The Jordanian sovereignty over Al-Baqura becomes even more interesting upon reading Article 7: "[...] the acquisition of the land in the area by persons who are not Israeli citizens shall take place only with the prior approval of Jordan." Generally, the opposite rule holds: foreigners have to request a permit in order to establish themselves in a certain territory, the citizens do not need to solicit such permits. In this case, Israelis, albeit foreigners, may live without permit in a Jordanian territory while Jordanians have to request such a permit to acquire land. In fact, Israel now accepts to see the Jordanian flag raised in Al-Baqura, because it has retained effective control of

the territory. As we saw earlier in this chapter, water control is a direct consequence of the control over this small territory.

The Present Situation

States of the lower Jordan Basin now face the worst water scarcity in the Middle East. Water has been overused in agriculture, which has brought about a degradation of the aquifer and a lowering of the water table.¹⁰⁰ Surface water has not been spared either and the Jordan, now overexploited, only offers poor quality water that is highly charged with salt in its lower course. Until October 1994¹⁰¹, of all the rivers in the area, the Jordan seemed to many observers to be the most likely to cause a war, in spite of its tiny size.¹⁰² King Hussein's declaration in 1990 that only water could bring him again to war against Israel became famous.¹⁰³

Up to the drought of 1999, irrigation used 71% of water consumed in Jordan and 66% of that used in Israel.¹⁰⁴ The perception of water as a strategic resource because of the role of agricultural production as an integral part of the defense policy is now changing among the states of the region. But this change in perception has not been completed in any of these states. Governments are now acknowledging, however, that self-sufficiency in food production will probably definitively remain out of reach. Sandra Postel showed recently how Jordan is now importing 91% of its grain and Israel, 87%.¹⁰⁵ The fact that Jordan, Israel and the Occupied Territories are water stressed is unquestionable as they have much less than 1,000 cubic meters of water per capita yearly, a limit under which a state cannot be self-sufficient in food production. The goal of food security is now slowly replacing that of self-sufficiency. The donors have clearly chosen to work towards food security, but the governments have not yet fully undergone the transition.

Nevertheless, Jordan, Israel and the Occupied Territories are now facing a grave crisis as they exploit the water resources at a rate similar to that of

¹⁰⁰ J.A. Allan, "Overall Perspectives on Countries and Regions", in *Water in the Arab World. Perspectives and Prognoses*, papers from a conference sponsored by the Arab Fund for Economic and Social Development and Harvard University's Division of Applied Sciences and the Center for Middle Eastern Studies at Harvard University (1-3 Oct. 1993), Harvard University Press, 1994, p. 95.

¹⁰¹ Bulloch and Darwish, *Water Wars*, op. cit., p. 36.

¹⁰² Only 340 km in length, the Jordan River has a flow that amounts to 2% of that of the Nile. It now only brings 1,300 mcm a year to the Dead Sea, which is now shrinking steadily. See Beshorner, "L'eau et le processus", op. cit., p. 839.

¹⁰³ Cans, *La bataille*, op. cit., p. 191.

¹⁰⁴ Beshorner, "L'eau et le processus", op. cit., p. 840.

¹⁰⁵ Sandra Postel, *Pillar of Sand: Can the Irrigation Miracle Last?*, Worldwatch Press, 1999.

the renewal of these resources. Jordan's consumption amounted to 730 mcm in 1994 and will probably reach 1,020 mcm in 2005.¹⁰⁶ Given the terms of the Israeli-Jordanian Peace Treaty of October 1994, Amman will find the necessary resources only by importing water and by achieving a joint water management with the other riparian states. This regional water scarcity must be constantly kept in mind as background to the web of political relations woven around water control.

Gaza now shows the most acute problems in the area. The overpumping of the aquifers has allowed seawater intrusion. Water quality is deteriorating because of increasing salinity but as well as because of pollution from untreated wastewater. Although the Gaza city wastewater treatment started functioning correctly in 1999, pollution already present in the soil keeps on progressing slowly towards the aquifer. This progression may very well last 20 years during which water quality will keep on deteriorating in spite of wastewater treatment now being achieved in the Gaza Strip. The deterioration of water quality has already led to the appearance of diseases typical of water stressed areas.¹⁰⁷

The Near East now offers the image of a dangerous imbalance. Israel and Jordan suffer from water scarcity. In spite of the abundance of water in the West Bank the situation there is even worse than in the Gaza Strip since most of the West Bank water is consumed by Israelis. Neighboring states, however, are much better endowed with water resources. Water poor Israel has military superiority in the area. Water poor Jordan and the Occupied Territories are the weakest entities in the area. Their policies will therefore differ in the following years but will all aim at controlling sufficient water resources.

Conclusion

Water control was completely fragmented among the springs and wells of the region at the beginning of the century and has been the object of many competitions since then. The British attempted extending their control over water in order to develop irrigation. They therefore faced a competition with both the Jewish and Arab communities living in the Mandate. After 1949, Israel and Jordan each undertook gigantic water infrastructure development that was accompanied by institutional construction designed to allow the state to control water over its territory. Israel then developed

¹⁰⁶ Yahia Bakour and John Kolars, "The Arab Mashrek: Hydrologic History Problems", in *Water in the Arab World*, op.cit., p. 132.

¹⁰⁷ Anna Bellisari, "Public Health and the Water Crisis in the Occupied Palestinian Territories", *Journal of Palestinian Studies*, vol. 23, 1994, 2, pp. 56-59.

centralized conjunctive water management over all of its territory whereas Jordan allowed the fragmentation of water control in the West Bank to perpetuate itself. There, the local actors continued exerting their control over water. A competition between local and national actors is now consequently quite clear in Jordan and the West Bank concerning water.

The competition for water control also continued at the international level once the Jordan River was split into a variety of states. Water may not have been a direct cause of the occupation of the Golan Heights, the West Bank or southern Lebanon, but it became an obstacle to their evacuation. The Israeli-Jordanian Peace Treaty and the Israeli-Palestinian treaties show that Israel retains control of the water of the territories it evacuates.

Israel never extended its centralized control over the springs and wells of the West Bank and Gaza Strip. It developed, however, numerous wells over these territories and now uses 82% of the West Bank's groundwater. Israel also integrated many villages of the West Bank by hooking them up to its national water network.

The PA is now facing competition for the control of water access and water use from several actors. Local actors control most of the 18% of West Bank water granted to the Palestinians by the Taba Agreement whereas Israel controls most of the rest. The manner in which these various competitions overlap and interact with one another will be the object of the following chapters.

Chapter 2

Conflicts and Conflict Analysis

Introduction

This chapter details six conflicts where the competition for water control and/or water access played a major role. Each conflict will be examined in order to identify the actors involved and distinguish the types of relations that exist among them. Competition, cooperation or exploitation relations will appear. Some of these conflicts do not extend geographically beyond a village's or municipality's border. Each of them, however, involved actors external to the village. Tackling the water issue via the conflicts allows for the identification of several actors who do not figure anywhere in decrees and laws. The role of these actors is investigated afterwards in later chapters. This chapter will go beyond the geographic framework strictly limited to the West Bank and the Gaza Strip in order to include an examination of the summer 1998 water crisis in Amman. It sheds light on several phenomena, which will be found again in the West Bank and Gaza Strip.

As was explained in the sections before chapter 1, conflicts will be used as mirrors of the tensions that exist in the society.¹ Conflicts are used as a means to access the reality of the hydropolitical constellations. This study aims at shedding light on the political interactions woven around the control of water access and water use. These interactions also exist when no conflict exists. The latter allow the former to be brought into the open.

¹This approach is one that will be referred to as the 'French school', developed by people such as Maury. See Maury, René-Georges, "L'hydropolitique, un nouveau chapitre de la géographie politique et économique", *Grands Appareillages hydrauliques et sociétés locales en Méditerranée, Actes du séminaire de Marrakech*, edited by Ahmed Bencheikh and Michel Marié, Presses de l'école nationale des Ponts et chaussées, 1994, pp. 123-135. For an application of such an approach, see G. Bedoncha, "Chronique d'une discorde villageoise", *L'eau, l'arme du puissant*, pp. 265-394.

Dura and the Water Thief

Dura is a small municipality of 25,000 inhabitants and seven square kilometers located southwest of Hebron. It was the stage of a conflict in 1998 that revealed some unexpected cooperative relations. The events will be detailed before the attitude of the actors is analyzed.

Dura inhabitants were no strangers to water scarcity when the SOGEA, a French company responsible for detecting the leaks in the adduction networks of the Hebron and Bethlehem municipalities on behalf of a project funded by the French development agency, identified an illegal connection on the one and only pipe that fed the village its drinking water. This pipe branched out of the main line that carried water from the Al-Fawwar well, south of Hebron, to the municipality of Hebron itself. This secondary pipe that brought water to Dura thus lied in Area C. In March 1998, the little town was suffering from an acute water shortage. The inhabitants therefore bought the water from water tankers, paying 15 NIS a cubic meter.² This price could rise up to 22 NIS a cubic meter when the house was far away. Water would have cost 4.5 NIS a cubic meter had they been able to buy it from the municipality through the adduction network.

The people of Dura had no idea that their main water salesman, a Palestinian, filled the water trucks using the illegal connection on the pipe leading to the village. His connection was large enough for him to take almost all of the water that flowed in the pipe in any one day. He therefore created the scarcity and then catered to it by selling the water. As the pipes lie underground, the water thief could act in full impunity, for no one knew he was actually taking his water from the municipal pipe. He had not expected his connection to be identified by the SOGEA in March 1998. As the illegal connection was located in Area C, the Palestinians from the Palestinian Authority (PA) could not intervene even though they were responsible for the installations. They needed an authorization from the Israelis.³ The director of the SOGEA therefore faced a very long waiting period, as the process is a slow one. He went to the mayor of Hebron to explain that a SOGEA team would go and cut the illegal connection. The material required to cut such a large connection is heavy and the team's truck did not pass unnoticed in the street. But, how could

² NIS = New Israeli Shekel.

³ In principle, they need an authorization from the West Bank Water Department, which depends on the Joint Water Committee. This actually grants the Israelis a veto right since the decisions of the JWC must be made on the basis of agreement between the two parties.

anyone know that its destination lied in Area C? The SOGEA director, accompanied by a few employees of the Hebron municipality, set off toward Dura.

The team never had to face the water thief because the Israeli military jeep was waiting on the Hebron-Dura road, just before the illegal connection. The soldiers confiscated the truck and the material since the team did not have the authorization to work in Area C. The team that was to liberate Dura from its water thief had to return by foot to Hebron.

The SOGEA director decided to modify his strategy. He went to another donor that was busy laying pipes in the area during that summer and explained that there was a need for a new pipe to replace the one on which the thief had his illegal connection. In fact, that pipe was in good shape, technically, except for that illegal connection, and cutting it would have been much less costly than laying a new pipe. Nevertheless, a new pipe was laid in August-September that bypassed the thief's illegal connection, which went dry. In September 1998, Dura received its water from the municipality. This could, of course, only be temporary since the thief now only needs to set up another illegal connection on the new pipe.

Apart from offering an anecdote worthy of a television series, this conflict allows us to explore unexpected cooperation and opposition.

First of all, this tale allows for the identification of actors pertaining to local, national and international constellations. There is the SOGEA, a French organization funded by the French development agency in order to execute a contract within the framework of a French development program in the Palestinian Areas. The role of USAID, a prominent donor in the Palestinian Areas, has to be recognized. Its importance has become even greater since the Wye Memorandum, when President Clinton promised the Palestinians an additional \$400 million. Both of these actors will be classified under the category of international actors. The Israel Defense Forces also appear here. It is a tool of Israeli national and international policy. It will be classified here under the category of national actors. The other actors involved: the Dura villagers, the water thief and the mayor of Hebron all belong to the category of local actors because their interests and their strategies lie entirely within very local boundaries.

The actors having been identified, their interactions must now be examined. This can start with the role played by international aid. The SOGEA is responsible for identifying the leaks and illegal connections. It carries out

its duty correctly. But the institutional context within which it works does not allow it to pursue its mission down to its logical goal: the elimination of illegal connections. This is induced by the agreements signed by Israel and the Palestinians. As was seen in chapter 1, they limit the powers of the Palestinians while making them responsible for installations in Area C.

The solution brought to this conflict - the laying of a new pipe - illustrates the emphasis placed by the donors on infrastructure. The delivery constraint, which will be examined in chapter 5, allowed the director of the SOGEA, Mr. Wattelet, to obtain that solution, for it offers the American managers an occasion to disburse funds. They then pay for the execution of work that is technically irreproachable but is socially inadequate. Why install a second pipe when the first one is in good shape? It would have been more appropriate here to undertake a conflict resolution or conflict prevention project. The villagers of Dura could have been informed concerning the water source used by their water salesman within a framework that would have empowered them to pressure the Hebron municipality, the PWA and the Israelis. Dura municipality buys its water in bulk at a rate of 3.5 NIS per cubic meter from Hebron municipality. It sells it to the individual customers at a price of 4.5 NIS per cubic meter. However, the losses along the network are such that Dura municipality pays a real purchasing price of 9.5 NIS a cubic meter if the amount spent for purchasing the water is divided by the quantity of water that is really sold. Most of these losses seem to come from illegal connections. Dura municipality would balance its water budget more easily if that problem was solved.

Conflict prevention and conflict resolution projects are much less costly than infrastructure projects and do not allow to disburse a great share of a donor's budget while requiring it to carry the burden of management costs. A donor's program manager can spend \$2 million quickly on an infrastructure project that will only involve a few clear, precise and easily checked liquidation reports. A conflict resolution project will only allow him to spend at most a \$100,000 without any easily checked results appearing. Besides, such a project is risky: what NGO wants to see the thief coming to its offices with his gun in his hand? Thus, the massive funding channeled to the Palestinians contributes to bypassing a serious and structural problem within the hydropolitical relations rather than solving it.

The tale of Dura also notes a collusion among the mayor of Hebron, the water thief and the occupation authorities. How could a military jeep wait in front of the illegal connection unless the army had been warned of the SOGEA truck's arrival? When this story was told to a member of the PWA

and to Palestinian NGO members, they answered almost invariably that the thief was obviously a collaborator. They did not know him but that situation could only happen if he was a collaborator protected by the Israelis. The step had then been taken which allowed the blame for the Dura water theft to be placed on the Israeli occupation. Wanting to externalize the conflicts is a marked trend among Palestinians. The idea according to which there is only one conflict concerning water, which is a conflict between the Palestinians and the Israelis, seems to be solidly anchored in the prevalent thinking. No other conflict can exist. This complicates the development of efficient institutions on the Palestinian side. Conflicts whose existences are denied can be prevented only with great difficulty.

The fact that an information leak could only have come from the Hebron municipality indicates some kind of cooperation between the mayor, named by the PA, the thief and the Israelis. Accusing the mayor of collaboration only contributes to ignoring a problem among Palestinians which few are willing to recognize: the water scarcity in the West Bank and Gaza Strip does not only benefit the Israelis, it also benefits some Palestinian actors. This is a problem Palestinians will have to manage themselves. Externalizing all difficulties and thereby blaming the Israelis for everything allows the perpetuation of the occupation as it prevents the Palestinians from facing the real problems that are involved in state building.

Finally, the role played here by the ignorance of the Dura villagers must be noticed. Like most Palestinians, they ignored the cause of the water shortage they were experiencing. They believed that Israeli wells had led the water table to drop and that the well providing them with water could therefore no longer satisfy their demand. All those who explain the water problem only in terms of unequal, unfair and unacceptable water sharing among Israelis and Palestinians support the Palestinians in this attitude. Ignorance thereby prevented the Palestinians of Dura from adopting an efficient strategy to settle their water problem. This ignorance fuelled their resentment towards the Israelis and contributed to keeping them in an unsolvable situation. Some Palestinian intellectuals state that it is better to have an unbearable situation since that is the best way to be strong in front of the Israelis when claiming water rights in the final negotiations. The refusal to face internal conflicts can sometimes be explained by this vision. Table 1 summarizes the actors and their stakes:

TABLE 1 – Dura and the Water Thief

Actor	Perceived stake	Proposed solution	Perceived interferences
The water thief	To keep up a profitable revenue generating activity	An illegal connection	The SOGEA identifies his connection and dries up his source
Dura villagers	To obtain drinking water	To deepen the existing well	The Israelis do not grant permits for deepening the well
The Hebron municipality	To ensure a provision of drinking water to the inhabitants	To drill new wells under the control of the Hebron municipality	-Illegal connections “do not amount to much” ⁴ -Conflict with the PWA to access and control water (see the example of the two parallel pipelines later)
Dura municipality	To ensure the provision of drinking water to its inhabitants	To receive more water from the Hebron municipality	The existence of illegal connections is known
The SOGEA	To eliminate illegal connections	To lay down a new pipe	The IDF prevents them from cutting the illegal connection
USAID	To disburse a very big budget in a program to improve the water network	To lay down pipes	-
The IDF	To achieve the respect of the 1995 treaty	To prevent the actions of the PA in Area C unless the appropriate permits have been granted	-

The Water Profit-Maker of Anabta

Located in the Tulkarem district, Rameen village received a permit in 1997, granted by the West Bank Water Department, which allowed it to build a reservoir and a water distribution system if and only if it bought its water from the neighboring village of Anabta, which had a well providing its domestic water. The Rameen village council therefore sought a donor interested in funding such a project. The American NGO Catholic Relief Services (CRS) was then busy carrying out such work thanks to funds channeled from USAID. CRS requested from Rameen village an agreement with Anabta village specifying the water quantity and the price at which that water would be sold once this infrastructure would be built.

⁴ Interview with Imad Az-Zir, official responsible over water at the Hebron municipality, carried out in Hebron on 20 September 1999.

The agreement was secured, but at a price which CRS would have refused had Rameen not quickly concluded the agreement before any intervention was possible on the part of the NGO.⁵ According to this agreement, Anabta was supposed to sell its water at 0.52 JD per cubic meter to the neighboring village, whereas the same water was sold at a much lower price to the inhabitants of Anabta.⁶ The inhabitants of Rameen were desperately lacking water and were willing to pay the price which, after all, remained at least five times lower than the price determined by a water salesman using a water tanker in the middle of summer. CRS asked the villagers for a contribution to the project, which hardly reached 10% of the total investment. Thus, the combination of water at an unfair price and the good deal represented by the obtainment of American funds, constituted an acceptable compromise for the Rameen villagers. But CRS could not accept, through its project, to enrich a well owner through the charging of an unfair price.

A CRS Palestinian employee tried every possible way to change the arrangement between Rameen and Anabta. He used the traditional methods, and applied unofficial pressures without going through the PWA whom, he felt, should not be involved. He tried to achieve pressures via families and friends. The well owner remained inflexible. The CRS Palestinian employee concluded, maybe with reason, that the well owner was a first rate collaborator and that “he was more powerful than Yasser Arafat himself.” All hopes to have the agreement between the villages modified were dashed and CRS had to choose between giving the project up, which would signify abandoning the Rameen inhabitants to their waterless fate, or keeping it up, which would signify enriching a water profit-maker on the long-run. Pressed by the Rameen inhabitants on one side and the delivery constraint on the other side, CRS decided to execute the project.

The independence with which Anabta village acted must be noted. Both village councils belong to the Ministry of Local Governments, but the latter does not intervene to ensure that all citizens access water at the same price, whichever village they come from. The PWA does not have any grip on the conflict and the actors know it so well that the Palestinian employee of CRS does not even attempt to turn to the PWA for assistance. The American NGO CRS introduced what Erica Sora Weinthal will call side-payments (see chapter 4). The project was first intended for the Rameen village which did not have drinking water. However, the agreement struck between the two villages, which is found in the annexes, shows that Anabta will own the entire network that will lie within its administrative limits. On the other hand, the revenue generated by the sale of water to the neighboring village is important. As opposed to what was observed by Weinthal in

⁵ See Annex 1 for a translation of the agreement.

⁶ JD means Jordanian Dinar. 0.52 JD represented about 3 NIS.

the Aral Sea Basin, this side-payment only benefits a local actor - a village - not the emerging state. Traditional methods were used in order to attempt at settling the dispute. The transaction between the two villages corresponds to the effective rules used according to the oral customary law that governs the property of well water. No attempt was made at innovating with an institutional construction that would question this property regime. Finally, the externalization of the conflict is worth noticing as the Palestinian employee reflected, "that this well owner can act like this only because he is a collaborator." This dispute opposing two Palestinian villages is thus ascribed to the Palestinian-Israeli conflict. Certain interference on the part of the Israelis is to be noted: the permit granted to Rameen benefited Anabta and that permit depended on the Israelis given their role within the Joint Water Committee. Table 2 summarizes the actors and their stakes:

TABLE 2 – Anabta and Rameen

Actor	Perceived stake	Proposed solution	Perceived interferences
Anabta village	Achieving a profit	Selling water at a high price to Rameen	CRS opposition
Rameen village	Securing water at an acceptable price	Buying water at a relatively high price from Anabta	CRS opposition
CRS	To ensure a sustainable hydraulic development	To secure a fair agreement between the two villages	The presence of a collaborator in Anabta

The Jordanian Water Crisis of the Summer of 1998

The summer of 1998 was very hot and painful for Amman, which went through a water shortage that lasted several months. Tap water became unfit for human consumption and rumors spread that Israel had poisoned the millions of cubic meters of water, which it had given back to Jordan during the summer, as was agreed upon by the Israeli-Jordanian Peace Treaty. The minister of water and irrigation lost his position and the director of the ministry was actually sent to jail until his judgment, when he was finally pardoned by the young King Abdullah. These events contributed to discrediting Prince Hassan, who fulfilled the functions of king during his brother's absence. This might have fuelled the decision of King Hussein to destitute him in January 1999, only a few days before dying.

The bad quality of water in Amman was caused by the fact that algae had proliferated in the King Abdullah Canal, where Amman draws part of its domestic water. This algae had been brought there by the water from Lake Tiberias, when the water exchange had taken place in conformity with the Jordanian-Israeli Peace Treaty. The concentration of that algae, when water still remained in the lake, did not cause problems. But an al-

gea count carried out before the exchange would have made it possible to foresee what was to occur afterward. The heat and the shallowness of the water in the canal allowed this algae to multiply to such a degree that, when it entered the pumping stations and died there because of the lack of light, it decomposed and made the water unfit for human consumption.

The crisis was acute and was solved, technically, by a German expert who identified the problem and the manner of cleaning the pumping stations. An Israeli expert could have offered the same technical skills, which illustrates a second clear lack of cooperation between the two riparian states. First of all, the algae analysis in Lake Tiberias and their foreseeable disastrous consequences were not communicated to the Jordanians by the Israelis. Then, once the crisis and the need to solve it had come about, the cooperation between the two states remained non-existent.⁷

Even though the water exchange between Israel and Jordan pertains to international relations, this crisis sheds light on the relations among many domestic actors within Jordan. The illegal water intake by irrigating farmers along the Jordan Valley, who use much more than their quotas, was denounced once the capital became short of water.⁸ Consequently, the Jordanian army was deployed along the canal during the summer of 1999 in order to prevent water thefts from the canal.

The crisis of the summer of 1998 is a reminder, within the framework of competition over water, of the importance of state actors on the international scene. But it also sheds light on difficult relations that exist between the local actors, who have *de facto* control over water, and the central power, which has difficulty exercising its authority. To be forced to use the army shows the magnitude of this difficulty.

The perception of the crisis and its origin deserves to be the object of an in-depth study. Rumors stating that Israel had voluntarily poisoned the water circulated even within the ministries. The focus on the exterior enemy prevented many actors from facing an interior conflict, which opposes irrigating farmers against the city dwellers.

Whether Israel deliberately refrained from informing Jordan concerning the alarming algae count in Lake Tiberias has not been determined.⁹ It

⁷ Interview of Andrew Maccoun, water specialist, division of natural resources, water and environment, Middle East Department, World Bank, Jerusalem, 8 February 1999.

⁸ To steal water in the King Abdullah is dubbed 'a national sport' by the farmers who, located downstream, receive much less than is planned by their water allocation. Interview with Bill Lyons, farm owner in the Jordan Valley, Ramallah, 18 March 1999.

⁹ The Israelis proceed daily with algae analyses in Lake Tiberias and they are used to facing a similar problem in their National Water Carrier. The analyses are carried out

could be reasonably assumed that the technician who took the reading did not consider phoning a foreign government as lying within his tasks. It can also be assumed that no mechanism existed that would have allowed for the transmission of this information to a higher authority responsible for communicating it to the Jordanians.

Even though it goes beyond the geographical scope of this study, the water crisis in Amman is examined in this chapter because it shows similar actors and relations as the ones found in the West Bank and Gaza Strip. A central power fully developed in the shape of a state, as opposed to the nascent state nature of the PA, is facing simultaneously what is perceived by its population as an external enemy and interior actors such as the irrigating farmers and the Amman city dwellers. This crisis illustrates well the difficulty in reallocating water from the agriculture sector to the domestic sector especially when the population considers that 'its' water is being used by the enemy foreign state. The PA now faces this same dilemma without benefiting from the tools granted by statehood such as the ones Jordan has. Besides, one could hardly imagine the Palestinian police busy preventing farmers from taking water from wells in the Gaza Strip especially because, as opposed to the King Abdullah Canal, this water intake is dispersed throughout the whole area.

The water crisis of the summer of 1998 principally illustrates the crucial necessity of a joint management of a river basin by riparian states. The Israeli-Jordanian Peace Treaty of 1994 does not specify anything other than a quantitative allocation scheme. The shortcomings of such a solution are exemplary in this case. Chapter 5 will return to this topic.

The Conflict Opposing the Jerusalem Water Undertaking to the Jerusalem Municipality

As opposed to what its name might suggest, the Jerusalem Water Undertaking (JWU) is based in Ramallah. The Jordanian Law No. 9 of 1966 entitled Regulation Drinking Water Affairs Law in Jerusalem Governorate established the JWU and entrusted it with a mandate to develop new water resources and to control all projects concerning water in its area. It was also conferring upon the JWU the responsibilities to provide drinking water to the population, to decide upon the pricing of that water, of the cost of services, the methods for collecting payments and the financial, administrative and technical regulations.

on water samples from various points in the lake, for the algae concentration greatly varies from one spot to another.

The area served by the JWU (see map below) initially included the municipalities of Al-Bireh, Ramallah, Deir Dibwan and the village of Kufr Malik. But it was supposed to extend, during a second and third phase, to the municipality of (East) Jerusalem, then to those of Bethlehem, Beit Sahour and Beit Jala.¹⁰ This explains the name of the JWU. The progression of the area served by the JWU was compromised by the Israeli occupation in 1967. Today, the JWU serves over 200,000 inhabitants in an area extending over more than 500 km², which includes the towns of Ramallah and Al-Bireh, as well as four other municipalities, 40 villages, five refugee camps and 20 settlements and Israeli military camps.

MAP 1: Area Served by the JWU¹¹:



¹⁰ Section 2 of Law No. 9 of 1966, *Regulation Drinking Water Affairs Law in Jerusalem Governorate*, Jordan.

¹¹ Jerusalem Water Undertaking, *Ramallah District, Performance Prospects*, Ramallah, December 1995, p. 3. The JWU only serves the settlements and the military camps as a bulk provider. A meter set up at the entrance of camps or settlements is read every second month and the bill is sent to the PWA, which is responsible for collecting the money from the Israelis. In July 1999, the JWU sold water to the Israelis at a uniform price of 3.15 NIS per cubic meter. There is a noticeable difference in the service offered to the individual Palestinian customers. In the case of Palestinian houses, an individual meter is set up in every house and is read every second month. A progressive billing is practiced, allowing the first few cubic meters to be sold at a lower price than the following ones. This ensures a basic water provision to the poorest households. Source: Interview with Mr. Abdel Karim Assaf, General Manager, JWU, Ramallah, 6 June 1999.

Part of the area served by the JWU now lies within East Jerusalem, which was annexed by Israel. For several years after 1967, the JWU kept on laying pipes in order to connect buildings in parts of annexed East Jerusalem, such as Beit Hanina. The (Israeli) Jerusalem municipality itself requested several times such connections from the JWU in order for schools to receive water. The quality of the service offered by the JWU is very good and it is held to be the best water utility in the Arab Middle East. A problem arose during the first closures in 1993. The employees of the JWU with West Bank identity cards could no longer go to East Jerusalem in order to read the meters and carry out the maintenance work over the network. The JWU now bypasses this problem thanks to three of its employees who have Jerusalemite identity cards and vehicles licensed in Jerusalem.¹²

During the last few years, the (Israeli) Jerusalem municipality undertook the construction of a water distribution system in the neighborhoods already served by the JWU. This network lies parallel to the existing network and is set up unilaterally, without any cooperation with the JWU. The Beit Hanina residents are approached individually and are offered the possibility to be hooked up to the Jerusalem municipality. The Israeli products and services enjoy a better quality reputation than their Palestinian equivalents. Even though there are no objective reasons to prefer a hook up to the Jerusalem network since the quality of the water and of the service offered by the JWU is equivalent,¹³ the residents change their water utility steadily as the laying of the pipes progresses. This is done slowly, a few localized construction sites at a time, without publicity.

In 1997, the JWU went to court against the municipality of Jerusalem. The Israeli judge decided in favor of the JWU, declaring that the existence of the JWU and its activity in these neighborhoods preceded the annexation. Since then, every time the municipality of Jerusalem lays new pipes in the neighborhoods normally served by the JWU, the latter writes to the former and informs the judge. The progression of the network of the municipality of Jerusalem nevertheless continues.

This conflict opposing the JWU and the municipality of Jerusalem is of course a conflict concerning the control of territory. The municipality of Jerusalem carries out what Pierpaolo Faggi calls a state territorialization process, a concept discussed in later chapters, where a state extends its

¹² When a license plate is obtained in Jerusalem, it will be yellow. If it is licensed in Ramallah, it will be green plated. In case of closures, the yellow plated vehicles can still go through the checkpoint into Jerusalem whereas the green-plated ones need a permit to do so even when no closure exists.

¹³ The JWU buys over half of its water from the Israelis anyway. The quality of the water is thus identical, whether it is provided by the JWU or by the municipality of Jerusalem.

control over a population and territory, which it formerly had no control over.¹⁴

Attention has been focused up to now on two actors: the JWU, a local actor with great independence from the PA, and the Jerusalem municipality, whose action occurs within the context of a state policy of territorial expansion.

In the low-intensity conflict occurring between the JWU and the municipality of Jerusalem, the Israelis win among other things because they deal with individuals, as atomized entities, isolating them from the solidarity structures they normally evolve in. The national construction process is now much more complete in Israel than in the Palestinian Areas. Israel is used to dealing with atomized individuals. It is structured to integrate them even if it is into a second-class status. In the example above, the relation with the individual allows the state structure to extend its control by bypassing the traditional social institutions in which this individual normally evolves. Let us note, however, that this example illustrates also the incomplete national construction on the Israeli side. Indeed, a decision made by an Israeli judge has no effect on the activities of the Jerusalem municipality.

The Conflict Concerning the Ein Sultan Spring

Jericho has a reputation as the oldest town in the world. An oasis located in the heart of a very arid environment, seven km west of the Jordan River and ten km north of the Dead Sea, in an area that receives only 150 millimeters of precipitation each year, Jericho has been depending for centuries on irrigation from the Ein Sultan spring. It provides to this day a flow of 680 cubic meters an hour, such a quantity that the Jericho population has long lived in a localized hydraulic abundance within this very arid environment. The water of the spring was used both for irrigation and for domestic needs, which did not involve tensions given the water abundance in relation to the small population. An extremely extensive and complicated irrigation network was developed through time. Four main irrigation canals now border the city streets, before dividing themselves into a myriad of bifurcations that allow the irrigation of thousands of dunums of land. Ein Sultan is now the most abundant spring in the area of Jericho as is illustrated by table 3:

¹⁴Pierpaolo Faggi, "Les développements de l'irrigation dans la diagonale aride entre logique productive et logique stratégique", *Revue de Géographie de Lyon*, vol. 65, no. 1, 1990, pp. 21-26.

TABLE 3 – Water Resources from Springs in the Jericho Area, 1998

Spring	Flow (m ³ /hour)	Town or village where the spring is
Ein Sultan	680	Jericho
Al-Qelt	400	Al-Qelt Valley
Al-Diuk	45	Al-Diuk
Al-Newaiemah	350	Newaiemah
Shossah	65	Newaiemah

Source: Municipality of Jericho.

The importance of irrigated agriculture in the area is illustrated by table 4, which details the crops over the 40,000 dunums of irrigated land in the area around Jericho:

TABLE 4 – Irrigated Surface in the Jericho Area, 1998¹⁵

Crop	Area (in dunums)
Citrus	4,000
Bananas	4,000
Dates	1,000
Grapes	1,000
Other orchards	10,000
Olives	-
Vegetables	30,000

Today 943 persons have water rights over the Ein Sultan spring.¹⁶ The water shares are measured in time and concern the length of time during which water is deviated, through the irrigation network, up to the plot of the water shareholder. The following photograph shows the irrigation network in Jericho. The Ein Sultan spring (top left corner of the map) is *the* water source for the network. The thick black line shows the wadi where – if they occur – flash floods are channeled.

¹⁵ This data was provided by the Ministry of Agriculture, Jericho office, September 1999.

¹⁶ Interview with the executive committee of the Ein Sultan Water Users' Association in Jericho on 8 June 1999.



The water shares held by the farmers vary from two and a half minutes to 32 hours every week.¹⁷ The weekly deviation is ensured by a *qanawati* hired by the municipality of Jericho.¹⁸ He rides a bicycle along the network and blocks and unblocks the bifurcations of the canals according to a calendar set up to respect the water rights. The municipality thus employs a team of 12 *qanawatiin* who work in shifts since water flows 24 hours a day.

This involvement of the municipality is unusual. In most of the villages irrigating from springs, the farmers themselves block and unblock the canals as will be seen in the next chapter. Although there is no clear memory of when this system originated among the farmers or the municipal staff, it seems that this system was set up by the British, in the context of their efforts to improve agriculture production in the Mandate over Palestine as was detailed in chapter 1. Two types of water rights exist: the orchard system and the *muftalah* system created under the British for the annual crops. In the context of the orchard system, water is tied to the land and cannot be rented out. The water shareholder then pays the municipality 15 JD a share every year, worth 23 minutes of water for every water turn. The shareholder also pays the water tax, which amounts to 3 NIS/minute. This cost is supposed to cover the salaries of the *qanawatiin* and the administrative costs of the municipality concerning the management of the water shares. In the context of the *muftalah* system, set up by the British for the yearly crops, a farmer can rent the water share of a water shareholder at a cost of 150 JD a share (23 minutes) yearly. The lease is recorded at the town hall; the tenant and the shareholder must each pay 15 JD to the municipality plus the water tax that amounts, once again, to 3 NIS/minute.

This system, no matter how complicated it seems, ensures a certain flexibility in the water use as well as a governmental control. This was exactly what the British hoped for. They had observed that many water shareholders did not use their water and had attempted to develop a mechanism that would allow farmers without water to access that resource in order to cultivate their land. Registering this rental at the town house shows the intention to progress towards a system similar to that which was set up by Israel later on, which allows the government to decide on the types of water use.

This management was apparently carried out without too many problems. During the Jordanian administration, the canals were cemented, which eliminated much water loss via infiltration into the earth canals. The mu-

¹⁷ Interview with the members of the ESWUA and of the ANERA staff in Jericho on 16 March 1999.

¹⁸ In Arabic, the word *qanat* refers to the irrigation canal. The *qanawati* is the person who takes care of the canal.

municipality started to pump water from the spring during the 1960s and to channel it to the town center in order to cater to the domestic needs. These did not represent much of an intake for several reasons. On the one hand, the water consumption per inhabitant was much lower than today, while the inhabitants then largely resorted to rain harvesting cisterns that existed in every house. On the other hand, the population only numbered around 6,000 twenty years ago whereas it had swollen to 14,674 in 1997 when the Palestinian Central Bureau of Statistics (PCBS) carried out its census.

The population had already swollen in 1948 when the Aqabat Jaber and the Ein Sultan refugee camps had been created. The first sheltered 4,250 refugees and the second sheltered 1,067 others in 1998. But the town entered into a demographic boom when the PA offices opened there. The ensuing development such as the construction of the casino that opened in the fall of 1998 and that of the Jericho Village Resort, with its swimming pool, contributed to an increase in the municipal domestic water intake while introducing non-traditional economic activities in Jericho.¹⁹

In 1999, the municipality took up 300 cubic meters of the hourly flow for domestic use and the rest, a little less than 400 cubic meters, was left to irrigation, not counting the quantity of water sold by the municipality to the water tankers. The farmers thus received much less water than before during their irrigation time. One of them expressed the difference, saying that his canal used to fill to a depth of 15 cm ten years ago, whereas today the water depth in the same canal only reaches 4 cm.²⁰ The farmers could not irrigate all of their land in 1999. They perceived this as unfair especially given that water was channeled to a casino and to the swimming pool of a hotel. They joined to create the Ein Sultan Water Users' Association (ESWUA).

The history of the ESWUA has its origin in a project proposed by ANERA in 1995 thanks to Belgian funding channeled by the International Fund for Agriculture Development (IFAD). The project proposed to modernize the irrigation system by building a network of pressurized pipes that would deliver water measured in volume rather than in time. This new network would have reduced the losses and would thus have allowed irrigation to receive 40% more water. This would have represented a real social revolution. Water theft would have become nearly impossible, a great evolution compared to the present situation where farmers located upstream in the network can sometimes unblock their canals and appro-

¹⁹ A swimming pool uses a relatively small quantity of water but easily becomes a symbol and focal point of the resentment of the irrigation farmers.

²⁰ Interview with Abu George, irrigating farmer, Jericho, 16 March 1999.

appropriate themselves the water outside of their water turns. Also, the farmers would then all pay their water at the same price whereas presently, the farmers located downstream along the network pay their water at a higher price than those located upstream.²¹

Aware of the fact a local representative committee had to be set up in order to allow the acceptance and the good management of a network that would change the old relations, ANERA encouraged the set up of a preparatory committee. Most of its members were later elected within the executive committee of the ESWUA in the elections of 15 April 1999.²²

Local politically prominent figures were active as early as 1997 within this preparatory committee. One of them was Daoud Erekat, cousin of the minister of Local Governments (MLG), who acted as secretary of the committee, a fact which does not go unnoticed as the irrigating farmers are opposing the control of water by the municipality which pertains to the Ministry of Local Governments. Daoud Erekat is a member of the Palestinian People's Party, successor to the former Palestinian Communist Party. He had lived in exile for a long time before obtaining the authorization to return to the West Bank in 1995. His methods are clear, "We have personal relations with some personalities who helped us to get the decree," he said, referring to decree no. 38, which recognized the ESWUA and its functions in 1998.²³

The committee set as its priority securing water rights for irrigation. It requested that studies be carried out to determine the long-term water needs of the town, a preoccupation that was shared with the donor, IFAD, as funding a costly irrigation network would prove useless were all the water to go to domestic use. The committee also requested progressive pricing for domestic water, so that water quantities beyond a minimal amount would be more expensive than the first cubic meters. Domestic water consumption would then be stifled somewhat. The committee especially sought to withdraw the control of the spring from the municipality. It succeeded

²¹ The irrigation water tax is the same for everyone whereas a farmer located upstream along the network receives more water within one minute than a farmer located downstream along the network because of the losses along the canals (via infiltration, evaporation and theft).

²² The author was present during that election. Every member of the ESWUA who had paid his membership fees could run freely as a candidate. Eighteen such candidates were registered. The vote was secret and free. Several women were voting. Every one of the 943 water shareholders could become a member and cast one vote so long as he paid his membership fee. One representative of the Ministry of Local Governments was present during the vote and the counting of the ballots.

²³ Interview with Daoud Erekat carried out in Jericho on 16 March 1999.

in 1998 when Yasser Arafat signed decree no. 38.²⁴ Its first article recognizes the ESWUA and declares that it belongs to the Palestinian Water Authority (PWA). Article 3 describes the goals of the association and specifies in paragraph 2 that it must provide the Jericho area with the necessary water in terms of drinking and irrigation water needs. The resistance of the municipality towards the ESWUA, preventing it for example from holding its elections within a municipal hall, is not surprising.

The decree is not only surprising because it completely changes a control system that operated since the 1930s, but also because it is entirely incompatible with the PWA Water Law which has been in preparation for several years with the help of foreign consultants. The law project plans to turn water into a public or state property and to set a control of water allocation and water use that would be centralized at the national level. This law project is similar to all of the modern water laws as well as to the model advocated by the World Bank, who does not wish a decentralization of the control and planning but only a decentralization of the execution of the tasks involved in water distribution and bill collection according to the planning decisions made at the national level.²⁵ Asked about the water law project, Daoud Erekat answered that he did not know anything about such a project. In September 1999, the municipality said that it simply did not recognize decree no. 38. In October 1999 the ESWUA worried about the fact that the Ministry of Labor was not granting it a permit and therefore not recognizing its status such as specified by decree no. 38.

The conflict opposing irrigation farmers and the municipality in Jericho sheds light on the political construction of the PA. On one side, the PWA develops a national law that is fine in theory and very attractive to foreign donors. This activity is necessary since the PA depends on funds offered by the international community. The development of laws that suit donors is a necessary condition to obtain their funds. But these laws remain largely theoretical. The water law has yet to be discussed by the PLC and most of the bills introduced there have not yet been signed by Arafat.

The manner in which Arafat sets his power depends directly on his relations with the local elites. These observations match Jean-François Legrain's analysis, which is detailed in chapter 4.²⁶

²⁴ For a translation of decree no. 38 see Annex 2.

²⁵ *Gestion des Ressources en eau, Document de politique générale de la banque mondiale*, World Bank, Washington, DC, 1993.

²⁶ Jean-François Legrain, soon to be published in the collection: *La Palestine au quotidien*, CERMOOC, Amman.

Mayors have yet to be elected in the West Bank and Gaza Strip. They are still nominated by the PA. Abdel Karim Sidr, mayor of Jericho, was born in this town although his family is not originally from Jericho. He is very unpopular among the irrigating farmers as opposed to the elected members of the executive committee of the ESWUA. In signing decree no. 38, Arafat has dealt with the reality of the power of local leaders. The traditional method with which the decree was obtained shows the real power mechanisms at work within the PA, a way of functioning that is independent of the mechanisms involving the ministries and the PLC.

The conflict opposing the irrigating farmers and the municipality in Jericho also illustrates the difficult economic transition occurring in the Palestinian Areas. Allan has shown the unavailability of a sectoral reallocation of water in the area.²⁷ A growing share of water will be withdrawn from the irrigating farmers on the long-term and granted to industry and domestic use. It will generate there a greater added value than in agriculture and will allow the importation of virtual water in the form of food-stuff. At the macroeconomic level, this theory is flawless. At the local level, however, this reallocation impoverishes sections of the population.

In Jericho, the irrigating farmers focus their anger on tourist development such as the Jericho Village Resort and its luxurious swimming pool or the casino. Inaccessible to Palestinians, the casino largely belongs to the Palestinian Commercial Services Company (PCSC), a public sector company belonging to the PA/PLO and directed by Arafat's economic advisor, Mohammed Rashid, also known as Khaled Salim. In the course of the last four years, the PCSC has systematically progressed in controlling investments in the Palestinian Areas and has secured a few crucial monopolies such as the one over cement.

The PCSC casino in Jericho should benefit the Palestinian population since 30% of its profits are supposed to be paid to the PA. The management of the casino is entrusted to an Austrian company that employed 1,040 persons in the middle of 1999, 750 of which were Palestinians.

The casino and the Jericho Resort Hotel probably generate more revenue per cubic meter of water that is used than the irrigating farmers do. Yet, the redistribution of that revenue is very different from that generated by irrigation. The 943 water shareholders do not all reside in Jericho but the revenues generated by irrigation are largely redistributed within Jericho in a manner that has been held as legitimate for a long time by the popula-

²⁷ J.A. Allan, "Substitutes for water are being found in the Middle East and North Africa", *Geojournal*, vol. 28, no. 3, 1992, pp. 375-385.

tion. This does not mean that this redistribution is fair or egalitarian. The inhabitants of the refugee camps do not have water rights, for example. But the revenues generated by the casino are only very partially redistributed within Jericho. An in-depth economic study should be carried out in order to determine precisely the economic impact of the hotels and the casino. A fact emerges clearly though: the social group that used to be advantaged by the water sharing - the water shareholders - is now disadvantaged by the development of these new sectors in Jericho. The poorest part of the population may find some possibility for social mobility, for they can aspire to positions such as doormen, for example. The traditional local economic elite is threatened by these new developments. They belong to families deeply rooted locally whereas the *nouveaux riches* are generally outsiders to Jericho. This conflict of 'the eggplants against the casino' is embodied in the fact that the mayor of Jericho is an 'outsider' to the town (even though he was born there) and that the members of the executive committee of the ESWUA are from local families. Arafat must take account of both groups if he is to retain power. This delicate equilibrium exercise is illustrated by the fact that he signed decree no. 38 although this decree contradicts the water law whose project is being finalized.

Setting the ESWUA within the PWA,²⁸ a purely fictitious institutional belonging, as is illustrated by the fact that the general secretary of the ESWUA ignored the very existence of a water law project, gives this conflict the superficial appearance of a competition between the PWA and the MLG. In fact, the conflict is a completely local one and opposes local actors carrying out traditional activities against newly arrived actors engaged in new activities. The PA has to deal with both groups and of course benefits from an externalization of the conflict that exonerates any Palestinian actor and blames the Israelis. If they allowed the Palestinians to pump more groundwater, the conflict would disappear. This would only be temporary because the competition would come back on the agenda once the use of domestic water would have increased sufficiently for all the additional resources to be consumed. Arafat will thus be capable of maintaining his equilibrium exercise if he obtains enough water during the final negotiations in order to appease this competition.

The members of the ESWUA showed their flexibility towards the laws and decrees by accepting, in 1999 the setting up of a council responsible for controlling the sharing of the Ein Sultan spring's water. This committee should include four representatives of the ESWUA, three representatives of the municipality, one representative of the PWA and one representative of the MLG. This new compromise introduced the presence of

²⁸ Article 1 of Decree no. 38 of 1998.

the PWA at Ein Sultan spring for the first time and offered a space for negotiation. It is supposed to be described within a by-law soon to be announced by the PWA. In fact, the existence of legal texts contradicting each other allows for a great flexibility in institutional innovation. What seems at first sight to the outside observer as a juridical cacophony is a means of pursuing negotiations with the local actors. A given text or the one contradicting it is invoked whenever is needed. The existence of three contradictory legal texts allows the actors to have a text they can always refer to, no matter what they want. In fact, oral negotiation still predominates.

The conflict opposing the eggplants to the casino is not over. Its evolution will continue to reveal the political relations existing among Palestinians. Water clearly reveals the tensions within the society. Table 5 summarizes the actors and their stakes:

TABLE 5 – The Conflict Opposing Irrigation and Domestic Use in Jericho

Actor	Perceived stake	Proposed solution	Perceived interferences
Irrigating farmers (ESWUA)	To secure their irrigation water provision	To ensure the respect of decree no. 38 even in an attenuated form	The shortage of water is due to the appropriation of water by the Israelis
Jericho municipality	To preserve their control over water	Not to recognize decree no. 38	The shortage of water is due to the appropriation of water by the Israelis
Chairman Arafat	To deal with the interests of both the traditional local elite and the newcomers	To allow several legal texts to coexist	The shortage of water is due to the appropriation of water by the Israelis
NGO ANERA	To ensure that the future pressurized piped irrigation network will not lay empty	To obtain a clear agreement among all parties	The shortage of water is due to the appropriation of water by the Israelis

The Competition between the American and German Pipelines

The summer of 1998 offered all those driving from Bethlehem to Hebron the occasion to witness a surprising construction scene. On one side of the road, a pipeline funded by Germany was being placed that would link two new wells drilled with German funds to the adduction network of the Hebron municipality. On the other side of the road, a second pipeline was being laid, funded by USAID and linking four new wells drilled with American funds to the adduction networks of the Hebron and Bethlehem

municipalities. The American pipeline has a diameter of 90 cm, which allows it to channel much more water than the 8 mcm of water that were to be provided by the four wells starting in December 1999. Connecting the two German funded wells to the American funded pipeline would have been logical and would have saved much money (the cost of a pipeline). This would have avoided the blatant wastage, which occurred when two pipelines, instead of one, were laid simultaneously along the same road.

The tale of these constructions sheds light on several tensions: between the PA and the landowners, between the PA and Israel, between the PA and the municipalities, between the aid agencies and between the municipalities themselves. This tale also shows how the dynamic intervention of foreign donors, even when it leads to the development of useful infrastructure, can have a damaging impact on the Palestinian institutional evolution.

The German project started first, in 1995, when the mayor of Hebron transmitted an emergency request, via Arafat, to the German Government. The project had already been signed with the Hebron municipality as a partner and the contract awarded when the Americans undertook their project with the PWA as partner. The contract was awarded by USAID to an American company in 1996 but the construction only started on 1 January 1998. One reason for this delay was the slow process of securing the required permits from the Israelis. The American Government brought the issue to the diplomatic level and got the permits. The Germans, even though they had started the process first, had to wait longer for their project's permits, which partially explains why both pipelines ended up being laid at the same time in 1998.

The drilling of every well and the construction of every reservoir or pumping station required the prior obtainment of an authorization by the Joint Water Committee, as is detailed in chapter 1. The choice of the position of the wells was essentially political.

Two of the four American funded wells are located in Area B and two others are located in Area C, where the PWA cannot intervene as was illustrated earlier by the tale of Dura and the water thief. The first well, located in Area C, is at the top of a hill, at a very bad location from a technical point of view. But that was the only site the Israelis would allow for the drilling.

This water network between Hebron and Bethlehem will be the first network entirely controlled and operated by the PWA. The Israeli preoccupation is clear. Positioning the crucial equipment in Area C allows the Israelis to control as much as possible the Palestinian state territorializa-

tion process occurring. Chapter 4 will return to the state territorialization process induced by the construction of such networks.

The Israelis were not alone in worrying about the development of the control exerted by the PA. When Germans, Americans and members of the PWA agreed to connect the two German wells to the American pipeline, the municipality of Hebron opposed this firmly. It wanted 'its' own pipeline, and rejected the idea of having to surrender the water of 'its' two wells to the PWA or sharing it with Bethlehem. The fact that no municipality or village located between Bethlehem and Hebron is supposed to connect to this pipeline makes this attitude even more understandable. Indeed, many villages located between Bethlehem and Hebron have already been approaching the authorities to obtain a connection. The success of the Jericho irrigating farmers in approaching Arafat shows that these villages have realistic hopes of securing a connection in a similar manner. A competition between Arafat and the mayor of Hebron for establishing patron-client relations is now in the making. If a village is refused a connection on the PWA controlled pipeline, it can turn to the Hebron municipality in order to ask for a connection on 'its' pipeline. This independent water network providing water to Hebron had engineers jokingly refer to the "independent state of Hebron" in 1999.

The competition among municipalities was clear during these constructions. Sa'ir village, neighboring Hebron, fuels an age-old antagonism toward Hebron. It refused for the pipelines to go through its territory and caused long construction delays, asking for a new road in exchange.

The land upon which the wells and reservoirs were built was supposed to be bought by the PA. However, the PA has yet to pay compensation to these landowners. Theoretically, the American company should have waited for that problem to be settled before proceeding with the construction. But its contract included a very tight schedule and they had to proceed "like cowboys." They undertook the works on private land that had not yet been expropriated. The anger of the landowners followed and some showed up on the construction site claiming their money. The companies to which the drilling and construction had been subcontracted started paying a regular 'ransom' to those landowners. They integrated these payments to their costs.

This project illustrates how massive works that are technically flawless may have disastrous institutional consequences. The municipalities compete with each other in order to access international aid. The control of the access to this material wealth allows Arafat and his competitors to establish patron-client relations. The massive international aid is hindering the na-

tional construction process. This topic will be taken up again in chapters 4 and 5.

Conclusion

These tales of conflicts concerning water access and water control allow us to question the myth which perceives water as the object of a single competition between Israel and its neighbors within a zero-sum game. Authors such as Sharif Elmusa,²⁹ Al-Kloub and Al-Shemmeri³⁰ have developed calculations in order to determine a 'just' quantitative allocation scheme for Israelis and Palestinians along the logic of the Johnston Plan. Such an allocation scheme is never just. Water is the object of so much competition among so many actors, at so many levels, that an agreement granting x cubic meters to Israel and y cubic meters to the Palestinians simply can neither be fair nor satisfactory to all. The stories that preceded showed that the nature of this specific hydropolitical constellation involves much more than the quantity of water. The stories that preceded showed that the nature of the hydropolitical constellation matters much more than the water quantities involved in the development of fair water use and distribution.

The international community, now worried about the water situation in the Middle East and about the well being of its own construction companies, channels huge sums to the hydraulic development. The various hydropolitical constellations are highly permeable, specifically by international influence through the awarding of funds, essentially because of the present weakness of the Palestinian national construction. Each of these examples described in this chapter showed the manner in which the local and national stakes depended upon the actors, resources and decisions pertaining to the international hydropolitical constellation.

In recognizing the Palestinian use of 18% of West Bank water, the Taba Agreement of September 1995 trapped the PA. Since then, the PA must deal with local actors within the framework of the competition for water control. The sectoral reallocation of water from agriculture to domestic use, an unavoidable transition in the area, will have to be carried out by the PA. It does not have the institutional means to do so today.

²⁹ Sharif Elmusa, "Equitable Utilization and Significant Harm: toward confluence", paper delivered at Birzeit University, 30 April 1999.

³⁰ B. Al-Kloub and T.T. Al-Shemmeri, "Application of multi-criteria decision aid to rank the Jordan-Yarmouk basin co-riparians according to the Helsinki and ILC Rules", *Water, Peace and the Middle East: Negotiating Resources in the Jordan Basin*, Library of Modern Middle East Studies, vol. 9, Tauris Academic Studies, New York, 1996, pp. 185-207.

In order to understand the complex interactions among local, national and international actors in the framework of the competition for water, the local, national and international hydropolitical constellations must first be studied. They constitute the topics of the following chapters.

Chapter 3

Local Hydropolitics

Introduction

The near absence of research on water management, water control and water use at the local level in the Palestinian Areas has allowed the persistence of numerous myths. The myth maintaining that Israel has total and complete control of *all* water pumped and of *all* water use in the West Bank and Gaza Strip is one of them. Chapter 1 gave an overview of the historical development that led to the division of West Bank aquifers in 1995 when the Israeli-Palestinian Taba Agreement granted 82% of this water to the Israelis and 18% to the Palestinians for the duration of the interim period.¹ As we saw in chapter 1, this water sharing reflected the situation that already existed at the time the agreement was concluded.² By the time the agreement had been signed, Israel had already extended its control to over 82% of the West Bank groundwater. The remaining 18% had fewer to no restrictions relative to the ones placed by the Israeli Water Law of 1959, thereby allowing the continuation of existing local water management institutions as the Jordanians, British and Ottomans had allowed before.

Chapter 2 highlighted numerous local actors who took part in the conflicts that had been identified. These various local actors, whether well owners, president of village councils, water thieves, water salesmen, water truck customers, farmers irrigating thanks to a well or spring, etc., sometimes entered partnerships or competitions that reached beyond the local context. However, they all shared in common the fact that the main stakes of the competition or cooperation remained circumscribed within the village or, at most, within the district where they exerted or sought power due to water.

In 1992, Hisham Awartani published a study of West Bank and Gaza Strip wells on behalf of the Palestinian Hydrology Group. He compared

¹ *Israeli-Palestinian Interim Agreement on the West Bank and Gaza Strip*, Protocol of Civil Affairs, Article 40, paragraph 20, Annex 10, Washington, 28 September 1995.

² The percentages of water quantities from each of the three aquifers used by Israelis and Palestinians in 1990 appear in Miriam Lowi, *Water and Power - The Politics of a Scarce Resource in the Jordan River Basin*, Cambridge Middle East Library: 31; 1993, Cambridge, p. 189.

the number of wells on the eve of the 1967 occupation to the number of existing wells in 1990 and he proceeded to a sampling of the latter.³ There were 750 wells in the West Bank in 1967, of which only 413 were in use due to a variety of reasons, mainly technical ones.⁴ Each of these wells was private property. Many were closed between 1967 and 1990 either because they had dried out, or because they had been closed on account of their being located in an area declared to be a security zone. In 1990, Awartani counted 364 wells used by Palestinians in the West Bank. Thirty-two others had been drilled by Mekorot to supply settlers with water. As they were equipped with much more powerful pumps, these wells had a much greater output than the Palestinian wells. According to Awartani, these 32 Israeli wells were thus extracting 47% of all water pumped in the West Bank in 1990 whereas the 364 Palestinian wells extracted the remaining 53%.⁵ That year there were 1936 wells in the Gaza Strip, of which 1791 were in use. Only 28 of these wells were Israeli, although once again, their pumping capacity was much higher than that of the Palestinian wells.

Awartani focussed his work on the competition waged between Palestinians and Israelis for accessing the water. As is shown in the following table, based on his observation, irrigation water from the National Water Carrier had a production cost 22% higher than water from West Bank wells although it was sold to Israeli farmers at a price 23% lower than that of West Bank water because of Israeli Government subsidies.⁶

TABLE 1 – Average Cost of Water, 1990

	Average production cost of water per cubic meter	Average consumer cost of water per cubic meter (for irrigation)
West Bank	0.16\$	0.172\$
Gaza Strip	0.10\$	0.14\$
Mekorot	0.195\$	0.14\$

Still focussed on Israel, Awartani mentioned that the Civil Administration imposed a pumping quota to every well used for irrigation. Wells used solely for domestic consumption were exempted from any quota. The fact that irrigation water alone was the object of restrictions from Israeli

³ Hisham Awartani, *Artesian Wells in Palestine: Present Status and Future Aspirations*, Palestinian Hydrology Group, Jerusalem, 1992.

⁴ *Ibid.*, p. ii.

⁵ *Ibid.*, p. vi. Three years later, the Taba Agreements were going to show how Awartani had underestimated the Israeli pumping.

⁶ *Ibid.*, p. viii.

authorities was made even clearer by the granting of drilling permits. Twenty-three permits were granted by the Civil Administration between 1967 and 1990, 20 of which concerned wells for domestic use only.

These figures were widely repeated by researchers working on water in the Middle East. Many hastily concluded that the quotas imposed on irrigation wells had by themselves prevented the development of irrigated agriculture in the Occupied Territories. However, other figures present in the same report written by Awartani demonstrate that other mechanisms apart from the quotas also contributed to the underdevelopment of irrigated agriculture.

Of the 364 Palestinian wells used in the West Bank in 1990, only 38 were devoted to domestic consumption and were thus exempt from any quota. In the Gaza Strip, 49 Palestinian wells were used only for domestic consumption whereas 1742 served for irrigation. That year, 8% of Palestinian wells in the West Bank overpumped beyond their quota. However, 38% of the wells Awartani sampled had pumped only 90% or less than the quantity allowed by their quota.⁷ Therefore, underpumping was much more frequent than overpumping. This phenomenon only concerned irrigation because drinking water wells were not submitted to any quota. Quotas therefore cannot be held as the sole limitation to the development of irrigated agriculture. If this were the case, every well would have at least pumped the quantity allowed by its quota.

This underpumping was observed during the fieldwork undertaken for this research in Palestinian villages, starting in the summer of 1997. A similar phenomenon was observed concerning the springs whose excess water was often unused and allowed to flow in the valley without any attempt to trap it. As far as springs were concerned, the occupation authorities had never interfered with their use in any of the villages where I investigated. Indeed, Israelis occupied the West Bank and the Gaza Strip in an 'imperial' fashion. Many aspects of their control would stop at the village entrance for they preferred to have the 'natives' manage their own internal problems.⁸

This underpumping of the wells and this under-utilization of the springs hardly fit the picture of a West Bank and Gaza Strip dried off by the Occupiers. Strangely, this phenomenon was never reported in the numerous

⁷ *Ibid.*, p. v.

⁸ For example, Palestinian villages hooked up to the Mekorot network would only buy water as bulk consumers. They would collect the fees from the individual customers and then pay the Civil Administration.

studies published on water in the Jordan Basin. In order to understand its origin one needs to explore the local hydropolitical constellations existing in Palestinian villages. Relations of cooperation or competition among local actors over accessing water and controlling it allow an explanation for such an observation that is so surprising at first.

The West Bank and the Gaza Strip show a global water scarcity. However, local situations of water abundance exist. Chapter 3 is devoted to the study of local hydropolitical constellations. It will therefore study the actors who control the access to water, its use and distribution within these local situations of abundance as well as the relations existing among these actors. The focus of this chapter on local situations of water abundance does not mean a denial of the acute water scarcity existing, like in the 151 Palestinian communities that still did not even have tap water in June 1999 and therefore rely entirely on the purchase of water from cistern trucks.⁹

An overview of the towns and villages that were investigated will first be shown. This sample allowed the exploration of a representative variety of cases. Some will be detailed extensively. Study cases dealing with irrigation will at first sight seem over represented in comparison with the weak development of irrigation in the Palestinian Areas. Indeed, only 6.0% of West Bank cultivated area was irrigated in 1994.¹⁰ However, irrigation consumes 65% of the water used by Palestinians.¹¹ This chapter demonstrates that control over this water now lies entirely within the hands of local actors and completely escapes control by the Palestinian Authority. Study cases concerning irrigation are thus very important for they describe the manner in which over half of the water used by Palestinians is now being controlled.

Following the description of these case studies, we will use concepts developed by A. Giddens, J. Migdal, A. Turton and L. Ohlsson in order to show how efficient social control over water does exist even though the exercise of that control is presently fragmented and lies in the hands of numerous local institutions that emerged more or less recently, during the past two thousand years. This fragmentation is essentially due to the fact that water management in the Palestinian Areas is often carried out ac-

⁹ Communication delivered by Fadia Daibes, Palestinian Water Authority, 7th International Conference of the Israel Society for Ecology and Environmental Quality Sciences, Bethlehem, 18 June 1999.

¹⁰ Applied Research Institute - Jerusalem, *Water Resources and Irrigated Agriculture in the West Bank*, Bethlehem, Palestine, March 1998, p. 94.

¹¹ *Strategy for Water Management in Palestine*, Palestinian National Authority, Palestinian Water Authority, January 1999, p. 3.

cordova to pre-modern institutions in the sense given by A. Giddens. The persistence of these institutions goes on in spite of the emergence of a Palestinian society that is, in many respects, modern. This present situation brings about a second order scarcity as defined by Ohlsson; that is, a scarcity of the social capacity to manage water, the acuteness of which is now greater than the first order scarcity, that is, the lack of water itself.

Case Studies

In 1990, the West Bank numbered over 400 villages, 527 springs, 326 functioning irrigation wells and 38 drinking water wells. The Gaza Strip numbered 1742 irrigation wells and 49 drinking water wells. The drilling of illegal wells in the Gaza Strip, especially in 1995, has now doubled the number of wells there.¹² New wells have also been drilled in the West Bank, although they are mostly legal ones in this case. The sheer number of these springs and wells made it impossible to study in detail every one of them. A random sample of towns and villages was studied via participant observation techniques or participatory rural appraisal techniques. This sample was made to include a sufficiently broad spectrum of representative situations. A typology was developed using the water source on the one hand and the water use on the other hand.

Four types of water sources exist: springs, wells, water network hook-ups and cistern-trucks. We did not include household cisterns that collect rainwater even though they constitute a common source of water because such cisterns are entirely operated at the household level. Their content therefore is not the object of competition among the actors which are being studied.

Two water uses were considered: domestic and irrigation. Industrial use is, at present, negligible. Its development will face the same obstacles as are now met in Jericho. Table 2 shows the towns and villages where studies were carried out. Other towns and villages such as Khan Younis and Jenin were also visited and examined. Each could enter our typology according to its water sources and water uses. Within each category, similar hydropolitical constellations would systematically appear. The same categories of actors would be found. The same power relations and power gaps would be found. The same methods for transferring water rights would appear as well as the same manners of excluding parts of the population from access to the water.¹³

¹² Interview with Jamal Ad-Dadah, PWA, Gaza, 12 May 1999.

¹³ For maps showing the spatial distribution of springs and wells as well as of water use see appendices.

The cases of Falamiah and Battir will now be described in detail for they are nearly Weberian ideal types. Falamiah is a village in the Tulkarem district, in the north of the West Bank, which has no spring, but had five wells drilled between 1958 and 1962. An integrated development project which centered around irrigation took place there between 1994 and 1997, which allows us to examine the interactions among local actors, irrigating farmers, well owners, Palestinian non-governmental organizations (NGOs) and one international actor, the French development agency. Falamiah stands as the ideal type of the hydropolitical constellation that is woven around the control of irrigation wells. Battir is a village of the Bethlehem district, in the south of the West Bank, with springs used for irrigation since the Roman era and no well. Battir did not undertake any internationally funded hydraulic development project in the course of the last years. Battir stands as the ideal type of the hydropolitical constellation woven around the control of a spring used for irrigation. Of the water used by Palestinians, 65% of it goes to irrigation and is controlled by mechanisms developed by either one of these two constellations.

The Hydropolitical Constellation of Irrigation from Wells

Traditionally, only rain-fed agriculture was carried out when springs did not exist. Modern technology as well as the possibility to mobilize enough funds had enabled wells to be drilled in numerous villages during the 1950s and 1960s. Local institutions then emerged to control the distribution of water from these wells. Local decision-making bodies sprouted up, giving extensive powers to the 'well owners', those that had initially provided the funds for drilling the wells. These institutions are therefore recent yet often oral and distinctly 'pre-modern' - as defined by Giddens - as will be shown in the second section of this chapter.

Falamiah

Until 1958, the village of Falamiah, in the Tulkarem district in northern West Bank, depended solely on its rain-fed water cisterns for all of its water needs. Only rain-fed agriculture was carried out. Modern technology and the possibility to mobilize enough funds enabled 5 wells to be drilled between 1958 and 1962, during Jordan's rule over the West Bank. Local institutions then emerged to control the distribution of water from these wells. Local decision-making bodies emerged that gave extensive powers to those who had initially provided the funds for drilling the wells. A new social stratification, determined by water access, appeared in the village. Now there emerged the water owner and seller, the purchaser for the sake of irrigation, and the landless who did no water purchasing. The

set of social rules that arose was entirely different from the age-old system found in Battir. But, just like Battir, it also operated in splendid isolation from the moment of its creation.

The Situation before the Project

Falamiah numbers five wells, drilled between 1958 and 1962 at the time of Jordan's rule over the West Bank. Each of the five wells was dug thanks to private funds, without any subsidies from the Jordanian Government or from a foreign development agency. Mobilizing such colossal capital as was necessary (about 20,000 JD per well at the time) required the farmers to group themselves into 'companies' of 24 shares each. The number of shareholders evolved with time as the sons of shareholders would inherit, upon their fathers' death, a fraction of the share that was inversely proportional to the number of heirs.¹⁴ The three wells that were to participate in the French funded development project in 1994 each numbered 28 to 42 shareholders. In the case of every well, one of the shareholders had enough shares to detain a minority blocking power when all the shareholders had to make a decision. The well was thus given the name of that person who was regarded by all villagers as the well owner.¹⁵

Every well used to feed an open sky pool from which the various plots of land were irrigated. Irrigation occurred upon request. The farmer in need of water would go individually to the well owner who would sell him a given amount of irrigation time from the pool. Thus, in 1992, Abu Mohammed sold the water of well no. 1 at an average price of 8 JD per hour (40 NIS per hour at that time). His well would deliver 30 to 50 cubic meters per hour. This outflow would fluctuate according to the season of the year, according to the number of irrigating farmers that would receive the water at the same time, and according to the distance of the plot of land from the pool, as the water loss along the network was sizeable. The network was constituted in such a way that a farmer could only acquire water from one well. The well owners were thus each heading a monopoly that would grant them real power in the village. No water users' priority list existed. No oral or written agreement would guarantee a farmer access to the water or a fixed price for that water. The well owner would rarely

¹⁴ Religious law is supposed to determine inheritance procedures in the West Bank, a rule which has been maintained since the 1967 occupation. Muslim law specifies that women should receive one third of the inheritance whereas men should receive two thirds. All of Falamiah's inhabitants are Muslim but women never claim the share of their inheritance as this would be considered shameful.

¹⁵ For example, Rashid Abu Mohammed has seven of the 24 shares of well no. 1 and is considered the well owner.

hesitate to take advantage of this situation. He would ask for a higher price during the summer, a dry season, than in winter, when it rains. He would sometimes postpone opening the tap until the farmer in need of water would have agreed to marry his daughter. He could choose unilaterally to provide more water to one particular farmer over another.

Once the Israeli occupation was established, pumping quotas were ascribed to every well.¹⁶ Every well in the Occupied Territories was equipped with a meter that was read monthly by the West Bank Water Department. Falamiah, as a whole, never used all of its water potential as was ascribed to it by the quotas imposed on its wells. This is illustrated in table 3.

TABLE 3 – Wells and Quotas

Well no.	Name of the well	Quota (m ³ /year)	Quantity used (m ³ /year)
1	Rashid Abu Mohammed	135,000	50,000
2	Abu Ghassan	160,000	120,000
3	Al-Mukhtar	200,000	150,000
4	Farouk	145,000	145,000
5	Yousef	120,000	120,000

Thus, in 1992, water in Falamiah was managed as a strictly private good, without any overall plan for the village development. The access to water was very unequal. Every farmer paid a different price for a cubic meter of water, not only because the price of an hour's worth of irrigation would fluctuate, but also because no one would receive the same quantity of water during one hour of irrigation. The local political clout of the well owners was immense even though their economic gains were not maximized because they did not sell all the water their quotas allowed them to.

Once again this is a situation where social control over accessing and using water was very tight. Yet, the Israeli occupation authorities never exercised this social control. It was fragmented among five different local bodies that would negotiate individually with every farmer in need of irrigation water. It operated in splendid isolation from the occupation authorities.

¹⁶ With Military Order no. 498 in November 1974, the Gaza wells became the last ones to be submitted to the obligation of having a meter indicating the quantity extracted. See Annette van Edig, *Aspects of Palestinian Water Rights*, Ramallah Center for Human Rights Studies, Ramallah, May 1999, p. 45.

The Process of Change in Falamiah

An engineer working for the Palestinian Hydrology Group, a Palestinian NGO, started meeting with the farmers of Falamiah in 1994. Ghassan Abu Fares was from Deir Istiya and did not have any personal stake in any of the wells in Falamiah. He was working for an NGO that had a social and political agenda apart from having technical capacities in the field of water. His negotiations with the farmers were to last three years. He was to negotiate the implementation of a development project in the village that would modernize the irrigation network, making it more efficient and thereby providing the village with additional water.¹⁷ The project also included a land reclamation component, for much of the land in the village was not suitable for agriculture. PHG was weary of the social institutions that were to control the use and the access to this additional water. So, the project not only included technical work that would increase the cultivated land in the village, it also included a new way of controlling the distribution of the water.

This process implied a great participation of the population. The irrigation method could be changed only if all of the shareholders of every well agreed to it. Thus, Abu Fares not only discussed with the 5 well owners, he also discussed with all of the shareholders of every well that took part in the project. This is illustrated by table 4.

TABLE 4 – Wells and Shareholders

Well no.	Number of shareholders	Number of meetings that gathered all of the shareholders
1	42	4
2	28	3
3	32	3

Abu Fares also tried to include well no. 4 in the project, but his efforts failed.¹⁸ Every well had a different social profile. In the case of wells 1 and 3, all of the shareholders were also water users. However, most of the

¹⁷ Closed reservoirs were to replace open-sky pools and pipes were to replace open-sky canals. This was to reduce the loss of water between the pump and the irrigated plot of land. A comprehensive evaluation of the development project carried out in Falamiah can be found in Patrick Caron, Jean-Philippe Tonneau and Julie Trottier, "Développement local, Appuis institutionnels, Planification; le cas de Falamiah", in *Rapport de mission dans les Territoires Palestiniens du 27 juillet au 13 août 1997*, no. 88/97, CIRAD-SAR.

¹⁸ Well no. 4 and well no. 5 used up all of their quota to irrigate the northern part of Falamiah. This zone is entirely cultivated and is situated outside of the project.

shareholders of well no. 2 did not live in Falamiah and thus did not practice irrigation. They lived in Qalqilya or in other surrounding villages where well no. 2 only provided them with a source of revenue. More than 50% of the water users depending on well no. 2 were not shareholders.

Abu Mohammed was the first in the village to be convinced to take part in the project. Abu Fares successfully argued that selling an additional 85,000 cubic meters per year would bring in substantial income from the well. He also insisted on the fact that unused water was a gift he made free of charge to the Israelis that would use this water, pumping it elsewhere from the water table. Moreover, Abu Mohammed owned land that the project was intending to reclaim. He had never used all of his water essentially because such a land reclamation would have required an investment beyond his capabilities.

Well no. 1 was the first to accept the project proposed by Abu Fares and to enter the agreement that now binds irrigating farmers and shareholders for the next 30 years. Well no. 1 is the only well that has committed the totality of its quota to that agreement.

Well no. 3 was the second well to enter the agreement. Here, Abu Fares also used the same arguments concerning the revenues generated by the sale of an additional 50,000 cubic meters. The Mukhtar hesitated though, for he feared that the irrigating farmers would draw more profit from their crops than he would from selling the water for irrigation. He foresaw the manner in which his power would be shaken by the project which Abu Fares suggested and only agreed to commit 30,000 cubic meters to the agreement, not including that part of the water already used to irrigate the plots of land in the project zone.

Abu Fares found it much more difficult to convince well no. 2 to participate in the project. As most of the shareholders did not live in Falamiah, they were not going to gain from the whole project. They perceived the well strictly as generating revenue and did not wish to change the existing situation. Abu Ghassan, who was considered to be the well owner as he owned four shares and lived in the village, had plots of land that lied outside of the project zone. He would have rather used the remainder of his water quota to irrigate that land.

Abu Fares used intensive social pressure to win Abu Ghassan over. The water users dependent on well no. 2 were very much in favor of the project and they lived next door to Abu Ghassan, as opposed to the other shareholders who lived far away. These efforts were crowned with suc-

cess and the shareholders finally committed 40,000 cubic meters per year to the agreement suggested by Abu Fares.

The Situation in 1997

Wells 1, 2 and 3 now all serve to feed a small reservoir of 200 cubic meters from which water is pumped to a bigger reservoir of 1000 cubic meters. The latter is located on the highest point of the project zone and irrigation can be operated thanks to gravity to all of the land in that zone. Landowners only had to contribute the cost of the pipe and tap leading to their own plot. Each well thus no longer has a monopoly over a specific area. The water from all 3 wells is now managed as a whole by an irrigation committee that is made up of the three well owners, four water users and one representative of the Palestinian Agricultural Relief Committees (PARC). When a farmer wishes to irrigate a plot of land, he submits his request to the committee, which will grant his request according to a crop policy. This policy aims at promoting crops that require less irrigation. Table 5 shows the water consumption of the various irrigated crops in Falamiah.

TABLE 5 – Crop Irrigation

Crop	Number of irrigation days	Outflow (m³/ dunum of land)	Yearly consumption (m³/ dunum of land)
Citrus (basin irrigation)	150	6	900
Citrus (drop irrigation)	100	3	300
Vegetables (open sky)	180	6	1080
Vegetables (greenhouse)	100 (x2)*	2.25	450
Fruit trees (apple, apricots, almond)	150	1	150

*In a greenhouse, there are two crops a year.

In the future, the irrigation committee will systematically reject the requests for irrigating new plots of citrus, but will accept automatically the requests concerning apricots, apples, and almond trees. Setting up a new greenhouse will have to be negotiated with the committee. This is why 36 greenhouses, each one dunum in size, were built in Falamiah in the course of 1997. Farmers invested in them quickly before being forced to submit a request to the irrigation committee once it started operating.

The irrigation committee will respect the wells' shareholders by giving them priority over the other water users. Their status thus remains privileged although their power has been drastically reduced as the new system has eliminated the individual negotiation between the well owner and the water user which used to determine the decisions concerning the price of water and the quantity that would be granted. The new system also allows foreseeing the future crops. Some 50 hectares of non-citrus fruit trees will be growing within a few years. This will imply the hiring of labor from outside the village because a two-hectare orchard requires a farmer's full time work.

The irrigation committee now decides the price of water. There is thus now a participation of water users in the price fixing. The price remains the same for all water users now and is linked to the quantity of water used, not to the length of irrigation time. The committee calculates the cost of diesel for the pump, oil and maintenance of the network, the operator's salary and the dividends to be paid to the shareholders before it decides on the price. Water will be bought from the shareholders at a price varying from 0.5 to 0.6 NIS per cubic meter and will be sold to the farmers at a price varying from 0.8 to 1.0 NIS per cubic meter.¹⁹ Profits will be poured into a development fund for the village. So, as far as the water users are concerned, the price of water has not changed on average compared to the situation prior to the project.

Conclusion

The evolution of the local hydropolitical constellation in Falamiah from 1994 to 1998 is worth analyzing. The decision-making bodies are now more numerous than they used to be. Two of the wells are still operating according to the old system. Some centralization of decision-making has been achieved at the local level, which has allowed for a more participatory control of the access and the use of water at the village level. The democratization is not ideal as women remain totally excluded from this control, as are the male villagers that own no land or well share in the village. Moreover, the splendid isolation of the village hydropolitical constellation has been breached, as there will be a representative of PARC in the irrigation committee from now on. Yet, PARC is an NGO, which means that there is yet to be state interference in this process. So, globally, the project will have strengthened the village of Falamiah by instituting a more centralized process that allows it to mobilize more fully its land and water resources. This is the type of process described by Migdal in the emergence of states. When the national authorities carry out such a

¹⁹ These prices are in 1997 NIS.

centralization process, a state building process occurs, which strengthens the state when facing its external enemies. There is not much hope that Falamiah will form an independent state in the future. So, the process we observe here is that of local centralization of power that strengthens only a local actor, not a state.

The Hydropolitical Constellation of Spring Fed Irrigation

In the Jordan Basin, irrigation from rivers or wadis was never much developed as opposed to the cases of the Nile in Egypt or of the numerous wadis in Morocco for example.²⁰ Traditionally, a village would most often organize itself around a spring or a well.

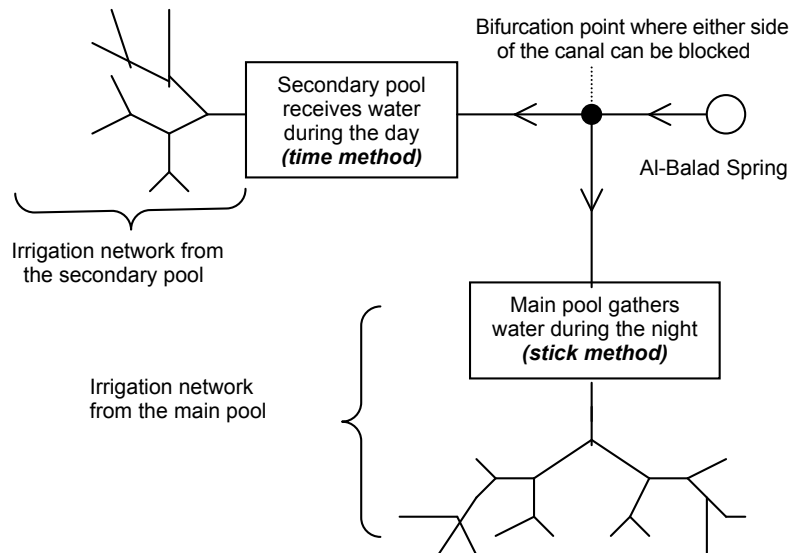
Battir

The social organization in the village of Battir, southwest of Jerusalem in the Bethlehem district, was already structured around the use of water dating back to the Roman times. This village lies adjacent to the Green Line and some of its land was lost to Israel with the armistice agreement of 1949. It numbers six springs that are all used for irrigation. The springs were also used for drinking water until the village was hooked up to the Mekorot network in 1972. Every house has a rain-fed cistern, which also provides it with domestic water. Of the six springs two have a much greater outflow than the others and the manner in which they are controlled has been intimately linked to the village structure. The first main spring is named Ein Al-Balad (the village spring) and the second one is named Ein Al-Jama'a (the mosque spring).

The Al-Balad spring was entirely rehabilitated in 1950. The system initially built in the Roman era, and used uninterrupted since, was cemented in order to reduce loss through seepage. The Al-Balad spring flows under the mosque where it is deviated so that men may wash before prayer. Until 1972, women used to go there to fill their jugs with water. One small pool exists there which collects water for irrigation. From the mosque, an open sky canal, replaced by a pipe in the 1980s, leads the water to the elegant Roman arched canal where it falls into the village's main pool. Figure 1 shows the course followed by the spring.

²⁰ A wadi is a surface stream that flows only occasionally, after heavy rainfall.

FIGURE 1 - Battir



Eight clans compose the village and each is entitled to one day of water. The turn thus comes back every eight days and moves up one day every week. From sunset to sunrise, the water is allowed to collect into the main pool. In the morning, a member of the clan that is entitled to the water on that day goes to the main pool with a branch stick which he stands upright on the bottom of the pool to measure how high up the water goes. He then sticks a peg into the big stick to indicate the water level. He removes the stick and divides it into as many portions as there are water shares by sticking evenly spaced pegs between the bottom of the stick and the water level for that morning. The water is then deviated to the upper, smaller pool so that the main pool is not replenished again until sunset when water is deviated back into it again.

Irrigation starts from the main pool, through an intricate network of smaller canals with bifurcations that can be blocked so that the water shareowner can bring the water into whichever plot of land he wants until the water level has reached down to the second peg on the main stick. The second water shareholder then comes and deviates the water from the main pool towards his land plot via the same network of canals by blocking different bifurcations and unblocking others. This process goes on

until sunset when irrigation will stop and the Al-Balad spring is once again deviated to the main pool. Of course irrigating at dusk may be more or less profitable than at other times of the day.²¹ The water turn thus not only comes every eight days as is determined by the share holder's belonging to one clan or the other, it also changes within that day. The shareholder that receives water first today, will be the last to receive his water eight days later.

From sunrise to sunset, the Al-Balad spring is deviated away from the village main pool into the smaller pool that was mentioned earlier. Water from this pool is allocated according to time. The clan that has the water day will simultaneously use both pools. But for the smaller pool, no stick is used as this pool was not filled during the night, but is rather replenished constantly during the day. The time between sunrise and sunset is divided into as many portions as there are water shareholders. This number may be different from that of the shareholders concerning water from the main pool. Each shareholder will receive the same time portion of water. Nowadays, the villagers look in the newspaper to check at what time the sun will set and use their watch to calculate the time portions. But until recently, they used the progression of the shadow of a given landmark to decide upon the beginning and end of each time portion.

We can thus distinguish two levels at which the control of water is independent in the village. First of all, the control over who uses Al-Balad spring, how much and for what purposes, lies entirely within the village. The Israelis never interfered with this process, just as the Transjordanians, British and Turks before them. Second of all, the village divides Al-Balad spring in equal time-shares, one night's worth of water accumulation, among each clan of the village. But within each water day, the clan decides by itself how it will divide this water among its members. There is a strict turn over of the position in the day (first, second, third, etc.) for receiving the water share from one water day to the other, but there can be exchanges of water shares among one clan. The passing over of a land and water share from one member to another is a process entirely regulated within that clan, without any interference from the village, let alone from the occupying authorities.

The second biggest spring, Ein Al-Jama'a is channeled into a separate pool where the stick method is used. Here again, a smaller deviation pool is also divided according to time. Less people use this spring which is not shared by all eight clans. The water turn therefore comes back more often

²¹ Evapotranspiration through the plants' leaves varies according to the intensity of light and heat.

than once every eight days. Ein Al-Jama'a was entirely confiscated by the British under the British Mandate. The water was used then for the little train station at the bottom of the valley that is now abandoned. The spring stopped being confiscated at the end of the British Mandate and the Battir villagers reverted to the system used under the Ottomans to share the spring among them and irrigate from it.

Each of the other four springs are also the object of totally independent control. Al-Fawwar spring is only used by one family. No one in Battir remembers land having ever been sold without its water share. In general, however, land is not sold, it is inherited. The process by which this is done, and by which some brothers leave farming in favor of another profession and either give, exchange, lend or other wise provide their water and land to their other brothers is entirely settled within the family.

Conclusion

The institutions controlling the use of water and the access to water in Battir are thus numerous and the manner in which they are connected is very intricate. The sharing of every one of the six springs is the object of an independent, informal decision-making body. The sharing of water within a water day is the object of yet another independent, unofficial decision-making body. In the case of Al-Balad and Al-Jama'a springs, there are even two controlling mechanisms: one for the upper pool that is divided according to time and one for the bigger pool that is divided according to the stick method. It is therefore safe to say that water use in Battir is closely controlled but the decision-making bodies, among which this controlling power is fragmented, number above 30. They operate according to unwritten, but scrupulously respected rules. This is a situation where 'social capital', as Ostrom calls it, is very high.²²

The Battir springs give water of excellent drinking quality, and have a sizeable overflow in winter. The water simply flows into the valley, without any attempts at trapping it, and merely mixes with polluted wastewater in the bottom of the valley. As water is closely linked to the land and as there is enough to irrigate all of the land owned by the eight clans that compose Battir village, it would be useless to attempt to trap this over-

²² Elinor Ostrom, *Crafting Institutions for Self-Governing Irrigation Systems*, Institute for Contemporary Studies, San Francisco, California, 1992, p. 30. Ostrom defines 'social capital' as the potential and actual self-organizing power of a community. Social capital may be built by establishing rules specifying who will be responsible for giving orders or for undertaking certain activities, and when and how these activities will be undertaken. Social capital is multiform and may consist of the improvement of the manner in which common tasks are carried out.

flow water. The Israelis never attempted it or recommended it to the villagers.

In 1972, the whole village was hooked up to the Israeli water network provided by Mekorot.²³ Several factors weighed into this decision. Of course tap water constituted a major progress in the quality of life. But could it not be provided by the village springs? This would have preserved the independence of the village concerning water. Integrating the village into the Israeli network corresponded to extending the Israeli territorialization process over the Occupied Territories. No one in Battir gave it much thought though, because they were infinitely more preoccupied by the social upheaval that would occur if the village adduction system brought water from the springs. The quantity of water used for domestic purposes was to increase dramatically with the advent of tap water.²⁴ Much less spring water would remain for agriculture and painful decisions would have to be made to distribute the shortage among the community. The villagers much preferred a hook up to Mekorot. This was perceived as an additional source of water, not as a territorial integration into Israel. They did not think that they would become dependent on this increased domestic water consumption and that reverting to carrying water on their heads would seem impossible one generation later. They did not feel they were letting the Israelis extend control over their community. Their splendid isolation in controlling their springs still went on.

The Traditional Social Organization of Spring Sharing

The cyclical distribution such as the one observed in Battir offers the advantage of matching the fluctuations of water flow. Abundance and scarcity are evenly shared among the clans as seasons go by. As the maintenance of the network is necessary for every user, it is carried out continuously. Such a village system usually allows water share transactions within its population but forbids water share transfers outside of it. Traditionally, solidarity only extended to those villagers sharing an irrigation network. Those using another water source, such as a well on the edge of the village, were excluded from the spring's water sharing. Usually, newcomers to such a village would not have any water right and could only integrate themselves as slaves (*'abeed*).

Villagers rarely admit the existence of a customary law regulating the sharing of spring water. Most often, the rules in use must be reconstructed

²³ Mekorot is the national water company in Israel.

²⁴ An adduction system is the set of pipes, pumps, valves and reservoirs that brings tap water to houses.

from answers to questions such as “What do you do when a water shareholder dies? Who gets his share?” When the existence of a regulation is recognized, it is most often designated as Muslim law. Studying Muslim water law, however, shows us that it does not correspond to the law that is in force, which is in fact a local customary law that varies from village to village.

The Hydropolitical Constellation of Water Distribution

Thirty-five percent of Palestinian used water feeds domestic use. This water may originate from wells or springs mainly devoted to irrigation and therefore controlled according to this main use. Domestic water may also originate from adduction networks, cistern trucks or individual cisterns that harvest rainwater fallen on a house’s rooftop and terraces.

The Jerusalem Water Undertaking (JWU) was already introduced in chapter 2. Its functioning will be detailed in terms of water control and will be compared to the water distribution situation in the Gaza Strip. We will see that water utilities have so far enjoyed a certain autonomy in their management of domestic water supply although they are constrained by the fact they buy water from Israel. The latter decides unilaterally the quantity of water it sells to the Palestinian utilities.

The Jerusalem Water Undertaking

The JWU owns 4 wells located in Ein Samia. It was drilling an additional one in June 1999 and two more were supposed to follow a few months later. When the Israelis occupied the West Bank in 1967, the JWU only had one well. A second one was drilled during the occupation thanks to German funds, a third one thanks to funds from the Committee Supporting Activities in the West Bank, and a fourth one thanks to funds from the European Union, the UNDP and the Arab Funds. Wells 5, 6 and 7 are now drilled thanks to German funds. The existing wells provided about 35% of the JWU’s water in 1999. Between 65% and 70% of the utility’s water had to be bought from Israel.²⁵ Before the Oslo Agreement, the JWU bought water from the Civil Administration which bought it from

²⁵ Interview with Mr. Abdelkarim Ass’ad, General Director of the JWU, Ramallah, 6 June 1999.

Mekorot.²⁶ Since the emergence of the PA, the JWU buys its water from the PWA which buys it in turn from Mekorot.²⁷

As we saw in chapter 2, the Jordanian Law No. 9 of 1966 that created the JWU conferred upon it a fairly wide autonomy and granted it the responsibility for deciding the pricing of the water as well as the cost of the services. The JWU functions globally quite well. The sales price of its water in the summer of 1999 had not increased since June 1995. The JWU had managed to increase its efficiency, which had generated a surplus in its balance sheet, a surplus that was used to balance the increased cost of the water it purchased. In 1999, the JWU provided 120 L of water per person per day in the town of Ramallah, a quantity that satisfies fully the recommendations of the World Health Organization and lies in the range of quantities used in developed countries. In 1999 the JWU provided an annual total of 8 million cubic meters (mcm) to its customers. Between 1991 and 1994, it recognized 25% of water loss along its network.²⁸ Water distribution networks always show losses. In Europe, a 20% water loss is considered as normal.²⁹ Therefore, 25% is slightly above the expected level in an industrialized country, yet much less than the leaks observed in the Gaza Strip or Hebron municipality where illegal connections proliferate.

In 1999, the JWU was planning to drill enough wells in the future to eventually become independent from purchasing water from Israel. Its dependence on Mekorot water began in 1974. The previous year, it had still been able to satisfy its customers without purchasing water from the Israelis. The latter do not automatically accept to sell to the JWU all of the water it asks for. Just as Israeli municipalities receive a water quota that is reevaluated yearly by the Israeli Water Commissioner, the JWU receives only the quantity decided by Israel. It thus received in 1999 the same quantity as in 1998 even though it had asked for an increase.³⁰ The only limitations on water extraction from the JWU's own wells were technical and natural since no quota was ever imposed on them by the

²⁶ The Civil Administration was selling the water to the JWU at a price higher than that at which it bought it from Mekorot. The JWU has therefore gone to court against the Civil Administration in order to recover the price difference. This suit was still in process in the summer of 1999.

²⁷ The PWA sold the water to the JWU at a loss for some time, then announced in June 1999 a price increase of 19%. This did not favor harmonious relations between the JWU and the PWA.

²⁸ Jerusalem Water Undertaking, *Performance Prospects*, December 1995, p. 33.

²⁹ Interview with Mr. Watelet, Director of SOGEA for the Middle East, Jerusalem, 3 February 1999. The SOGEA is the French company in charge of identifying leaks in the municipal networks of Bethlehem and Hebron within a development project funded by the French development agency.

³⁰ The 1999 drought caused this to happen in many municipalities.

Israelis. At first sight, it seems that the JWU could extract an unlimited quantity of water if it drilled all of the wells it wanted. Three permits were necessary after the beginning of the occupation in order to obtain a functioning well. A first permit was needed to drill the well, a second one to equip it and, finally, a third one to build the pumping station. This system persists today and an Israeli green light must be secured for every permit via the Joint Water Committee (JWC). The PWA is now discussing issuing extraction permits for domestic wells. This regulation was not yet in force in 1999 but the JWU feared a water quota might be imposed on its wells for the first time by the PWA.

The JWU uses a progressive price system in order to ensure a minimum supply of water at a low price to every customer. The price of the first few cubic meters is lower than that of the additional cubic meters. The quality of the water delivered by the JWU is equivalent to that of adduction water in Israel, which should not be surprising since 70% of water delivered by the JWU comes directly from the Israeli network.

Overall, the JWU has been offering a good quality service which has encouraged its customers to pay their water bill. It must now deal with the PWA instead of the Civil Administration. This change has not coincided with an acceleration of the procedures. According to Abdel Karim Ass'ad, the director of the JWU, before the Oslo Agreement existing drilling permits could be renewed with a two-hour phone conversation. Once the PA was set up, such a renewal took one year and a half. The JWU is aware that water control still lies in Israeli hands. As far as its activities are concerned, the PWA has essentially replaced the Civil Administration.

The JWU is governed by a Board of Directors whose composition was defined by Regulation No. 24 of 1966 made under section 5.5 of the Regulating Drinking Water Affairs Law in Jerusalem Governorate No. 9, 1966. According to the latter, the Board of Director numbers seven members: two members elected by the Ramallah municipal council, two others elected by the Al-Bireh municipal council, one by the Deir Dibwan municipal council, one by the Kufr Malik village council and one nominated by the minister. Chapter 5 will show that the military orders promulgated by the Israelis once they occupied the West Bank allowed them to alter such institutions set up by Jordanian laws. Yet, in 1999, the JWU was still publishing this law as its institutional basis.

Municipal elections still had not taken place in 1999 and the mayors and municipal councils were still nominated by the PA. The Board of Directors of the JWU thus depends on the Ministry of Local Governments (MLG) even though it enjoys a large autonomy. Chapter 4 will demon-

strate that the strategy developed by the PWA now aims to set up regional water utilities that should withdraw water control from the hands of municipalities and, simultaneously from the MLG.

Water Distribution in the Gaza Strip

The water distribution situation in Gaza is very different from the one existing in the area served by the JWU. In 1995, the water distribution situation was still fragmented among four municipal utilities, twelve village councils and UNRWA.³¹ This situation still persisted in 1999 after both the telephone service and electricity had been privatized. These privatizations had entailed a loss of revenue for the municipalities that were all the more reluctant towards the creation of the Coastal Water Utility, a utility that was planned to take over all of the management of water distribution in the Gaza Strip. The withdrawal of water management from the municipalities meant more than a loss of revenue. During the 30 years of occupation, the municipalities had evolved like

“small states and little kingdoms. Personal interests have been rising. Many municipal employees get a revenue out of ignoring the illegal connections, of forgetting to send out water bills, of having pipes wider than planned installed when setting connections or of out of undertaking works in this street rather than in that one.”³²

In 1997, the Gaza Strip numbered 1,020,813 inhabitants³³ served by over sixteen adduction networks all independent of each other. All together, these networks provided 50 mcm for the year (mcm).³⁴ These networks got 70% to 80% of their water from municipal wells and bought the rest from Israel. Municipalities in the north of the Gaza Strip depended completely on their wells whereas the deterioration of water quality in the south led these municipalities to buy part of their water from Israel in order to mix the two and thereby reduce the salinity. Thus, for example, in 1999, the municipality of Khan Younis owned 7 wells out of which it extracted 3.7 mcm of salty water, if water provided by an additional well owned by UNRWA is included. It bought 1 mcm from the Israelis and that good quality water caused the overall salt content to decrease.³⁵

³¹ Jamal Saghir, Andrew Macoun and Elisabeth Sherwood, "Management Contracts in Water and Sanitation - Gaza's experience", 1999, p. 1.

³² Interview with Ramez Al Madhoun, Lyonnaise des Eaux Khatib & Alami, Gaza, 12 May 1999.

³³ 1997 population census, Palestinian Central Bureau of Statistics.

³⁴ Interview with Ramez Al Madhoun, op.cit.

³⁵ In 1999, two desalination plants using inverse osmosis started functioning in Khan Younis. Each treated the water from one of the seven wells. This good quality water was not mixed with the rest. It flowed in specific sections of the network at set times.

The Gaza Strip was different in many ways from the JWU area in 1999. The control of water distribution systems was very fragmented and losses along the network were much higher because of a high number of illegal connections. Water distribution systems have developed in an anarchic fashion. Thus, in the Jabalya Refugee Camp, a private operator had drilled his own well and built his own network. He has been selling water to his customers for 20 years in full independence from the surrounding municipalities.

In 1999, the Gaza Strip showed the characteristics of a 'tragedy of the commons' such as is defined by Garrett Hardin; that is, a situation where the natural resource is a common property and exploiters are led to extract a maximum within the shortest time possible. This leads to overexploitation and economic inefficiency. The cost of an illegal connection in Gaza or that of drilling an illegal well was so small, the sanction so nonexistent until 1999, that there existed a nearly free access to the resource. Of course, this encouraged illegal supplies of domestic water and gravely endangered the sustainability of the water utilities.

Conclusion

The institutions controlling water distribution stem from a phenomenon as recent as the control of irrigation wells. It gave rise, however, to a very different hydropolitical constellation. Municipalities still operated most of the networks in 1999 with a fairly large autonomy. As municipalities depend on the MLG, they escaped the PWA, which planned to withdraw the control of piped water from them by creating regional water utilities.

The Palestinian Perception of the Situation

Except for a few Palestinian engineers that are very knowledgeable concerning the situation, the population does not know the reality of the water network. Most of the inhabitants interviewed in Bethlehem believed that their wells were old and thereby shallow. They explained their water shortage by saying that settlements had drilled deep wells which had dried theirs out. They invoked the Military Order that submitted the drilling of any new well to the previous obtainment of a permit granted by the occupying authorities to explain the fact that they could not drill new wells as deep as the settlements'. The solutions they considered for the shortages thereby consisted of drilling new wells. An illegal drilling thus appeared

The population that then received this freshwater could fill drinking water tanks and use the tap the rest of the time in order to get salty water for uses other than drinking (information obtained during a visit of these desalination plants on 26 May 1999).

as a nationalist act, especially considering that all of the Palestinians are aware of the water abundance in the settlements.

The Perception of the Situation by the Israeli Settlers

The settlers we interviewed showed a perception of the situation that was as far removed from the reality as the Palestinians'. They believed the area had no well in 1967 and that Palestinians then only harvested rain-water in their cisterns in order to make it through the dry season. The settlers perceived their presence as beneficial for the Palestinians and highlighted the development brought about by the Israelis "who had provided them with all of their water distribution systems." They did not know that Palestinians pay a water price that is different from the Israelis. They did not know the neighboring Palestinian villages were in the midst of an acute shortage. Many of them posed as real ecologists and promoted biological agriculture and the use of wind energy. To water the lawn did not disturb them, as they had never observed a water shortage.

The Hydropolitical Constellation of Water Tankers

The average supply through the Bethlehem municipal network only rose to 50 to 60 L per day per person in the summer of 1998. In Hebron, it only amounted to 40 L per day per person.³⁶ Moreover, 151 Palestinian communities were still totally deprived of water distribution systems in 1999.³⁷ These observations explain the booming water trade via cistern trucks. A deep economic study should be carried out on this phenomenon. Cistern trucks fill up at springs,³⁸ network outlets, via legal or illegal connections³⁹ or at private wells and later sell their water to individual households.

This trade is not regulated in any fashion including water quality or water price. The same cistern trucks are often used to empty the content of septic tanks and to carry drinking water later on. Thus, even when the operator of the cistern truck gets his water supply at a legal connection and thereby obtains water of real drinking quality, the latter has often become unfit for human consumption after it has stayed in the cistern truck. At

³⁶ Interview with Mr. Wattelet, op.cit.

³⁷ Communication delivered by Fadia Daibes, op.cit.

³⁸ Some villages whose springs were in high demand have decided to ask a fee from cistern trucks for every fill up.

³⁹ In the case of illegal connections, they are only, to the best of my knowledge, on networks managed by Palestinians. The Israelis have too strict a control of illegal connections on their network for this phenomenon to reach more than a negligible amplitude.

first sight, it seems like a situation of pure and perfect competition because both water salesmen and water buyers are very numerous. The price of trucked water does fluctuate according to the acuteness of the shortage. A deeper observation of the villages, however, sheds light on local oligopoly situations. Thus, in Kufr Name, three water salesmen (all of them Palestinians) provided the village with water in 1999. One of them was a Kufr Name villager whereas the other two were foreigners to the village. The villagers did not know where the water brought by these salesmen initially came from. In Deir As-Sudan, five water salesmen shared the water market. They had a gentlemen's agreement among them to keep the water price steady (fifteen New Israeli Shekel per cubic meter in 1999).⁴⁰ These local oligopolies allow cistern truck salesmen to sell water at a price higher than that, which would result from a situation of pure and perfect competition.

The hydropolitical constellation made up by the cistern trucks is the most untraceable one. It completely escapes PA control. It generates a black market whose contribution to the Palestinian GNP is unknown although it is definitely non-negligible. This hydropolitical constellation is the most difficult to study because, as was shown in the Dura example in chapter 2, many water salesmen get their water supply from an illegal connection to a municipal adduction network. This is often carried out thanks to a closed-eye policy from some municipal employees. The intertwining of these two hydropolitical constellations - the water distribution systems and the cistern truck - is thus undeniable but literally dangerous to study.

Conclusion of Section 1 - Case Studies

The analysis of local hydropolitics has allowed us to highlight the existence of four types of hydropolitical constellations: two woven around the control of irrigation water and two woven around the control of domestic water. The first two types control 65% of the water used by the Palestinians and completely escape PA control. The latter two control 35% of the water used by the Palestinians and partially escape PA control. Here, the weak control exerted by the PA is exerted through the MLG instead of the PWA.

These hydropolitical constellations may more or less overlap with each other territorially without interacting much with each other. For example, a village with a spring controls the distribution of this spring water in a

⁴⁰ Results obtained via participatory rural appraisals carried out in these villages in February 1999.

fashion that is completely independent from the manner in which tap water is accessed and controlled in the same village. Only the two hydro-political constellations concerning domestic water interfered with each other significantly via the legal and illegal connections that feed water to the tankers. This is summarized in Table 6.

TABLE 6 – Summary of Hydropolitical Constellations

Hydropolitical constellation	Age of the constellation	PA control*	Israeli control*	Interaction with other constellation
Irrigation from wells	Recent in the West Bank; ancient in the Gaza Strip	None	Quotas	None
Irrigation from springs	Ancient	None	None	None
Water distribution	Recent (post-1948)	Via MLG, JWC, and PWA	Via water sales and JWC	Slight (via connections feeding tankers)
Water tankers	Recent (post-1948)	None	None	Slight (via connections feeding tankers)

* The control here only refers to the control exerted within the constellation. We are omitting here the control both Israel and the PA could exert upstream from the constellation via the granting of permits for drilling or equipping a well, for building a pump house and for rehabilitating a spring.

Discussion

Pre-Modern and Modern Institutions

The first two types of constellations, woven around the control of springs and wells are fundamentally different from the latter two types, woven around the control of drinking water. The first two types involve institutions that are distinctly pre-modern, as defined by Giddens, whereas the latter two types involve modern institutions as defined by the same author. The definitions of modernity and of its driving forces as they appear in Giddens' work will be briefly presented. Then, the case studies will be reexamined in order to illustrate the manner in which these hydro-political constellations sort themselves into modern and pre-modern systems. Finally, the observation will be made that the modern systems concern domestic water whereas the pre-modern ones concern irrigation water. This observation weighs heavily on the consideration over the Palestinian political development as the PA is now facing a necessary sectorial reallocation from irrigation to domestic use, a topic that will be covered in-depth in the next chapter.

Let us note that the terms ‘pre-modern’ and ‘modern’ do not carry any value judgement. A modern system is not synonymous with ‘better’. A pre-modern system is not synonymous with ‘backward’. It simply is a system that still persists because the driving forces of modernity have not affected it (yet).

Modernity According to Anthony Giddens

According to Anthony Giddens, modernity is a mode of social organization that emerged in Europe starting in the 17th Century and afterwards became more or less worldwide in its influence.⁴¹ Three driving forces led to the emergence of modernity: the separation of time and space, the disembedding of social systems and the ordering and reordering of social relations thanks to the reflexive appropriation of new knowledge.⁴² Each of these driving forces deserves an explanation.

The separation of time and space started with the apparition of the mechanical clock. According to Giddens “to empty time” is a precondition to “empty space.” Concretely, this means that the coordination across time of social actors that are geographically far from each other is the basis of the control of space in the modern world. This may be illustrated today by companies that buy their raw material in a first state, subcontract the transformation and the assembling of their products in two other states in order to target a market in a fourth state, while the decisions of these companies are made in a fifth state and their headquarters are located in a sixth state. The separation of time and space is also illustrated by teams of researchers who collaborate in common research projects while being scattered around the planet and communicating via e-mail.

The disembedding of social systems means the lifting out of social relations from their local contexts of interaction and their restructuring through indefinite spans of time-space.⁴³ Giddens distinguishes two disembedding mechanisms that are essential for the development of modern social institutions. The first mechanism consists of the creation of symbolic tokens such as money, which serves as a mode of deferral that allows to carry out non-immediate barter. Money therefore lifts the transaction out of a specific exchange setting and allows a time-space separation. The second disembedding mechanism put forward by Giddens consists of expert systems. This refers to the professional expertise that organizes

⁴¹ Anthony Giddens, *The Consequences of Modernity*, Polity Press, Cambridge, England, 1992, p. 1.

⁴² *Ibid.*, pp. 16-17.

⁴³ *Ibid.*, p. 21.

wide fields of the material and social environments we live in nowadays. It may be the expertise of the engineers who built the car, the highway and the plane all of which allow us to travel from point A to point B. These engineers are trusted without being checked on the quality of their work.⁴⁴

This trust on expert systems thus becomes a key concept in Giddens' work. "[A]ll disembedding mechanisms imply an attitude of trust."⁴⁵ Any disembedding of social institutions will be successful only if enough trust exists; the opposite of trust not being distrust, according to Giddens, but rather, angst.⁴⁶

The third driving force of modernity, the ordering and reordering of social relations thanks to a reflexive appropriation of knowledge, does not occur in traditional societies according to Giddens. He admits that no tradition is completely static because every generation must reinvent itself when it recuperates the cultural inheritance of the previous generation.⁴⁷ A traditional culture honors the past and values symbols because they contain and perpetuate the experience of generations. Tradition is a manner of integrating reflexive monitoring in the organization of a community. "[I]t does not so much resist change as pertain to a context in which there are few separated temporal and spatial markers in terms of which change can have any meaningful form."⁴⁸

Giddens' reflections on oral cultures are very pertinent for the analysis of Battir even though its inhabitants have a high level of schooling. In oral cultures, tradition is not known as such, even though these cultures are the most traditional of all. To understand tradition as distinct from other modes of organizing action and experience demands cutting into time-space in ways which are only possible with the invention of writing. Writing expands the level of time-space distanciation and creates a perspective of past, present and future in which the reflexive appropriation of knowledge can be set off from designed tradition. However, in pre-modern civilizations reflexivity is still largely limited to the reinterpretation and clarification of tradition, such that in the scales of time the side of the "past" is much more heavily weighed down than that of the "future."⁴⁹

⁴⁴ *Ibid.*, p. 27.

⁴⁵ *Ibid.*, p. 29.

⁴⁶ *Ibid.*, p. 100.

⁴⁷ *Ibid.*, p. 37.

⁴⁸ *Ibid.*, p. 37.

⁴⁹ *Ibid.*, p. 37.

According to Giddens, the reflexive appropriation of knowledge in social activities is filtered by four elements: differential power, values, the impact of unexpected consequences and the circulation of knowledge in the double hermeneutic.⁵⁰ Differential power simply expresses the fact that those with positions of power have a variable access to knowledge and will often use the latter in pursuing special interests. Values may prevent the reflexive appropriation of knowledge because they do not lie on a rational basis. For example, Palestinians show a great reluctance towards dry toilets, which could spare much water, because of values opposed to this principle. Finally, the reflexive appropriation of knowledge by social actors leads them to modify the social construction, which in turn modifies knowledge. This is the process Giddens refers to when he invokes the circulation of knowledge in a double hermeneutic.

Water Control in Israel: A Modern System

Chapter 1 traced among other things, the emergence of the Israeli Water Law in 1959. It is worth noting that it corresponds to a system of modern institutions as defined by Giddens.

In Israel, the allocation to every water user, whether it be a municipality, an irrigating farmer or an industry is determined by an institution that is completely disembedded from the local context of the well or spring. The Water Commissioner grants yearly licenses that specify both the water quantity and its use. The granting of these permits is the result of a very rapid reflexive application of knowledge. The permits are indeed granted according to the previous winter's precipitation and the resulting recharge of the aquifer. Thus Israeli farmers received greatly reduced water allocations in the spring of 1999, while the election campaign was in full swing.⁵¹ These reductions have made agriculture bear the brunt of the 1998-1999 drought and spared domestic and industrial water consumption. This is coherent with the weak contribution of agriculture to the Israeli gross national product. One cubic meter of water generates indeed much more added value in Israel when it is devoted to industrial use rather than to agriculture.⁵²

⁵⁰ *Ibid.*, p. 44.

⁵¹ See Amiram Cohen, "Water to farmers may be cut by 40%", *Ha'aretz*, Friday, 19 March 1999; Margot Dudkevitch, "Kinneret level near 60-year low", *The Jerusalem Post*, Monday, 29 March 1999; David Rudge, "Rain too little, too late to ease drought", *The Jerusalem Post*, Friday, 9 April 1999; and Danna Harman and Liat Collins, "Emergency Water Cutbacks Ordered", *The Jerusalem Post*, Monday, 12 April 1999.

⁵² Allan, J.A. and Karshenas, M., "Managing environmental capital: the case of water in Israel, Jordan, the West Bank and Gaza, 1947 to 1995", in *Water, Peace and the*

To recognize a modern system in Israeli water management is not synonymous with a positive value judgement concerning it. Chapter 1 showed that Israel succeeded in setting up these water management institutions that are disembedded from their local contexts and open to the reflexive appropriation of knowledge because of the demographic upheaval that emptied the country from most of its long established population in 1948. It is important, however, to recognize the modern aspect of institutions managing water in Israel because this contributes largely to shaping the relations among Palestinians, Israelis and other international actors that will be detailed in chapter 5.

The Control of Irrigation Water: A Pre-Modern System

Using the categories defined by Giddens, the hydropolitical constellations woven around irrigation water control must be classified as pre-modern even though the institutions regulating the use of wells emerged simultaneously with the drillings, that is, often, in the 1950s and 1960s.

The separation of time and space was not completed either in the case of irrigation wells or in that of springs. The institutions controlling water access and water use remain firmly anchored in their local context. All villagers share knowledge of the technology involved. In irrigation networks where the open sky channels were replaced by pipes, villagers may touch the lower side of the pipe in order to feel its temperature. The latter is cool when water flows through it. One can thus continue knowing exactly where water is brought to, who receives it and in which quantities. No one trusts blindly an abstract expert system to achieve the sharing of the water. The technical modernization of an irrigation network does not automatically mean that the institutions controlling it have become modern in the sense given by Giddens.

The Falamiah case offers an especially interesting example for the social change was clear even though the institutions managing water were not disembedded from their local context. There was a veritable reflexive appropriation of knowledge acquired outside of the village because the crop policy now favors crops requiring little irrigation, which allows the cultivation of a greater surface using the same quantity of water. It is very important here to observe that the vector of modernity, the NGO PARC, which brought this applied knowledge, was an outsider to the village. The fact that Abu Fares had to devote three years to discuss with the well

Middle East: Negotiating Resources in the Jordan Basin, Library of Modern Middle East Studies, vol. 9, Tauris Academic Studies, New York, 1996, pp.121-133.

owners before a single cubic centimeter of concrete was poured, illustrates clearly the necessity of trust in order to achieve any transformation of the institutions. The presence of a representative of PARC in the irrigation committee represents a small step towards the disembedding of water control from its local context since the PARC employee is not a member of the village. Let us note, however, that this slight disembedding still does not involve a presence of the PA. It only concerns a fraction of the water that is used today in Falamiah because only one of the five wells committed all of its water to the agreement.

The irrigation committee in Falamiah also innovates because it brought water management in the era of written regulations. Giddens' remarks on oral cultures apply very well to institutions regulating irrigation water. The Palestinians have a level of schooling that is very high. Most read and write and several irrigating farmers in Battir and in Falamiah are university graduates. But the fact that these institutions are oral prevents them from being perceived as such. Their existence is most often denied by the very people who use them because they perceive these institutions as an unavoidable fact of life rather than as a social construction. Thus an engineer from PARC told me there were neither codes nor rules regulating the sharing of water in Falamiah. A university graduate from Battir told me the system I was describing was false. Yet, she was unable to point at a mistake in the description. She was in fact rebelling against the written description of a social organization that could not be perceived as such.

The disembedding of irrigation water regulating institutions from their local context, an unavoidable phenomenon in the event of the emergence of a Palestinian state, is now facing several obstacles. The oral institutions are generally negated in their very existence, which makes it very difficult to identify the actors deriving power from this social organization.⁵³ Chapters 4 and 5 will show that the vectors of modernity are mostly foreign, Europeans and Americans, and have a very poor knowledge of the constellations with which they interfere. On the other hand, the transformation of the social organization controlling water would acutely alter the power distribution within the local hydropolitical constellations. The local actors do not resist because of any kind of obscurantist behavior. They resist because water control bestows power and no one wants to loose power.

⁵³ Attempts were made to solve this problem in chapter 2 by proceeding to examine conflicts concerning water.

The Domestic Water Control: A Nearly Modern System

The hydropolitical constellations woven around the control of domestic water, whether it be piped water or cistern truck water, show distinct characteristics compared to those observed previously. Here, the time-space distancing has been attempted as well as a certain extent of disembedding of the institutions regulating the access and the use of water from their local context.

The JWU has distinctly modern characteristics according to Giddens' criteria. The 'expert system' set up by engineers is trusted by most of its 200,000 users. The latter usually ignore the origin of the water they receive, the path it follows along the network or the manner in which its quality is controlled. They rely on the JWU, which implies a power transfer. The JWU's water consumer does not control his water. He must pay to receive it and his possibilities for obtaining it otherwise are quite limited. Most often, the only alternative is to buy it from water tankers, which is generally four to five times more expensive, or to fill plastic jugs at a spring. Most springs in the West Bank offer water unfit for human consumption and consumers are often aware of this.⁵⁴

The reflexive application of knowledge is ongoing at the JWU. It has allowed for the improvement of its efficiency, avoiding a water price increase since 1995. All of these observations allow us the JWU to be classified in the category of modern institutions as defined by Giddens.

The case of the Gaza Strip also shows similar aspects of modernity to the JWU although they are much less complete in Gaza than in Ramallah. Here, illegal connections proliferate and the ease with which a new well can be drilled in spite of being illegal allows numerous water users to avoid the institutional constraints set up by the municipal water utilities. The disembedding of institutions regulating domestic water often remains incomplete for the water supply of numerous households depends on unwritten arrangements with municipal employees who close their eyes on illegal connections. This phenomenon is defined as corruption in a modern world. It can also be described as the persistence of oral institutions embedded in a very local context (the illegal connection).

The hydropolitical constellation woven around the supply by water tankers is largely regulated by market mechanisms. The water transactions introduce a distancing in time and space between the extraction of wa-

⁵⁴ David J. Scarpa, *The Quality and Sustainability of the Water Resources available to Arab Villages to the West of the Divide in the Southern West Bank*, paper delivered at the Special Workshop: Palestinian Water Problems, International Conference, Environmental Challenges for the Next Millennium, Bethlehem University, 18 June 1999.

ter and its use. As rudimentary as it may be, the transportation via water tank constitutes an expert system. The consumer does not know where his water comes from. He knows nothing about its quality and relies on a system of a token symbol, money, in order to access the resource. All of this confers a distinctly modern character to this constellation.

An Elusive State Building Pervaded by Persisting Myths

Two observations should be especially highlighted. First of all, the modernization of the nature of water distribution in the Palestinian Areas has not been carried out, so far, in favor of a state-centralized management, as is the case in Israel. The passage to modernity does not necessarily mean nowadays the passage to a social organization in the shape of a state. Instead, the exercise of social control over water in a great number of modern institutions is fragmented. Therefore, the situation of water in the Palestinian Areas will be examined in the next section according to Joel Migdal's theoretical framework. Modernization came hand in hand with state formation in Europe starting from the 17th Century. But the modernization of Palestinian institutions is now carried out in a context Giddens would qualify as 'radicalized modernity'. This implies among other things the marked influence of actors external to the PA. The link between modernization and state building will be covered in the next chapter.

Second of all, the ignorance induced by the use of expert systems has many repercussions. The customers of water distribution networks do not understand the origin of the shortage in the network. The customers of a water salesman do not know where the water tanker fills up. This ignorance allows the persistence of myths. These myths emerge in a context of conflict and therefore tend to feed explanations directly blaming the designated enemy. The ignorance of water consumers and their belief in false explanations contribute today to their being unable to develop efficient strategies in order to solve water shortages.

A Firm and Fragmented Social Control

In his study of Third World states⁵⁵, Joel S. Migdal identified their main political challenge as they attempt to extend their control on the numerous, relatively autonomous, organizations that already exerted social control throughout the state territory.⁵⁶ As this proved to be impossible for

⁵⁵ Let us define Third World as those states recently emerged from decolonization, not as meaning necessarily or only poor countries.

⁵⁶ Joel S. Migdal, *Strong Societies and Weak States: State-Society Relations and State Capabilities in the Third World*, Princeton University Press, Princeton, New Jersey, p. 32.

most states in the Third World, they then attempted to reach the best compromise possible with these organizations.

The control of water in the Palestinian Areas corresponds completely to the situation described by Migdal: "In other words, the total sum of authority may be high in the society, but the exercise of that authority may be fragmented."⁵⁷ Water in is tightly controlled. Its use, access, and transmission of this access are carefully controlled by a multitude of institutions that are mainly oral and pre-modern but may also be modern and rely on written rules.

The example of Jericho, in chapter 2, illustrates perfectly an attempt by the PA to reach a viable compromise with a social organization exerting water control on a fraction of the territory. Such compromises seem like simple corruption to an uninformed observer. It is important to overcome such a superficial impression in order to understand the mechanisms the PA is now able to deploy in order to extend its control over the numerous institutions regulating water within its territory. This delicate exercise is made all the more complex by the fact that some of these institutions are modern whereas others are pre-modern. This issue is further discussed in chapter 4.

A Second Order Scarcity

Leif Ohlsson has made a clear distinction between first order scarcity and second order scarcity.⁵⁸ A first order scarcity means a lack of the natural resource itself. A second order scarcity means a lack of the social resources necessary to manage this natural resource. According to Ohlsson, a social entity may be unable to face a first order scarcity because of an even more acute second order scarcity, that is the lack of social capacity to manage that resource.

The quantity of water allocated to the Palestinians for the interim period is clearly sufficient to cover their domestic water needs but insufficient, globally, to cater to the irrigation water demand. Currently, many localized domestic water shortages are occurring in the West Bank and Gaza Strip. It does not constitute, globally, a first order shortage. The fragmentation of the control of water use among a multitude of modern and pre-modern institutions now prevents a sectorial reallocation from irrigation to domestic use and introduce a second order scarcity. Such a reallocation could be achieved by a modern state organization of water that would allow a global and centralized management such as is achieved in Israel.

⁵⁷ *Ibid.*, p. 28.

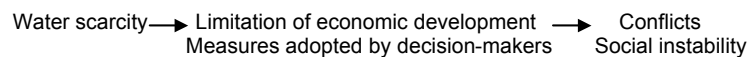
⁵⁸ Leif Ohlsson, *Environment, Scarcity and Conflict: A Study of Malthusian Concerns*, Department of Peace and Development Research, University of Göteborg, 1999.

Of course, the first order irrigation water scarcity is largely induced by the division of the West Bank aquifers as was determined for the interim period by the Taba Agreements. This induced first order scarcity generally attracts all of the attention and overshadows the second order scarcity that is rampant among Palestinian institutions. There is consequently a tendency to believe that solving the first order shortage, via a final status agreement that would grant more water to the Palestinians and less to the Israelis, would be enough to solve the Palestinian water scarcity. Such an attitude is ignoring the acute second order scarcity in the West Bank and the Gaza Strip. The acuteness of this second order shortage is much greater than that of the first order shortage. Yet, the resolution of the second order shortage can start before final status is achieved as it implies only relations among Palestinian institutions.

A Structurally Induced Social Scarcity

A.R. Turton and L. Ohlsson have developed the concept of a structurally induced social scarcity.⁵⁹ This situation results from a simultaneous combination of first order abundance (of the resource) and second order scarcity (of the social capacity to manage that resource). A relative abundance of water may thus lead in theory to social instability. These authors follow Falkenmark and start from the hypothesis that a resource scarcity limits the economic development of a Third World country. This limitation, the 'water barrier', will therefore become a potential source of conflict or social instability.⁶⁰ Their method is thus the opposite of the 'French school of thought'⁶¹ - the method followed by this research - as it used conflicts concerning water as a starting point in order to identify the actors involved, then examine their political interactions and eventually conceptualize these interactions. Schematically, the method of Falkenmark, Turton and Ohlsson is represented by figure 2 and this research by figure 3:

FIGURE 2

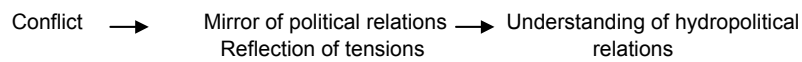


⁵⁹ A.R. Turton, L. Ohlsson, *Water Scarcity and Social Stability: Towards a Deeper Understanding of the Key Concepts Needed to Manage Water Scarcity in Developing Countries*, communication given at the Stockholm International Water Symposium on 11 August 1999.

⁶⁰ M. Falkenmark, "Global Water Issues Facing Humanity", *Journal of Peace Research*, vol. 27, no. 2, 1990, pp. 177-190.

⁶¹ René-Georges Maury, "L'hydropolitique, un nouveau chapitre de la géographie politique et économique", in *Grands Appareillages hydrauliques et sociétés locales en Méditerranée*, proceedings of the Marrakech Seminar (October 1993), edited by Ahmed Bencheikh and Michel Marié, Presses de l'école nationale des Ponts et chaussées, 1994, pp. 123-135.

FIGURE 3



Interestingly enough, the method used in this work leads to observe a structurally induced social scarcity situation in the West Bank and Gaza Strip, such as was hypothesized by the conceptual development of Turton and Ohlsson.

The fact that water is mostly controlled in a completely local fashion, where local abundance situations exist, has allowed the development of this situation. There is no global first order scarcity concerning domestic use. However, there is one concerning irrigation water although existing institutions mostly control water only within these localized abundance situations. This has allowed the development of a structurally induced social (second order) scarcity.

Conclusion

The study of Palestinian hydropolitics in the West Bank and Gaza Strip shows us that water access, water use and the transmission of this access to water are almost exclusively controlled at the local level. In the case of irrigation water, this control is firm and respected in the West Bank, but the fact that the exercise of this control is fragmented among a multitude of local institutions that escape the PA makes any sectoral reallocation from irrigation to domestic use very difficult. These institutions have a distinctly pre-modern character. The challenge of the PA consists today in achieving the disembedding of these local institutions, a preliminary step necessary to erect a modern state control of water. In the case of domestic water, the control is not as firm and does not escape the PA completely.

The Palestinians are now facing an irrigation water scarcity largely induced by the unequal sharing of the West Bank aquifers between Israelis and Palestinians. However, the domestic water scarcity is largely induced by the lack of social capacity to manage the resource. The evolution of the domestic water crisis in the Palestinian Areas will thus be determined more largely by the relations the PA will build with local Palestinian institutions that now control water than by the negotiations concerning the final status.

TABLE 2 - Summarizing the Case Studies

Town or village	Irrigation	Domestic water source	Number of wells	Number of springs	Population (in 1997)	Research method
Jericho	Yes	Water adduction from Ein Sultan spring (in the middle of town)	None Managed by municipality	1	14,674*	Participant observation
Artas	Yes	Village spring (manual extraction) Water adduction exists - water flow from Bethlehem highly varies, often non-existent	0	1	2,679*	Participant observation
Falamiah	Yes	Water adduction from village well	5	0	850	Participant observation
Battir	Yes	Water adduction from Mekorot	0	6	3,094*	Participant observation
Dura	No	Water adduction from Hebron municipality - flow highly varies, often non-existent Purchase of water from cistern trucks	0	None Managed by municipality	25,000	Participant observation
Ein Arik	Yes	Village spring (manual extraction) Purchase of water from cistern trucks	0	8	1200*	Participatory rural appraisal (PRA)
Ramallah (urban area)	No	Running water from the Jerusalem Water Undertaking		0	17,851 in Ramallah city*	Participant observation
Gaza Strip	Yes	16 utilities now being consolidated into one Private wells Purchase of water from cistern trucks	1900 legal 2000 illegal	-	1,020.813*	Participant observation
Deir lbzi'	Negligible	Purchase of water from cistern trucks	0	1 (3 km away)	1468*	PRA
Kufr Name	No	Purchase of water from cistern trucks	0	1	3200	PRA
Deir As-Sudan	Negligible	Purchase of water from cistern trucks	0	2	1541*	PRA

* Numbers were taken from the 1997 census carried out by the Palestinian Central Bureau of Statistics (PCBS). See: http://www.pcbs.org/english/phc_97

Chapter 4

National Hydropolitics

The analysis of the national hydropolitical constellation requires a different method than that used in the previous chapter. The national actors within the Palestinian Authority (PA) have powers and responsibilities that were defined in the series of treaties signed by Israel and the Palestinians since 1993. It will therefore be necessary to examine these treaties since they define the legal framework within which the national actors evolve.

It is necessary to define the Palestinian entity - its political nature and legal reality - in order to understand the place water occupies in its institutional construction. The path that led to the Declaration of Principles in 1993 and the Cairo Agreement of 4 May 1994 will be briefly examined. We will then study these agreements in order to determine the capacity of the PA to produce law and therefore to modify water control within its territory. The subsequent Israeli-Palestinian agreements - the 1995 Taba Agreement, the 1998 Wye Agreement and the 1999 Sharm Esh-Sheikh Agreement - will then be detailed in order to determine the legal capacity, which these treaties grant the PA.

The second section of this chapter will examine the role played by water in Palestinian institutional construction. This will lead to studying the upheaval in property regimes that is at stake and the strategies and tactics of the PA as well as its integration among the actors of the local, national and international constellations.

From Madrid to Cairo

In the aftermath of the Gulf War, the invitation to the Madrid conference aimed at establishing a “real peace everywhere in the region” but specified that the negotiations between Israelis and Palestinians were to be held in two phases:

“With respect to negotiations between Israel and Palestinians who are part of the joint Jordanian-Palestinian delegation, negotiations will be conducted in phases, beginning with talks on interim self-government arrangements. These talks will be conducted with the objective of

reaching agreement within one year. Once agreed, the interim self-government arrangements will last for a period of five years. Beginning the third year of the period of interim self-government arrangements, negotiations will take place on permanent status. These permanent status negotiations between Israel and the Arab States, will take place on the basis of Resolutions 242 and 338.”¹

The use of the word ‘self-government’ rather than ‘autonomy’ was deliberate. The Camp David Agreement had included the word ‘autonomy’, which the Israelis had then declared to understand as the autonomy of the population, not of the territory.² This difference in interpretation later became a source of disagreement.

During the fourth round, in February 1992, the Israelis proposed the Interim Self-Government Arrangements (ISGA). This plan proposed that Israel would remain the source of authority until a final agreement would be reached and the ISGA would only apply to the Palestinians living in the Occupied Territories, but neither to the Israelis living in these territories nor to the East Jerusalem Palestinians. Settlements would keep growing under the ISGA. Israel would negotiate the delegation of powers to the institutions of the ISGA and would retain the residual powers. Israel alone would be responsible for exterior and interior security as well as for public order. The ISGA institutions would only have an administrative function and the exercise of powers under the ISGA would be submitted to cooperation and coordination with Israel. Israel would negotiate the delegation of powers and responsibilities in the following matters: justice, personal administrative matters, agriculture, education and tourism, employment and social welfare, local police, local transport, communications, and municipal and religious affairs. Finally, under the ISGA, all laws and Military Orders would remain in force.³

The Palestinians refused the ISGA and proposed in March 1992 the establishment of the Palestinian Interim Self-Governing Authority (PISGA) which would represent the Palestinians, would be responsible to them

¹ Invitation letter to the peace conference in Madrid on 18 October 1991 such as reproduced in Madiha Rashid Al-Madfa'i, *Jordan, the United States and the Middle East Peace Process*, Cambridge University Press, 1993, pp. 239-240.

² The Camp David Accords foresaw an ‘autonomy’ for the Occupied Territories as was thought up by Moshe Dayan at the beginning of the 1970s. He wanted a ‘functional compromise’ in dealing with the inhabitants rather than a ‘territorial compromise’ as was advocated by the Allon Plan. See Azmi Bishara, "Les Palestiniens dans la négociation: une vue de l'intérieur", *Politique Etrangère*, 57th year, no. 4, Winter 1992, pp. 773-774.

³ J.M. Segal, "Strategic Choices Facing the Palestinians in the Negotiations", *Journal of Palestine Studies*, 22 (1993) 2, p. 18.

alone and whose powers would not be delegated by Israel.⁴ The PISGA proposal included many other points but brought forth no results, since Israel rejected it.

Interestingly enough, the 4 May 1994 Cairo Agreement contained most of the ISGA propositions. We thus observe a clear continuity in the type of arrangements that were deemed acceptable to Israeli governments, from Shamir to Rabin, in spite of their being respectively labeled as the most hawkish and most dovish governments in the history of Israel.

The Madrid process never took-off again in 1993. It had been taken over by another series of discussions carried out secretly in Oslo.

Sketching out the Madrid process was important, even though it fizzled out quickly, because it contains the seeds of the political and legal reality of today's PA. Most of the clauses now binding the Palestinians already existed in the ISGA proposal.

The Oslo Agreement

Israelis especially sought to rid themselves of Gaza,⁵ but adding Jericho to the deal was not much of a cost to them. Israel had already offered to evacuate that area in 1973. Shimon Peres for Israel and Ahmad Qurai for the PLO secretly signed the Washington Declaration of Principles on 19 August 1993. It was submitted to the Knesset for ratification on September 23 and received a majority of the Jewish vote.⁶

The agreement signed in Washington on 13 September 1993 includes four documents: three letters dated 9 September 1993 and a Declaration of Principles, each of which had, officially, equal value for both the partners in the agreement as well as the external partners.⁷ The two letters ex-

⁴ Emile A. Nakhleh, "Palestinians and Israelis - Options for Coexistence", *Journal of Palestine Studies*, 22 (1993) 2, p. 15. Like Avi Shlaim ("Prelude to the Accord: Likud, Labor and the Palestinians", *Journal of Palestine Studies*, 23 (1994) 2, pp. 9-10) he suggests that the PISGA preceded the ISGA. The order shown in the article of J.M. Segal ("Strategic Choices", *op.cit.*, p. 18) is retained here since only Segal shows a detailed analysis of the events of February and March 1992.

⁵ Shimon Peres, *Le Temps de la Paix*, edited by Odile Jacob, 1993, p. 34.

⁶ G.D. Schad, "16 August-15 November 1993. Chronology", *Journal of Palestine Studies*, 23 (1994) 2, pp. 160 and 168. Five deputies in the Knesset were Arab Israelis. Peres admits he feared that these five, non-Jewish votes would by themselves ensure the majority needed to ratify the agreement. He saw the agreement as more legitimate if it benefited from a Jewish majority.

⁷ This is made especially clear by the Middle East Peace Facilitation Act of 1993 signed by President Clinton on October 28. This American law lifts several American restrictions on the PLO albeit in a conditional fashion. Indeed, section 3.b, paragraph 3

changed between Rabin and Arafat make for an unequal mutual recognition. The recognition of Israel by the PLO is definitive and unconditional as it also includes several unilateral commitments;⁸ whereas, the recognition of the PLO by Israel is conditional. Rafea Ben Achour has emphasized the importance of the conditionality of the Israeli recognition which can be revoked in the event that Israel judges the PLO is not honoring its commitments.⁹ A similar condition is found on the part of the Americans at paragraphs 3 and 4 of section 3.b of the Middle East Peace Facilitation Act.¹⁰ We will see in chapter 5 that the United States has already, according to these clauses, taken action.

Whereas the PLO recognized the State of Israel, the latter only recognized a national liberation organization as representing the Palestinian people.¹¹ Recognition usually comes between governments or nations, yet, the Israeli recognition innovates in this matter. From the Palestinian point of view, this recognition offers the advantage of being defined as a people, which, in theory, grants the right of self-determination.¹² However, the

of that law specifies: "Any suspension [...] of a provision of law [...] shall cease to be effective if the Palestinian Liberation Organization has not continued to abide by all the commitments described in paragraph 4". This paragraph 4 specifies: "The commitments referred to in paragraphs (2) and (3) are the commitments made by the Palestine Liberation Organization -

- (A) in its letter of September 9, 1993, to the Prime Minister of Israel;
- (B) in its letter of September 9, 1993, to the Foreign Minister of Norway; and
- (C) in, and resulting from the implementation of the Declaration of Principles on Interim Self-Government Arrangements signed on September 13, 1993."

(US Congress, S.1487, *Middle East Peace Facilitation Act of 1993*). This law was published in the section *Documents and Source Material* in the *Journal of Palestine Studies* XXIII, no. 2 (Winter 1994), pp. 150-152. We therefore observe the importance of the two letters written by the PLO to the Israeli Foreign Minister and to the Norwegian minister Holst. The United States consider the PLO to be bound as much by the commitments included in these two letters as by those included in the Declaration of Principles.

⁸ Rafea Ben Achour, "L'accord israélo-palestinien du 13 septembre 1993", *Revue générale de droit international public*, 98 (1994) 2, p. 351. The PLO recognized the right of the State of Israel to live in peace and in security; it accepted UN Resolutions 242 and 338, committed itself to the peace process in the Middle East, renounced terrorism and any other act of violence, and promised to be responsible for any element of the PLO that would break these commitments. This letter declared invalid the articles of the Palestinian National Charter, which deny the right of Israel to exist and Yasser Arafat committed himself to submit to the PNC the modifications to be brought to the Palestinian Charter. Buhran Dajani ("The September 1993", *op.cit.*, p. 8) emphasizes the "anti-constitutional nature" of this commitment and says that Arafat exceeded the limits of his authority.

⁹ Rafea Ben Achour, "L'accord israélo-palestinien", *op.cit.*, p. 351.

¹⁰ However, the conditionality here does not concern the recognition but the suspension of the restrictions concerning the PLO.

¹¹ Rafea Ben Achour, "L'accord israélo-palestinien", *op.cit.*, p. 353.

¹² UN Security Council Resolution 605, adopted on 22 December 1987, recognized the Palestinians as a people. However, a UN resolution is a political act, not a legal one. A precise definition of the word 'people' has never been developed in Interna-

conditionality of the Israeli recognition is such that this status and the rights that are linked to it are subject to a possible revocation by Israel.

The agreement was signed by the government of the State of Israel and the PLO team (of the Jordan-Palestinian team at the peace conference on the Middle East), which represented the Palestinian people. A strict reading of the text would allow Israel to consider the agreement invalid in the case of the Palestinians overthrowing the “PLO team” in order to set up a new group “representing the Palestinian people.” In any case, the terms of the agreement grant Israel the right to denounce the treaty in such an event.

The title of the agreement - Declaration of Principles on Interim Self-Government Arrangements - purposefully avoids the word autonomy, as was discussed earlier. Yet, the Washington agreement almost takes up, word for word, the clauses contained in the Camp David Agreement concerning autonomy, albeit excluding the Jordan-Egyptian responsibilities.¹³

Article VI, paragraph 2 specifies that “[...]authority will be transferred to the Palestinians on the following spheres: education and culture, health, social welfare, direct taxation, and tourism.” Article VII, paragraph 5 of section B of the Agreed Minutes to the Declaration of Principles on Interim Self-Government Arrangements¹⁴ specifies that “[t]he withdrawal of the military government will not prevent Israel from exercising the powers and responsibilities not transferred to the Council.” The residual powers thus belong to Israel, exactly as the ISGA proposal suggested in 1992.

“[T]he outcome of the permanent status negotiations should not be prejudiced or preempted by agreements reached for the interim period.” (Article V, paragraph 4). This was also the case with the ISGA the Washington agreement specified, as the ISGA had proposed, that Israel negotiate the delegation of powers to the Palestinian institutions. Thus Article VII, paragraph 1 specifies that “The Israeli and Palestinian delegations will negotiate an agreement on the interim period (the ‘Interim Agreement’), an agreement which, according to Article VII, paragraph 2,

“shall specify, among other things, the structure of the Council, the number of its members, and the transfer of powers and responsibilities from the Israeli military government and its Civil Administration to the Council. The Interim Agreement shall also specify the Council’s execu-

tional Law, so the mutual recognition as peoples among the parties in a conflict is therefore very important.

¹³ Rafea Ben Achour, “L'accord israélo-palestinien”, *op.cit.*, p. 367.

¹⁴ Which, according to Article XVII, paragraph 2 of the agreement, must be considered an integral part of the Declaration.

tive authority, legislative authority in accordance with Article IX below, and the independent Palestinian judicial organs.”

Article IX specifies in its second paragraph 2, “(b)oth parties will review jointly laws and military orders presently in force in remaining spheres.”

As the ISGA and the Camp David Agreement had proposed, the power of the Palestinian Council as defined by the Washington agreement is a personalized power. Indeed, Article IV, paragraph 1, section B of the Agreed Minutes to the Declaration of Principles on Interim Self-Government Arrangements specifies that “[j]urisdiction of the Council will cover West Bank and Gaza Strip territory, except for issues that will be negotiated in the permanent status negotiations: Jerusalem, settlements, military locations, and Israelis.” At least as far as the interim period is concerned, the power of the Council will only extend to Palestinians, not the territory itself.

The Washington agreement thus set up a framework to negotiate several other agreements intended to define a transitional period that should not exceed five years. The Washington agreement will have exhausted its effect once a treaty concerning the final status of the Palestinian entity will start being implemented. It planned the conclusion of an agreement concerning the elections to be held, at the latest, nine months after the Declaration of Principles came into effect (Article III, paragraph 2), that is, on 13 July 1994.¹⁵ It also planned the conclusion of an agreement on the interim period (Article VII, paragraph 1), which was reached in Cairo on 4 May 1994 as well as an agreement on a redeployment of Israeli armed forces (Annex II, Article 1), which should have been reached at the latest on 13 December 1993, but which ended up as Annex 1 of the Cairo Agreement on 4 May 1994.

The Declaration of Principles was drafted in very vague terms which allowed both parties to reach drastically opposed interpretations. It postponed hot topics such as water to the final status negotiations (Article V, paragraph 3) supposed to start, at the latest, at the beginning of the third year of the interim period.¹⁶ It corresponded to the ISGA, and Rabin declared it to be coherent with the Allon Plan. Chapter 1 already analyzed the contents of the declaration of principles concerning water. So as not to be repetitive this section will focus on the manner in which the Israeli-Palestinian treaties constrain Palestinian institution building.

¹⁵ As the process was quite slow, these elections were only held in 1996.

¹⁶ Final status negotiations finally started at the beginning of November 1999.

Does the Declaration of Principle lay the seeds of a sovereign state or a subdued province? Its clauses are not supposed to prejudge the results of final status negotiations. This assumption seems utopian, one reason being the unlikelihood of a party to accept less from the final status than it acquired in the interim status. Moreover, how long will the interim period last? It has already exceeded its initially planned life-span as it was supposed to draw to an end on 4 May 1999. An attempt will be made to define the status of the Palestinian interim entity.

The 4 May 1994 Cairo Agreement

The Cairo Agreement creates an entity that cannot be defined by any classical category of International or Public Law. Comparisons between this entity and traditional categories will be made in an attempt at defining it.

Territorial Sovereignty

According to the Cairo Agreement, it is clear that the Palestinian entity does not have territorial sovereignty. It is granted a distinct territory only through a series of juridical powers that allow it to carry out acts designed to produce legal effects. However, the PA does not enjoy a monopoly over these powers. It shares with Israel the constraint, the exercise of public powers and that of juridical power. It has, moreover, no power over the Israelis traveling over or residing in the territory that falls under its responsibility.

Limited Territorial Powers

A great variety of categories in International Law imply limited territorial powers: the condominium, the lease, the regime of concessions the peaceful military occupation, the regime of capitulations and that of the protectorate provide us many examples of such categories. Let us focus on the protectorate, which consists of a protector state that becomes responsible for the foreign policy of the protected state. Charles Dupuis described this type of regime in 1921:

“The institution of the protectorate allows the protector state to use quite largely the native administrators who keep on exercising their functions in the name of the native state and can afford being little or not suspect, not to show hostility for it would be useless in helping them to preserve their prestige. The protectorate makes it easier for the government to accept this for it preserves all of the outward signs of power, it preserves some power and it usually received some compensation in exchange for the sacrifices it accepts [...]

The protector state therefore has no scruples in order to curtail the responsibilities linked to its protection duty, to keep to itself the control of the financial administration of the protected state. It usually leaves the native courts in charge of dealing with disputes concerning only the natives and remote from international relations, but it grants special courts the responsibility where foreigners are involved. It watches over the financial management of the protected state and forbids it to borrow money without its consent.”¹⁷

This category might best resemble the PA, as the following section will show. The use of a category such as limited territorial powers is questionable by the fact that it usually involves states. The Palestinian state proclaimed in 1988 was recognized by over 100 states, but recognition only has a declarative effect, not a constitutive effect in International Law. In actuality, it does not create the entity.¹⁸ Moreover, the Cairo Agreement was signed by the government of the State of Israel and the PLO as representative of the Palestinian people, not by two states. However, certain categories will need to be used since the Cairo Agreement pertains to International Law. The agreement was signed by two subjects of International Law because recognized national liberation movements have been customarily assimilated to this category.

Autonomy

Autonomy is different from the categories cited earlier because it pertains to public law rather than international law. During the last century, the concept of ‘autonomy’ was developed by Otto Bauer and Karl Renner as a solution for the Balkans with the expected collapse of the Austro-Hungarian Empire.¹⁹ Several nationalities coexisted there, spatially mixed one into the other, which prevented the self-determination of a nation on its territory. Bauer and Renner thought up a system – autonomy - which would allow every member of every nationality to benefit from a full citizenship. The autonomy status was granted to every nationality in an attempt to protect its differences and specificities. Autonomy implies the power of self-organization, the attribution of state-like functions and the absence of tutelage control.

¹⁷ Charles Dupuis, *Le droit des gens et les rapports des grandes puissances avec les autres Etats avant le pacte de la Société des Nations*, Plon-Nourrit et Cie, 1921, pp. 235-239. (author’s translation)

¹⁸ Charles Rousseau, *Droit International Public. Tome III: Les compétences*, Paris, Sirey, p. 531.

¹⁹ Azmi Bishara, "Les Palestiniens dans la négociation", op.cit., p. 773.

The PA, as it is defined in the Cairo Agreement, does not pertain to that category since it does not grant Palestinians Israeli citizenship or any kind of self-organizing power because the treaty details the structure and composition of its institutions.

It became customary after World War II to use the term autonomy in order to refer to the transition period during which powers were transferred to the native inhabitants of a colony on the road to independence as a sovereign state. The PA does not pertain to this category either since the Oslo and Cairo Agreements do not specify that independence as a sovereign state will be achieved.

The Territorial Reality of the Palestinian Authority

Article I.A of the 1994 agreement specifies the delimitation of the PA territories. The territorial arrangement in Gaza seems to aim at allowing two communities that are spatially locked into each other to keep on co-existing without ever meeting. Palestinians have 'their' roads that 'avoid' the settlements and Israelis have theirs, which link the settlements directly to Israel. This spatial segregation was highlighted by Article IV.7.a(4) (Annex I) which foresaw the construction of bridges at crossings between the 'bypass' roads (that lead to the settlements) and Road No. 4 for the Palestinians.

The territorial arrangement defined by the Cairo Agreement did not provide a viable basis for an independent state. It rather set up several fragments isolated from one another and subject to various regimes. This made easier an Israeli control on the Palestinian entity and made this entity economically highly vulnerable in case of closures.

The interim Taba Agreement, signed in 1995, enlarged the area under PA administration and instated a fragmentation of the West Bank into Areas A, B and C. The PA would, from then on, be responsible for the civil administration and security of Area A. It would be responsible for the civil administration of Area B while Israel would maintain the military responsibility. Area C would remain under the territorial and military control of the Israeli administration while the PA would exert powers that are "not territorial" as they are specified in the agreement.²⁰ Area A corresponds to the centers of high population density; that is, the urban areas of Jenin, Tulkarem, Qalqilya, Nablus, Ramallah, Jericho, Bethlehem and Hebron

²⁰ Chapter 2 of the Israeli-Palestinian agreement signed in Washington on 28 September 1995, which discusses the arrangements concerning the redeployment and security (Article XI, paragraph 2 a, b etc.).

(see map in the annex). The total surface area of A and B in 1995 only covered 26% of the West Bank. In 1998, the Wye Memorandum signed by the Netanyahu Government intended to transfer 1% of Area C to Area A and 12% of Area C to Area B.²¹ The Wye Memorandum was never implemented and the Sharm Esh-Sheikh Memorandum was to replace it on 4 September 1999, after Ehud Barak had become the head of the government. According to this new agreement, 7% of Area C was to be transferred to Area B on 5 September 1999, 2% of Area B was to be transferred to Area A on 15 November 1999 and 1% of Area C was to be transferred to Area A as well as 5.1% of Area B to Area A on 20 January 2000.²²

We must conclude that the territorial reality of the PA has not evolved much since the Interim Agreement of 1995. The agreement already determined an allocation scheme for sharing the water during the interim period, as specified in chapter 1. This sharing was not modified by the subsequent agreements.

The Power Structure of the PA

The 1994 agreement determined the structure and the extent of the powers transferred to the PA. The structure of these powers was not modified by the subsequent agreements.

Article IV of the 1994 agreement describes the structure and the composition of the PA. The PA “shall carry out and be responsible for all the legislative and executive powers and responsibilities transferred to it under this Agreement.”²³ Each of the members of the PA will take up his or her functions (either the first time or upon a later change) after an exchange of letters between the PLO and the government of Israel takes place according to Article IV, paragraph 3. Israel therefore receives a veto power over the composition of the PA, since no clause obliges it to proceed with this exchange of letters.

The territorial jurisdiction of the PA extended in 1994 over the Gaza Strip and the area of Jericho (Article V.1.a). The functional sovereignty, however, extended over all the powers and responsibilities specified in the agreement (Article V.1.b). They excluded international relations, in a fashion reminiscent of a protectorate. They also excluded interior security

²¹ Chapter 1 of the Wye River Memorandum, signed in Washington on 23 October 1998. Further redeployments, section A of Article 1.

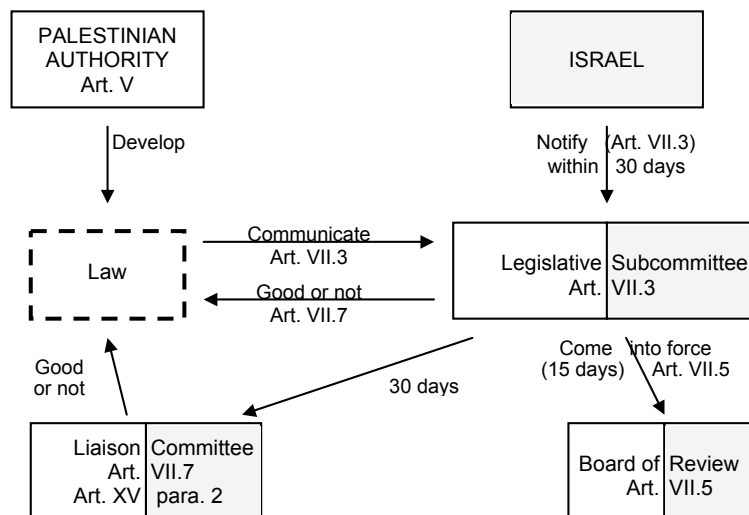
²² *Sharm Esh-Sheikh Memorandum on Implementation Timeline of Outstanding Commitments of Agreements Signed and the Resumption of Permanent Status Negotiations*, Article 2, paragraphs a, b and c.

²³ Article IV, paragraph 1.

and public order in the settlements and in the area of Military Installations, as well as the Israelis and exterior security (Article V.1.b), which is reminiscent of the regime of concessions or that of the capitulations.²⁴ Finally, the personal jurisdiction of the PA does not extend to the Israelis (Article V.1.c), a clause that also heavily reminds of the capitulations. It is worth noting that, according to Article I.d, the term ‘Israelis’ also includes the companies registered in Israel.

According to Article V.2, the PA has the legislative, executive and judicial powers specified in the agreement. The legislative powers of the PA, as they are described in Article VII, gives the PA very little legislative power since Israel has effective veto power over every law the PA initiates via the mechanism illustrated by figure 1:

FIGURE 1 – Structure of the Legislative Power



²⁴ The first example of a regime of capitulations goes back to the treaty of 1 February 1535 signed by François I and Suleiman the Magnificent. This regime concerned the juridical condition of foreigners in states outside of the Christian world. These foreigners largely escaped the jurisdiction of the territorial state and remained partially submitted to the laws of their states of origin. Several aspects of the Cairo Agreement resemble this regime. Reference to the full capitulation regime cannot be made, though, since the agreement was not signed by two states. See Charles Rousseau, *Droit International Public*, op.cit., p. 93.

Every law instigated by the PA must be communicated to a legislative subcommittee (Article VII.3). Within 30 days after the communication of the law, Israel may ask the legislative subcommittee to decide whether this law exceeds the jurisdiction of the PA or whether it is inconsistent with the clauses contained in the agreement (Article VII.3). The subcommittee first decides whether or not the law can come into being as the final decision has not been made yet (Article VII.4). In case the legislative subcommittee is unable to decide, within 15 days, whether the law may come into force, the issue must be referred to a board of review (Article VII.5) made up of one Israeli judge and one Palestinian judge who will decide. The law will be enacted only once the board of review has decided that it does not deal with a security issue under Israeli jurisdiction, that the law does not seriously threaten other important Israeli interests protected by this agreement and that this law's application cannot cause irreparable damage or harm. (Article VII.6).

If the legislative subcommittee has not reached a decision within 30 days, it sends the issue to a joint Israeli-Palestinian committee (Article VII.7). The latter is made up of an equal number of members of both sides (Article XV.2) and makes the final decision.

Thus, Israel has an effective veto power, via the legislative subcommittee, over *all* legislation initiated by the PA. This legislative subcommittee will be set up by the Cooperation and Coordination Joint Committee (CAC) on civil matters (Article VII.3). As the CAC is composed of an equal number of Israelis and Palestinians (Annex II, Article 1.3), any legislative subcommittee it will create will be organized in a similar fashion and will function in the same way.

Such tight control does not appear in any category of limited territorial powers that was mentioned earlier. The Israeli-Palestinian joint committee resembles a condominium between the PLO and Israel as it is composed of both parties, theoretically on equal footing, in order to control a set territory. The power relationship that prevails, however, is a reminder of consented military occupation. Finally, the effective control described in the agreements demonstrates a public law concept: the tutelage.²⁵

²⁵ The administrative tutelage is exerted upon decentralized territorial collectivities. The latter benefit from an autonomy determined by the legislator, respectful of the national law and under the control of a superior authority. The authority exerting the tutelage not only verifies the legality of the decisions of the local powers; it also checks their conformity to the general interest. The authority enforcing the tutelage is not allowed to decide in place of the authority under tutelage, but it can express itself via the suspension, annulment, refusal of authorization, etc.

Such a system shows a striking similarity with the mode of functioning of the CAC and of the Legislative Subcommittee which enforce an effective 'tutelage' by Israel upon the

Article XVII describes a procedure meant to settle divergences in interpreting the agreement. Disagreements should be settled during the negotiation within the Joint Committee (Article XVII, paragraph 1). In case of failure, the parties may agree on a conciliation procedure (Article XVII, paragraph 2). Finally, in case the conciliation procedure fails, the parties may accept to submit their dispute to an arbitration (Article XVII, paragraph 3). The usefulness of a conciliation procedure can be questioned, given the structure of the Joint Committee. The Israeli wish to solicit an arbitration is questionable as the Jewish state can block any Palestinian claim at the level of the Joint Committee.

In addition to observing that the power of the PA is limited structurally, the matters that are granted to the PA must also be examined. Article III, paragraph 4 specifies that, "The withdrawal of the military government shall not prevent it from continuing to exercise the powers and responsibilities specified in this Agreement." Residual powers thereby lie with the military government, as is made clear in the Declaration of Principles and which already appeared in the ISGA project in 1992.

According to Article VI.9, laws and Military Orders in force before the signature of the agreement will remain in force unless they are amended or abrogated in the manner specified in the agreement (that is with an Israeli veto). In this respect, Raja Shehadeh has emphasized the magnitude of the concession the Palestinians accepted. Indeed, all of the Military Orders that were in existence had not yet been published or brought to the attention of the Palestinians.²⁶ Military Order No. 1407 dated 13 March 1994 was the last to be published (4 May 1994). The Palestinians ignored the content and number of the ones that had been issued between 13 March and 4 May.

The executive powers granted to the PA as well as the security arrangements were described elsewhere.²⁷ Suffice here to mention that the security arrangements contained in Annex 1 essentially create a Palestinian front for Israeli power. The great similarity between several clauses of Annex 1 and the Camp David Agreement must be emphasized. Article II, paragraph 3, for example, set up joint Palestinian-Palestinian police pa-

Palestinian Authority (PA). The PA, however, cannot be defined as a decentralized territorial unit as it is not a part of the territory of Israel, and its inhabitants are not Israelis.

²⁶ Raja Shehadeh, "Questions of Jurisdiction: a legal Analysis of the Gaza-Jericho Agreement", *Journal of Palestine Studies*, 23 (1994) 4, p. 19.

²⁷ Julie Trottier, "L'Attitude de la Jordanie envers l'entité palestinienne naissante", *Notes et Etudes de l'Unité des Relations Internationales*, no. 7, 1996, pp. 35-39.

trols. The Camp David Agreement had planned joint Jordanian-Israeli police patrols.

Annex II details the transfer of powers and responsibilities from the Civil Administration to the PA. It includes the clauses concerning water that were examined earlier in chapter 1.

Legal Matters

Annex III set up a regime that recalls the capitulations. Indeed, according to Article I, paragraph 2:

“Israel has sole criminal jurisdiction over the following offenses:

- a. Offenses committed in the Settlements and the Military Installations Area subject to the provisions of this Annex, and
- b. Offenses committed in the Territory by Israelis.”

Although the PA has no jurisdiction over Israelis, the Israeli police may arrest and detain a non-Israeli (Article 1, paragraph 4.b). The arrest of a non-Israeli will occur for a possible transfer to the Palestinian police (Article 1, paragraph 4.b(1)). But, if that individual is suspected of having committed a crime against one or several Israeli(s), Israel can keep on detaining him or her until the Legislative Committee has decided which court is appropriate for judging him or her (Article I, paragraph 4.b(2)). Just as Israel has an effective veto in the Legislative Committee, this system entails the preservation by Israel of an effective criminal jurisdiction on whomever is suspected of having committed a crime against an Israeli, whether the suspect is Israeli or not.²⁸ The effective criminal jurisdiction of the PA therefore only applies to crimes committed by Palestinians against Palestinians. This regime resembles that of the capitulations and that of the protectorate.

What is the Palestinian Authority?

The Authority set up by the Cairo Agreement has a hybrid nature. Though neither a protectorate nor a regime of capitulations, it does show several aspects of these two regimes. The 1994 and 1995 agreements provide a legal basis for Israel to maintain its control over the West Bank and Gaza

²⁸The possible detention of a non-Israeli for as long as the Legislative Committee wishes ignores the laws that protect an individual against an arbitrary detention within Israel.

Strip. It may be that the PA, through the various agreements, inaugurates a new form of pacific and consented military occupation.

According to Article XXIII, paragraph 5, this regime is valid only during the interim period and is not supposed to affect the final status that still remains to be negotiated. The Taba, Wye and Sharm Esh-Sheikh Agreements did not fundamentally modify the power structure set up in 1994.

Walid Khalidi wrote as early as 1988:

“To the best of my knowledge, the furthest the Labor Party seems willing to go would be the creation of Palestinian ‘enclaves’ in the Gaza Strip and the West Bank [...] Municipal or quasi-municipal functions would devolve to local Palestinian representatives in these enclaves, but internal security would remain in Israeli hands. Jordan would be invited to ‘co-police’ the enclaves with Israel and presumably to extend its citizenship to all the inhabitants. This attenuated and selective Jordanian presence would be the justification for calling the arrangement a ‘territorial compromise’.”²⁹

Khalidi thus foresaw quite precisely the nature of the entity set up by the 1994 and 1995 agreements, except with respect to the Jordanian presence. Nabil Sha’ath showed the exclusion of Jordan from the Oslo Agreement as a Palestinian victory. However, the Palestinians did not obtain greater sovereignty with the Cairo Agreement than they would have obtained under a Jordanian personal jurisdiction as the Camp David Agreement had planned.

Rabin himself justified the Oslo Agreement thus:

“I prefer the Palestinians to cope with the problem of enforcing order in the Gaza Strip. The Palestinians will be better at it than we were because they will allow no appeals to the Supreme Court and will prevent the [Israeli] Association for Civil Rights from criticizing the conditions there by denying it access to the area. They will rule by their own methods, freeing, and this is most important, the Israeli army soldiers from having to do what they will do.”³⁰

Maybe Rabin only wanted to use the PLO to manage a Palestinian minority which his own police and military had great difficulty controlling. His vision of the future certainly did not include a straightforward annexation,

²⁹ Walid Khalidi, "Toward Peace in the Holy Land", *Foreign Affairs*, vol. 66, no. 4, 1988, p. 779.

³⁰ Naseer H. Aruri and John J. Carroll, "A New Palestinian Charter", *Journal of Palestine Studies*, 23 (1994) 4, p. 12.

which would have greatly increased the Palestinian population within Israel. He might, however, have considered some sort of 'townships' for Palestinians with an Israeli West Bank and Gaza Strip. This is also coherent with the 1994 and 1995 agreements.

The Role of Water in Palestinian State Building

The control of water is intimately linked to Palestinian state building. The preceding section showed how the PA has no real independence from the Israelis in its capacity to produce law. Chapters 2 and 3 showed that neither has the PA developed any capacities toward the local actors who now control water. If the PA succeeds in developing such a control, whether it is achieved by acquiring some independence from the Israelis or by submitting the local actors to national laws, it will have greatly progressed on the road to state building. In the following pages, the upheaval in property regimes which such a process would induce, and the parallel sanctioned discourses and consequent parallel legal constructions which the tensions initiated by such a change now bring about will be examined. Finally, the state territorialization process implied by the control of water as well as the Palestinian Water Authority (PWA) strategies will be looked at. Then, a return to the tricky issue of the definition of a national interest in terms of water will be discussed.

A Change in Property Regime

We saw in chapter 3 how water became the object of a private appropriation by the well owners and the spring water shareholders. The appropriation of spring water was initially achieved over centuries in relation to the appropriation of land. The appropriation of well water was carried out in relation to the investment made in the drilling of wells. The water trade via tankers respects that property of water when water is fetched at wells or springs. The use of illegal connections occurs on municipal networks, where water is belonging to a collective entity.

The PWA now plans, in its water code under preparation, to make water into either public property or state property.³¹ The mechanism whereby such a property change can occur deserves to be examined for it is intimately linked to Palestinian state building.

³¹ Several drafts of the law have been put out. The 1996 draft mentioned water as state property whereas the more recent version (not accessible to the public at the time of this thesis' completion) mentioned water as public property.

One of the most precious aspects of Marx's contribution remains his detailed description of the mechanisms that led to the expropriation of the yeomen in England and the Gaels in Scotland.³² He details the process, started in the 15th Century, that allowed a radical change in land property and that was brought to completion with the land enclosure act at the beginning of the 19th Century. This contribution introduced the consideration of property changes in explaining the political evolution of a society. The Gaels of the Scottish Highlands, whose cottages and villages were destroyed, were progressively pushed back into an increasingly narrower area in order to leave room for the pastures used by the big landowners. Their collective fate was comparable to that of the American Indians and the West Bank Palestinians whose villages are now surrounded by growing settlements.

The transformation of water property today in the Palestinian Areas is clearly distinct from that of land property in England and Scotland during the 15th and 16th Centuries. If we temporarily leave aside the issue of the 82% of the West Bank aquifers used by the Israelis and if we first concentrate on the 18% of that water that are granted to the Palestinians according to the 1995 agreement, two distinctions first emerge. First of all, the transformation of water as a private property into a public or state property would be achieved via legislation. Marx shows clearly how British Law opposed the transformation of land property during the first 150 years of that process. Legislation finally recognized it and eventually brought it to completion only once that process was largely accomplished. Yet, the process that might transform the property of water in the Palestinian Areas is supposed to be led and completed by the nascent state via its legislative tools. This would be quite a different path than the one carried out by Israel which, as we saw in chapter 1, did not have to face deeply rooted institutions that had controlled water and regulated its property for centuries.

The second distinction concerns the identity of the owners. Marx describes a process whereby the property of land went from small peasants that were owner-exploiters to great capitalist farmers. In the case of water in the Palestinian Areas, the property would pass from peasant owner-exploiters or capitalist well owners to the nascent Palestinian state.

Up to now, this crucial transformation is mentioned by the PWA only as a management issue, although it pertains, in fact, to an issue of political capacity to control a vital resource. The various strategies of the PWA,

³² Karl Marx, "L'expropriation de la population campagnarde", chapitre XXVII of *Le Capital, Livre 1*, translated by J. Roy, Flammarion, Paris, 1985, pp. 170-182.

which have come about with the help of foreign funds and consultants, do not deal with this delicate issue. They deal with management methods at a time when the very control over water has not yet been established.

The transformation now considered by the PWA does not only concern the property of water but also the regime of property rights; that is, the set of arrangements developed by a human group to control its use of a natural resource. A property rights regime includes both the property rights and the property regulations. The property rights include the bundles of entitlements that define the rights and duties of the owners concerning the use of the resource. The property regulations determine the manner in which these rights and responsibilities are exercised.³³ Susan Hanna distinguishes four types of property regimes. They are illustrated in table 1:

TABLE 1 – The Four Types of Property Regimes³⁴

Type of regime	Owner	Owner's rights	Owner's responsibilities
Private property	Individual	-Socially acceptable use -Control of the access	Avoid socially unacceptable uses
Communal property	Collective	Exclusion of non-owners	- Maintenance - Limitation on the rate of utilization
State property	Citizens	Defines the regulations	Maintains social objectives
Open access (no ownership)	None	Capture	None

We saw in chapter 3 that the property regime regulating the springs used for irrigation in the West Bank corresponds to the category 'communal property' in Hanna's classification, whereas the property regime regulating the wells in the West Bank corresponds to the category 'private property'. In the Gaza Strip, the drilling of an illegal well is so easy that the real property regime concerning water is closest to the category 'open access'. The tankers belong to the private property regime whereas the water provided by municipal wells and distributed via networks officially belongs to a state property regime although they pertain in reality to the communal property regime, as was clearly illustrated by the examples of the Hebron and Jericho municipalities.

³³ Susan Hanna, "Property Rights, People, and the Environment," *Beijer Reprint Series*, no. 74, reprint from *Getting Down to Earth*, edited by R. Costanza, O. Segura and Juan Martinez-Alier, Island Press, Washington, DC, 1996, p. 381.

³⁴ *Ibid.*, p. 384.

The state property regime, if it emerges some day, will have to replace the property regimes that are solidly embedded within a social, political, cultural and economic context. This change is made difficult by the perception of the use of the resource. In her study of American fisheries, Hanna emphasized what she calls a “frontier vision of resource use.”³⁵ According to this vision of resource use, the degradation or the exhaustion of the resource can be dealt with by abandoning an area and moving on to another area; that is, by pushing back the area being exploited to a ‘new frontier.’ The 82% of West Bank water presently used by the Israelis offers the Palestinians this ‘new frontier.’ Why should they proceed to a painful upheaval of water property regimes when these other resources exist in such abundance and are not used by the Palestinians? It seems preferable to push back the water frontier by reducing the portion allocated to the Israelis. Chapter 5 will show that, realistically, the Israelis are not expected to give up more than a fraction of that water during the final status negotiations. Claiming this water, nevertheless, constitutes the only discourse within the PA that is presently acceptable to the people. This situation encourages the PA to develop what will be called in the next section two parallel sanctioned discourses and two parallel juridical constructions. The arguments given to the international donors deal with a national water law, the one given to the population deals with the ‘recuperation’ of water from Israeli control and use.

Before the parallel legal constructions are examined, the necessity of transforming the existing water property regimes for the construction of the nascent Palestinian state will be looked at. The privatization of water rights and the respect for communal management are, nowadays, the two major water issues to be considered. For example, the World Bank is now encouraging the privatization of water rights in Morocco. This decentralization never concerns decision-making, but rather very specific tasks such as payment collection. The type of water law advocated by the World Bank clearly stipulates that the planning and regulation of water use must be carried out in a centralized fashion at the national level.³⁶ Chapter 5 will discuss this further.

Today, the PA is in competition with the local actors who make decisions within the existing regimes. The PA does not benefit from any autonomy from the Israelis in its legislative power, while its laws and decrees are imposed with great difficulty upon the local actors. Thus, the municipality of Jericho has simply declared that it does not recognize decree no. 38 of

³⁵ Susan Hanna, “The New Frontier of American Fisheries Governance,” in *Ecological Economics*, 1995.

³⁶ World Bank, *Gestion des Ressources en eau, Document de politique générale de la banque mondiale*, World Bank, Washington, DC, 1993.

1998 signed by Yasser Arafat, which takes away the control of Ein Sultan spring's water from the hands of the Jericho municipality. The Hebron municipality, on its part, maintains its own pipeline and seeks to have more wells drilled in order to benefit from a water provision that will be independent of the pipeline managed by the PWA, which lies on the other side of the Hebron-Bethlehem road.

A water control centralized at the national level by the PA is clearly necessary in order to achieve an equitable management of the water over the whole of the Palestinian Areas. Such a centralized control is essential in order to achieve a sectoral reallocation of water. Nowadays, 65% of the water used by the Palestinians is devoted to irrigation.³⁷ The reallocation of that irrigation water to domestic use is unavoidable in the long-term because of the growing demographic pressure in the region. This tendency is indeed already observed in Israel and in Jordan.³⁸ But beyond that practical interest of efficient management, the vital issue concerns who will decide which property rights regime should be used and who will benefit from the power which water control confers within these property rights regimes.

J. Migdal quoted the Shah of Iran who wanted to replace the Oriental bazaars with supermarkets,³⁹ and the Ataturk Government, who executed over 60 persons because they had worn a fez, in order to illustrate the seemingly unlimited appetite of state leaders to change the regulations of social life, often under the banner of a drive for modernization. Migdal explains this state drive to regulate all social spheres, varying from what type of head cover people may wear to when people may pass to winter time, by the fact that the role and effectiveness of the state within its territory are very interdependent with its position in the world of states. Thus a state that regulates efficiently the use of a resource is capable of mobilizing it efficiently for whatever reason when it faces an external enemy. According to this perspective, water control in the Palestinian Areas is especially important for Palestinian state building. The mobilization of water for such a use or any other use will greatly determine the future of the Palestinian economy.

³⁷ *Strategy for Water Management in Palestine*, Palestinian National Authority, Palestinian Water Authority, January 1999, p. 3.

³⁸ Sandra Postel, *Pillar of Sand: Can The Irrigation Miracle Last?* A Worldwatch Book, Norton & Company, New York, 1999, pp. 128-132.

³⁹ J.S. Migdal, *Strong Societies and Weak States, State-Society Relations and State Capabilities in the Third World*. Princeton University Press, Princeton, New Jersey, 1988, p. 20.

Ironically enough, the Israeli occupier has never pushed the state's tentacles into local water management. The local constellations were thus capable of persisting without much state interference. The resistance opposed by the local actors to the PA will therefore be all the more stubborn. Carl Widstrand⁴⁰ and Jean-Jacques Pérennès⁴¹ emphasized in the past how peasants rarely 'resist' in an obscurantist fashion, but rather resist because they pursue strategies that are antagonistic to those of the state. The positions of the Hebron and Jericho municipalities precisely follow strategies that conflict with those of the PWA.

Migdal regretfully stated the fact that the resistance to the extension of the state into the regulation of society was not taken into account in the development of earlier models such as the 'stages of growth' by Walt Rostow or the 'center and periphery' of Edward Shils. Migdal insisted on the need to focus on all of the social institutions that exerted some social control, whether they be official or not, in order to determine the real manner in which the regulations were produced and maintained in societies. This proves to be necessary in order to construct a model that would take into account the forces of resistance, which counter the ambitions of the state.

National Actors Interacting with Local and International Actors

Paul Mathieu and Erika Weinthal have both examined the socio-political aspects of great rivers' development, whether it be the Senegal River in the first instance or the Aral Sea Basin in the second case. Mathieu highlighted the manner in which the strategy of the state consisted largely in conciliating the internal or local social stability and the requirements of international funding.⁴² His approach of actor strategies in three embedded spatial scales is illustrated in figure 2 that shows the relations between local, national and international actors. Mathieu used this model in order to illustrate the economic and social stakes in the development of the Senegal River Basin.⁴³ His model is adapted here in order to illustrate the political relations concerning water in the West Bank and the Gaza Strip.

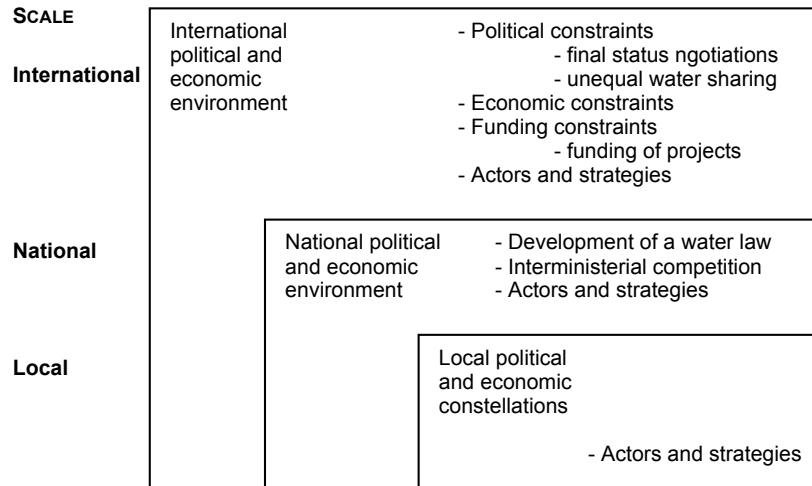
⁴⁰ Carl Widstrand (ed.), *Water Conflicts and Research Priorities: Water and Society, Conflicts in Development, Part 2*, in the collection 'Water Development, Supply and Management,' vol. 8, Oxford, Pergamon Press, 1980, p. 122.

⁴¹ Jean-Jacques Pérennès, *L'eau et les hommes au Maghreb. Contribution à une politique de l'eau en Méditerranée*, Karthala, 1993, pp. 544-545.

⁴² Paul Mathieu, "Irrigation, réforme foncière et réactions paysannes dans l'aménagement de la vallée du fleuve Sénégal", *Revue de Géographie de Lyon*, vol. 65, no. 1, 1990, p. 51.

⁴³ *Ibid.*, p. 49.

FIGURE 2 – Systemic Diagram of Various Spatial Levels and of their Embedment



The strategy of every actor appearing in this diagram has an impact on the process of change the mechanisms of water control undergo. The national political system is the one that exerts the least control on water at the present time. It contains competitions among ministries. The municipalities are indeed related to the Ministry of Local Governments (MLG) whereas the PWA is independent from that ministry. The growing weight of Sa'eb Erekat (Minister of the MLG) strengthens his ministry when facing the others. As in any emerging state, every ministry attempts to acquire maximum powers and responsibilities. The PWA must thus achieve a *modus vivendi* with the Ministry of Agriculture and the Ministry of Local Governments before it can face local actors in the competition for the control of water. The creation of a water law not only takes place within the context of competition with the local actors, but also in the context of interministerial competition.

The fragility of the structure of the national political system makes it especially vulnerable to the influence of the international environment. The international environment includes the international economic constraints such as the virtual water mentioned in chapter 1, the international political constraints such as the Israeli occupation and the Israeli use of 82% of West Bank water, and the financial constraints. The financial aspect has

been the least examined even though it weighs heavily on Palestinian state building and on the hydropolitical development.

The fact that international funding keeps the PA afloat has been much repeated. At the Washington conference on 1 October 1993, the various donors committed themselves to a total of \$2,996.32 million to the Palestinians between 1994 and 1998.⁴⁴ Another \$3 billion was promised on 30 November 1998 for the West Bank and Gaza Strip for the next five years.⁴⁵ This foreign aid is especially high given that the population of the West Bank and Gaza Strip reached 2.9 million inhabitants in 1997.⁴⁶ The interaction between that international aid and Palestinian state building is little studied to this day. Chapter 5 will discuss the various goals sought by these donors and the various constraints they are submitted to. At this stage, concentration will be placed on the donor impact on Palestinian hydropolitics at the national level.

We could have expected to find here a development similar to that observed by Erika Sora Weinthal in the Aral Sea Basin. She studied the new states that emerged from the dislocation of the former Soviet Union, asking the following questions: Why do new states succeed in building international institutions managing water before having reconfigured their domestic institutions regulating water? And, under what conditions are new states capable of negotiating institutions in order to overcome collective action problems in situations where the incitement structure seems to imply prior cooperation?⁴⁷

The author starts with the observation that post-communist states had to negotiate the creation of international institutions in order to cooperate in the area of water at the same time that they had to undertake domestic institution building. This observation is also valid for the Palestinians, who must start the final status negotiations with Israel concerning water at a time when their national water law has not yet been approved by the Palestinian Legislative Council. Weinthal grants special attention to the role played by NGOs and IOs (International Organizations) both in the creation of regional cooperation and in state building through the control of water. She concludes that the very weakness of the national institutions responsible for solving the domestic problems provides the key element

⁴⁴ Adel Zaghera, *Foreign Aid and Development in Palestine*, Jerusalem Media & Communication Center, Jerusalem, March 1999, p. 5.

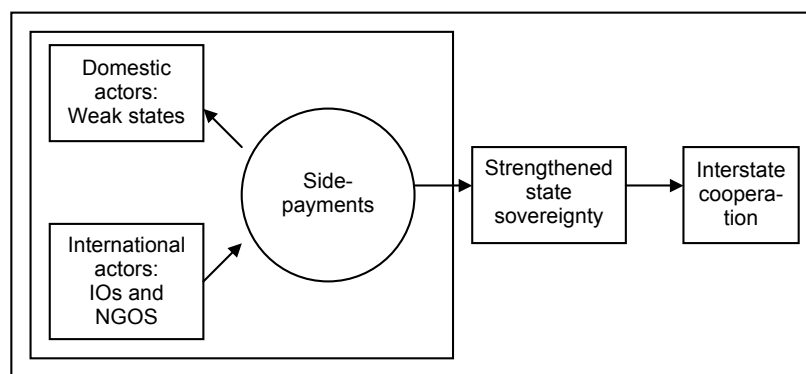
⁴⁵ "Israël-Palestiniens LEAD: Israël quitte la réunion des donateurs aux Palestiniens à Francfort", AFP dispatch, 20:58, February 4, 1999.

⁴⁶ Palestinian Central Bureau of Statistics, *1997 Survey*.

⁴⁷ Erika Sora Weinthal, *Making or Breaking the State? Building Institutions for Regional Cooperation in the Aral Sea Basin?*, Ph.D. thesis, Columbia University, 1998.

to understanding regional cooperation regarding water among states in transition. Her two-level institution building model, illustrated in figure 3, shows how necessary it is to go beyond conventional theories on international cooperation because they generally maintain a strict separation between the domestic and international processes.

FIGURE 3 – Two-Level Institution-Building Model⁴⁸



Weintal’s model shows IOs and NGOs a key role by providing side-payments in the creation of conditions favoring both interstate cooperation and state building.

“At the interstate level, a leader must bargain with other leaders over whether or not to devise an institutional agreement and if so then over the specific content of the agreement. At the domestic level for transitional states, a leader needs to ensure compliance with the interstate agreement by conducting parallel negotiations with critical domestic constituencies while also seeking to negotiate the design of the new domestic institutional structures of the state apparatus itself. Although these two sets of institutions are distinct, their negotiations are inevitably intertwined because effective states are necessary for carrying out interstate agreements.”⁴⁹

IOs and NGOs offer side-payments to emerging states in exchange for their participation in regional cooperation. These side-payments are used to fund completely different things at the domestic level. The governments of these emerging states prefer having the international community

⁴⁸ *Ibid.*, p. 119.

⁴⁹ *Ibid.*, p. 107.

carry the financial burden of the hydraulic development rather than ask their populations to do so, partly because they are so weak that the mobilization of the necessary domestic resources would be very difficult. Moreover, the new Central Asian states do not perceive the World Bank and the International Monetary Fund as pertaining to the former colonizing power. Quite the opposite: the transition towards a market economy is an integral part of breaking with the former colonizer.

Weinthal concludes that the active role of IOs and NGOs, which aim in fact at developing regional cooperation in the field of water in Central Asia, contributes largely to the institution building in these new states. By satisfying the groups hurt by the transition, these IOs and NGOs spare the political elite the trouble, allowing for the unwanted side effect of the state being built without any democratic development.

Several parallels can be drawn between the situation of the Palestinian entity and the new states in the Aral Sea Basin. Here as well, the presence of IOs and NGOs results more from a desire to settle an international problem and to bring about regional cooperation than to develop local water infrastructure. Again, these same institutions seek to fund projects that satisfy the demands of the population, which allows the PA not to fund them through a mobilization of internal resources. And, this process can occur without any accompanying democratic development, although this is, once again, an indirect side effect.

The stake of water does not have the same relative weight as the other international issues being disputed in the West Bank and Gaza Strip. The issues of borders, refugees and settlements are much more crucial for the negotiators than the issue of water. Yet, among the Central Asian states, the issue of regional water management ranked much higher in the states' priorities. On the other hand, the power balance between Israel and the PA is completely different from the one existing among the Central Asian states. Israel controls the content of the laws instigated by the PA and now uses 82% of the West Bank water. This probably constitutes the key element in explaining the fact that IOs and NGOs at work here have not contributed as much through their water projects to Palestinian state building. They are, in general, the same IOs and NGOs active in the Aral Sea Basin. They therefore follow the same general policies concerning water development, the same priorities in terms of regional cooperation and national water policies. They have not led to the emergence, within the PA, of national institutions capable of disembedding the local institutions controlling the use of water from their local contexts or of modifying the water property regimes. They have not either alleviated the com-

petition among Palestinian ministries in order to achieve a clear distribution of ministerial responsibilities.

Two Contradictory Dynamics

The water development projects presently funded by the international community fuel either one of two contradictory dynamics. The first one is centripetal and concentrates water power generated by water development in the hands of the PA. The second one is centrifugal and strengthens the various actors who now control water in a fragmented fashion in the West Bank and Gaza Strip.

The Centrifugal Dynamic

Several cases depicted in chapters 2 and 3 illustrate the centrifugal dynamic. The hooking up of Battir to the Israeli water network in 1972, the development project that took place in Falamiah between 1994 and 1997, the Hebron municipality pipeline funded by German foreign aid, and the agreement between the villages of Rameen and Anabta all show processes through which the water control mechanisms evolved.

When Battir village hooked up to Mekorot in 1972, it played into a strategy of hydraulic development that aimed at extending Israeli state control over the West Bank. Pierpaolo Faggi discussed the dual nature of most water projects undertaken by the state.⁵⁰ He distinguishes the 'productive logic' officially put forward in the goal of the project such as, for example, greater cereal production or better quality drinking water, from a 'strategic logic' that is rarely put out in the open. The strategic logic may consist of a population displacement that allows the state to better control a frontier area that was previously little populated. It may entail the displacement of water control from the hands of local actors into the hands of the state. The strategic logic of a water project leads to what Faggi calls a territorialization process: the extension of state control over a territory.

Anyone doubting the strategic logic involved in Mekorot's extension over the West Bank need only visit the Haganah museum in Tel Aviv. The Haganah was the ancestor of the Israel Defense Forces at the time of the British Mandate. In other words, this is a military museum. And among the grenades and machine guns on display, a map illustrates the emerging water network linking Jewish settlements in the 1930s. The bilingual

⁵⁰ Faggi, Pierpaolo, "Les développements de l'irrigation dans la diagonale aride entre logique productive et logique stratégique", *Revue de Géographie de Lyon*, vol. 65, no. 1, 1990, p. 21-26.

English and Hebrew caption specifies that building a centralized water network was an integral part of the struggle to establish control over the territory and, thus, to obtain a state.

Why did Battir, like many other Palestinian villages to this day, voluntarily participate in the territorialization process carried out by Israel over the West Bank? This is consistent with Palestinian national identity and conscience. As Jean-François Legrain has shown in his analysis of the voting patterns at work in the 1996 Palestinian legislative elections,⁵¹ 'ethnolocalism' still dominates the Palestinian political vision. During these elections, the geographic link between the voter and the candidate's origin was the explicative criterion of the vote.⁵² Villages did not have unified voting patterns, and Legrain's analysis shows that the *Nakhia*, that is the smallest Ottoman administrative unit, explains the voting pattern. In 1996, the vote was carried out according to primary solidarities that already existed in the 18th Century. Legrain concludes that traditional solidarities still predominate over national conscience. A national construction does exist but still remains incomplete.

Our observations of local and national hydropolitics have led us to observe a pattern similar to that observed by Legrain. Well and spring control not only lies within the village, but also is fragmented among portions of a village. The dominant forms of solidarity are to be found there. Hooking the village up to Mekorot allowed for the continuation of these solidarities by providing additional water for domestic purposes. The villagers' perceptions of political relations through water did allow them to perceive the social upheaval that would occur if they reallocated a sizeable portion of their spring water to domestic consumption by building an independent, internal adduction network. But, these same perceptions prevented them from understanding that hooking up to Mekorot participated in a process that would strengthen Israeli control over a strategic territorial dimension, the water networks. This would complicate the construction of a Palestinian territorial state.

Handing over water power to the Israelis is still carried out to this day. Several villages are eagerly waiting for international aid to hook them up to Mekorot. Their engineers' drawings and Israeli issued permits are ready. Considering the massive international aid pouring into the Palestinian Areas, their wish will soon be satisfied. The centrifugal dynamic goes on.

⁵¹ Jean-François Legrain, soon to be published collection *La Palestine au quotidien*, CERMOC, Amman.

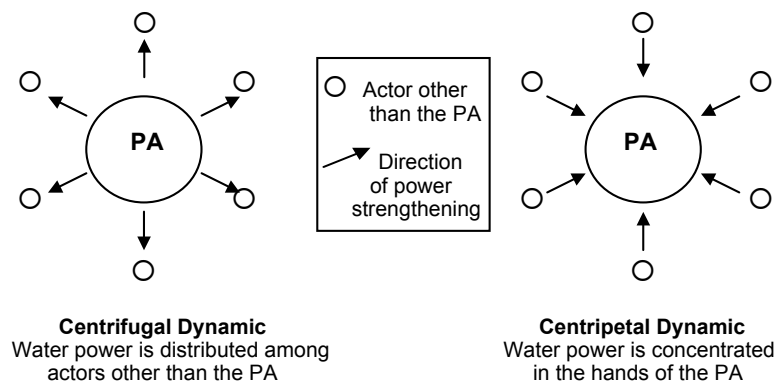
⁵² His analysis showed that party affiliation, religion and sex did not affect the vote. A Muslim would vote for a Christian so long as the latter originated from his village's *Nakhia*.

When Falamiah created its new irrigation committee in 1997, it centralized somewhat the control over its well water. As a village, Falamiah developed a better capacity to mobilize its water and land to produce more wealth. The centrifugal dynamic was at work. The irrigation committee includes a representative of PARC, a Palestinian NGO. Here the uneasy relationship between the PA and NGOs comes into light. PARC has now acquired some participation in the control of water. Yet, its agenda escapes the PWA. The centrifugal dynamic is thus fuelled in Falamiah both by the strengthening of the village's water mobilizing capacity, and by the strengthening of NGO participation in water control.

The case of the Hebron municipality pipeline offers a striking example of the centrifugal dynamic. The Hebron municipality operates an independent water network fed by wells it also controls independently. Its two new wells and its new pipeline, functioning since 1999, have increased the quantity of water it controls. We already examined in chapter 2 the power conflicts which this implies. The scarcity of domestic water in Hebron was thus less in the summer of 1999 compared to the previous summer in spite of the drought that prevailed throughout 1999. This improvement of the material living conditions of the population did not, however, coincide with institution building at the national level.

In conclusion, the centrifugal dynamic expresses a water power transfer towards any actor other than the PA or a strengthening of the water power that actor already has. The latter may be Israel or any local actor such as a municipality or a well owner. Figure 4 illustrates both dynamics.

FIGURE 4 – The Centrifugal and Centripetal Dynamics



The Centripetal Dynamic

A centripetal dynamic is also at work, whereby the PWA tries to acquire exclusive control over Palestinian water. Sizeable funding was granted to the PWA by various donors to develop a comprehensive water law that includes the development of a strategy and the exclusive control over water.⁵³ So far, both are largely theoretical. The most concrete achievement of the PWA today, within the centripetal dynamic, remains the construction of a pipeline and the drilling of four new wells that should bring an additional 8 mcm per year evenly split between the municipalities of Bethlehem and Hebron starting in December 1999. This infrastructure development was made possible by energetic American involvement. The wells and pipeline were funded by USAID and the swiftness with which the permits were granted was due to high-level diplomatic involvement on the part of the United States. This will be the first Palestinian network entirely independent of the Israeli network. The PWA should thus control it in a centralized fashion. This pipeline may, one day, be charted on the wall of a Palestinian museum as a crucial part of state building.

Yet, the centrifugal dynamic is already at work here. The German funded pipeline that was laid down simultaneously (on the opposite side of the road) as the American one, will link Hebron municipality to two independent wells. A state planning would have saved money and would have integrated the two pipelines into one, which both the Germans and Americans supported. But, the Hebron municipality refused. So as the first Palestinian independent network arises, a Hebron independent network also arises.

Donors have fuelled rather unwittingly both the centrifugal and centripetal dynamics. The World Bank funding of the creation of a Palestinian water strategy, the Norwegians funding of the creation of a Palestinian water law, the Germans funding of a regional water strategy and the Americans funding of the first independent Palestinian pipeline all fuel the centripetal dynamic. However, many of the projects funded by the same donors fuel the centrifugal dynamic. The Canadians rehabilitating the Siamat well in the Gaza Strip, the French funding the irrigation project in Falamiah, the Germans funding the Hebron pipeline, the World Bank and the Italian Government funding adduction networks that will integrate Ein Arik and Kufr Name to the Israeli network, all fuel the centrifugal dynamic.

⁵³ These will be detailed soon in a second article.

Parallel Sanctioned Discourses

The concept of a 'sanctioned discourse' was developed by Charles Tripp at the School of Oriental and African Studies.⁵⁴ It refers to a normative vision in which the thought process of an analyst or a political actor is locked, a sort of largely ethical paradigm that determines the hypotheses we can put out and the questions we can ask. The discourse on water within the Arab-Israeli conflict offers a vivid illustration of a 'sanctioned discourse'. On the Palestinian side, it is deemed unacceptable to attribute water problems to any other cause than the Israeli occupation and the theft of Palestinian water by the Israelis. The identification of any other cause is immediately labeled as Palestinian anti-nationalism.

Like any state institution born out of decolonization, the PA tries to use its legitimacy in its struggle with the Israelis for water control. Thus, the PWA now insists in all international meetings on the necessity to change the unfair water sharing agreed to in 1995 for the interim period. The PWA claims the 82% of the West Bank's water now controlled by the Israelis as its own.

Entering a negotiation with every local Palestinian institution controlling water would be a slow and painful process. But, on the long-term, it would greatly strengthen the PWA as it would allow the development of state control over water, a control already granted to the PA by international treaties. This state building would strengthen the PA in its dealings with Israel and Jordan. However, the PWA has not done this yet. Its draft legislation and strategy were prepared by consultants' teams. Its few workshops to discuss it gathered elite NGO representatives as well as international organizations representatives, not village farmers and well owners.

Instead, the PWA is focusing everyone's attention on the struggle with the Israelis for the control of water. This provides an immediate benefit, for it allows the PA to rally all Palestinians behind it. Irrigating farmers, well owners, water thieves and city dwellers alike all agree that West Bank water should go to the West Bank. The 82%-18% division cannot be perceived as fair, and the PWA advertises the unequal consumption of 250 l/day for a settler and 40 l/day for a West Bank villager, in order to fuel this feeling of injustice.

However, the PWA should beware of a severe backlash effect as this approach is feeding the centrifugal dynamic. Emphasizing the competition with the Israelis comforts Palestinians with the idea that stealing water is

⁵⁴ Charles Trip, private communication, London, 1997.

part of a national struggle because it means stealing from the Israelis. Thus the Palestinian Hydrology Group concluded, in a study carried out in 1996, that water loss due to the social factors in Gaza greatly exceeded the losses due to the technical situation of the network.⁵⁵ Emphasizing the struggle with the Israelis fuels a situation of water anarchy illustrated by the 1,000 wells drilled illegally in Gaza in 1995⁵⁶ or the 1,100 illegal connections identified by the SOGEA in the Bethlehem and Hebron municipal networks in the past two years and a half.⁵⁷ Such water anarchy can only weaken the PA on the long-term because it will prevent it from developing state-like control over water.

We observe today the emergence of two parallel sanctioned discourses that correspond conceptually to the two interfaces between the national constellation and the international and local systems as illustrated in figure 2. The sanctioned discourse used by the PWA or by the rest of the PA in its relations with the local actors is entirely focused on Israel. The latter is designated as responsible for all the scarcity problems encountered by the Palestinians. According to the logic of that discourse, the only solution to these problems remains the recuperation of the water hoarded by the Israelis. The sanctioned discourse used by the PWA and the PA in general in its dealings with the international actors also grants much attention to the Israeli responsibility, as is illustrated for example by the strategy document of the PWA that was under preparation in January 1999:

“At present, Israel is utilizing about 85% of the water from the Palestinian groundwater aquifers, and Palestinians are denied their rights to the water of the Jordan River. This policy has led to a severe water crisis in the Palestinian territory in general and the Gaza Strip in particular. Water demands are increasing due to the current high population growth coupled with the increase in the per capita water consumption. The gap between the available water for the Palestinians and the demand is very high. Many studies conducted recently have shown that this gap will increase dramatically in the coming few years, thus making the issue of securing the water rights a necessity and a priority for the Palestinians.”⁵⁸

The sanctioned discourse targeting the international actors includes also, however, an element of state building. The PWA puts forward its water

⁵⁵ *The Social, Environment and Economic Impact of Water Losses in the Gaza Strip*, Palestinian Hydrology Group, Jerusalem, 1996, p. 20.

⁵⁶ Y. Nasser, "Palestinian Management Options and Challenges Within an Environment of Scarcity and Power Imbalance", in *Water, Peace and the Middle East: Negotiating Resources in the Jordan Basin*, vol. XIX, no. 9, Collection: Library of Modern Middle East Studies, Tauris Academic Studies, London, 1996, p. 50.

⁵⁷ Data obtained during author's fieldwork.

⁵⁸ *Strategy for Water Management in Palestine*, Palestinian National Authority, Palestinian Water Authority, January 1999, p. 1.

law and its strategy that are being prepared. This is necessary in order to secure foreign funding. But the discourse is, up to now, only directed toward the international actors as is attested by the ignorance of the local actors. The latter do not know about the water law that is being developed and do not perceive the role it plans to grant them.

These two sanctioned discourses have brought about two parallel, legal constructions that remain largely theoretical. One is essentially directed to the exterior and the other to the interior. One is drafted in English, the other one in Arabic. Both largely cater to short-term imperatives: securing the support of international donors in one case and securing the support of local elites in order to ensure that they be loyal to the PA. Not so surprisingly, these two legal constructions often contradict each other or are not enforced. The effective rules regulating water remain to this day largely customary and oral.

This phenomenon strengthens Arafat for he remains the unavoidable center to which local actors must turn in order to negotiate a hook up to a pipeline or in order to obtain a decree protecting their water rights. This double legal construction complicates the emergence of a real Palestinian state capable of producing laws that are enforced. It is fuelled by the numerous water projects now taking place in the Palestinian Areas. This leads to the conclusion that the international donors do not necessarily favor the emergence of a state when providing financial support for these projects. The examination of national and local hydropolitics in the Palestinian Areas shows indeed that state building would benefit from an attitude that would imply less money and more support to the institution building process.

The Palestinian Water Authority: Between Strategy and Tactic

As was shown in chapter 1, the creation of a Palestinian Water Authority was planned in Article 7, paragraph 4 of the Declaration of Principles of 13 September 1993. Presidential Order No. 90 of 1995 established the PWA, and Bylaw No. 2 of 1996 concerning the establishment of the PWA defined its institutional insertion as well as its mandate. Its Article 8 described the composition of the National Water Council whose responsibility, according to Article 9, consists of establishing the Palestinian water policy and establishing the policy for developing and exploiting the water resources. The chairman of the PA is the president of the National Water Council. The members of the council are the ministers whose spheres of activities include water,⁵⁹ as well as representatives of Palestinian univer-

⁵⁹ They are the Ministers of Agriculture, Justice, Planning and International Cooperation, Local Government, and Industry.

sities. The PWA acts, within that council, as a secretariat. The Council may, according to Article 10, adopt the additional members it sees fit.

According to Law No. 2 of 1996, the Water Council is hierarchically superior to the PWA who receives the mandate to:

- Manage the water resources in an efficient way.
- Apply the national water policy.
- Establish and supervise water projects.
- Initiate cooperation between the parties affected by water management.

The PWA is hierarchically superior to the West Bank Water Department whose mandate consists of selling bulk water, operating the pumping stations and maintaining the main lines of the network. Finally, the water utilities are located at the bottom of the organizational chart. They gather the regional water utilities to be created, the municipal utilities, the village committees, the village councils and UNRWA water departments.

Resolution No. 66 of 1997 concerning the internal regulations of the PWA defines in its Article 5 the responsibilities of the PWA. We observe here a clear attempt at instituting state control over water. For example, Article 5, paragraph 5 stipulates that the PWA is responsible for

“regulating and monitoring private and public groundwater wells (quality and quantity), or any water establishment existing or shall be created in the future, including springs, any water related project and private and public wastewater projects.”⁶⁰

Article 5, paragraph 6 also places upon the PWA the responsibility of granting drilling permits:

“The registration of all the owners of drilling equipment, groups and bodies who undertake well drilling including their equipment and drilling techniques, in order to issue licenses that enable them to legally undertake the drilling activities. Obtaining all relevant information from the drillers regarding drilling records and other information relevant to the main hydrogeological formations during the course of drilling.”⁶¹

⁶⁰ Article 5, paragraph 5, Resolution no. 66 of 1997 concerning the establishment of the PWA.

⁶¹ Article 5, paragraph 6, Resolution no. 66 of 1997 concerning the establishment of the PWA.

Finally, Article 6 of the same resolution bestows upon the PWA the crucial responsibility of the allocation and reallocation of water:

“The Authority shall have the full rights to allocate and specify the use of surface and ground water which is being developed, and to re-allocate and regulate the water allocation it to serve (sic) the public interest and after the council’s approval.”⁶²

According to this Article, the PWA should, in principle, become the main protagonist of the transformation of water property regimes in the Palestinian Areas. It is a crucial role and the fact that the PWA is not a ministry, but rather an authority under the direction of Chairman Arafat is not surprising.

The five challenges identified by the strategy document of the PWA are in the political, socioeconomic, institutional, environmental and management spheres. As far as political challenges go, the issue of water rights is only formulated in relation to the Israelis and not in relation to the local actors. As far as the socioeconomic challenges go, the issue of water price is identified without any mention of the upheaval in property regimes which this would imply. As far as the institutional challenges go, the document specifies that the PWA shall establish four regional utilities in the West Bank and one in the Gaza Strip which will place the management of domestic water in the private sphere and will operate on the bases of cost recovery. This positions the PWA in direct competition with the Ministry of Local Governments, which now controls the municipal water networks. As far as the environmental challenges go, the document identifies the necessity to link the treatment of wastewater to the remainder of water management. This also corresponds to the Israeli policy. As we observed earlier in this chapter as well as in chapter 1, the Israelis now control the Palestinian water development via the Joint Water Committee, which grants or refuses the permits. The Israelis now refuse to grant permits for projects that would increase water provision to the Palestinians unless the treatment of wastewater would also be the object of development. The five challenges identified by the PWA thus satisfy also the vision of the international actors who determine the funding the PA receives.

The water policy formulated by the PWA in its preparatory document complies with the expectations of the World Bank as far as a national water policy goes, as we will see in chapter 5. It includes the following elements:⁶³

⁶² Article 6, Resolution no. 66 of 1997 concerning the establishment of the PWA.

⁶³ *Strategy for Water Management in Palestine*, Palestinian National Authority, Palestinian Water Authority, January 1999, pp. 6-7.

1. All water sources should be public property.
2. All citizens have the right to good quality water at an affordable price for their personal consumption.
3. The domestic, industrial and agricultural development must be compatible with the quantities of water resources available.
4. The polluters must pay (as water is an economic good).
5. The supply must be based on a sustainable development of all the water resources.
6. The development of the water resources of the Palestinian territory must be coordinated at the national level and carried out at the appropriate local level.
7. The management of the national water sector should be carried out by a responsible body by separating the institutional responsibility to develop the policy from the regulation functions from the services supply functions.
8. The public participation in the management of the water sector should be ensured.
9. The management of water at all levels should integrate the quality and the quantity of water.
10. The supply of water and the management of wastewater should be integrated at all administrative levels.
11. Demand and supply management.
12. Pollution control.
13. Conservation.
14. The Palestinians will defend their interests in relation to securing the rights of the resources shared with other states.
15. The international collaboration for optimal development and use of new resources.

The PWA strategy document evokes somewhat the difficult upheaval in property regimes implied by such a strategy when it recognizes, in the section devoted to national regulations, the need to solve legal, political and cultural complications concerning the fact that the PWA will take over the established private water rights.⁶⁴

Tactical Constraints

The strategy and the water law being developed by the PWA satisfy, as we saw earlier, the sanctioned discourse used towards the international

⁶⁴ *Ibid.*, p .9.

actors. They insist on recuperating the water used by the Israelis but recognize the need for an institutional change that would transform the water property regimes now existing in the Palestinian Areas.

The tactics applied presently by the PWA differ from the strategy that is advocated. This results from the interministerial disputes within the PA, the institutional weakness of the PWA and the fact that this reform of the water property regimes corresponds to a request from abroad. It corresponds to what Jean-Jacques Pérennès calls 'an engineer's logic', a 'drawing board rationality' that seeks an optimal use of the resources in a mathematical and pragmatic way.

The history of the area, however, shows that the water developments, whether they be institutional or infrastructural in nature, have rarely followed a logical, pragmatic and rational path in the past. Thus, the Israeli National Water Carrier follows a path that makes no technical or economic sense, and can only be justified by political considerations that wanted it within the Green Line.⁶⁵ Is it therefore reasonable to expect that such a social and political upheaval will take place simply because it is rational? The relations between the PWA and the other actors involved in the hydropolitical constellations will be examined.

The Relations between the PWA and the Other Ministries

The key-determining element today in the evolution of water control by the PWA is probably found in the relations among the various Palestinian ministries. The fact that the latter try, to this day, to extend their responsibilities as much as possible has been discussed. Within this context, two ministries may expect to play an especially active role: the Ministry of Agriculture (MOA) and the Ministry of Local Governments (MLG). The first could feel concerned by the fact that 65% of the water used by the Palestinians is devoted to irrigation. But, as the control of irrigation totally escapes it as mentioned in the preceding chapter, the MOA does not seem to place much ambition in this direction. This is reflected by the fact that it presents little or no project concerning irrigation development to the donor community and by the *modus vivendi* which has obviously developed in the Gaza Strip between the MOA and the PWA as is illustrated by the granting of permits for new wells via a joint procedure as will be described in the following section devoted to the relations between the PWA and the local actors.

⁶⁵ As it constitutes a river that flows upside down, it consumes a great portion of the energy used every year in Israel.

The MLG controls the municipalities whose mayors and municipal council members are nominated by the PA since no municipal election has yet taken place. The MLG, therefore, presently controls the municipal water utilities. The PWA project to create the five regional water utilities amounts to withdrawing that responsibility from the hands of the MLG and granting it to the PWA. The resistance of the MLG is clear. The refusal of the Jericho municipality to recognize decree no. 38 of 1998, which grants in principle the control of the Ein Sultan spring to the PWA, and the behavior of the Hebron municipality, which seeks to secure funding to drill a well that would supply water to its independent network, are not isolated acts. They pertain to this resistance of the MLG to the PWA. The numerous projects funded nowadays by foreign donors with the MLG as partner contribute to the strengthening of the MLG within this competition, even when the projects do not deal with water. Indeed, these funds allow the MLG to increase its weight, its activity and the client-patron relations that are associated with it.

The PWA's focus on the five regional water utilities stems from two main causes. First of all, it is easier for the PWA to develop its control over wells that are newly drilled and have never been controlled by anybody else in the past. Secondly, the first competition identified by the PWA, from a tactical point of view, is with the MLG concerning the control of adduction water. Thus, even though the strategy of the PWA identifies the competition with Israel as a priority, another competition, with the MLG, becomes more important from a tactical point of view.

The Relation between the PWA and the Local Actors

The PWA is now interacting with local actors essentially in either of two ways. It now controls, in collaboration with the (Israeli) Civil Administration, the pumping quotas ascribed to irrigation wells. Moreover, it grants or refuses the drilling permits after the Joint Water Committee has given its approval. The difference between the situation existing in the Gaza Strip and that in the West Bank is quite clear. As was observed in chapter 1, the West Bank is upstream from Israel - in terms of aquifers - whereas the Gaza Strip lies downstream. Moreover, the Israelis pump water directly from the West Bank aquifers in order to cater to a significant portion of its national consumption. The Gaza Strip, with its salty groundwater, does not represent such an important stake. As a consequence, the PWA has immense pains in obtaining drilling permits from the JWC concerning the West Bank whereas it can act much more freely in the Gaza Strip.

The Gaza Strip now numbers about 2000 wells with permits and over 1900 that are illegal.⁶⁶ The phenomenon of illegal wells increased in an exponential manner after the Israeli evacuation, when over 1500 wells were drilled without any authorization in 1995 alone. The PWA requested that the Palestinian Legislative Council (PLC) impose sanctions against these illegal wells. But the PLC has yet to produce a law in that respect, so the PWA still has no legal possibility to apply sanctions against these wells. Even if such sanctions were allowed legally, it is unlikely that the PWA would have the actual means of imposing them.

When the PWA was created, the irrigation permits were granted by the MOA in the Gaza Strip (as opposed to what was happening in the West Bank where that responsibility was the PWA's). The PWA thus sought to transfer powers away from the MOA in order to be allowed to interact with the well owners in the Gaza Strip. A collaboration now seems to be happening between the MOA and the PWA via the joint granting of new permits.

The PWA had stopped granting any drilling permits in the Gaza Strip in 1995 in order to protect the gravely damaged aquifer. Illegal wells had then been drilled in great numbers, illustrating the weakness of the PA in water control. These wells were mostly drilled by farmers, who can easily dig them overnight since the Gaza Strip soil is sandy and the water lies only 30 to 50 meters below the surface. When a farmer has an illegal well, he can irrigate his fields with free water without being worried by an eventual pumping quota imposed by the PWA.⁶⁷

As the PWA was aware that the multiplication of illegal wells deprived it of any control overpumping, it undertook, in March 1999, the granting of permits once again. This choice was analogous to the legalization of clandestine immigrants in Europe or that of soft drugs' use in the Netherlands. A government prefers to legalize a phenomenon in order to somewhat control it. In mid-May 1999, three permit requests had been examined by the PWA. Every time a team made up of two representatives of the MOA and two representatives of the PWA, went to visit the farmer requesting to drill a well. In Beit Lahiya, a farmer wanted to drill a well within the five dunums of land he cultivated. The joint MOA-PWA team identified a legal well 100 meters away from that farmer's land plot and another well,

⁶⁶ Interview with Jamal Ad-Dadah, PWA, Gaza, 12 May 1999.

⁶⁷ The phenomenon of illegal wells did not become sizeable in the West Bank for several reasons. The soil there is rocky and water can only be found at great depths. The drilling material, in itself quite sizeable, must be kept functioning for several days or weeks, which would give the police ample time to intervene. Moreover, the Israelis largely depend on West Bank water and will make sure that any illegal drilling is interrupted.

an illegal one, 30 meters away. The PWA recommended one of three possible solutions: first of all, let the farmer get his water from the legal well. In case that solution did not prove to be possible, let the farmer get the water from the illegal well. Finally, in case neither of these two solutions proved to be possible, a third solution could consist of granting the farmer a drilling permit. The three solutions and their order of preference were communicated to Nabil Ash-Sharif, who is at the head of the PWA and who was the one to decide.

Elsewhere, at the center of Deir Al-Balah, a farmer wanted to drill a well in the middle of the four dunums he cultivated whereas his neighbor had introduced a request to drill another well in the middle of the three dunums he cultivated. The permit was granted to this second farmer but specified that he must provide all the water necessary to the first farmer in order for him not to have to drill his own well.

The third case, also in Deir Al-Balah, saw the farmer withdraw his permit request because the joint MOA-PWA team managed to negotiate an agreement between the village council and the farmer in order for him to be allowed to use an old well. This was made possible by the fact that Deir Al-Balah now depends on Mekorot for its domestic water consumption and no longer uses that well.

This initiative of the PWA in the Gaza Strip contradicts all logic at first sight as environmentalists agree that the Gaza aquifer is overexploited gravely. In theory, and according to an engineer like 'drawing board' rationality, refusing the drilling of any new well would be more logical. Yet, the history of the last five years has shown that this brings about a situation that is even more uncontrollable since a proliferation of illegal wells then occurs.

This initiative of the PWA therefore has the merit of catering to reality and creating a relationship between the PA and the farmers. It allows an improvement of the management of the resource by introducing a certain mediation between the farmers, which reduces the number of wells being drilled. The PWA plays here a state-like role as it allows for a more efficient mobilization of the resource. It is especially interesting to notice that the PWA chooses deliberately the 'atomization' of its interlocutors.⁶⁸ The PWA employee responsible to evaluate the permit requests himself declared that he preferred to deal with individuals rather than with associa-

⁶⁸ The concept of the 'atomization' of the individual has been defined in chapter 2. A society is atomized when all individuals have direct links with the state institutions, without having to go through the traditional solidarity structures in order to interact with the state.

tions of well owners “because the wells here is fragmented (sic).” Here we observe the PWA using the same tactic as the Jerusalem municipality used in its competition with the JWU, as was detailed in chapter 2. The PWA deals with individuals in order to integrate them in its institutions; it does not attempt to deal with the traditional solidarity structures in which these individuals evolve.

Therefore in the Gaza Strip, much more than in the West Bank, the emergence of a state control of water by the PWA is observed. This raises the issue of the disembedding of traditional institutions managing water from their social, economic and cultural context. The PWA in the Gaza Strip and the Jerusalem municipality in Beit Hanina both illustrate how a modern institution, in the sense given by Giddens as shown in chapter 3, can erode these institutions by bypassing them in order to negotiate directly with the individual. A certain democratic ideal would want to see the PWA start negotiations with these institutions in order to achieve a water management that would suit the greatest number of people. The difficulty entailed by such a task and the weakness of the PWA facing these solidly rooted traditional institutions discourages such an initiative. Bypassing them is both simpler and more efficient.

The Relation between the PWA and the Donors

The role of donors, as full-fledged actors in the international hydropolitical constellation, will be examined in chapter 5. The role played by project funding in the competition among Palestinian ministries as well as the manner in which the PWA tries to use this funding in its own attempt at state territorialization as defined by Faggi will be emphasized.

The donors rarely understand with certainty who is supposed to be their adequate partner in the various projects they fund. Several ministries could often undertake a project. A real competition is waged among these ministries in order to secure foreign funding. Employment generation within a ministry is part of a classical patron-client mechanism and even though donors do not normally fund salaries, they allow the ministries to reallocate their budgets to salaries. On the other hand, a ministry gains power when it becomes the owner of any infrastructure upon the completion of a project. It can then benefit from controlling the access to this infrastructure. It can either seek monetary gain from this access or grant it according to conditions it decides.

Moreover, the projects aiming at developing a strategy for the PWA are used in order to advance the Palestinian territorialization process. In October 1998, for example, a team of World Bank funded consultants spent

an entire day discussing the PWA strategy for the water development of the Jordan Valley that lies mostly in Area C and in military areas. The Israelis will be very reluctant to give it back to the Palestinians. This exercise is thus very theoretical. It was important for the PWA essentially because it served to show the Palestinian claims on that territory. It made no sense from a practical point of view but was fully justified from a territorialization process point of view.

Water and National Interest

The absence of the often-predicted wars for water can be explained in part by the notion of water as a national interest. This is indeed a rare case where the various schools of thought all agree, at first sight.

Objectivists such as Hans Morgenthau consider that the objectives of a foreign policy must be defined in terms of national interest. The latter is defined in terms of relative powers.⁶⁹ Determining the relative power of a nation is often difficult, but the issue of water offers the researcher a break, or so it seems. To an objectivist, the control of resources of good quality water undoubtedly constitutes a source of economic and military power for a state in an arid region.

The subjectivists, who emerged after the objectivist school of thought, maintain that the national interest does not constitute a single objective reality. It rather corresponds to a set of subjective preferences that change when the aspirations of nations' members evolve. How could we deny the importance of controlling and accessing water as a national interest according to that perspective? Indeed, demographic growth and agricultural and industrial development both create an ever increasing demand for water in the Near East, while the rising living standards bring about a greater consumption of domestic water.

Finally, the decision-making approach claims that the national interest can never be objectively measured even if it is defined in terms of power, for this definition remains rooted in subjective values. We therefore must suppose, according to this approach, that political decision-makers undertake actions that reflect their peoples' aspirations and needs. In other words, the national interest would be nothing more than what decision-makers have designated it to be. All decision-makers in the Near East portray water, within their discourse, as a vital national interest.

⁶⁹ Hans J. Morgenthau, *Politics Among Nations: The Struggle for Power and Peace*, 2nd edition, Knopf, New York, 1954.

James Rosenau argued in 1971 that the concept of national interest had never lived up to its initial promise as an analytical tool for several reasons.⁷⁰ First of all, how could an interest be 'national'? How could all individuals and all social groups have a common interest? Second of all, which criteria could be used to determine what constitutes an interest? Finally, how can interests be cumulated once they are identified? Rosenau concluded that the national interest concept had very little future as an analytical tool, although it would still be often used as a political tool.

In the case of water, Rosenau's objections fail since all individual and all social groups need water and the criterion for determining this interest is the need for survival. Thus, exceptionally, all schools of thought agree in their considering water control as a national interest of every entity in the Near East. Given the water scarcity and the demographic growth found in the Near East, the competition among states for the control of water becomes aggravated. And several analysts came to fear a water war. The second generation of researchers who examined water, as was illustrated by the *Introduction and Overview of the Literature*, concluded that the probability of a water war is very weak, observing that the water crises only concerned the development of agriculture, not that of domestic water. Their approach was rational and their conclusion, valid. However, it pertained to the same approach as the one used by the first generation of researchers. The fact that the control of good quality water constituted a vital national interest for every entity in the region was not questioned.

The validity of the equation between the control of water resources of good quality and national interest must be reexamined and Rosenau's remark on the impossibility of formulating a national interest looked at. Although all individuals and all social groups need water to survive, the quantity and the quality necessary varies enormously according to the uses that are made of that water.

In 1994, Avril Alba tried to tackle water under the aspect of hydraulic security. She emphasized the fact that water had always been conceptualized as a state interest and as an issue to be settled among state. Alba noticed, however, that numerous populations in the Jordan Basin experienced hydraulic insecurity, which was not the case for the states themselves. These localized zones of hydraulic insecurity could only lead to conflicts.⁷¹ Alba therefore advocated a consideration of local realities

⁷⁰ James N. Rosenau, *The Scientific Study of Foreign Policy*, The Free Press, Collier-Macmillan Ltd., London, 1971, p. 249.

⁷¹ Avril Alba, *Water in Israel and the Occupied Territories: Toward a Comprehensive Security Agenda*, BA thesis, University of Adelaide (Australia), November 1994, p. 72.

in order to develop a strategy that would truly correspond to a national interest for every state actor.

The PA will be in a very uncomfortable position in relation to the local communities once it extends its power over water. In any case, a territorialization process led by the PA thanks to water control, will deconstruct the local power relations. The fact that such a process can be carried out in a smooth, pacific and democratic way now constitutes a national interest far more important than a simple increased water share within an allocation scheme.

Conclusion

The national hydraulic constellation includes some of the weakest actors concerning water control in the West Bank and the Gaza Strip. As defined by the Israeli-Palestinian agreements, the PA does not have the capacity to produce laws independently from the Israelis. The emergence of a Palestinian national water law now involves an upheaval in existing water property regimes. Evolving within the international hydropolitical constellations, national actors such as the PWA carry out actions that are largely influenced by donors. This interaction does not presently lead to a strengthening of the national sovereignty as opposed to what can be observed elsewhere, such as in the Aral Sea Basin. A centrifugal dynamic is at work through water development, which strengthens the water power of local actors and of Israel. Simultaneously, a centripetal dynamic is also at work through other water development projects, that strengthens the water power of the PA. The PA, because it exists within the framework of the international hydropolitical constellation and because it contains within itself the local hydropolitical constellations, evolves between two parallel sanctioned discourses. One targets the local actors and focuses only on Israel as thief of water rights. The other targets the international actors and adds a dimension of institution building to the discourse on Israel. Two parallel legal constructions are now sketched out, which correspond to the two parallel sanctioned discourses. These two legal constructions contradict each other and remain largely theoretical to this day. One aims at satisfying the donors, and the other aims at satisfying the local elite that now controls water in Palestinian villages.

Therefore, the PWA now advocates a strategy that focuses on the competition with Israel while implementing a tactic that focuses on the competition with other ministries for the control of water.

Chapter 5

International Hydropolitical Constellation

Of the three hydropolitical constellations that were identified, only the international constellation has up to now been targeted by most studies devoted to water in the Jordan Basin, as was illustrated by the review of the literature in the beginning of the book. This constellation will now be examined using the results detailed in the preceding three chapters. As illustrated in figure 2 of chapter 4, the international hydropolitical constellation locks the other constellations into economic, political and financial constraints, which will now be examined one by one. As was shown in the *Introduction and Overview of the Literature*, many researchers have dealt with International Law in the Jordan Basin. Their results will be used in order to examine how the actors attempt at legitimizing their discourses. Indeed, International Law is not constraining; it does, however, contribute to shaping the political discourse and therefore fuels the political constraints.

The financial constraints remain much less studied than the economic and political constraints. They presently have an unprecedented weight over the Palestinian hydropolitical evolution and the mechanisms they involve will have to be examined. The World Bank will be the object of special attention here for, of all the donors, the World Bank has been the most active around the world in relation to institution building concerning water. The Palestinian Areas is no exception. The influence of the World Bank on the process of disembedding traditional institutions regulating water access and water use is therefore immense.

The focus of the scientific community on the international aspect of water in the Jordan Basin provides in itself a topic for investigation. A 'sanctioned discourse', as defined in chapter 4, was constructed by the researchers themselves. This discourse describes the situation in a manner which is not false but which does not allow to push interrogations beyond a certain limit. We attempted to trace the origin of that sanctioned discourse and to understand its construction.

Fabricating the Enemy

In chapter 3, the myth according to which the Israelis had developed a total and complete control over all water access and water use everywhere in the West Bank and the Gaza Strip was discussed. Chapter 3 showed that this was completely true only for 82% of West Bank water. As limited as it may be, some control of water use does exist within Palestinian villages. And it is this very existence of a local control over water that now complicates the reallocation by the Palestinian Water Authority (PWA) of water from irrigation to domestic use, as was examined in chapter 4.

Other myths persist among Palestinians, among the members of the international community who work with them and among many researchers in political science. A second myth explains the water shortages experienced by the Palestinians by the depth of their wells: “the Palestinian wells are generally older and shallower than the Israeli wells. The Israeli wells overpump the water table which dries up.” A third myth maintains that the artesian wells drilled by the Israelis in the Jordan Valley systematically dry up the springs such as the one of Al-Auja.

The paragraph above provides two inaccurate explanations of a real phenomenon: the reduction in flow or the drying up of wells and springs. These explanations are based upon a mistaken perception of the geological structure of the land, portraying it as a land crust that lies upon a big underground lake whose level falls inexorably. The hydrogeological reality is more complex. Water exists at various depths. A well can be drilled and never provide water whereas the neighboring well, half as deep, shows a generous flow.¹ On the other hand, the aquifer feeding the springs is often independent from that feeding the artesian wells. The well sometimes reaches a very deep aquifer that is separated from the aquifer feeding the spring by an impermeable soil. In that case, there is no interference between the well and the outflow of the spring. Interactions are possible but they can be determined only after hydrological and hydrogeological measurements have been made and the geological context is well known. Such interactions are not systematic.² The fact that the aqui-

¹In fact, one never knows, at the moment of undertaking the drilling, whether water will be found or not, as is illustrated by the experience of the German development agency in the West Bank. One of their wells provides the best flow of all wells in the West Bank whereas the other one is a total failure since it never gave any water. One does not try to drill as deep as possible when excavating a well. A hydrogeologist tests the rock fragments throughout the drilling and decides the moment when drilling should be stopped because water has been found.

²Let us note as well that the use of the term 'artesian well' in hydropolitics literature also brings confusion. In a scientific text, an artesian drilling refers to any well whose

fer is overexploited is undeniable and it seems that the water table is globally receding although there is no unanimity among hydrogeologists concerning the rate at which this is happening. This receding of the water table is the result of a global overexploitation problem.

These two myths, within the sanctioned discourse, have allowed the fabrication of an enemy. There is no denial here that Israel has been the enemy of the Palestinians or the fact that it persists in remaining an enemy in spite of the Israeli-Palestinian treaties. Yet, it is necessary to distinguish the 'fabricated enemy.' The 'fabricated enemy' is defined as the perceived enemy according to the analysis carried out by an actor. As this actor does not access perfect information, he identifies his enemy according to a knowledge that is more or less accurate. The circulation of inaccurate information contributes to shaping the analyses of the actors and, thus, to 'fabricating' enemies. Let it be noted that a certain idealist approach could argue that all enemies are fabricated. Dismantling the myths that led to their fabrication would therefore suffice to dissolve the very perception of an enemy. The research does not subscribe to this approach. Indeed, even once these myths are overcome thanks to a more accurate knowledge of the situation, Israel remains for now the enemy of the Palestinians from a hydropolitical point of view because it monopolizes an undue portion of water and because the treaties it has signed with the Palestinians allow it to maintain this situation for now.

A post-modernist approach would maintain, in turn, that it is impossible to completely achieve exact and real knowledge and that any enemy can therefore only be fabricated. However, the postulate of the impossibility of achieving real knowledge does not prevent this reality from existing. This research will therefore refuse the post-modernist approach.

The difference between the enemy and the fabricated enemy must be explained. Israel makes up both from the Palestinian point of view. But the fabricated enemy is that which is perceived within the sanctioned discourse. Knowing the fabricated enemy matters because the protagonists will develop their strategies accordingly and may not be able to perceive

water comes to the surface and flows or gushes forth without any use of mechanical means. In common language, however, the term 'artesian well' is used when the water level in the well is higher than in the surrounding aquifer. For example, when a water table lies between 100 and 200 meters deep and if the water level after drilling has been carried out is 20 meters deep, we speak of an 'artesian well' in common language, but of a 'well in captive aquifer' in scientific language. From an interview with Jean-Marie Barrat, doctor in hydrogeology and director of the Water Data Banks Project funded by the European Union in the framework of the Water Working Group of the multilateral talks.

other enemies. But it is just as important to understand the process of fabrication.

An attempt has been made to trace the origin of the myths that have shaped the fabrication of the enemy within the Palestinian hydropolitical discourse as well as within the research community. This research went as far back as a document published by the United Nations in 1980, which constitutes, as far as is known, the oldest published document carrying the seeds of these myths.³ It specifies that the Palestinian springs and wells were dried up because of the wells drilled by the Israelis who, equipped with powerful machinery, can drill more deeply.⁴ This constitutes an inaccurate explanation. It declares that the limitation of water consumption by the Palestinians in the West Bank and in the Gaza Strip is responsible for the stagnation of irrigated agriculture.⁵ This mono-causal explanation is incomplete. At that time, labor work in Israel was more profitable financially for the farmers than the cultivation of their fields. The structure of the local hydropolitical constellations also often limited the development of irrigation from the wells as was detailed in chapter 3. These factors contributed more to explaining the stagnation of agriculture development, as was shown in 1992 by the fact that 38% of irrigation wells pumped 90% or less of their quota as discussed in chapter 3.

This document of the United Nations also blamed the Israeli wells of the Jordan Valley for the Al-Auja spring drying up.

“The Palestinians have little power to do anything but watch hundreds of their pre-1967 springs and wells, gradually turn saline and then dry up while, in the vicinity, employees of Israeli water authorities use highly sophisticated water pumping and transport systems to irrigate Jewish settlements in the West Bank.”⁶

This discourse would be repeated from then on. The examples given in the document and their accompanying explanations were taken up in numerous publications (often without any acknowledgement of the source) until they had been repeated so much that they came to appear as truths. They are quoted still recently in political studies⁷ and legal studies⁸ that

³ *Israel's Policy on the West Bank Water Resources*, prepared for, and under the guidance of, the Committee on the Exercise of the Inalienable Rights of the Palestinian People, United Nations, New York, 1980.

⁴ *Ibid.*, p. 13.

⁵ *Ibid.*, p. 10.

⁶ *Ibid.*, p. 14.

⁷ See for example *Water, the Red Line*, Jerusalem Media and Communication Center, Jerusalem, 1994.

are otherwise works of good scientific value. Unless a researcher undertakes fieldwork, he will have no means of achieving a more accurate understanding of reality. There therefore exists a fabricated enemy within the sanctioned discourse now existing among the research community dealing with water in the Jordan Basin. Facing a fabricated enemy entails adopting strategies valid for that enemy, not for the real one. Many actors now deploy sub-optimal strategies for that reason.

Within the research community, this sanctioned discourse has had several consequences. It did not allow for the perception of other forms of competition for water other than the Israeli-Palestinian competition, more specifically at the international level and within the framework of a zero-sum game. It focused all attention on numerical data concerning the water quantities present in the aquifers and used by the various parties, numbers that are simply inaccessible to the public.⁹ The economist François Valette has proved that the data officially put out by the Israeli Government concerning its consumption of West Bank water is incoherent and cannot all be true.¹⁰ Moreover, the Water Data Bank Project funded by the European Union within the Water Working Group of the multilateral talks, had to proceed to a harmonization of the measurement methods used in the various governmental departments in order to make it possible to achieve comparable data.¹¹ The harmonization of measurement methods was achieved in 1998 but the results from the measurements were never shared and the project was renamed Water Data Banks (plural). As a consequence, only an approximate value can be granted to the data found in the literature.

⁸ See for example Annette van Edig, *Aspects of Palestinian Water Rights*, Ramallah Center for Human Rights Studies, Ramallah, May 1999, pp. 46-49.

⁹ The most trustworthy numbers are probably those appearing in Greg Shapland, *Rivers of Discord, International Water Disputes in the Middle East*, C. Hurst & Co., London, 1997. A diplomat at the British Foreign Office, Shapland could access better quality data than most researchers.

¹⁰ Valette specializes in the development of mathematical, technico-economical analytical models and his calculations illustrate the incoherence of that data. See François Valette, "Model of Technico-Economical Analysis of Regional Integrated Water Resources Management. Application to the West Bank Case", article presented at the 9th Water Symposium on Water, Stockholm, 11 August 1999.

¹¹ The fact that different measurement methods were used in order to produce the data actually disqualifies all the data published up to that moment. A different result is obtained when a different measurement method is used because each method has a different error margin. It is therefore impossible to establish a quantitative comparison when the data was obtained due to different methods.

The Political Constraints

Within the international hydropolitical constellation, the dominant actor as far as the West Bank and the Gaza Strip are concerned remains, of course, Israel. On 15 August 1967, Military Order No. 92 granted complete authority over all issues concerning water to an Israeli officer named by the Area Commander.¹² This strays from the Israel Water Law but that difference is coherent with the fact that the Israelis never annexed the West Bank and the Gaza Strip. They remained militarily occupied territories and the Israelis never extended their national laws there, as opposed to East Jerusalem and in the Golan, which were both annexed.

The following fall, Military Order No. 158 of 19 November 1967 was going to submit the construction of any new water installation to the prior obtainment of a permit and allow the confiscation of any water resource for which no permit existed.¹³ This is consistent with the Israeli Water Law¹⁴ even though this goes against customary law in Palestine as was illustrated in chapter 3. One year later, Military Order No. 291 of 19 December 1968 was going to invalidate all prior and existing arrangements of disputes concerning water.¹⁵

These Military Orders did grant Israel, in theory, total and complete control of water use and water access in the West Bank and the Gaza Strip. Several law specialists who demonstrated the incompatibility of the Or-

¹² *Military Order No. 92, 15 August 1967, Order Concerning Jurisdiction Over Water Regulations, Amendment to Jordanian Law Concerning Water.* "This vests all powers defined in any Jordanian law dealing with water in the hands of an Israeli officer appointed by the Area Commander. This Israeli official-in-charge assumes full control over water resources. He has the right to authorize a given organization to operate or establish a new water authority, he may control its methods of operation and appoint its head, etc." published in *Israeli Military Orders in the Occupied Palestinian West Bank, 1967-1992*, compiled by Jamil Rabah and Natasha Fairweather, Jerusalem Media and Communication Center, Jerusalem, 2nd edition, 1995.

¹³ *Military Order No. 158, 19 November 1967, Order Concerning Amendment to Supervision over Water Law, Amendment to Water Law 31, 1953.* "No person is allowed to establish or own or administer a water institution (any construction that is used to extract either surface or subterranean water resources or a processing plant) without a new official permit. It is permissible to deny an applicant a permit, revoke or amend a license without giving any explanation. The appropriate authorities may search and confiscate any water resources for which no permit exists, even if the owner has not been convicted." Published in *ibid.*

¹⁴ Bin-Nun, Ariel, *The Law of the State of Israel - An Introduction*, Rubin Mass Ltd., Jerusalem, 2nd edition, 1992, pp. 93-94.

¹⁵ *Military Order No/ 291, 19 December 1968, Order Concerning Settlement of Disputes over Land and Water Amendment to the Land and Water Regulation Law 40, 1952.* "All prior settlements of disputes regarding water are no longer valid. The Military Commander has the jurisdiction to cancel any regulation in the law or any water and land transactions even if these transactions were ratified by the civil courts. The water official is to be given jurisdiction in these matters." Published in *ibid.*

ders with the Geneva Convention denounced them. In practice, however, Israel did not extend its power as far as these Military Orders allowed. From a hydraulic point of view, its occupation was of an imperial type. It stopped at the villages' gates and allowed the persistence of customary institutions in local water management as was observed in chapter 3. Israel essentially used these Military Orders to ensure it could access and control the water not yet exploited in 1967.

After the signing of the Israeli-Palestinian agreements of 1993 and 1994, Israel retained its power over water in two manners. First of all, every Military Order remained in force until a new Palestinian legislation would replace it, as shown in chapter 4. Second of all, as demonstrated in chapter 1, setting up the Joint Water Committee (JWC) allowed Israel to preserve a veto power over any Palestinian hydraulic development, whether it be institutional or infrastructural. The JWC met every second week under the Labor Government, but the coming into power of the Netanyahu Government decreased that frequency to three to four times a year.

Israel and the Palestinians now start the final status negotiations concerning water. Israel cannot afford to admit publicly that it might accept to grant a greater water share to the Palestinians for this would be too costly in domestic popularity. Such political impact explains the spring 1999 declaration made by the Israeli Government according to which, Israel had unilaterally decided not to 'give back' Jordan's water share during the summer according to the mechanism figuring in the 1994 agreement and detailed in chapter 1. The electoral campaign was then in full swing in Israel and such declarations could earn votes, a necessity made even greater by the fact that Israeli farmers had seen their irrigation quotas reduced by 40% during that same spring.¹⁶ Many Israelis were not willing to see cutbacks at home while the water transfer to Jordan would be maintained. Of course, this was an 'exchange' with Jordan as Israel obtains in return the winter flood water from the Yarmouk. But few citizens understood that refinement in the treaty.

Hardly two weeks later, this was solved and Israel ensured Jordan that it would receive its water as promised by their peace treaty. This reversal was carried out discreetly and many Israelis remained convinced that Israel had been strong when facing Jordan and had protected 'its' water.

¹⁶ See for example Amiram Cohen, "Water to Farmers May be Cut by 40%," *Ha'aretz*, 19 March 1999; and Danna Harman and Liat Collins, "Emergency Water Cutbacks Ordered," *The Jerusalem Post*, 12 April 1999.

In fact, the issue of water negotiations within final status negotiations does not rank as important to the parties involved like the issues of land and refugees. Sharif and Qawash declared to the European Union task force on water that Ariel Sharon, then Israel's Minister of Foreign Affairs, had stated to Abu Mazen that he was ready to grant every individual an equal quantity of water. Israel accepting such a solution remains improbable. The next section devoted to economic constraints will show that a more realistic expectation would see Israel agreeing to give the Palestinians the quantity of water which it had already taken away from its own users during the last droughts a decade ago without affecting its GNP in a significant manner.

Palestinians are going into the final status negotiations claiming the backing of International Law. In May 1997, the General Assembly of the United Nations adopted the Convention on the Law of the Non-Navigational uses of International Watercourses whose project was prepared by the International Law Committee. This convention would come into force once 35 states would have signed it.¹⁷ In the meantime, the International Law concerning water use had developed the doctrine of limited sovereignty. This doctrine involves six main principles: the principle of equitable use, no appreciable harm, duty to cooperate, duty to exchange information, prior notification and pacific resolution of disputes.¹⁸ It must be noted that the principle of equitable use does not necessarily mean 'equal use.' The equitable character must be determined according to natural factors, socioeconomic factors, alternative resources, past and future uses and the protection of resources. Also, this principle appears in the 1993, 1994 and 1995 Israeli-Palestinian treaties even though the water allocation scheme appearing in this last treaty for the interim period hardly matches the application of the equitable use principle.

The interpretations of International Law may allow claims that do not seem very realistic. A. van Edig thus maintains that the respect of treaties signed at the time of the Mandate bind Israel, Syria, Lebanon and the Palestinian Authority (PA) as successor states to the British and French Mandatory Powers. According to the treaties signed in 1920 and 1923, the Syrian population must thus have access to Lake Tiberias and enjoy fishing and navigation rights there as well as on the river Dan. According to the same treaties and because "the PA is a successor state to the British Mandatory Power", the author maintains that the PA has the same rights as Israel on Lake Tiberias as well as on the Jordan and the Yarmouk.¹⁹

¹⁷ Annette van Edig, *Aspects of Palestinian Water Rights*, op.cit., p. 5.

¹⁸ *Ibid.*, pp. 7-12.

¹⁹ *Ibid.*, pp. 17-18.

As far as groundwater is concerned, van Edig shows that Israel is supposed to apply humanitarian international law in the West Bank and Gaza Strip, as it appears in the 1907 Hague Convention and in the Fourth Geneva Convention of 1949, which was ratified by Israel in 1951.²⁰ Water is not directly mentioned there but may be considered as public or private property. This incorporates it in the object of restrictions appearing in Articles 46, 52 and 53 of the Hague Convention where water is considered to be private property, and in Article 55 where it is considered by the occupier to be public property. Finally, Article 53 of the Fourth Geneva Convention stipulates that property destruction by the occupier is forbidden except when this destruction is unavoidable in military operations. The author demonstrates that the Israeli Military Orders concerning water violate Articles 46, 52, 53 and 55 of the Hague Convention as well as Articles 46 and 53 of the Fourth Geneva Convention.²¹

According to Joseph Dellapenna, the international custom concerning international waters cannot function in the Jordan Valley because these clauses are wholly inadequate to ensure a sharing of the waters there.²² The Declaration of Principles of 1993 explicitly refers to international custom as it mentions an equitable use as shown in chapter 1. Dellapenna argues that such a vision entails nothing more than an equitable allocation, such as the Johnston Plan for example.²³ This plan describes a water allocation that has, since a long time, become inadequate.²⁴

Dellapenna shows that treaties have succeeded better than custom as tools to manage internationally shared waters. He notices that over 100 treaties based on the rule of limited sovereignty had already been concluded in 1950 by states sharing water resources. Examining the practice, he distinguishes three types of evolutions: agreements not including a formal allocation or joint management, agreements granting allocations to every state and agreements of joint management of international water.²⁵ The first type may simply commit riparian states to share information. This type of treaty is enough so long as water abundance prevails, but does not prevent a conflict in case of scarcity. The second type may involve an allocation

²⁰ Ibid., p. 41. The author specifies that during the Bet El case, the Israeli Supreme Court recognized that the Hague Convention of 1907 should be considered as part of the customary international law and should thus be treated as part of Israeli national law.

²¹ Ibid., pp. 50-64.

²² Dellapenna, Joseph W., "Designing the Legal Structures of Water Management Needed to Fulfill the Israeli-Palestinian Declaration of Principles", *Palestine Yearbook of International Law*, vol. 7, 1992/1994, p. 78.

²³ Ibid., p. 88.

²⁴ See chapter 1 for a description of the Johnston Plan.

²⁵ J. Dellapenna, "Designing the Legal Structures", *op.cit.*, pp. 90-95.

of volumes of water, as was the case in the Johnston Plan or the specification of the quantity of water that must be left in the river. Finally, the third category gathers the least cases even though joint management often eliminates the cost of renegotiating water allocation treaties.

History has already shown that an allocation scheme such as the Johnston Plan does not function in the Jordan Valley. That is why Dellapenna deplored, in 1994, the allocation scheme that was found in the Israeli-Jordanian treaty of that year. He advocated a joint management and proposed a legal framework in order to achieve it.²⁶ Up to now, history has not followed his suggestion, as the Israeli-Palestinian agreement of 1995 did not include anything more than an allocation scheme. Yet, Dellapenna is correct since, sooner or later, any allocation scheme comes to be perceived as unfair by one of the riparian states. As a long-term solution, only the common management makes up a viable option.

The Israeli Eyal Benvenisti joins Dellapenna in his conclusion. Joint management allows riparian states to go beyond the simple water sharing of an aquifer. It allows them to ensure the joint monitoring of the pumping rate, pollution level, situation of wells, and recharge of the aquifer. Benvenisti quotes successful examples of joint management like the one achieved by France and Switzerland who entrusted the management of Lake Geneva to a joint commission since 1978.²⁷

Claiming an allocation scheme that ensures one's state the lion's share remains much more profitable in terms of domestic popularity than considering joint water management. A few examples of such behavior on the part of Israel have been shown. On the part of the PA, the sanctioned discourse must claim water, not the joint management of water. Chapter 4 examined the perilous situation of the PA while facing the traditional water management of local institutions. The PA cannot escape from this discourse.

The discourse targeting the population must be distinguished from that of the plenipotentiaries around a negotiation table. It appears that, up to 1999, the Palestinians essentially insisted on their water rights. During the first sessions of the water working group within the multilateral negotiations, for example, the Palestinians and Jordanians were determined to tackle the issue of water rights which they placed as a precondition to any cooperation and as a key for water management at the regional level. Is-

²⁶ *Ibid.*, pp. 102-103.

²⁷ Eyal Benvenisti and Haim Gvirtzman, "Harnessing International Law to Determine Israeli-Palestinian Water Rights: The Mountain Aquifers," *Natural Resources Journal*, vol. 33, no. 3, Summer 93, pp. 543-567.

rael sought to separate the technical aspects from the political aspects and wanted to leave the discussion over water rights to the bilateral negotiations. In May 1993, Israel accepted to set up a working group within the bilateral negotiations in order to discuss the water rights. In turn, the Palestinians stopped threatening to boycott the activities of the water group between the sessions.²⁸ Israel recognized Palestinian water rights in the Israeli-Palestinian treaty of 1995, but without defining them anywhere in the treaty.

This probably is not the most efficient strategy the Palestinians could choose. As explained in chapter 4, Israel accepted to conclude the Oslo Agreements largely because they were perceived as allowing order to be maintained in the West Bank and in the Gaza Strip at a lesser cost for Israel. The Jewish state will probably accept to yield to the Palestinians a bit more water in order to avoid the development of too much public disorder within the pockets of hydraulic insecurity, such as the Jericho conflict which seriously threatened to degenerate and occasion disorder among Palestinian actors in the fall of 1999. Israel probably will not accept to grant a larger share of water to the Palestinians simply to honor International Law. In the absence of external pressures, Israel will probably grant only the quantity of water that is sufficient to maintain order and calm. As observed, the Israeli occupation of the West Bank and the Gaza Strip was carried out in an imperial fashion from a water point of view. Perhaps what is being observed here is a confirmation of the theory of P. Kennedy. He concludes that a state will keep on extending its control over other territories so long as the cost of that occupation (whichever type it is) is less than the gains brought about by that occupation.²⁹

Claiming all the water of the West Bank and Gaza Strip may antagonize the foreign states that might otherwise support the Palestinians during the negotiations. The custom prescribes an equitable share when a shared aquifer is concerned.³⁰ In case the Palestinians alienate international support, Israel will probably only allocate them the minimum quantity, which it judges to be sufficient in order to maintain order. Another tactic could be more successful: the Palestinians could request a bit more than that minimal amount even though the allocation would then inevitably have to

²⁸ Joel Peters, *Pathways to Peace - The Multilateral Arab-Israeli Peace Talks*, The Royal Institute of International Affairs, London, 1996, pp. 17-18.

²⁹ P. Kennedy, *The Rise and Fall of the Great Powers*, London, 1988.

³⁰ The recharge zone (that is the surface infiltrated by rainwater and the territory this water flows through before reaching the aquifer) of the aquifer that lies under Israeli soil is largely localized in the West Bank. When the recharge zone is separated from the aquifer by an international border, it becomes a shared aquifer. See Barberis, Julio A., *International Groundwater Resources Law*, FAO Legislative Study, no. 40, FAO, Rome, 1986, p. 5.

be renegotiated a few years later. Such modest claims could bring much support from foreign states and could allow the Palestinians to receive more water. This alternative tactic would, however, remain locked in the logic of the allocation scheme which is not the globally optimal solution.

The water sharing made official by the 1995 agreement constitutes a trap for the PA. The water share granted was already largely controlled by the local actors and a shift occurred: a competition for water between Israel and the Palestinians turned into a competition between Palestinian protagonists. Just as the Balfour Declaration was a promise made by Great Britain of territories Great Britain did not control, the water sharing of 1995 was a transfer to the PA of water management responsibilities the Israelis did not exert. It is expected that the Israeli negotiators will reproach the PA for claiming more water when it does not even yet control the water that was already granted to it for the interim period by the 1995 agreement. This will weaken the Palestinian position.

The Economic Constraints

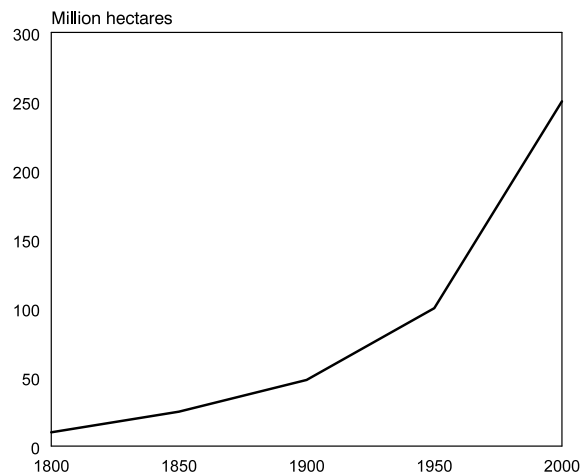
The alarmist theses of the early authors dealing with water in the region were largely tempered by arguments pertaining to international economic constraints. Two worldwide trends verify themselves in the region: the growing urbanization of the population and the growing presence of international trade. The first trend increases the demand of domestic water which, in case of localized scarcity, creates a tension between the irrigating farmers and the domestic users. The second trend offers a solution for this problem thanks to the importation of foodstuff.

Sandra Postel showed that city dwellers represented 46% of the world population in 1996 and are expected to represent 59% in 2025.³¹ The Palestinian Areas do not escape this trend. At the planetary level, about two-thirds of water extracted from rivers, lakes and aquifers was devoted to irrigation. The possibilities of finding new water sources are becoming rarer as the most easily accessed water has already been used. A greater competition results, at the world level, between cities and farmers for obtaining the water.

On the other hand, demographic growth in the world has led to an almost exponential growth of irrigation during this century as illustrated by the following graph in figure 1:

³¹ Sandra Postel, *Pillar of Sand*, op.cit., p. 112.

FIGURE 1 – Number of Irrigated Hectares in the World since 1950³²



The competition between cities and irrigating farmers is more severe wherever water is rare. J.A. Allan has shown that the most water scarce states have already spontaneously turned to the importation of foodstuff in order to solve their problem.³³ Whether this is done explicitly or not, this constitutes a reallocation of irrigation water to domestic use. At the macroeconomic level, such a reallocation is totally justified. A cubic meter of water can be used to produce a greater added value in the services and industry than in irrigated agriculture.

Ricardo's theory of comparative advantages would prescribe, in the case of water, that scarce areas end irrigated agriculture and instead use water in services and industry, which would generate a wealth that would allow the importation of the food that is no longer produced. The states of the Jordan Basin have already proceeded a long way in that direction as Jordan now imports 91% and Israel imports 87% of their cereals.³⁴ The *Introduction and Overview of the Literature* already detailed the concept of 'virtual water' when reviewing the work of Allan³⁵ and showed that his conclusions bring him to advocate both a sectoral reallocation of water

³² *Ibid.*, p. 41.

³³ J.A. Allan, "Watersheds and Problemsheds: Explaining the Absence of Armed Conflict over Water in the Middle East", *Middle East Review of International Affairs*, vol. 2, no. 1, (#5), March 1998, pp. 1-4.

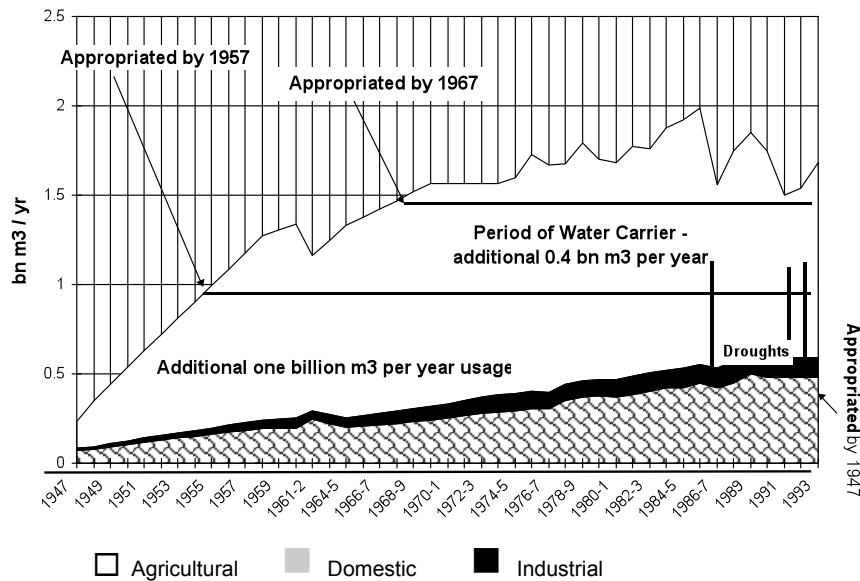
³⁴ Sandra Postel, *Pillar of Sand*, *op.cit.*, p. 130.

³⁵ 'Virtual water' is contained in imported foodstuff. It includes both the water physically contained in that food, and all the water necessary to produce that food.

from irrigation to domestic use and a cereal importation concerted policy for the Middle East states in order to ensure their food security as opposed to the current illusory self-sufficiency.

Allan has especially studied the importance of water in Israeli economy. The numbers he uses are either put out by the Israeli Bureau of Statistics or come from his own evaluations. The data put forward by the Israeli Government concerning its consumption and its water provision are not coherent. Allan's analysis nevertheless does produce some useful conclusions. The author shows the proportionally decreasing water usage for irrigation compared to domestic and industrial uses since the end of the 1960s, as is illustrated in the graph appearing in figure 2:

FIGURE 2 – Israeli Water Consumption by Sector, 1947-1993, showing the impact of the 1987 and 1992 droughts on sectoral water allocation ³⁶



Source: Abstract of Statistics of Israel and J.A. Allan.

A noticeable drop in agriculture water consumption appears between 1989 and 1991. These were drought years in the area, a cyclical phenomenon that

³⁶ J.A. Allan, "Water in the Jordan Catchment Countries: A Critical Evaluation of the Role of Water and Environment in Evolving Relations in the Region", MEWREM occasional papers, SOAS, p. 46.

is recurrent every ten years. The Israeli Government had thus cut the water quotas granted to the farmers. Chapter 1 showed the very flexible institutional mechanism which Israel has adopted, and which allows it to proceed to such changes with great speed. Allan shows that the economy evolved between 1959 and 1991 towards a decreasing weight of agriculture in the Israeli GNP. This evolution made it possible to cut into allocations to irrigation without significantly affecting the GNP. Israeli consumption picked up again as early as 1992 and remained at a maximum since then. Allan observes that this increase in water consumption coincided with the beginning of the secret talks in Oslo. He therefore hypothesizes that Israel deliberately brought its water consumption to a maximum in order to enter final status negotiations while showing maximum water needs. Israel will have to cede a certain quantity of water to the Palestinians, hypothesizes again Allan, and it is easier to enter negotiations while already consuming the maximum. Israel will grant the Palestinians, according to this reasoning, neither more nor less than the quantity it has already deprived its agriculture of between 1989-1991 as it has already proved to itself that its economy can do without this quantity of water.³⁷

Allan's arguments are convincing. Had Israel maintained its consumption at the 1991 level, it should now decrease it even more if it grants water to the Palestinians during final status negotiations. In addition to Allan's arguments, Israeli plans for a strong demographic growth in the next few years because of a combined effect of the birth rate and immigration should also be considered. To keep up a high irrigation water consumption even though agriculture contributes a nearly insignificant portion of the GNP allows it to justify a high water demand. The Israeli Government already knows that it will be able to reduce easily this allocation to agriculture in order to provide domestic water to the thousands of new Israelis it hopes to welcome soon. It therefore matters for Israel to ensure that it will then access all of the water it consumes today. If Israel brought its agriculture to an end today, its water consumption would drop drastically as the preceding figure showed and it would be more difficult for Israel to guarantee the provision of domestic water for that future population during the final status negotiations. In other words, it can be hypothesized that Israel now keeps up its irrigation water consumption at a high level in order to ensure its future control of that water, not in order to achieve direct economic use.

This last hypothesis is supported by the fact that Gershon Baskin's proposal from the summer 1999 did not receive any feedback from the Israeli authorities. Baskin advocated an economically realist solution during the

³⁷ J.A. Allan, communication delivered in Birzeit University on 29 April 1999.

1999 drought.³⁸ Observing that the cost of Palestinian agricultural labor is lower than that of agricultural labor in Israel, he suggested that Israel 'give' its irrigation water to the West Bank and Gaza Strip Palestinians. This would generate employment among Palestinians from the Occupied Territories who are heavy consumers of Israeli products. As agriculture only weakly contributes to the Israeli GNP and as it contributes 33% of the Palestinian GDP,³⁹ such a reallocation of irrigation water from Israeli farmers to Palestinian farmers would not hurt the Israeli GNP much. It would allow the Israelis to buy cheaper vegetables than those generally cultivated in Israel. It would also allow, according to a Keynesian logic, to increase the sales of consumer goods to the Palestinians, which would in turn enrich the Israeli economy.

This proposition was unacceptable, probably for two reasons. First of all, Israel wants to keep up its irrigation water consumption both in order to start final status negotiations from a maximum position and in order to ensure a water 'reserve' from which it will be able to draw the domestic water necessary for the thousands of immigrants to come. Second of all, even if Israel gave today irrigation water to the Palestinians, no Palestinian institution as of yet exists that could manage it at the national level and channel it to their farmers according to the logic of the Israeli Water Law that pervaded Baskin's proposal.

In conclusion, the international socioeconomic constraints show that, facing the present demographic increase, irrigation should decrease drastically in Israel and the Palestinian Areas in the next few years. Institutional mechanisms exist in Israel in order to operate such a transition. The Israeli economy will be able to absorb the manpower ejected from agriculture. However, chapters 3 and 4 showed that these institutional mechanisms do not yet exist in the Palestinian Areas. As irrigation water is controlled there by the local establishment, the reallocation will be the object of perilous competition among the local actors on the one hand and the PA who needs the support from these very actors on the other.

The problem of the absorption of the manpower that will eventually be ejected from agriculture is much more difficult in the West Bank and Gaza Strip than in Israel, as is illustrated by the conflict that now simmers concerning the control of the Ein Sultan spring in Jericho. The new water uses in the tourism sector in Jericho probably generate a greater revenue

³⁸ G. Baskin is co-director and founding member of the Israeli Palestinian Center for Research and Information (IPCRI) in Jerusalem/Bethlehem.

³⁹ Agriculture also employs 30% of Palestinian manpower and generates 25% of Palestinian exports. See Adel Zagher, *Foreign Aid and Development in Palestine*, Jerusalem Media and Communication Center, Jerusalem, March 1999, p. 62.

per cubic meter of water used. But that revenue is not presently redistributed among the socioeconomic actors who benefited up to now from the water use, that is, the irrigating farmers. An in depth economic study of the revenues generated and distributed in Jericho lies beyond the scope of this work. It could be highly interesting to precisely determine the revenue generated when a cubic meter of water is used in tourism, the revenue generated when the same cubic meter is used in irrigation and the proportion of that revenue that is redistributed within the Jericho area. The permit policy practiced by Israel must be kept in mind. A Palestinian irrigating farmer who loses his revenue because he no longer has water cannot find work in Israel unless he receives a permit. If the wealth generated in the tourism sector is reinvested abroad, in Israel or elsewhere, the manpower ejected from agriculture by the sectoral reallocation of water becomes excluded from accessing the wealth generated by the reallocation. Thus a serious risk of seeing the sectorial reallocation of water from irrigation to services exists, generating a greater wealth at a world level while impoverishing and deepening the inequalities among incomes in the West Bank and Gaza Strip.

The Financial Constraints

Chapter 4 discussed the massive foreign aid that reached the Palestinians since 1994. Already in 1993, \$2,996.32 million was promised to the Palestinians for the period between 1995 to 1998, while at the Washington conference on 30 November 1998, donors pledged another \$3.8 billion over the following five years. The United States then committed themselves to increasing their contribution from \$500 million to \$900 million.⁴⁰ Other commitments increased the amount that was initially promised in 1993 to \$3,435.995 for the period between 1995 to 1998.⁴¹

The foreign aid to the Palestinians is dangerously high. In 1995-1996, this aid amounted to 17% of the Palestinian GDP.⁴² It brings about a certain dependency on the part of the Palestinians and makes them vulnerable economically to the eventual departure of the donors. The danger of economic dependency remains less than the consequences of developing without democracy, which this aid allows.

The Holst Fund should be mentioned here, named after the late Norwegian Minister of Foreign Affairs Johan Jurgén Holst. This fund is used to cover the cost of setting up the PA as well as its recurrent costs. The reve-

⁴⁰ *Ibid.*, p. 5.

⁴¹ *Ibid.*, p. 18.

⁴² *Ibid.*, p. 48.

nues of the PA generated by taxes collected in the Palestinian Areas do not suffice to pay for the recurrent costs such as those of the salaries paid to the civil servants and the administrative costs.

The Holst Fund proved to be necessary when, for example, the Israelis refused to transfer the tax money to the PA. In those instances, it provided a very rapid mechanism to bring money to the PA. Only four days are necessary for requested money to reach the field, and this is the only urgent aid mechanism presently in existence. The Holst Fund also allowed the rapid funding of employment generating programs when the Occupied Territories were under closures. Even though the Holst Fund allows for the survival of the PA, no one, even in the PA, knows from which donor a particular money transfer comes from. Canada provides about 25% of its total aid to the Palestinians through the Holst Fund, as an 'invisible donor.'⁴³

The Holst Fund has a dangerous side-effect: it has allowed the survival of the PA in difficult conditions but it has also allowed it to govern without having to show responsibility to its population since it does not spend the money of its own tax payers. This is a phenomenon analogous to the one observed in the oil states. As the citizens do not pay taxes, the government does not have to be responsible to them. Erica Sora Weinthal similarly observed how foreign aid granted to the states in the Aral Sea Basin allowed them to avoid a democratic development.⁴⁴ Moreover, this aid provides 'conflict dividends' rather than 'peace dividends' as is often put forward. The donors will indeed stop their funding when the Israeli-Palestinian conflict will finally be solved. The Palestinian Areas, with a GNP of \$4,100 million in 1996, that is a GNP per capita of \$1,700 do not justify such a priority within the development aid framework compared to numerous states in the Third World.⁴⁵ The PA has become dependent on funds that are linked to the continuation of a conflict rather than to the disappearance of that conflict.

The foreign aid constitutes a real risk for the political Palestinian development. The manner in which this aid affects the present hydropolitical constellations must be examined. The donors who fund projects in that sector will first be identified, and the examination of their hydropolitical

⁴³ Rex Brynen, "Canada and the Middle East Peace Process", in *The United States and Canada, Political Systems, Policy Making, and the Middle East*, PASSIA, Jerusalem, 1998, p. 117.

⁴⁴ Erica Sora Weinthal, *Making or Breaking*, op.cit.

⁴⁵ The GNP amounted to \$5,000 million in 1992 and the per capita GNP amounted to \$2,700. The drop was essentially due to the losses entailed by the closures imposed by the Israelis. The mere lifting of the closures would thus be enough to allow the economy to pick up. All these numbers are in constant dollars for 1995 and are quoted from Adel Zagher, *Foreign Aid*, op. cit., pp. 76-77.

agendas when they exist as well as the mechanisms that determine and limit their actions will then be examined.

Concerning the period between 1994 to 1998, \$453.904 million was promised to the water and wastewater sector, that is 13% of the total international financial commitments. A total of 68% of that amount, i.e., \$306.427 million, was actually disbursed.⁴⁶ The most important donor in that sector during that period was the United States, who disbursed \$133.471 million, i.e., 44% of the total that was spent. They were followed by Germany, who spent \$81.91 million in the same sector, i.e., 27% of the total. Most of the American and German funds went to public investment. Only a negligible portion was devoted to technical assistance. Japan came third with \$18.274 million, i.e., 6% of the total disbursed. The World Bank, the United Kingdom, Norway, Italy, France and Belgium each contributed less than 5% of the total amount disbursed. Finally, Australia, Austria, Canada, Finland, the Netherlands, Spain, Sweden and the UNDP contributed each less than 1% of the total disbursed.⁴⁷

The donors' impact on the Palestinian hydropolitical evolution is not directly proportional to the sum they spent in that sector. The choice of their partner and the nature of the project being funded are much more vital criteria. The water infrastructure projects are very costly whereas the projects aiming at modifying the water management method are much less so. Both types of projects have an impact on the hydropolitical evolution. Both unavoidably feed either the centrifugal logic or the centripetal logic described in chapter 4. Whether these projects constitute infrastructure works or institution building projects, they modify the existing hydropolitical constellations and strengthen or weaken the power of some actors within these constellations.

Every donor has his own political agenda and his own functional mechanisms that limit and influence a project's achievements. The coordination among donors has up to now left a lot to be desired, as A. Tamimi deplored in December 1997 when he pointed at the obvious overlap between five projects that were respectively funded by USAID, France, Norway, the World Bank and Germany which all planned in part or in whole, to develop a water master plan for Ramallah.⁴⁸ Chapters 2 and 4 already detailed the issue of the two parallel pipelines bringing water to Hebron, one being funded by USAID and the other by Germany. Even though this

⁴⁶ Ibid., p. 18.

⁴⁷ Ibid., p. 33.

⁴⁸ Urooj Amjad, *Water Planning in Ramallah*, MA thesis in urban planning, Virginia Technical University, defended on 11 November 1999.

overlap does not only result from a lack of coordination among the donors, clearly a better coordination at the very start of the two projects would have contributed to reducing the wastage and the negative political effect of that development.

After the Frankfurt conference in February 1999, the donors decided to improve their coordination. The German embassy gathers the Palestinian ministries' representatives and the various donors interested by the water sector about three times a year. Donors essentially try to use this opportunity to exchange information concerning the projects and to understand which ministries are empowered to carry out which tasks like, for example, who, between MOPIC and the PWA, should be their partner. Given the competition among the ministries to extend their powers as much as possible, the donors rarely receive a clear answer to these questions.

Every donor has his own policy and his own internal constraints, but the 'delivery constraint' must be emphasized, as it exists at a greater or lesser degree among all the donors. The delivery constraint will be defined here as the obligation for the donor to spend his money within tight deadlines. The delivery constraint emerges as a determining element in understanding the action of donors in the Palestinian Areas. These deal with sizeable budgets which must be exhausted by few managers working in difficult conditions. The obtainment of permits is often a very slow process for, as mentioned in chapters 1 and 4, Israel must give its agreement for every infrastructure construction permit and the manager who has not exhausted the money that was committed for a given year is blamed for not having worked well. Given the delivery constraint, heavy infrastructure work is attractive as it allows colossal sums to be spent. Pouring concrete generally provides the activity that will spend the most money in a minimum length of time. This largely contributes to explain the preference granted to infrastructure as opposed to local conflict resolution and conflict prevention projects, whose necessity clearly emerges from what was depicted in chapters 2, 3 and 4.

The delivery constraint also implies that a single manager must deal with several big projects at once. These may vary from hospital construction to agricultural land reclamation. The managers responsible for water projects thus rarely have the time necessary to understand all the hydropolitical aspects at stake. Their workload simply does not allow it. The projects that are carried out thus sometimes reach objectives that were not necessarily planned within a global policy on the part of the donor, but rather stem from the ignorance of the managers who were involved.

The delivery constraint has led to a subcontracting phenomenon. Given a deadline he cannot possibly honor, the donor 'gets rid of' several million

dollars by entrusting a project to another organization that will ensure its management in exchange for a percentage in administrative costs. Several bilateral donors, but also multilateral donors such as the EU, have entrusted their funds to the United Nations Development Program/Program of Assistance to the Palestinian People (UNDP/PAPP). The UNDP operates in the West Bank and the Gaza Strip with very little of its own funds. Most of what it spends comes from 'trust funds', that is from a donor that entrusted a sum to it in order to ensure a specific project is carried out.

Japan thus gave \$10 million in trust funds to the UNDP/PAPP in 1998 and renewed its contribution in 1999. The agreement detailing the conditions of the trust fund specifies the percentage, generally about 8%, of the total sum that will be paid to the UNDP in order to cover its costs. The UNDP receives that percentage only on the basis of the sum that is disbursed. Thus, if Japan commits \$1 million within a trust fund to carry out a given project with a one year execution calendar and if the UNDP has only disbursed half of the sum once one year has elapsed, it will only receive 8% of this half.

This system encourages the UNDP to disburse the funds while honoring tight deadlines. If it cannot disburse the funds it 'loses' the revenue, which it was counting on for the following year and must proceed with laying off staff when too much expected revenue has been lost. The efficiency of the UNDP to disburse is thus very great. As the UNDP manages big budgets, it undertakes mostly infrastructure works that allow for the rapid disbursement of the money. Such works are subject to the obtainment of permits by the Israeli authorities and the obtainment of these permits is often delayed. When the delay becomes too long to respect the execution calendar, alternative methods to disburse the money must be found. In conclusion, the UNDP sells the other donors a delivery service to which they resort when they are incapable of sustaining the disbursement rhythm, which their budgets impose on them.

The delivery constraint now weighs heavily on all of the managers employed by the donors in the West Bank and the Gaza Strip. It is hardly compatible with the unavoidably slow process of disembedding centuries-old institutions from their local contexts and with the accompanying patient negotiations with the local actors. It is often even hardly compatible with the development policy of the donor himself. Many Palestinians have understood this constraint on the donors and use it to their benefit. Some Palestinian officials now refuse the amount of money offered by one donor because they consider they can obtain more, whether it be from that same donor or from another one. The agreement of the PA is essential for any project to be carried out, even if the partner is an NGO. The PA

knows the donors must spend their money urgently; it consequently brings the bids up.

Although the donors all share at various degrees the delivery constraint, they each have their own hydropolitical agenda and their own specific constraints.

The United States

The biggest donor in the water sector, the United States, has a tied aid.⁴⁹ Sarah Roy devoted her Ph.D. thesis to study the American aid given to the Palestinians in the West Bank and Gaza Strip.⁵⁰ She investigated the history of American development aid since its origin in 1944. Two laws, the Mutual Security Act in 1951 and the Foreign Assistance Act in 1961 required that the development aid be used to build economic structures and political alliances in friendly countries. The fundamental orientation of American aid took shape in 1956 when the senate ordered a study from Max Milliken and Walt Rostow whose theory of the stages of growth was to become famous. This study concluded that the delivery of an economic aid within a global assistance program would bring economic growth to the Third World, which would be useful to counter the Soviet influence in poor countries. The authors recommended to the American Government to invest in big infrastructure programs. This recommendation seems to have been followed for the project of the construction of the King Abdullah Canal in Jordan started two years later thanks to American funds.

In 1961, President Kennedy authorized the establishment of the USAID within the state department, which tied the structure and the operation of economic aid to the foreign policy.⁵¹ During the 1970s and the 1980s, new laws came to amend the first ones to introduce a notion of growth with equity but the basic structure, the goal and the function of American aid remained unchanged.

Sara Roy showed that, in 1995, the aid brought by USAID in the West Bank and in the Gaza Strip came through the Economic Support Fund (ESF), which granted aid on the basis of American security interests in order to maintain the economic and political stability of governments that were favorable or at least not hostile to the United States. In 1980, the

⁴⁹ This means that every piece used in the projects must be bought in the United States, including the cement pipes that compose the pipeline laid down between Bethlehem and Jerusalem.

⁵⁰ Sarah Roy, *Development Under Occupation: A Study of United States Government Economic Development Assistance to the Palestinian People in the West Bank and Gaza Strip, 1975-1985*, Ph.D. thesis, Harvard University, 1988.

⁵¹ Sarah Roy, "US Economic Aid to the West Bank and Gaza Strip", *Middle East Policy*, vol. IV, no. 4, October 1996, p. 52.

Congress passed the International Security and Development Cooperation Act, which combined the ESF, military assistance and development aid within a single law concerning foreign aid. This limited USAID even more in the development of its policy, as it had to first cater to political considerations rather than follow developmentalist approaches.

The presence of American development aid in the West Bank and in the Gaza Strip started in 1975 when, in the aftermath of the War of 1973, the United States wished for an Arab-Israeli rapprochement. Nixon bypassed the Congress' refusal to grant aid to Syria by creating the Middle East Special Requirements Funds (MESFR). In 1975, \$1 million from that fund was directed for the first time by the American Government toward the West Bank and the Gaza Strip in order to fund development projects. American NGOs were entrusted with the conception and the execution of these projects.⁵²

Up to 1994, the United States remained the only donor who allowed Israel to play a role in the project approval process.⁵³ Even though there was no legal basis for the participation of Israel in an American aid program, the NGOs had to submit all of their project proposals to the Israeli Ministry of Labor and Social Affairs. This ministry conveyed the project proposals to the Israeli Ministry of Defense whose approval was necessary.⁵⁴

Israel did not approve the projects that would reduce the Palestinian dependency on the social and economic infrastructure that was set up by Israel in the Occupied Territories. This observation matches the considerations on the state territorialization process led by Israel over the West Bank and the Gaza Strip. However, Israel approved more easily the projects located in villages showing 'good behavior', where, for example, no Palestinian NGO worked. In fact, Israel essentially approved the projects that concentrated on domestic water, electricity, roads and health in order to preserve the structural integration of the Palestinian economy into its own economy. Israel approved very few projects in the fields of agriculture and industry, which could have led to a Palestinian economic development.

The American budget swelled in an exponential manner starting in 1993. The yearly \$1 million of 1975 was transformed into an annual \$75 million between 1994 and 1998.⁵⁵ The American aid remains, however, strongly

⁵² American NGOs such as CRS already worked in the West Bank before 1967, but they were not bringing development aid using American government funds.

⁵³ *Ibid.*, p. 56.

⁵⁴ *Ibid.*, p. 56.

⁵⁵ *Ibid.*, p. 58.

conditioned. The PLO commitments to the Compliance Act of 1993 and the Middle East Peace Facilitation Act of 1994 required the biannual obtainment of a certificate to be delivered by the state department stating that the PLO respected the Oslo Agreement. In May 1997, Jesse Helms and Benjamin Gilman protested to Secretary of State Madeleine Albright against the death penalty that had been announced as punishment for the Palestinian who would sell his land to Jews. As we saw in chapter 4, such a law could not possibly have come into force thanks to the mechanism detailed in the 1994 agreement. This announcement concerning the death penalty was therefore not produced by the legislative process. The certificate of respect of the Oslo Agreement was nevertheless not renewed on 13 August 1997. The PLO office in Washington was closed and its staff was sent on vacation.⁵⁶ Given the existing mechanisms that grant a large role to the State Department and to Israel in the USAID projects in the West Bank and in the Gaza Strip, what can be said of the American hydraulic projects undertaken since 1995? The Palestinians owe the Americans the first hydraulic network entirely independent from the Israeli network. This shows a complete reversal compared to the policy described by Sara Roy according to which only the projects integrating Palestinian villages into Israeli networks were accepted. The Americans are now busy setting up the first real territorialization process to be carried out by the PA.

The manner in which this process is carried out should be examined. At the time of writing this research, the Palestinian who owned the land on which the wells were drilled, thanks to American funds, had not yet been compensated by the PA. In principle, the PA was to expropriate and compensate these landowners, but this was not followed through even though the construction work was carried out because of the delivery constraint that placed very tight deadlines. During the drilling, some owners came regularly to claim money from the Jordanian contractor to whom the American company had subcontracted the task. This contractor integrated these payments into the costs of the project.

Thus, while USAID funds elsewhere projects in support of democracy in the Palestinian Areas, its pipeline project was carried out without allowing a typically democratic process to take place. USAID could have refused for the drilling to be undertaken before the owners were compensated. This would have been coherent with the goal of democratic construction. Other goals obviously predominated: that of increasing the water provision to Palestinian city dwellers of course, but also that of equip-

⁵⁶ Adel Zagha, *Foreign Aid*, op.cit., pp. 56-57.

ping the PA with an independent hydraulic network. Both the productive logic and the strategic logic defined by Faggi are found here. The strategic logic seems to entail the creation of an independent Palestinian entity, not necessarily a democratic Palestinian state.

The World Bank

The trends described in the section devoted to the economic constraints concerning the evolution of urbanization and that of irrigation at the world level have worried the World Bank for several years. It adopted a policy towards hydraulic development as early as 1993 and continues today to be preoccupied with the planetary management of water through the World Water Vision. Even though the World Bank grants a much lesser proportion of funds than the United States to water development in the West Bank and Gaza Strip, it now plays a key role in the modernization process, as defined by Giddens, of the Palestinian institutions controlling water. The policy of the World Bank towards water will first be examined before looking at its activity in the Gaza Strip and the manner in which it now plays in the Palestinian institutional evolution.

In 1993, 22 states benefited from less than 1,000 cubic meters per year per capita and 18 others benefited from less than 2,000 cubic meters per year per capita. Agriculture consumed 69% of the water used on the planet, a proportion that rose to 80% in developing countries; industry used 23% of the total water consumption whereas domestic use only took up 8%.⁵⁷ The World Bank then identified three general problems in water management everywhere in the world, problems that were of course more acute in those states that were poorer in terms of water. First of all, the Bank deplored the fragmentation of the public investments, as well as the fragmentation of the programming and management of the water sector. It noticed that the interdependencies among organisms, jurisdictions and sectors had not generally been sufficiently taken into account. Second of all, the Bank identified an excessive dependence on overburdened public organisms that had not been able to recognize the necessity to practice prices that were economically realistic. These organisms, the World Bank concluded, had generally neither assumed the financial responsibility nor allowed the participation of the users nor catered to the needs of the poor. Finally, the World Bank noticed that the public investments and the regulations generally did not take sufficiently into account the water quality, health and the environment.⁵⁸

⁵⁷ World Bank, *Gestion des Ressources en eau, Document de politique générale de la banque mondiale*, World Bank, Washington, DC, 1993, p. 28.

⁵⁸ *Ibid.*, p. 10.

The Bank concluded with the need to reform the global legislative and regulatory frameworks:

“The Bank will help the governments to set up a solid juridical and regulatory framework in order to deal with the issues of pricing, monopoly, protection of the environment and other aspects of water management. Similarly, it will support the adaptation of institutional structures at the national and regional levels responsible for coordinating the formulation and the application of policies tending to improve the water management public investments and planning of drought mitigation programs. In many countries, the institutional reform will essentially be carried over the hydrographic basins as appropriate for the analysis as well as for the coordination of the management. These dispositions for coordination are especially important in countries with a federal structure, where the governments of provinces or states control the management of water resources located on the territory falling under their jurisdiction. In these countries, before committing funds for operations that have important effects among states, the Bank will ask for the adoption of a legislation or of other appropriate dispositions in order to set up an effective coordination as well as set procedures in the attribution of water.”⁵⁹

In the event the borrower state does not progress sufficiently in achieving ‘priority actions’ such as setting up an adequate institutional framework, the Bank will limit its loans to the provision of drinking water to the poor and to water conservation.⁶⁰ The Bank will prepare guidelines on the strengthening of capacities intended for the states wishing to formulate strategies for water resources management as well as on the best ways to establish coordination mechanisms among riparian states, on general economic analysis models for the hydrographic basins and on the best management practices of water users’ associations.⁶¹

The World Bank does not systematically advocate the disengagement of the state. Instead, when water is concerned, the Bank grants an important role to the intervention of public authorities in its plans for water management. First of all, the need for great amounts of capital for the water infrastructure tend to create natural monopolies that thereby introduce the need to regulate in order to avoid an abusive water pricing and allocation. Second of all, the size of the investments and the gestation period, the Bank concludes, discourages private investors. Also, the use of surface water and that of groundwater are interdependent. Finally, flood control

⁵⁹ *Ibid.*, p. 14 (author’s translation).

⁶⁰ *Ibid.*, p. 20.

⁶¹ *Ibid.*, p.21.

and the control of water related diseases constitute public goods whose utilization costs can hardly be charged on an individual basis and the strategic importance of water for security and development cannot be ignored.⁶²

The water management model advocated by the World Bank thus wants a centralization concerning the global analytical approach and a decentralization of the service provisions.⁶³ The planning of water use, the decisions of water allocation and of sectoral reallocation according to this model must be determined at the national level and even at the level of the hydrographic basin thereby gathering several states, in some instances. The decentralization advocated by the World Bank does not apply to the decision-making concerning water price, water distribution among users and sectoral allocation. The decentralization must be carried out only concerning tasks such as the payment of bills. This last activity is considered to be better carried out through the intermediary of users' association for they can exert the necessary social control.⁶⁴

The institutional model advocated by the World Bank is thus exactly the opposite from the institutional reality that was described up to now in the case of the West Bank and the Gaza Strip whether it be on the local, national or international level. This model could be described, according to Giddens' terms, as one of radicalized modernity. The institutions managing water in this model are totally disembedded from any local contexts. This model entails a complete upheaval in the property regimes existing in the Palestinian Areas, as was detailed in chapter 4.

How does the World Bank now conciliate theory and practice in the West Bank and Gaza Strip? In terms of funding, it figures among the small donors in the water sector, a position that bears no relation with the institutional impact of its work. Faithful to its integrative vision of all spatial levels, the World Bank has funded the drafting of a regional strategy document as well as an attempt at setting up water utility services managed by the PWA. A first experience was started in 1996 in the Gaza Strip, and a second project started in 1999 in the south of the West Bank.

In 1996, the Gaza Strip did not attract private investors much given the political and security uncertainty of the future. This was problematic for the World Bank, which plans, within its water management model, the decentralization of the provision of services by private organisms. At the

⁶² *Ibid.*, pp. 30-31.

⁶³ *Ibid.*, p. 61.

⁶⁴ *Ibid.*, p. 21.

same time, the PA had just received the responsibility of managing Gaza water via the 1995 Israeli-Palestinian treaty. It was therefore reluctant to give up so rapidly such a recently acquired responsibility. Finally, very little information concerning the existing system was available and there were thus no possibilities to draft a concession contract. Besides, water was then sold in Gaza at a price of \$0.30 to \$0.40 a cubic meter, which could not allow a company to make the necessary investments economically viable due to the negligible revenues it would gain from the sale of water.⁶⁵

The World Bank chose to fund a management contract of a limited duration, which would allow both the PA and a private company to learn to work together. The private company would be responsible, during the length of the contract, to set up several tools such as a computerized administrative system, which would allow a private company to take up the management of water in the Gaza Strip upon the contract's expiration, and within the framework of a concession or a franchise. This corresponds indeed to the management method figuring in the Bank's general policy on water.

The execution of the water management contract in Gaza is especially interesting to examine. It is the first project of that type to be funded by the World Bank in the Middle East. It consists of a systematic approach to disembed the existing institutions from their local context and to introduce a modern water management according to Giddens' definition of modernity. The challenge consists here of withdrawing the control of domestic water from the hands of four municipalities and twelve village councils who now manage the water in order to entrust this responsibility to a single utility: the Coastal Water Utility.⁶⁶ The challenge therefore simultaneously consists of withdrawing water power from the hands of a ministry, the MLG, in order to grant it to the PWA. It consists as well of the elimination of the numerous power and income generating mechanisms that have been woven around domestic water control which were detailed in chapter 3. The Gaza Strip now represents a laboratory where methods are being developed to disembed water management institutions from their local contexts.

⁶⁵Jamal Saghir, Andrew Macoun and Elisabeth Sherwood, "Management Contracts in Water and Sanitation - Gaza's Experience", 1999, p. 1.

⁶⁶ This was the initial project. In fact, once the project started, more village councils controlling water emerged, thereby increasing the total number of municipalities and village councils involved in this project.

In mid 1996, the Lyonnaise de Eaux won the international competition and obtained the management contract in collaboration with Khatib and Alami (LEKA). Its task consisted in assisting the local governments' service providers and the PWA in order to improve the provision of domestic water. This contract leaves the responsibility of executing the management decisions to the local authorities. Thus, for example, LEKA had identified 11,000 illegal connections at the end of 1998, yet only informed the municipalities and the PWA in order for them to solve the problem.

In 1996, the water networks in the Gaza Strip showed losses as high as 50%. They were essentially due to human factors rather than to technical faults.⁶⁷ These 'human factors' pertained to the mechanisms mentioned in chapter 3, which appear as corruption to the modern manager but simply result from the structure of the local hydropolitical constellation woven around adduction water control. LEKA therefore sought to set up a systematic approach that would allow the identification of illegal connections. It drew up a form (see Annex 3) and sent 12,000 copies to the municipalities in order to ensure a follow up to their identification of these illegal connections. The forms sent back by the municipalities were generally filled unsatisfactorily. The use of the box "private well" was so popular that, according to the forms sent back, ten families living in the same building could each have their own private well.

Although the problem of illegal connections was the priority target for LEKA, a public awareness campaign was also carried out. LEKA attempted to use the traditional legitimization mechanisms and asked the mufti of Gaza what Islamic Law prescribed in terms of water use and water management. Islamic Law was developed over centuries in water scarce regions and it is therefore not surprising that the Mufti's answer matches the policy advocated by the World Bank. LEKA published it on glossy paper and distributed it.⁶⁸

LEKA faced a real resistance on the part of the MLG, not only from the employees who feared losing the powers and revenues which the existing water distribution situation grants them, but also from the ministry itself, in spite of the official agreement with the MLG.

In spite of all these obstacles, the municipal networks of the Gaza Strip showed 30% fewer losses in the first half of 1998 than during 1995 and

⁶⁷ *The Social, Environment and Economic Impact of Water Losses in the Gaza Strip*, Palestinian Hydrology Group, Jerusalem, 1996, p. 20.

⁶⁸ See Annex 4.

experience shows that LEKA fulfilled the obligations that fell directly under its responsibility.

The revenues from the sale of water to the customers do not fund the Gaza water management contract. It is entirely funded by a \$25 million credit granted to the PA by the World Bank.⁶⁹ The Bank therefore goes on the short-term against its long-term policy. It justifies this by the transitional situation Gaza is experiencing.

We therefore observe an international actor, the World Bank, intervening at a very local level, because of a worldwide policy orientation - its vision of water management on the planet - in order to disembed the existing water management institutions from their local social context. Within the Palestinian interministerial competition, the Bank is the PWA's best ally facing the MLG.

The other bilateral donors do not have a water policy as elaborate as the World Bank and do not necessarily have an aid that is as tied to their foreign policy as the Americans. France offers an aid that is tied, which means the 14,000 water meters set up by the SOGEA in the Hebron and Bethlehem districts in 1999 were all imported from France. The German aid, however, uses locally produced goods. Chapters 2 and 4 showed how the construction of the German pipeline had fed the centrifugal dynamic. It seems that this did not follow from a deliberate policy on the part of Germany, but rather from a lack of institution building policy accompanying infrastructure development.

For a nascent state such as Palestine, the intervention of donors raises many questions of principles. In the case of donors such as the United States and the World Bank, their support to the PWA contributes to its being strengthened within the PA and therefore to shape the future state institutional structure. Even though this is accomplished in the name of the best possible management methods, it does reveal foreign importation of an institutional structure rather than the development of a native one. The project of the World Bank in Gaza shows the difficulties induced by such a process, even when all strategies are deployed in order to face the local and national actors who resist that institutional construction.

The manner in which the intervention of donors in the water sector plays in the state territorialization process must also be noticed. The United States has fuelled for years the state territorialization process carried out

⁶⁹ Jamal Saghir, Andrew Macoun and Elisabeth Sherwood, "Management Contracts", *op.cit.*, p. 3.

by the Israelis over the West Bank and the Gaza Strip before reversing its policy in 1995 and fuelling since then a Palestinian state territorialization process over a portion of that same territory.

Finally, the issue of the right of a people to an endogenous democratic construction is also raised. Some donors have detailed plans concerning the institutional structure that must emerge. Their action is reminiscent of colonialism. On the other hand, the donors with no precise policy strengthen, without having planned it, some actors in their competition with other actors, which does not help an eventual endogenous democratic development. It seems that any intervention from a foreign donor automatically complicates such a development.

The permeability of national and local hydropolitical constellations to the interventions of donors is now immense because of the very nonexistence of the Palestinian state. The delivery constraint is especially heavy because of the size of the budgets allocated to foreign aid to the Palestinians. This leads the donors to interfere profoundly with the national and local hydropolitical evolution in a somewhat incoherent fashion, fuelling both the centripetal and centrifugal dynamics.

Conclusion

Israelis and Palestinians now start the final status negotiations where water appears as one of the five issues to be discussed. Israel already recognized Palestinian water rights in the 1995 agreement but the definition of these rights remains to be achieved. From an economic point of view, Israel is fully capable of granting an additional 400 mcm per year to the Palestinians without hurting its GNP. On the long-term, however, a simple allocation scheme does not provide the optimal way of managing water in the Jordan Basin, for a joint management would be much more efficient.

The local and national hydropolitical constellations are especially permeable to the intervention of donors. Whatever the project they support, whether it be infrastructure construction or institution building, the partner they choose to deal with comes out strengthened in comparison with the other actors competing for the control of water.

The West Bank and the Gaza Strip do not escape the existing macroeconomic trends according to which irrigated agriculture will drastically decrease in very water scarce areas in the near future. This contributes to explain the very weak support donors bring to projects developing irrigation. The institutional upheaval they induce is therefore largely con-

strained to the control of water distribution systems. The control of irrigation water remains little affected even though it constitutes 65% of the water now used by the Palestinians.

Conclusion

As this exploration of the interaction among the various hydropolitical constellations draws to an end, the great permeability of these constellations with respect to one another must be emphasized. The exercise of control over water use and water access, in the case of Palestinian used water, continues to be fragmented among a multitude of institutions that are most often ignored. This fact facilitates accessibility to outside interference. Most researches dealing with the international competition for water agree with the conclusion that a war over water is most improbable, yet increased water insecurity could very well contribute to growing social disorder as postulated by Homer-Dixon's theory.¹ Two elements can be taken into account in developing scenarios for the future: the efficiency the Palestinian Authority will achieve in setting up state control over water and the results of the Israeli-Palestinian negotiations.

A first scenario, rather realistic, would expect the Israelis to grant an additional 400 mcm per year to the Palestinians in a strict allocation scheme logic.² The PA could thus ease the domestic water scarcity presently existing in the urban centers and could thereby delay the necessary institutional construction needed to carry out the sectoral reallocation. A situation like the one typically described by Turton and Ohlsson as 'structurally induced social scarcity' would ensue.³

The need for a sectoral reallocation would forcefully reemerge a few years later because of the Palestinian demographic growth. The additional allocation of water would thus be an optimistic scenario in the short-term but a disastrous one in the long-term. Eventually, the Palestinians would find themselves facing the urgent need to reallocate irrigation water to domestic use without having the institutional means to carry this out. They would face this crisis without the current massive foreign funding

¹ Homer-Dixon's theory is described in the *Introduction and Overview of the Literature*.

² Chapter 5 showed J.A. Allan's results, which demonstrate how Israel was able to reduce in the past its water consumption by 400 mcm without significantly affecting its GNP and therefore Israel could agree to grant that water quantity during the final status negotiations.

³ These authors and the concepts they developed were detailed in chapter 3.

since the Arab-Israeli conflict would have been solved a few years earlier and the conflict dividends would have dried out.⁴

Another, also rather realistic scenario, would expect the Israelis not to grant any additional water to the Palestinians. The water crisis now existing in the West Bank and the Gaza Strip would become more acute. The illegal connections and the water tanker trade would increase. Unless the PA manages to disembed the institutions regulating water control from their local contexts within a modernization process in the sense given by Giddens, the hydraulic insecurity would increase in many localities.⁵ The 'ethnolocalism' already predominant in the West Bank and the Gaza Strip would be strengthened at the expense of national construction as the water rich localities would be engaged in a more acute competition with the water poor localities.⁶ The examples provided by the villages of Rameen and Anabta could demonstrate much fiercer competition in the future.⁷ In the long-term, this scenario might prove to be more optimistic than the first one since the 'hydraulic insecurity' would develop at a time when the donors would still have a massive presence in the area and could support an institutional transition.

An ideal scenario, though hardly realistic, would see Israel abolishing its policy of permits for Palestinians entering Israel. Palestinians could then find employment more easily. The manpower ejected from agriculture by the sectoral reallocation of water from irrigation to domestic use could then reinsert itself in the economic cycle more easily. The Palestinian Authority would democratically undertake an institutional reform that would be perceived as legitimate by the Palestinians because the negotiators of the final status would have understood that an allocation scheme simply could never generate an equitable sharing on the long-term.⁸ The negotiations would have concluded with the setting up of a joint management of the aquifers that would allow Palestinian and Israeli actors to access water on an equal footing, according to the usage of the water and not according to nationality.

This optimistic scenario depends on a great number of conditions. These conditions include: Israel accepting to decrease its water consumption in order to increase Palestinian water consumption; PA succeeding in man-

⁴ The conflict dividends are detailed in chapter 5.

⁵ Chapter 3 includes a discussion of modernity according to Giddens.

⁶ 'Ethnolocalism' is a concept produced by Jean-François Légrain and is discussed in chapter 4.

⁷ Chapter 2 details the cases of Rameen and Anabta.

⁸ See chapter 5 on that topic.

aging interministerial competition, and the PWA attaining authority while facing the MLG;⁹ PA disembedding the institutions now controlling irrigation water from their local contexts in order to set up real national water planning;¹⁰ and the actors involved in the hydropolitical constellations freeing themselves from the 'sanctioned discourse' that refuses any change in the existing Palestinian institutions, since it maintains that all that needs to be done is to recuperate the water unjustly appropriated by the Israelis.¹¹ Overcoming this sanctioned discourse will be possible if the general population is at last correctly informed on the origin of the water shortages. It will thus be possible only if water is finally de-mythified in the West Bank and Gaza Strip, although this is a necessary but not a sufficient condition.

It seems hardly possible to gather in the future so many favorable conditions. Today, it is more realistic to imagine the negotiators perceiving water as a national interest and believing sincerely that they are defending this national interest when resisting any solution other than an allocation scheme that would ensure the control of the lion's share by their state. Hydraulic insecurity will therefore become increasingly severe within localized pockets in the West Bank and the Gaza Strip. If the hypothesis put forth by this research is correct, according to which Israel only wanted the Oslo process because it perceived it as the least costly solution to maintain social order, this insecurity will constitute the best argument the Palestinians could use, within an allocation scheme, in order to achieve a better situation.

⁹ See chapter 4 on that topic.

¹⁰ See chapter 3 on that topic.

¹¹ See chapter 4 for a discussion of the parallel sanctioned discourse.

Bibliography

- Abate, Z. "The Integrated Development of Nile Basin Waters." In *The Nile: Sharing a Scarce Resource. A Historical and Technical Review of Water Management and of Economic and Legal Issues*. Cambridge: Cambridge University Press, 1994, pp. 227-241.
- El-Abed, Oroub. "La note salée du dessalement." *The Star*, 13 June 1996.
- Al-Abed, Raed. "J.V.F.A. Farmers Determined to Fight Water Increases till the End." *The Star*, Amman, 6 October 1994.
- Abu Safiyih, Yousef. "Effect of the Water Problem in Gaza on Health." *Shu'un Tamawiyyeh*. Jerusalem: Arab Thought Forum, October (in Arabic), pp. 63-67.
- Agence France Presse. "Israël quitte la réunion des donateurs aux Palestiniens à Francfort vendredi." 5 February 1999.
- Agreement between the Government of the Kingdom of Norway and the Palestinian Authority Development in the Water Sector (Phase II)*. 12 February 1998.
- Ahmad, Abdullah A. "Law No. 18 of 1988 - Water Authority Law." In *Jordan Environmental Profile Status and Abatement*. Amman, Jordan, 1989, pp. 115-37.
- Ahmed, Samir. "Principles and Precedents in International Law Governing the Sharing of Nile Waters." In *The Nile: Sharing a Scarce Resource. A Historical and Technical Review of Water Management and of Economic and Legal Issues*. Cambridge: Cambridge University Press, 1994, pp. 351-363.
- Ait Kadi, M. "Discours politique et choix technologiques: cas des grands aménagements hydroagricoles au Maroc." *Hommes, Terres et Eaux*, vol. 23, no. 90 (March 1993): pp. 59-69.
- Akesbi, Najib and Tahyer, Sophie. "La politique d'ajustement structurel dans le secteur agricole au Maroc et son impact sur les périmètres irrigués." *Annales Marocaines d'Economie*, no. 7 (Winter 1993): pp.49-68.
- "Akkoord Israel-Jordanie verscherpt Palestijnse Perikelen." *Elsevier* 50, no. 43 (1994): pp. 78-79.
- Alba, Avril. *Water in Israel and the Occupied Territories: Toward a Comprehensive Security Agenda*. Thesis submitted for the degree of Bachelor of Arts (Honors) in the Department of Politics, Faculty of Arts, University of Adelaide (Australia), November 1994.
- Ali Ayub, Mahmood and Kuffner, Ulrich. "La gestion de l'eau dans le Maghreb." *Finances et Développement* (June 1994): pp. 28-29.
- Allain, Sophie. "Construction de règles locales de gestion collective de l'eau en France: analyse de cas concrets et nouveaux axes de recherche." Presented at the international seminar L'irrigation et la gestion collective de la ressource en eau en France et dans le monde, Montpellier, November 1998.
- Allain-El Mansouri, B. "La politique des barrages collinaires au Maroc. Un exemple: la Wilaya de Rabat-Salé." *Cahiers d'URBAMA* 9 (1994): pp. 117-130.

- Allan, J.A. "Economic and Political Adjustments to Scarce Water in the Middle East." Contribution to the Zurich Conference, 10-13 December 1992.
- _____. "The Importance of a Realistic Evaluation of Renewable and Non-renewable Water Resources in Arid and Semi-arid Regions." In R. Wooldridge (ed.), *Techniques for Environmentally Sound Water Resource Development*. Wallingford: HR Wallingford, 1992, pp. 63-76.
- _____. "Substitutes for Water are being Found in the Middle East and North Africa." *Geojournal*, vol. 28, 3 (1992): pp. 375-385.
- _____. "Fortunately there are Substitutes for Water: Otherwise our Hydropolitical Futures would be Impossible." In *Water Resources Management*. London: ODA, 1992, pp. 13-26.
- _____. "Economic and Political Adjustments to Water Scarcity in the Middle East." In C.A.O. van Niewenhuijze, *Fifth Euro-Arab Dialogue*. The Hague: Rab-bani Foundation, 1993, pp. 43-55.
- _____. "Mechanisms for Reducing Tension over Water: Substituting for Water (in the Middle East)." *MEED*, vol. 38, no. 4 (January 1994): pp. 12-14.
- _____. "Food Production in the Middle East." In Sami Zubaida and Richard Tapper (eds.), *The Culinary Arts of the Middle East*. London: British Academic Press/IB Tauris, August 1994, pp. 19-32.
- _____. "Water in the Arab Middle East: Availability and Management." In Ali Ihsan Bagis (ed.), *Water as an Element of Cooperation and Development in the Middle East*. Turkey, Ankara: Ayna Publications in cooperation with the Friederich Naumann Foundation, May 1994, pp. 65-100.
- _____. "Overall Perspectives on Countries and Regions." In P. Rogers and P. Lydon (eds.), *Water in the Arab World: Perspectives and Progress*. Harvard University Press, September 1994, pp. 65-100.
- _____. "Developing Policies for Harmonised Nile Waters Development and Management." In *The Nile: Sharing A Scarce Resource. A Historical and Technical Review of Water Management and of Economic and Legal Issues*. Cambridge: Cambridge University Press, 1994, pp. 385-391.
- _____. "Evolving Water Demands and National Development Options." In *The Nile: Sharing A Scarce Resource. A Historical and Technical Review of Water Management and of Economic and Legal Issues*. Cambridge: Cambridge University Press, 1994, pp. 301-311.
- _____. "A Transition in the Political-Economy of Water and the Environment in Israel-Palestine." In *Joint Management of Shared Aquifers*. Jerusalem: Truman Center for Peace and Palestine Consultancy Group, 1995.
- _____. "Water in the Middle East and in Israel-Palestine: Some Local and Global Resource Issues." In *Joint Management of Shared Aquifers*. Jerusalem: Truman Center for Peace and Palestine Consultancy Group, 1995.
- _____. "Water Deficits and Management Options in Arid Regions with Special Reference to the Middle East and North Africa." In *Water Resources Management in Arid Countries*. Muscat, Oman: Ministry of Water Resources, 1995, pp. 1-8.

_____. "The Political Economy of Water: Reasons for Optimism but Long Term Caution." In *Water, Peace and the Middle East: Negotiating Resources in the Jordan Basin*. Library of Modern Middle East Studies, vol. 9. New York: Tauris Academic Studies, 1996, pp. 75-119.

_____. "Virtual Water: A Long Term Solution for Water Short Middle Eastern Economies." Paper presented at the 1997 British Association Festival of Science, University of Leeds, 9 September 1997.

_____. "Watersheds and Problemsheds: Explaining the Absence of Armed Conflict over Water in the Middle East." *Middle East Review of International Affairs*, vol. 2, (#5) no. 1 (March 1998): pp. 1-4.

_____. "Global Systems Ameliorate Local Droughts: Water, Food and Trade." Presented at Exploratory Workshop on Drought and Drought Mitigation in Europe, 1-3 March 1999. Ispra, Italy: Space Applications Institute, Joint Research Center.

_____. "Productive Efficiency and Allocative Efficiency: Why Better Water Management May Not Solve the Problem." *Agricultural Water Management*, 40 (1999): pp. 71-75.

Allan, J.A. (ed.). *Water, Peace and the Middle East: Negotiating Resources in the Jordan Basin*. Collection: Library of Modern Middle East Studies, no. 9, vol. XIX. London: Tauris Academic Studies, 1996.

Allan, J.A. and Karshenas, M. "Managing Environmental Capital: The Case of Water in Israel, Jordan, the West Bank and Gaza, 1947 to 1995." In *Water, Peace and the Middle East: Negotiating Resources in the Jordan Basin*. Library of Modern Middle East Studies, vol. 9. New York: Tauris Academic Studies, 1996, pp. 121-133.

Amawi, Alba M. "USAID in Jordan." *Middle East Policy*, vol. IV, no. 4 (October 1996): pp. 77-89.

Amery, Hussein A. "The Litani River of Lebanon." *Geographical Review*, vol. 83, no. 3 (July 1993): pp. 229-237.

Anbar, Ali Hassan Dawod, *Socio-economic Aspects of the East Ghor Canal Project, Jordan*. Ph.D. thesis, August 1983, University of Southampton, Faculty of Science, Geography.

Applied Research Institute - Jerusalem. *Water Resources and Irrigated Agriculture in the West Bank*. Bethlehem: ARIJ, March 1998.

Ardilly, Sylvain. *Les eaux de l'apartheid, Répercussions économiques et sociales de la stratégie hydraulique israélienne dans les territoires palestiniens: 1967-1995*. MA (DEA) thesis in anthropology and political sociology, with a concentration in the politics of development. University of Paris 1 - Panthéon - Sorbonne, Institute for the Studies of Economic and Social Development, 1999.

Arlosoroff, S. "Managing Scarce Water - Recent Israeli Experience." In *Water, Peace and the Middle East: Negotiating Resources in the Jordan Basin*. Library of Modern Middle East Studies, vol. 9. New York: Tauris Academic Studies, 1996, pp. 21-48.

Assaf, Karen. "Palestinian Water Resources - Water Quality." In Robin Twite and Jad Isaac (eds.), *Our Shared Environment: Israelis and Palestinians Thinking*

- Together About the Environment of the Region in Which They Live*. Jerusalem: IPCRI, December 1994, pp. 279-313.
- Assaf, Karen and Assaf, Said. *The Status of Domestic Water Supply in Six Villages of the West Bank and Gaza Strip*. Westport, Connecticut: Save the Children Federation, 1985.
- _____. *The Water Situation in the West Bank and Gaza Strip* (Arabic). In *Resources and Its Uses in the Arab World*. Kuwait: Arab Fund for Social and Economic Development, 1986.
- _____. *The Chemical and Hydrological Status of the Wells at the Arab Development Society Project*. Birzeit University Research Center for Swedish Save the Children Organization, 1984.
- Assaf, Karen; Al-Khatib, Nader; Kally, Elisha and Shuval, Hillel. *A Proposal for the Development of a Regional Water Master Plan Prepared by a Joint Israeli-Palestinian Team*. IPCRI, October 1993.
- Attar, Haj. "Législation et réglementation des eaux au Maroc." *Hommes, Terre et Eaux, Revue Marocaine des Sciences Agronomiques et Vétérinaires*, vol. 14, no. 55 (June 1984): pp. 5-12.
- Aubriot, Olivia. "Comment 'lire' un système d'irrigation? Un angle d'approche pour l'étude de systèmes irrigués traditionnels, illustré de cas pris au Népal." Presented at the international seminar L'irrigation et la gestion collective de la ressource en eau en France et dans le monde, Montpellier, Novembre 1998.
- Aubriot, Olivia. *Eau: miroir des tensions. Ethno-histoire d'un système d'irrigation dans les moyennes montagnes du Népal central*. Ph.D. thesis, Department of Anthropology, Université de Provence (Aix-Marseille 1), January 1997.
- Auriac, Franck; Charre, Joël and Dérioz, Pierre. "Systèmes d'utilisation de l'eau, mutations paysagères et organisation de l'espace en Comtat et Languedoc. Axes de recherches géographiques." In Ahmed Bencheikh and Michel Marié (eds.), *Grands Appareillages hydrauliques et sociétés locales en Méditerranée, Actes du séminaire de Marrakech (octobre 1993)*. Presses de l'école nationale des Ponts et chaussées, 1994, pp. 187-202.
- Awartani, Hisham. "A Projection of the Demand for Water in the West Bank and Gaza Strip 1992-2005." Paper submitted at the First Israeli-Palestinian International Academic Conference on Water, 10-13 December 1992, Zurich.
- _____. *Artesian Wells in Palestine, Present Status and Future Aspirations*. An-Najah National University, Nablus. Jerusalem: PHG, 1992.
- Awartani, Hisham and Wishahi, Sayel. *Wells in the Jordan Valley: Current Conditions, Rehabilitation Prospects*. Research Reports Series, no. 11. Center for Palestine Research and Studies, Economics Department, February 1999.
- Ayeb, Habib. "Le bassin du Jourdain dans le conflit israélo-arabe." *Les Cahiers du CERMOC*, no. 6 (1993) Amman.
- _____. *L'eau au Proche-Orient, La guerre n'aura pas lieu*. Paris: Karthala, 1998.

Bar, Micha. *Cooperation and Regimes in International River Basins: The Role of Norms*. Thesis submitted in candidacy for Ph.D., Hebrew University, Jerusalem, August 1998.

Bar-El, Raphael. *The Long-Term Water Balance East and West of the Jordan River*. Report submitted by the Israeli Ministry of Economy and Planning, May 1995.

Barberis, Julio A. *Los recursos naturales compartidos entre Estados y el Derecho internacional*. Madrid, 1979.

_____. *International Groundwater Resources Law*. FAO Legislative Study, 40, Rome, 1986.

Barhoum, M.I. "East Jordan Valley Villagers Versus Social Institutions." *International Review of Modern Sociology* 10, 1 (1980): pp. 37-65.

Barraque, Bernard. "La gestion de l'eau." *Documentation française Aubervilliers*. Collection: Problèmes politiques et sociaux: dossiers d'actualité mondiale 686, 1992.

Baskin, Gershon. "The Clash over Water: An Attempt at Demystification." *Palestine-Israel Journal*, no. 3 (Summer 1994): pp. 27-35.

Baskin, Gershon (ed.). *Water: Conflict or Cooperation*. Jerusalem: IPCRI, March 1993.

Beaumont, Peter. "The Myth of Water Wars and the Future of Irrigated Agriculture in the Middle East." *Water Resources Development*, vol. 10, no. 1 (1994).

Becker, C. Dustin and Ostrom, Elinor. *Human Ecology and Resource Sustainability: The Importance of Institutional Diversity*. Beijer Reprint Series, no. 62. Stockholm: Beijer International Institute of Ecological Economics, The Royal Swedish Academy of Sciences, 1995.

Becker, Nir and Zeitouni, Naomi. "A Market Solution for the Israeli-Palestinian Water Dispute." *Water International*, vol. 23, no. 4 (December 1998): pp. 238-43.

Beg, Mirza Arshad Ali. "Water Supply Systems in the Muslim World." *Islamic Thought and Scientific Creativity*, 4 ii (1993): pp. 49-68.

Belkadi, Ahmed. "La concurrence sectorielle à propos de l'eau dans les Doukkala." *Dirasat, Revue de la Faculté des Lettres d'Agadir*, no.4 (1990): pp. 163-76.

Bellisari, Anna. "Public Health and the Water Crisis in the Occupied Territories." *Journal of Palestine Studies*, vol. 23, no. 2 (1994): pp. 52-63.

Benantar, Abdennour. "La question de l'eau dans les négociations arabo-israéliennes." *Revue d'Etudes Palestiniennes*, no. 47 (1993).

Bencheikh, Ahmed. "Politiques d'aménagement, administration territoriale et modernisation politique au Maroc." In Ahmed Bencheikh and Michel Marié (eds.), *Grands Appareillages hydrauliques et sociétés locales en Méditerranée, Actes du séminaire de Marrakech (octobre 1993)*. Presses de l'école nationale des Ponts et chaussées, 1994, pp. 153-160.

Bencheikh, Ahmed and Michel Marié (eds.). *Grands Appareillages hydrauliques et sociétés locales en Méditerranée, Actes du séminaire de Marrakech (octobre 1993)*. Presses de l'école nationale des Ponts et chaussées, 1994.

- Benvenisti, Eyal. "Collective Action in the Utilisation of Shared Freshwater: The Challenges of International Water Resources Law." *American Journal of International Law*, vol. 90, no. 3 (1996): pp. 384-415.
- Benvenisti, Eyal and Gvirtzman, Haim. "Harnessing International Law to Determine Israeli-Palestinian Water Rights: The Mountain Aquifers." *Natural Resources Journal*, vol. 33, no. 3 (Summer 1993): pp. 543-567.
- Berkes, Fikret and Folke, Carl (eds). *Linking Social and Ecological Systems: Management Practices and Social Mechanisms for Building Resilience*. Beijer Reprint Series, no. 99. Stockholm: Beijer International Institute of Ecological Economics, The Royal Swedish Academy of Sciences.
- Berkoff, Jeremy. *Une stratégie pour la gestion de l'eau au Moyen-Orient et en Afrique du Nord*. Collection: Le développement en marche. Washington, DC: World Bank, 1995.
- Beshorner, Natasha. "L'eau et le processus de paix israélo-arabe." *Politique étrangère*, no. 4 (Winter 1992): pp. 837-855.
- Biger, G. "River and Lake Boundaries in Israel." In C.H. Schofield and R.N. Schofield (eds.), *The Middle East and North Africa*. London: Routledge, 1994 (World Boundaries, 2), pp. 99-109.
- Bin-Nun, Ariel. *The Law of the State of Israel: An Introduction*. Jerusalem: Rubin Mass Ltd., 2nd edition, 1992.
- Boelens, Rutgerd. "Collective Water Management and the Construction of Normative Frameworks in Irrigation Systems." Presented at the International seminar L'irrigation et la gestion collective de la ressource en eau en France et dans le monde, Montpellier, November 1998.
- Boutet, Annabelle. *Le thème de l'eau dans les systèmes religieux de la région du Jourdain*. MA (DEA) thesis, Institute of Political Studies, Aix-en-Provence, dir: Bruno Etienne, scholastic year: 1991-1992.
- Brand, Laurie. "In the Beginning was the State... The Quest for Civil Society in Jordan." In Leiden (ed.), *Civil Society in Middle East II*. London: EJ BRILL, 1995.
- Brans, Edward H.P.; de Haan, Esther J.; Nollkaemper, André and Rinzema, Jan (eds). *The Scarcity of Water, Emerging Legal and Policy Responses*. London: Kluwer Law International, 1997.
- Brimberg, Jack; Mehrez, Abraham and Oron, Gideon. "Economic Development of Groundwater in Arid Zones with Applications to the Negev Desert, Israel." *Management Science*, vol. 40, no. 3 (March 1994): pp. 353-363.
- Briscoe, John; Feachem, Richard G. and Rahaman, M. Mujibur. *Evaluation de l'effet sur la santé: approvisionnement en eau, assainissement et hygiène*. UNICEF S.L., 1987.
- Brooks, David. "Between the Great Rivers: Water in the Heart of the Middle East." In Eglal Rached, Eva Rathgeber and David Brooks (eds.), *Water Management in Africa and the Middle East, Challenges and Opportunities*. Ottawa: International Development Research Center, 1996, pp. 73-93.

- Brooks, David B. and Lonergan, Stephen C. *Watershed: The Role of Fresh Water in the Israeli-Palestinian Conflict*. Ottawa: International Development Research Center, 1994.
- Bruno, Henri. *Contribution à l'étude du régime des eaux en droit musulman*. Ph.D. thesis, University of Paris, Faculty of Law, Paris, Arthur Rousseau Editeur, 1913.
- Bulloch, John and Darwish, Adel. *Water Wars: Coming Conflicts in the Middle East*. London: Victor Gollancz, 1993.
- Burchi, Stefano. *Treaties Concerning the Non-navigational Uses of International Watercourses – Europe*. FAO Legislative Study, 50, FAO, Rome, 1993.
- _____. *Preparing National Regulations for Water Resources Management Principles and Practice*. FAO Legislative Study, 52, Rome, 1994.
- Burette, P. “Genèse d’un droit fluvial international général. Utilisation à des fins autres que la navigation.” *Revue générale de droit international public*, no. 95 (1991).
- Burrell, Alison (ed). *Agricultural Policy in Jordan*. Published for the Abdul Hameed Shoman Foundation, Amman. London and Atlantic Highlands: Ithaca Press, 1986.
- Busch, Charles D. *Needs Assessment for an Irrigation Management Service Water Quality Improvement and Conservation Project*. Report 3114-94-3b-01, DAI (USAID), November 1994.
- Cans, Roger. *La bataille de l'eau Paris*. Le Monde Editions, 1994.
- Caponera, Dante A. *Le droit des eaux dans les pays musulmans*. Collection FAO: Progrès et mise en valeur: Agriculture, no. 43, FAO, Rome, 1956.
- _____. *Water Laws in Moslem Countries*. FAO Irrigation and Drainage Paper 20/1, 1973.
- _____. “International Co-operation and Inland Waters: the Influence of Federalism.” *Natural Resources Journal*, vol. 16 (1976).
- _____. “Roman Water Law System.” Proceedings of the International Conference on Global Water Law Systems, vol. I, Colorado State University, 1976.
- _____. *The Law of International Water Resources*. FAO Legislative Study, 23, Rome, 1980.
- _____. “Principles for International Groundwater Law.” *Natural Resources Journal*, vol. 22 (1982).
- _____. “Legal Aspects of Transboundary River Basins in the Middle East: The Al-Asi (Orontes), The Jordan and The Nile.” *Natural Resources Journal*, vol. 33, no. 3 (Summer 1993): pp. 629-663.
- Caron, Patrick. Mission report in the Palestinian Territories from 11-16 November 1996. AMODESP project program, CIRAD/SAR, no. 140/96 internal report.
- _____. *Zonages à dire d'acteurs du district de Naplouse - Territoires Palestiniens*. Mission report from 23 February to 9 March 1997, CIRAD/SAR, no. 54/97.

- Carruthers, Ian and Clark, Colin. *The Economics of Irrigation*. Liverpool University Press, 1983.
- Cassell Philip (ed.). *The Giddens Reader*. London: Macmillan, 1993.
- Chaoui, Mohamed. "La réglementation en matière d'exploitation et d'utilisation des ressources en eau." *Revue Marocaine de droit et d'économie du développement*, no. 26 (1991): pp. 11-25.
- Chesnot, Christian. "Les enjeux pour Israël de la conférence internationale sur l'eau au Proche-Orient." *Egypte Monde (les cahiers du CEDEJ)*, no. 10 (1992).
- Chesworth, P.M. "The History of Water Use in the Sudan and Egypt." In *The Nile: Sharing a Scarce Resource. A Historical and Technical Review of Water Management and of Economic and Legal Issues*. Cambridge: Cambridge University Press, 1994, pp. 65-79.
- Chraïbi, Mohammed. "Techniques d'irrigation et structures agraires." *Bulletin économique et social du Maroc*, vol. XXXIII, no. 120-121 (January-June 1971): pp. 63-80.
- _____. "La tarification de l'eau d'irrigation et ses corrélatés." In *La question agraire au Maroc 2*. Publication of the Bulletin économique et social du Maroc, Documents, no. 133-134, 1977, pp. 167-176.
- Cippà, Andrea. *Water Management in the City of Hebron October 1997*. Report no. 1945. Hebron, Palestine: TIPH, 1997.
- Clarke, Robin. *Water: The International Crisis*. Cambridge, Massachusetts: The MIT Press, 1993.
- Cohen, Amiram. "Water to Farmers May be Cut by 40%." *Ha'aretz*, Friday, 19 March 1999.
- Cohen, H.A. and Plaut, S. "Quenching the Levant's Thirst." *Middle East Quarterly*, 2 (1995): pp. 37-44.
- Collins, R.O. "History, Hydropolitics and the Nile. Nile Control: Myth or Reality?" In *The Nile: Sharing A Scarce Resource. A Historical and Technical Review of Water Management and of Economic and Legal Issues*. Cambridge: Cambridge University Press, 1994, pp. 109-135.
- Commins, Stephen. "In the Line of Fire: Development in Conflict." In *Development in States of War*. Oxford: Oxfam (UK), 1996, pp. 8-14.
- Commission française du développement durable. "Le concept du développement durable appliqué au domaine de l'eau Recommandations de la Commission à l'attention de la Conférence Internationale, Eau et Développement Durable, Paris, Mars 1998 et de la Commission du Développement Durable des Nations Unies, New York, avril 1998." *Les cahiers du développement durable*, no. 6 (February 1998): pp. 1-33.
- Committee on Sustainable Water Supplies for the Middle East. *Water for the Future. The West Bank and Gaza Strip, Israel and Jordan*. Washington, DC: National Academy Press, 1999.
- Cooley, John K. "The War over Water." *Foreign Policy*, no. 5, 4 (1984): pp.3-26.

- Cox, W.E. *Water and Development: Managing the Relationship*. Paris: UNESCO, 1989.
- Crane, R. *Water Markets, Water Reform and the Urban Poor: Results from Jakarta, Indonesia*. *World Development*, 22 i (1994): pp. 71-83.
- Davidson, J. and Myers, D. "Water for Life." In *No Time to Waste*. London: Oxfam, 1992.
- Davis, Uri; Maks, Antonia E.L. and Richardson, John. "Israel's Water Policies." *International Journal of Palestine Studies*, vol. IX, no. 2 (Winter 1980): pp. 3-31.
- De Sernaclens, Pierre. "La théorie des régimes et l'étude des organisations internationales." *Revue internationale de Sciences Sociales* (November 1993): pp. 527-537.
- Deconinck, Stefan. "Water en het Israëlisch-Palestijnse vredeproces." *Internationale Spectator* (January 1997): pp. 17-22.
- Dees, Joseph L. "Jordan's East Ghor Canal Project." *Middle East Journal*, vol. 13 (Autumn 1959): pp. 357-371.
- Dellapenna, Joseph W. "Designing the Legal Structures of Water Management Needed to Fulfill the Israeli-Palestinian Declaration of Principles." *Palestine Yearbook of International Law*, vol. 7 (1992/1994): pp. 63-103.
- _____. "Custom-built Solutions for International Disputes." *The UNESCO Courrier*, February 1999, pp. 33-36.
- Descotes, Sandrine. "Gestion sociale de l'eau: modèle d'évolution et mise en perspective historique d'un système d'irrigation du Haut-Atlas Marocain." Presented at the international seminar L'irrigation et la gestion collective de la ressource en eau en France et dans le monde, Montpellier, November 1998.
- Deshazo, Randy and Sutherland, John W. *Building Bridges, Diplomacy and Regime Formation in the Jordan River Valley*. Lanham, Maryland: University Press of America, 1996.
- Dieckhoff, Alain. *L'invention d'une nation; Israël et modernité politique*. Paris: Gallimard, 1993.
- Dillman, Jeffrey D. "Le pillage de l'eau dans les territoires occupés." *Revue d'Etudes Palestiniennes*, no. 35 (1990).
- Dinar, Ariel and Wolf, A. "International Markets for Water and the Potential for Regional Cooperation: Economic and Political Perspectives in the Western Middle East." *Economic Development and Cultural Change*, 43 i (1994), pp. 43-66.
- Dodge, T. and Tell, T. "Peace and the Politics of Water in Jordan." In *Water, Peace and the Middle East: Negotiating Resources in the Jordan Basin*, Library of Modern Middle East Studies, vol. 9. New York: Tauris Academic Studies, 1996, pp. 169-184.
- Dollé, Vincent and Toutain, Georges (eds.). "Les systèmes agricoles oasiens." Presented at the Tozeur seminar, 19-21 November 1988, Centre International de Hautes Etudes Agronomiques Méditerranéennes (CIHEAM), Série A: Séminaires Méditerranéens, no. 11, 1990.

- Donkers, Henk. "Water als factor in het Israëlich-Arabisch conflict." *Internationale Spectator*, 49 i (1995): pp. 13-18.
- _____. "Fresh Water as a Source or International Conflicts: The Water Conflicts between Israel, Jordan and the Palestinians." In Edward H.P. Brans, Esther J. de Haan, André Nollkaemper and Jan Rinzema (eds.), *The Scarcity of Water, Emerging Legal and Policy Responses*. London: Kluwer Law International, 1997.
- Dottridge, J. and Gibbs, B. "Water for Sustainable Development in the North-Eastern Badia, Jordan." In P. Howsam and R.C. Carter (eds.), *Water Policy: Allocation and management in practice*. London: E & FN Spon, 1996, pp. 87-94.
- Drezon-Tepler, Marcia. "Contested Waters and the Prospects for Arab-Israeli Peace." *Middle Eastern Studies*, vol. 30, no. 2 (1994): pp. 281-303.
- Dudkevitch, Margot. "Kinneret Level near 60-year Low." *The Jerusalem Post*, Monday, 29 March 1999.
- Dumont, Sophie and de La Motte de Broons, Foulques. "L'eau au Proche-Orient: enjeu stratégique et instrument de paix." *Revue de la Défense Nationale* (February 1995): pp. 119-132.
- Duroselle, Jean-Baptiste. "La décision de politique étrangère." In *Tout empire périra: une vision théorique des relations internationales*. Paris: Publications de la Sorbonne, 2nd edition, 1982, pp. 115 -132.
- ECSCWA. *Land and Water Policies in the Arab Region: A Contribution to the Expert Group Consultation on Sustainable Agricultural and Rural Development, Cairo, 25-29 September 1994*. ECSCWA and FAO, E/ESCWA/AGR/1994/2.
- El-Eini, R. I.M. "The Implementation of British Agricultural Policy in Palestine in the 1930s." *Middle Eastern Studies*, vol. 32, no. 4 (October 1996): pp. 211-250.
- Eisenboerg, Aharon. "Drinking Water Quality in Israel." In Robin Twite and Jad Isaac (eds.), *Our Shared Environment: Israelis and Palestinians Thinking Together About the Environment of the Region in Which They Live*. Jerusalem: IPCRI, December 1994, pp. 314-338.
- Elmusa, Sharif S. "Dividing the Common Palestinian-Israeli Waters - An International Water Law Approach." *Journal of Palestine Studies*, vol. 22, no. 3 (1993): pp. 57-77.
- _____. "The Israeli-Palestinian Water Dispute can be Resolved." *Palestine-Israel Journal of Politics, Economics and Culture*, no. 3, Jerusalem (Summer 1994).
- _____. "The Israeli-Palestinian Water Dispute Can be Resolved." *Palestine-Israel Journal*, no. 3 (Summer 1994): pp. 18-26.
- _____. "The Jordan-Israel Water Agreement: a Model or an Exception?" *Journal of Palestine Studies*, vol. 24, no. 3 (Spring 1995): pp. 63-73.
- _____. "The Land-Water Nexus in the Israeli-Palestinian Conflict." *Journal of Palestine Studies*, 25 (Spring 1996): pp. 69-78.
- _____. *Negotiating Water: Israel and the Palestinians. A Final Status Issues Paper*. Washington: Institute for Palestine Studies, 1996.
- ENDA and the French Republic, Ministry of Cooperation. *Enjeux de l'après-bar-rage. Vallée du Sénégal*, 1986.

- Escallier, Robert. "L'homme et le fleuve au Maghreb." *Maroc-Europe*, no. 3 (1992): pp. 181-190.
- Evans, T. "History of Nile Flows." *The Nile: Sharing a Scarce Resource. A Historical and Technical Review of Water Management and of Economic and Legal Issues*. Cambridge: Cambridge University Press, 1994, pp. 27-63.
- Faggi, Pierpaolo. "Les développements de l'irrigation dans la diagonale aride entre logique productive et logique stratégique." *Revue de Géographie de Lyon*, vol. 65, no. 1 (1990): pp. 21-26.
- El-Faiz, Mohamed. "Pour une histoire de longue durée des aménagements hydro-agricoles dans le Haouz." In Ahmed Bencheikh and Michel Marié (eds.), *Grands Appareillages hydrauliques et sociétés locales en Méditerranée, Actes du séminaire de Marrakech (octobre 1993)*. Presses de l'école nationale des Ponts et chaussées, 1994, pp. 23-34.
- Falkenmark, Malin. "Fresh Water as a Factor in Strategic Policy and Action." In Westing (ed.), *Global Resources*. pp. 85-113.
- Fanek, Fahed. "Water Prices Must be Reformed." *Jordan Times*, 29 May 1994.
- Feder, Gershon and Le Moigne, Guy. "Une gestion équilibrée des ressources en eau." *Finances et développement* (June 1994).
- Feitelson, Eran and Haddad, Marwan (eds.). *Joint Management of Shared Aquifers: The First Workshop Jerusalem-Palestine Consultancy Group and the Harry S. Truman Research Institute for the Advancement of Peace*. November 1994.
- _____. "A Stepwise Open-Ended Approach to the Identification of Joint Management Structures for Shared Aquifers (Israel, Palestinian Authority)." *Water International*, vol. 23, no. 4 (December 1998): pp. 227-237.
- Fenaux, Pascal. *Moyen-Orient. Les dossiers de la paix*. Les dossiers du GRIP, no. 175-176, November-December 1992.
- Fleming, Sarah (ed.). *War and Water Forum*. Geneva: International Committee of the Red Cross, 1999.
- Fletcher, Elaine. "Israel's Environment: Government, Media and the Public." In Jad Isaac and Robin Twite (eds.), *Our Shared Environment: Israelis and Palestinians thinking together About the Environment of the Region in Which They Live*. Jerusalem: IPCRI, December 1994, pp. 22-57.
- Fortmann, Louise. "Talking Claims: Discursive Strategies in Contesting Property." *World Development*, vol. 23, no. 6, Elsevier Science Ltd. (1995): pp. 1053-1063.
- Foucher, Michel. *Fronts et Frontières. Un tour du monde géopolitique Fayard*. 1988.
- Gammoh, J.S. *A study of Socio-economic Structure of North Shouneh and South Shouneh in the Jordan Valley, with Particular Reference to the Agricultural Extension*. FAO, Rome, 1981.
- Garber, Andra and Salameh, Elias (eds.). *Jordan's Water Resources and their Future Potential: Proceedings of the Symposium, 27-28 October 1991*. 1992.

- Gardner, Roy; Moore, Michael and Walker, James. "Governing a Groundwater Commons: A Strategic and Laboratory Analysis of Western Water Law." *Economic Inquiry*, 35 (1997): pp. 218-234
- Garfinkle, Adam. *Israel and Jordan in the Shadow of War: Functional Ties and Futile Diplomacy in a Small Place*. New York: St. Martin's Press, 1992.
- Gaudin, Jean-Pierre. "Politiques négociées et analyse des notabilités." In Ahmed Bencheikh and Michel Marié (eds.), *Grands Appareillages hydrauliques et sociétés locales en Méditerranée, Actes du séminaire de Marrakech (octobre 1993)*. Presses de l'école nationale des Ponts et chaussées, 1994, pp. 161-176.
- Gellner, Ernest. *Postmodernism, Reason and Religion*. London and New York: Routledge, 1992.
- German Overseas Institute. *Water in the Middle East and North Africa; Literature since 1985, a Selected Bibliography*. Near and Middle East Documentation Service, Series A, no. 23, Hamburg, 1995.
- Ghezawi, Ali Z. and Khasawneh, Mohammad M. *Irrigation Water and Agriculture in the Jordan Valley and Southern Ghore: The Possibility of Cultivating Substitute Crops*. Amman: Center for International Studies, Royal Scientific Society.
- Ghiotti, Stéphane. "Irrigation traditionnelle et gestion collective de la ressource en eau en Ardèche: les béalières." Presented at the international seminar L'irrigation et la gestion collective de la ressource en eau en France et dans le monde, Montpellier, Novembre 1998.
- Giddens, Anthony. *The Consequences of Modernity*. Cambridge, England: Polity Press, 1992.
- Gleich, Peter H. "Water and Conflict", International Security." *International Security*, 18, 1 (Summer 1993): pp. 79-112.
- _____. "Water and Conflict: Fresh Water Resources and International Security." *International Security*, vol. 18, no. 1 (Summer 1993): pp. 79-112.
- Grandin, Jean-Claude. "Concurrences et Conflits entre Usages et Usagers de l'Eau." In *Pour, Le Partage de l'Eau*. L'Harmattan, 1991, pp. 114-122.
- Grey, D. "The Development of the Water Resources of the Occupied Palestinian Territories: Some Key Issues." In J. Issac and H. Shuval (eds.), *Water and Peace in the Middle East*. Amsterdam: Elsevier, 1994.
- Grunewald, François. "Le désert, l'eau, la guerre." *Le Courrier*, no. 172 (November-December 1998): pp. 83-86.
- Guille, Nicholas. "La mainmise israélienne sur l'eau dans les territoires occupés." *Revue d'études palestiniennes*, no. 11 (1984).
- Guitouni, Abdelkader. "Le périmètre irrigué de Sidi Yahya - passé, présent, avenir." *Maroc-Europe*, no. 5 (1993): pp. 101-111.
- Haddad, Marwan. "Environmental Conditions in the Occupied West Bank." In *Proceedings of Workshop on Environment, Land and Water Establishment*. Jerusalem, 1992.
- Haddad, Marwan and Mizedy, Numan. "Water Resources in the Middle East: Conflict and Solutions." In *Water, Peace and the Middle East: Negotiating Re-*

sources in the Jordan Basin. Library of Modern Middle East Studies, vol. 9. New York: Tauris Academic Studies, 1996, pp. 3-17.

Haddadin, M.J. "Water Management: A Jordanian Viewpoint." In *Water, Peace and the Middle East: Negotiating Resources in the Jordan Basin*. Library of Modern Middle East Studies, vol. 9. New York: Tauris Academic Studies, 1996, pp. 59-73.

Hagan, Ross. *Achieving Sustainable Irrigation Water Conservation in the Jordan Valley, Water Quality Improvement and Conservation Project*. Report 3114-95-3b-06, DAI (USAID), December 1995.

Hagan, Ross; Abu-Khate, Mohammad I.; Emtairah, Ismael Y. and Al-Rashdan, Jamal. *Survey of On-Farm Water Management in the Jordan Valley Water Quality Improvement and Conservation Project*. Report 3114-95-3b-03, DAI (USAID), April 1995.

Hagan, Ross E. and Kuhnle, Darryl. *Promoting Water Conservation by Training Jordan Valley Farmers Water Quality Improvement and Conservation Project*. Report 3114-95-3b-04, DAI (USAID) October 1995.

Hanna, Susan. "Property Rights, People and the Environment." Beijer Reprint Series no. 74. Granted with permission from R. Costanza, O. Segura, Juan Martinez-Alier (eds.), *Getting Down to Earth*. Washington, DC: Island Press, 1996.

Harman, Danna and Collins, Liat. "Emergency Water Cutbacks Ordered." *The Jerusalem Post*, Monday, 12 April 1999.

Hashemite Kingdom of Jordan. *East Ghor Project, Questions and Answers*. First edition, 1 July 1962.

Hauptert, John S. "Recent Progress of Jordan's East Ghor Canal Project." *The Professional Geographer*, vol. XVIII (January 1966): pp. 9-13.

Hayton, Robert D. "The Law of International Aquifers." *Natural Resources Journal*, vol. 22 (1982).

_____. *The Law of International Groundwater Resources, Intermediate Report*. Revision 2, International Law Association, Committee on International Water Resources Law, 1985.

_____. *The Freshwater-Maritime Interface: Legal and Institutional Aspects*. FAO Legislative Study, 46, Rome, 1990.

Hazleton, J.E. *The Impact of the East Ghor Canal Project on Land Consolidation, Distribution and Tenure*. Amman: Economic Research Department, Royal Scientific Society, 1974.

_____. "Land Reform in Jordan: The East Ghor Canal Project." *Middle Eastern Studies*, 15 (1979): pp. 258-269.

Henderson, Amy. "No Easy Solution to Jordan's Endemic Water Shortage." *The Star*, 15 July 1993.

Herzenni, Abdellah. "L'Ounein: Modes d'utilisation des eaux d'irrigation et rapports sociaux." *Bulletin Economique et Social du Maroc*, nos. 159-161 (1987): pp. 85-109.

Herzl, Théodor. *Terre ancienne, terre nouvelle*. Paris, Genève: Slatkine, 1980.

- Hillel, Daniel. *Rivers of Eden. The Struggle for Water and the Quest for Peace in the Middle East*. Oxford University Press, 1994.
- El-Hindi, Jamal L. "The West Bank Aquifer and Conventions Regarding Laws of Belligerent Occupation." *Michigan Journal of International Law*, vol. 11, no. 4 (Summer 1990): pp. 1400-1423.
- Hirsch, A.M. "Water Legislation in the Middle East." *American Journal of Comparative Law*, vol. 8 (1959).
- Hof, Frederic C. "The Yarmouk and the Jordan Rivers in the Israel-Jordan Peace Treaty." *Middle East Policy*, 3 iv (1995), pp. 47-56.
- _____. "The Water Dimension of Golan Heights Negotiations." *Middle East Policy*, vol. V, no. 2 (May 1997): pp. 129-141.
- Hoffmann, Berthold. "Hydro Paranoia and Its Myths - The Issue of Water in the Middle East." *Orient, Zeitschrift des Deutschen Orient-Institutes* 39, Heft 2 (1998): pp. 251-269.
- Homer-Dixon, Thomas F. "On the Threshold: Environmental Changes as Causes of Acute Conflict." *International Security*, vol. 16, no. 2 (Fall 1991), pp. 76-116.
- _____. *Environmental Scarcity and Global Security*. Headline Series, Foreign Policy Association, no. 300, Fall 1993.
- _____. "The Ingenuity Gap: Can Poor Countries Adapt to Resource Scarcity?" *Population and Development Review*, vol. 21, no. 3 (1995), pp. 587-612.
- Homer-Dixon, T., Boutwell, J. and Rathjens, G. "Environmental Change and Violent Conflict." *Scientific American* (February 1993): pp. 38-45.
- Hosh, Leonardo and Isaac, Jad. "Roots of the Water Conflict in the Middle East." Paper submitted to The Middle East Water Crisis: Creative Perspectives and Solutions, May 7-9, 1992, University of Waterloo, Canada.
- Howell, P.P. and Allan, J.A. (eds.). *The Nile: Sharing a Scarce Resource. A Historical and Technical Review of Water Management and of Economic and Legal Issues*. Cambridge: Cambridge University Press, 1994.
- Howsam, P. and Carter, R.C. (eds.). *Water Law, Water Rights and Water Policy: Allocation and Management in Practice*. London: E & FN, 1996, pp. 371-378.
- Hvidt, M. "The Quest for Organizations: Establishing a Logic of Collective Action in Irrigation." In L. Erslev Andersen (ed.), *Middle East Studies in Denmark*. Odense: Odense University Press, 1994, pp. 51-64.
- Ingrosso, Pietro; Abu Jabal, Mohammad and Oddo, Benedetta (eds.). *Groundwater in Israel Palestine and Sinai, Selected Bibliography (1985-1996)*. Gaza Strip: Water Research Center, Al-Azhar University, 1997.
- Isaac, Jad. "Environmental Protection and Sustainable Development in Palestine." In Robin Twite and Jad Isaac (eds.), *Our Shared Environment*. Jerusalem: Israeli/Palestinian Center for Research and Information, December 1994.
- _____. *Environmental Profile for The West Bank Vol. 2: Jericho District*. Applied Research Institute - Jerusalem, October 1995.

_____. *Environmental Profile for The West Bank Vol. 3: Hebron District*. Applied Research Institute - Jerusalem, October 1995.

_____. *Environmental Profile for the West Bank Vol. 6: Jerusalem District*. Applied Research Institute - Jerusalem, October 1996.

_____. (ed.). *Environmental Profile for Gaza Vol. 1 (Oct. 1995), Vol. 2 (Nov. 1995), Vol. 3 (June 1995)*. Applied Research Institute - Jerusalem.

_____. (ed.). *Environmental Profile for The West Bank Vol. 1: Bethlehem District*. Applied Research Institute - Jerusalem, June 1995.

_____. "A Sober Approach to the Water Crisis in the Middle East." Applied Research Institute - Jerusalem, <http://www.arij.org/pub/sober.html#as-h4-63485>

Isaac, Jad. and Shuval, Hillel. (eds). *Water and Peace in the Middle East*. Amsterdam: Elsevier, 1994.

Israel, Water Law 5719-1959. *Sefer Ha-Chukkim*, no. 288, 13 August 1959.

"Israel / Jordan: Cooperation in Environment Protection." *Environmental Policy and Law* 25, no. 6 (1995): p. 323.

Israeli, Jordanian, and Palestinian Study Teams, Middle East Peace Process, Multilateral Working Group on Water Resources. *Middle East Regional Study on Water Supply and Demand Development*. Concluding Report Sponsored by the Government of the Federal Republic of Germany, February 1998.

Israeli Military Orders in the Occupied Palestinian West Bank 1967-1992. Jerusalem: JMCC, 2nd edition, 1995.

Israeli-Palestinian Agreement of 28 September 1995. Complete version.

Israeli-Palestinian Agreement on the West Bank and the Gaza Strip, Washington DC, 28 September 1995; Declaration of Principles On Interim Self-Government Arrangements, Washington DC, 13 September 1993. Document Series No. 7. Jerusalem Media and Communication Center, August 1996.

Israel's Policy on the West Bank Water Resources. Prepared for and under the guidance of the Committee on the Exercise of the Inalienable Rights of the Palestinian People. New York: United Nations. 1980. A/AC 183.

Al-Jayyousi, Odeh Rashed and Shatanawi, Muhammad Rashid. "An Analysis of Future Water Policies in Jordan Using Decision Support Systems." *Water Resources Development*, vol. 11, no. 3 (1995): pp. 315-330.

Jerusalem Media and Communication Center. *Water: The Red Line*. Jerusalem, 1994.

Jerusalem Water Undertaking. *Ramallah District, Performance Prospects*. December 1995.

Kahan, David. *Agriculture and Water Resources in the West Bank and Gaza 1967-1987*. Boulder, Colorado: West Bank Data Base Project, Westview Press, 1987.

Kahhaleh, Subhi. *The Water Problem in Israel and Its Repercussions on the Arab-Israeli Conflict*. Institute For Palestine Studies Papers, no. 9 (E), Beirut, 1981.

- Kahnert, F. & Levine, G. (eds.). *Groundwater Irrigation and the Rural Poor: Options for Development in the Gangetic Basin*. Washington, DC: World Bank, 1993.
- Käkönen, Jyki (ed.). *Perspectives on Environmental Conflict and International Relations*. TAPRI studies in international relations. London: Pinter, 1992.
- Kalkafi, Eyal. "Ben-Gurion, Sharett and the Johnston Plan." *Studies in Zionism*, vol. 13, no. 2 (August 1992): pp. 165-186.
- Kally, E. and Fishelson, G. *Water and Peace: Water Resources and the Arab-Israeli Peace Process*. Westport: Praeger, in cooperation with the Armand Hammer Fund for Economic Cooperation in the Middle East, Tel Aviv University, 1993.
- Kamal Al-Asa'd, Abdel Rahim. *Towards 'the Reconstruction of Palestine': The Role of an Effective Relationship between NGOs and the State in the West Bank*. MA thesis submitted to PPC / University of Bradford for partial fulfillment of a Master degree in National Development and Project Planning, September 1997.
- Kamal, Sana. "Water Crisis Dissolves." *Middle East International* (16 May 1997): pp. 11-12.
- Katz, D.A. *Model for Evaluating Conflict over Shared Water Resources: the Arab-Israeli Conflict as a Case Study*. Unpublished thesis, University of Washington.
- Khader, Bichara. "La géopolitique de l'eau en Méditerranée." *Les cahiers du Monde Arabe*, 113, Louvain-la-Neuve: Centre d'Etudes et de Recherches sur le Monde Arabe Contemporain (1994): p. 25.
- Khawaja, Marwan. "The Dynamics of Local Collective Action in the West Bank: A Test of Rival Explanations." *Economic Development and Cultural Change*, vol. 44, no. 1 (October 1995): pp. 147-179.
- El-Khodari, Riyad. "Water Resources in the Gaza Strip (Arabic)." *Shu'un Tan-mawiyeh*. Jerusalem: Arab Thought Forum, October, pp. 68-72.
- Khouri, Rami, G. *The Jordan Valley. Life and Society below Sea Level*. Published in Association with the J.V.A., Longman, 1981.
- Kilani, Mondher. "L'influence de l'Etat dans la Transformation du Système hydraulique du groupe d'oasis de Gafsa (Tunisie)." *Genève-Afrique*, vol. XXIV, no. 2 (1986): pp. 7-46.
- _____. "Eau et développement: L'exemple des projets de rénovation des oasis de Gafsa (Tunisie)." *UNI Lausanne*, no. 47 (1986 / 2): pp. 24-28.
- _____. "Lignages et identité ethnique dans l'oasis de Gafsa." *IBLA, Revue de l'Institut des Belles Lettres Arabes*, no. 160 (1987/2): pp. 299-318.
- Klein, Micha. "Water Balance of the Upper Jordan River Basin." *Water International*, vol. 23, no. 4 (December 1998): pp. 244-248.
- Kliot, Nurit. *Water Resources and Conflict in the Middle East*. London: Routledge, 1994.
- Kliot, Nurit and Shmueli, Deborah. "Real and Ideal Institutional Frameworks for Managing the Common Arab-Israeli Water Resources (Israel)." *Water International*, vol. 23, no. 4 (December 1998): pp. 216-226.

Al-Kloub, B. and Al-Shemmeri, T.T. "Application of Multi-criteria Decision Aid to Rank the Jordan-Yarmouk Basin Co-riparians According to the Helsinki and ILC Rules." In *Water, Peace and the Middle East: Negotiating Resources in the Jordan Basin*. Library of Modern Middle East Studies, vol. 9. New York: Tauris Academic Studies, 1996, pp. 185-207.

Kolars, John. "The Litani River in the Context of Middle Eastern Water Resources." In J. Kolars and T. Naff (eds.), *The Waters of the Litani in Regional Context*. Oxford: Centre for Lebanese Studies, 1993 (Prospects for Lebanon, 7), pp. 21-60.

_____. "Les ressources en eau du Liban ; le Litani dans son cadre regional." *Monde arabe Maghreb Machrek*, no. 138 (October-December 1992): pp. 11-26.

Lahbabi, Mohamed. "Transfert massif d'eau sur de longues distances pour le développement régional et ses effets sur l'environnement humain." *Hommes, Terre et Eaux*, vol. 8, no. 29 (December 1978): pp. 63-71.

Lang, Stephanie. *Socio-economic Differentiation of Farmers in Jordan: A Target-Group Analysis*. GTZ Intern Trainee report, Amman, October 1994.

Laster, Richard. "Environmental Law in Israel Today." In Robin Twite and Jad Isaac (eds.), *Our Shared Environment: Israelis and Palestinians Thinking Together About the Environment of the Region in Which They Live*. Jerusalem: IPCRI, December 1994, pp. 107-146.

Lecomte, Jacques. *L'eau, usages et conflits d'usages*. Collection Que sais-je?, no. 266. Paris: P.U.F., 1998.

"Législation des eaux au Maroc." *Hommes, terre et eaux, Revue Marocaine des Sciences Agronomiques et Vétérinaires*, vol. 14, no. 55 (June 1984): pp. 17-102

Lindholm, H. "Water and the Arab-Israeli Conflict: An Imperative for Regional Cooperation?" In *Regional Case Studies of Water Conflicts*. Padrigu Papers. Gothenburg, Sweden: Peace and Development Research Institute, 1992.

Lonergan, Stephen C. and Brooks, David B. *The Economic, Ecological and Geopolitical Dimensions of Water in Israel*. Victoria, BC: University of Victoria, Centre for Sustainable Regional Development, 1994.

Louis, Pierre (ed.). "L'eau dans l'agriculture." *L'Homme et l'eau en Méditerranée et au Proche-Orient 4*. Collection: Travaux de la Maison de l'Orient 14. Lyon: Maison de l'Orient, 1987.

Lovato, Phil. *Las Acequias del Norte, Technical Report Number 1, The Community Ditch Systems of Northern New Mexico*.

Lowi, Miriam, R. "Bridging the Divide: Transboundary Resource Disputes and the Case of West Bank Water." *International Security*, vol.18, no. 1 (Summer 1993): pp. 113-138.

_____. *Water and Power. The Politics of a Scarce Resource in the Jordan River Basin*. Cambridge Middle East Library, 31. Cambridge: Cambridge University Press, 1993.

Macchia, Flaminia. "L'eau, enjeu majeur du processus de paix." *Le Matin*, Tuesday, 15 June 1999, p. 13.

- Malandain, Guy. "Les voies d'une nouvelle législation." In *Pour, Le Partage de l'Eau*. L'Harmattan, 1991, pp. 15-22.
- Mallat, Chibli. "Law and the Nile River: Emerging International Rules and the Shari'a." In *The Nile: Sharing a Scarce Resource. A Historical and Technical Review of Water Management and of Economic and Legal Issues*. Cambridge: Cambridge University Press, 1994, pp. 365-384.
- Malouf, Khalil. "Beyond Litani - a Commentary." In J. Kolars and T. Naff (eds.), *The Waters of the Litani in Regional Context*. Oxford: Centre for Lebanese Studies, 1993 (Prospects for Lebanon, 7), pp. 61-65.
- Mandel, Robert. *Conflict over the World's Resources: Background, Trends, Case Studies and Considerations for the Future*. Collection: Contributions in political science, no. 225. Greenwood: New York, 1988.
- Manners, I.R. *The Development of Irrigation Agriculture in the Hashemite Kingdom of Jordan with Particular Reference to the Jordan Valley*. Unpublished Ph.D. thesis, Oxford University, 1969.
- _____. "Problems of Water Resource Management in a Semi-arid Environment: The Case of Irrigation Agriculture in the Central Jordan Rift Valley." In *Spatial Aspects of Development*. London: John Wiley and Sons, 1974, pp. 95-113.
- Masri, Anan and Abu Faris, Hussam. *Water and Sanitation Systems in the Rural Areas, West Bank*. Jerusalem: Catholic Relief Services, November 1994.
- Mathieu, Paul. "Culture, rapports sociaux et efficacité de l'irrigation en Afrique noire." *Etudes et Documents*, Institut d'Etude des pays en développement, UCL, no. 8904 (1987).
- _____. "Irrigation et associations locales à Madagascar. Jeux et enjeux d'un transfert de gestion aux organisations paysannes." In *Politiques agricoles et initiatives locales. Adversaires ou partenaires*. Coordination: Chantal Blanc-Pamard. Collection Colloques et Séminaires, Editions de l'ORSTOM, Paris, 1993, pp. 239-58.
- _____. "La terre, l'eau et les hommes au Sahel, aspects économiques et sociaux." In *L'eau et les Hommes, Forum des chercheurs, Louvain-la-Neuve, 10 mai 1996*. Approches A.S.B.L., pp. 21-36.
- _____. "Irrigation, réforme foncière et réactions paysannes dans l'aménagement de la vallée du fleuve Sénégal." *Revue de Géographie de Lyon*, vol. 65, no. 1 (1990): pp. 46-51.
- Maury, René-Georges. "L'hydropolitique, un nouveau chapitre de la géographie politique et économique." In Ahmed Bencheikh and Michel Marié (eds.), *Grands Appareillages hydrauliques et sociétés locales en Méditerranée, Actes du séminaire de Marrakech (octobre 1993)*. Presses de l'école nationale des Ponts et chaussées, 1994, pp. 123-135.
- Medzini, Arnon. "Water Conflicts in the Middle East." In P. Howsam and R.C. Carter (eds.), *Water Policy: Allocation and Management in Practice*. London: E & FN Spon, 1996, pp. 267-274.
- _____. *The River Jordan: The Struggle for Frontiers and Water: 1920-1967*. Unpublished Ph.D. thesis, University of London, October 1997.

- El-Menouar, Allal. "Le cadre institutionnel des ressources en eau au Maroc (Arabic)." *Revue Marocaine de droit et d'économie du développement*, no. 26 (1991): pp. 15-43.
- Meyer, Michael C. *Water in the Hispanic Southwest: A Social and Legal History, 1550-1850*. Tucson, Arizona: The University of Arizona Press, 1984.
- Migdal, Joel S. *Strong Societies and Weak States, State-Society Relations and State Capabilities in the Third World*. Princeton, New Jersey: Princeton University Press, 1988.
- Ministry of Planning and International Cooperation (MOPIC). *Regional Plan for the West Bank Governorates. Water and Wastewater, Existing Situation*. Ramallah, 1st edition, December 1998.
- _____. Directorate for Urban and Rural Planning, Sensitive Water Resources. *Recharge Areas In The West Bank Governorates. Emergency Natural Resources Protection Plan*. Ramallah, 2nd edition, December 1998.
- _____. *Emergency Natural Resources Protection Plan for Palestine, "West Bank Governorates"*. December 1998.
- _____. *The Regional Plan for the West Bank Governorates*. December 1998.
- _____. *The Regional Plan for the West Bank Governorates (Executive Summary)*. December 1998.
- Monachesi, Alejandra and Albaladejo, Christophe. "La gestion concertée de l'eau dans un bassin versant pampéen. Apprendre l'hydraulique et la démocratie." *Natural Science Society*, vol. 5, no. 3 (1997) Elsevier: pp. 24-38.
- Moore, J.W. "Parting the Waters: Calculating Israeli and Palestinian Entitlements to the West Bank Aquifers and the Jordan River Basin." *Middle East Policy*, 3 ii (1994): pp. 91-108.
- Moore, J.W. "Defining National Property Rights to a Common Property Resource: The Case of the West Bank Aquifers." *Resource and Energy Economics*, vol. 16, no. 4 (November): pp. 373-390.
- Moric, Jon R. Thom, Derrick J. *Irrigation Development in Africa: Lessons of Experience*. Boulder, CO: Westview Press, 1990.
- Moroccan Parliament. "Loi N°10-95 sur l'eau." *Bulletin officiel du Royaume du Maroc* (20 September 1995): pp. 627-663.
- Murakami, Masahiro. *Managing Water for Peace in the Middle East: Alternative Strategies*. Tokyo, New York, Paris: United Nations University Press, 1995.
- Murray Li, Tania. "Images of Community: Discourse and Strategy in Property Relations." *Development and Change*, vol. 27 (1996): pp. 501-527.
- Muslih, Muhammad. "The Golan: Israel, Syria, and Strategic Calculations." *Middle East Journal*, vol. 47, no. 4 (1993): pp. 611-632.
- Mustafa, Hasan. *Eight Years of Community Development in Battir Village*. Jerusalem, 1959.
- Nachmani, Amikan. "A Commodity in Scarcity: The Politics of Water in the Middle East." *Survey of Arab Affairs*, no. 35 (1994).

- Naff, Thomas. *Data and Analysis of the Jordan River System*. Philadelphia: Associates for Middle East Research, May 1987.
- _____. "Israel and the Waters of South Lebanon." In J. Kolars and T. Naff (eds.), *The Waters of the Litani in Regional Context*. Oxford: Centre for Lebanese Studies, 1993 (Prospects for Lebanon, 7), pp. 1-19.
- _____. "Hazards to Middle East stability in the 1990s: Economics, Populations, and Water." In P. Marr and W. Lewis (eds.), *Riding the Tiger: The Middle East Challenge after the Cold War*. Boulder: Westview, 1993, pp. 137-162.
- Naff, Thomas and Matson, Ruth C. *Water in the Middle East. Conflict or Cooperation?* Middle East Research Institute, University of Pennsylvania. Boulder: Westview Press, 1984.
- Nasser, Y. "Palestinian Management Options and Challenges within an Environment of Scarcity and Power Imbalance." In *Water, Peace and the Middle East: Negotiating Resources in the Jordan Basin*. Library of Modern Middle East Studies, vol. 9. New York: Tauris Academic Studies, 1996, pp. 49-57.
- Neff, Donald. "Israel-Syria: Conflict at the Jordan River, 1949-1967." *Journal of Palestine Studies* 23, 4 (Summer 1994): pp. 26-40.
- Netanyahu, S. "Trans-Boundary Water Policy Coordination under Uncertainty, The Israeli-Palestinian Mountain Aquifer." In P. Howsam and R.C. Carter (eds.) *Water Policy: Allocation and Management in Practice*. London: E & FN Spon, 1996, pp. 275-282.
- Norconsult International A.S. *Water Tariff Study*. Vol. I, Working Document Report, May 1998.
- Ohlsson, Leif. *Water - An Elusive and Ultimate Constraint for Development in Regional Case Studies of Water Conflicts*. Padrigu Papers. Gothenburg, Sweden: Peace and Development Research Institute, 1992.
- _____. (ed.). *Hydropolitics: Conflicts over Water as a Development Constraint*. Zed Books, 1995.
- _____. *Environment, Scarcity and Conflict: A Study of Malthusian Concerns*. Department of Peace and Development Research, University of Göteborg, 1999.
- Ostrom, Elinor. *Crafting Institutions for Self-Governing Irrigation Systems*. San Francisco: ICS Press, 1992.
- Ostrom, Elinor and Gardner, Roy. "Coping with Asymmetries in the Commons: Self-Governing Irrigation Systems Can Work." *Journal of Economic Perspectives*, vol. 7, no. 4 (Fall 1993): pp. 93-112.
- Ouhajou, Lekbir. "Les rapports sociaux liés aux droits d'eau, cas de la vallée du Dra." *Dirassat, Revue de la Faculté des Lettres d'Agadir*, no.4 (1990): pp.123-40.
- Ouhajou, Lekbir. *Espace hydraulique et société; Les systèmes d'irrigation dans la vallée du Dra Moyen (Maroc)*. Ph.D. thesis in geography and planning with a concentration in rural areas, Paul Valéry - Montpellier III University, Arts et Lettres, Langues et Sciences Humaines, Geography Department.
- Palestinian Hydrology Group. *The Social, Environmental and Economical Impact of Water Losses in the Gaza Strip*. Jerusalem, 1996.

- Palestinian National Authority. *1999 Draft Water Law* (Arabic).
_____. *Draft Strategy for Water Management in Palestine*. 1999.
_____. *Agricultural Water Management and Conservation Methods in Gaza*. Governorates Department of Planning and Water Resources, May 1999.
- Palestinian Water Authority. *Integrated Water Resources Management, Identification of Needs and Investment Projects Vol.1, Gaza City*. December 1996.
_____. *Palestinian Water Authority Regulations*. Draft.
_____. *Water Sector Strategic Planning Study; Interim Report*. Executive Report, vol. 1. Palestinian National Authority, December 1998.
_____. *Strategy for Water Management in Palestine, January 1999*. Palestinian National Authority.
- Pallas, P. "Conjunctive Use of Surface and Groundwater, Land and Water Integration and River Basin Management." *FAO Land and Water Bulletin* 1 (1995).
- Pascon, Paul. "Méthode d'Etude des structures agraires au niveau villageois." *Bulletin Economique et Social du Maroc*, no. 128/129 (1976): pp. 117-134.
_____. "De l'eau du ciel à l'eau d'Etat: psychosociologie de l'irrigation." *Hommes, Terre et Eaux, Revue marocaine des Sciences Agronomiques et Vétérinaires*, vol. 8, no. 28 (September 1978): pp. 3-10.
- Pascon, Paul and Bouderbala, Negib. "Le droit et le fait dans la société composite. Essai d'introduction au système juridique marocain." *Bulletin économique et social du Maroc*, no. XXXII - 117 (April-June 1970).
- Percival, Valerie and Homer-Dixon, T.. *Environmental Scarcity and Violent Conflict: the Case of Rwanda*. The Project on Environment, Population and Security. American Association for the Advancement of Science and University College, University of Toronto, 1995.
- Perennes, Jean-Jacques. "Les politiques de l'eau au Maghreb: d'une hydraulique minière à une gestion sociale de la rareté." *Revue de Géographie de Lyon*, vol. 65, no. 1 (1990): pp. 11-20.
_____. "Un aspect de la question hydraulique au Maghreb: La politique des barrages." *Egypte/Monde Arabe*, no. 10- 2nd trimestre (1992): pp. 37-50.
_____. *L'eau et les hommes au Maghreb. Contribution à une politique de l'eau en Méditerranée*. Paris: Karthala, 1993.
_____. "Réflexions sur les acteurs des politiques d'irrigation au Maghreb: ingénieurs et paysans." In Ahmed Bencheikh and Michel Marié (eds.), *Grands Appareillages hydrauliques et sociétés locales en Méditerranée, Actes du séminaire de Marrakech (octobre 1993)*. 1994, pp. 139-152.
- Peters, Joel. *Pathways to Peace, The Multilateral Arab-Israeli Peace Talks*. London: The Royal Institute of International Affairs, 1996.
- Pintus, Florence. "La gestion de l'eau dans un village égyptien du Delta du Nil." Presented at the international seminar L'irrigation et la gestion collective de la ressource en eau en France et dans le monde, Montpellier, November 1998.

- Popp, Herbert. "L'agriculture irriguée moderne au Maroc entre les décisions de l'Etat et celles de l'individu. Analyse socio-géographique." *Revue de géographie du Maroc*, no. 6, Nouvelle Série (1982): pp. 105-113.
- Postel, Sandra. *Pillar of Sand. Can the Irrigation Miracle Last?* W.W. New York: Norton & Company, 1999.
- Provencher, B.; Burt, O. "A Private Property Rights Regime for the Commons: The Case for Groundwater." *American Journal of Agricultural Economics*, vol. 76, no. 4 (November 1994): pp. 875-988.
- Puech, Daniel and Boisson, Jean-Marie. "Eau-Ressource et Eau-Milieu, vers une gestion durable." *Les Cahiers de l'Economie Méridionale*, Collection Rapports d'Etude, no. 1, Montpellier (1995).
- Qashu, Hasan. *The Middle East Water Strategist: A Long-Term Framework for Integrated Water Resources Planning and Management*. Washington, DC, 1993.
- Rabinovich, Itamar. *The Road not Taken*. New York: Oxford University Press, 1991.
- Rached, Eglal; Rathgeber, Eva and Brooks, David (eds). *Water Management in Africa and the Middle East, Challenges and Opportunities*. Ottawa: International Development Research Center, 1996.
- "Recherche et mobilisation de l'eau (réalisation et projection)." *Hommes, Terres et Eaux*, vol. 20, no. 78 (March 1990): pp. 5-15
- Reguer, Sara. "Controversial Waters: Exploitation of the Jordan River, 1950-1980." *Middle Eastern Studies*, vol. 29, no. 1 (January 1993): pp. 53-90.
- Reichman, Shalom; Katz, Yossi and Paz, Yair. "The Absorptive Capacity of Palestine, 1882-1948." *Middle Eastern Studies*, vol.33, no.2 (April 1997): pp.338-61.
- Reiss, Peter; Al-Rashdan, Jamal and Hanbali, Mohammad. *Opportunities & Options for Participatory Irrigation Management in Central Jordan Valley, Water Quality Improvement and Conservation Project*. Report 3114-95-3b-02, DAI (USAID), January 1995.
- Riad, Hammoud. *L'eau enjeu géopolitique au Proche-Orient*. Unpublished Ph.D. thesis, 1997, edited by Samaha Khoury, Bordeaux 3.
- Rivera, Daniel. *Private Sector Participation in the Water Supply and Wastewater Sector: Lessons from Six Developing Countries*. Directions in Development. Washington, DC: World Bank, 1996.
- Rogan, Eugene L. and Tell, Tariq. *Village, Steppe and State: The Social Origins of Modern Jordan*. London: British Academic Press, 1994.
- Rogers, P. and Lydon, P. (eds.). *Water in the Arab World: Perspectives and Progress*. Cambridge, Massachusetts: Harvard University Press, 1994.
- Rosenau, James N. *The Scientific Study of Foreign Policy*. New York: The Free Press, London: Collier-Macmillan Limited, 1971.
- Rouyer, Alwyn R. "Zionism and Water: Influences on Israel's Water Policy During the Pre-State Period." *Arab Studies Quarterly*, vol. 18, no. 4 (Autumn 1996): pp. 25-48.

- Roy, Sara. "US Economic Aid to the West Bank and Gaza Strip." *Middle East Policy*, vol. IV, no. 4 (October 1996): pp. 50-76.
- Rudge, David. "Rain Too Little, Too Late to Ease Drought." *The Jerusalem Post*, Friday, 9 April 1999.
- Ruf, Thierry. "Du passage d'une gestion par l'offre en eau à une gestion par la demande sociale; Ordre et désordre dans les questions d'irrigation et de conflits d'usage de l'eau." Presented at the international seminar L'irrigation et la gestion collective de la ressource en eau en France et dans le monde, Montpellier, November 1998.
- Sabbah, Walid and Isaac, Jad. "An Evaluation of Water Resources Management in Ramallah District." <http://www.arij.org/water/pub/evaluation/evalu-water.html>
- Saghir, Jamal; Macoun, Andrew and Sherwood, Elisabeth. "Management Contracts in Water and Sanitation - Gaza's Experience." Unpublished Report, 1999.
- Sahawneh, F.E. *Irrigation and Irrigated Agriculture in Jordan: An Economic Geography Appraisal*. Unpublished Ph.D.thesis, Michigan State University, 1970.
- Saket, B.K. *Foreign Aid to Jordan (1924-25 / 1972-73) Its Magnitude, Composition and Effect*. Ph.D. thesis, University of Keele, 1976.
- Salameh, E. "Jordan's Water Resources: Development and Future Prospects." *Arab American Affairs*, (Summer 1990): pp. 69-77.
- Saleh, Anis Ezzat. *Company Performance and the Institutional Environment; A Comparison of the Palestinian, French and Netherlands Water Supply Sectors*. M.Sc. thesis (D.E.W. 032), International Institute for Infrastructural Hydraulic and Environmental Engineering, IHE, Delft, Netherlands, May 1998.
- _____. *Internal Evaluation of Palestinian Water Industry*. Jerusalem: Palestinian Hydrology Group, January 1999.
- Salman, Salman M.A. *The Legal Framework for Water Users' Associations: A Comparative Study*. World Bank Technical Paper, no. 360, Washington, DC: World Bank, 1997.
- Scarpa, David J. "The Quality and Sustainability of the Water Resources Available to Arab Villages to the West of the Divide in the Southern West Bank." Paper delivered at the Special Workshop: Palestinian Water Problems, International Conference, Environmental Challenges for the Next Millennium, Bethlehem University, 18 June 1999.
- Schiffler, M. "Das Wasser im Nahostfriedensprozess - Ansätze zu einer gerechten Aufteilung und Möglichkeiten zur Entschärfung der Wasserknappheit" (Water in the Arab-Israeli Peace Process - Approaches to an Equitable Apportionment and to the Alleviation of Water Scarcity). *Orient*, 36 iv (1995), pp. 603-624; 739.
- Schiffler, M. et al. *Water Demand Management in an Arid Country: The Case of Jordan with a Special Reference to Industry*. Berlin: German Development Institute, Reports and Working Papers, 1994.
- Schmida, Leslie C. "Israel's Drive for Water." *The Link*, vol. 17, no. 4 (November 1984): pp.1-16.

- Schmitz, Jean. "Hydropolitique du fleuve Sénégal (1975-1991) Problèmes fonciers, frontière et ethnicisation des conflits." In Momar-Coumba Diop (ed.), *Le Sénégal et ses voisins*. Dakar: Sociétés-Espaces-Temps, 1994, pp. 60-80.
- Serageldin, Ismail. *Water Supply, Sanitation, and Environmental Sustainability, The Financing Challenge*. Collection: Directions in Development. Washington, DC: World Bank, 1994.
- _____. *Toward Sustainable Managements of Water Resources*. Collection: Directions in Development. Washington, DC: World Bank, 1995.
- "Severe Water Crisis in Hebron." *The Jerusalem Times*, 21 August 1998.
- Sexton, Richard. *Perspectives on the Middle East Water Crisis: Analysing Water Scarcity Problems in Jordans and Israel*. London: ODI Publications, 1990.
- Shapland, Greg. *Rivers of Discord, International Water Disputes in the Middle East*. London: C. Hurst & Co., 1997.
- Shatanawi, Muhammad R. and Al-Jayousi, Odeh. "Evaluating Market-Oriented Water Policies in Jordan: A Comparative Study." *Water International*, 20 (1995): pp. 88-97.
- Shaw, James. *Rule of Law Development in the West Bank and Gaza Strip, Survey and State of the Development Effort, April 1999*. Gaza: United Nations, Office of the Special Coordinator in the Occupied Territories, April 1999.
- Shepley, Steve, C.; Gaiser, David; Bitoun, Marcel; Nassif, Hind and Schoen, Vicki. *Jordan Valley Impact Assessment: The Dynamic Transformation 1973-1986*. USAID Contract no. ANE-0260-c-00-7054-00, January 1988.
- Sheridan, David. *L'irrigation: promesses et dangers: l'eau contre la faim?* Paris: L'Harmattan, 1985.
- Shute, H.J. "Water in the Arab-Israel Conflict." *International Perspectives* (July-August 1986): pp. 22-24.
- Shuval, Hillel I. "Le problème du partage de l'eau entre Israël et les Palestiniens. A la recherche d'une solution équitable." *Monde arabe Maghreb Machrek*, no. 138 (October-December 1992): pp. 27-37.
- _____. "Approaches to Resolving the Water Conflicts between Israel and her Neighbours - a Regional Water for Peace Plan." *Water International*, vol. 17 (1992), pp. 133-143.
- _____. "Towards Resolving Conflicts over Water between Israel and its Neighbours: the Israeli-Palestinian Shared use of the Mountain Aquifer as a Case Study." In *Water, Peace and the Middle East: Negotiating Resources in the Jordan Basin*. Library of Modern Middle East Studies, vol. 9. New York: Tauris Academic Studies, 1996, pp.137-168.
- _____. "A Water-for-Peace Plan." *Palestine-Israel Journal*, vol. III, no. 3/4 (Summer-Fall 1996), pp. 74-83.
- Simpson, Larry. "Les 'marchés de l'eau': une option viable?" *Finances et Développement* (June 1994): pp. 30-32.
- Sironneau, J. "L'eau, ressource stratégique, menaces et enjeux de l'hydropolitique." *Géopolitique*, no. 43 (1991).

_____. "L'eau au coeur du processus de paix entre Israël et l'OLP Propositions." *La Houille Blanche*, no. 1 (1995): pp. 21-33.

Soffer, Arnon. "The Litani River: Fact and Fiction." *Middle Eastern Studies*, vol. 30, no. 4 (1994): pp. 963-974.

Solanes, Miguel. *Irrigation Users' Organizations in the Legislation and Administration of Certain Latin American Countries*. FAO Legislative Study, 24, Rome, 1983.

Solanes, Miguel and Gonzalez-Villarreal, Fernando. *The Dublin Principles for Water as Reflected in a Comparative Assessment of Institutional and Legal Arrangements for Integrated Water Resources Management*. TAC Background Papers, no. 3. Stockholm: Global Water Partnership, June 1999.

Sora Weinthal, Erika. *Making or Breaking the State? Building Institutions for Regional Cooperation in the Aral Sea Basin*. Submitted in partial fulfillment of the requirements for a Ph.D. at the Graduate School of Arts and Sciences, Columbia University, 1998.

Stork, Joe. "Water and Israel's Occupation Strategy." *MERIP Reports* (July-August 1983): pp. 19-24.

Sutcliffe, Claud R. "The East Ghor Canal Project: A Case Study of Refugee Resettlement, 1961-1966." *The Middle East Journal*, vol. 27, no. 4 (Fall 1973): pp. 471-482.

_____. *Change in the Jordan Valley: The Impact and Implications of the East Ghor Canal Project, 1961-1966*. Unpublished Ph.D. thesis, Princeton University, 1969.

_____. *Systematic Index of International Water Resources Treaties, Declarations Acts and Cases by Basin*. FAO, Legislative Study, 15, Rome, 1978

_____. *Systematic Index of International Water Resources Treaties, Declarations Acts and Cases by Basin*. FAO, Legislative Study, 34, Rome, 1984

Al-Tamimi, Abdel Rahman. "L'eau et son rôle dans l'élaboration de la paix au Proche-Orient." *Monde arabe Maghreb Machrek*, no. 138 (October-December 1992): pp. 38-43.

Al-Tamimi, Abdel Rahman. "A Technical Framework for Final-Status Negotiations over Water." *Palestine-Israel Journal*, vol. III, no. 3/4 (Summer-Fall 1996), pp. 67-74.

Tarawneh, Mohamed Fayez. *Aspects of Rural Transformation in the Jordan Valley: The Case of Deir Alla*. MA thesis in anthropology, Yarmouk University, Irbid, Jordan, 1989.

Teclaff, Ludwig. *The River Basin in History and Law*. The Hague: Nijhoff, 1967.

_____. *Abstraction and Use of Water. A comparison of Legal Regimes*. United Nations, Department of Economic and Social Affairs (ST/ECA/154), 1972.

_____. *Legal and Institutional Responses to Growing Water Demand*. Legislative Study, 14, FAO, Rome, 1977.

- Tiffen, Mary. "Sustainable Resource Management and Project Planning." In James T. Winpenny (ed.), *Development Research: The Environmental Challenge*. London: Overseas Development Institute, 1992, pp. 92-102.
- Torbjorn, Damhaug. *Water Master Planning Co-operation Palestinian Water Authority (PWA), Strengthening of PWA's Planning Capacity*. Mission Report, 23 September 1998.
- Treaties Concerning the Non-navigational Uses of International Watercourses, Asia*. FAO Legislative Series, 55, FAO, Rome, 1995.
- Turton, A.R. "Southern African Hydropolitics: Development Trajectories of Zambezi Basin States and South Africa." Paper presented to the 2nd Southern Africa Water and Wastewater Conference, September 1997, Harare, Zimbabwe.
- _____. "Impediments to Inter-state Co-operation in International River Basin Commissions within Arid Regions: Can Existing Theory Allow for predictability?" Paper prepared for the Water Issues Study Group, SOAS, 1999.
- _____. "Water State and Sovereignty: The Hydropolitical Challenges for States in Arid Regions." MEWREW Occasional Paper, no. 5. SOAS, University of London, January 1999.
- _____. "Sea of Sand, Land of Water: A Synopsis of Some Strategic Developmental Issues Confronting the Okavango Delta." MEWREW Occasional Paper, no. 6. SOAS, University of London, January 1999.
- _____. "Water Demand Management: A Case Study from South Africa." MEWREW Occasional Paper, no. 4. SOAS, University of London, January 1999.
- _____. "Precipitation, People, Pipelines and Power: Towards a Political Ecology Discourse of Water in Southern Africa." Presented at Political Ecology Seminar, SOAS Geography Department, 1999.
- Turton, A.R. and Bernhardt, W. "Policy-Making within an Oligarchy: The Case of South Africa under Apartheid Rule." Paper presented at the 14th International Congress of Anthropological and Ethnological Sciences, 26 July-1 August 1998, Williamsburg, Virginia.
- Turton, A.R. and Ohlsson, L. "Water Scarcity and Social Stability: Towards a Deeper Understanding of the Key Concepts Needed to Manage Water Scarcity in Developing Countries." Paper presented at the 1999 Stockholm Water Conference, Stockholm, Sweden.
- Tvedt, T. "The Struggle for Water in the Middle East." *Revue Canadienne d'Etude du Développement*, ISS/92 (1992).
- Twite, Robin and Issac, Jad (eds.). *Our Shared Environment: Israelis and Palestinians Thinking Together About the Environment of the Region in Which They Live*. Jerusalem: Israel/Palestine Center for Research for Information, December 1994.
- Tyler, Daniel. *The Mythical Pueblo Rights Doctrine: Water Administration in Hispanic New Mexico*. Southwestern Studies, no. 91. The University of Texas at El Paso, 1990.
- US Government, US Army Corps of Engineers. *Water in the Sand: A Survey of Middle East Water Issues*. Washington, DC, June 1991.

United Nations, Dept. of Technical Co-operation for Development. *Treaties Concerning the Utilization of International Water Courses for Other Purposes than Navigation: Africa*. New York: United Nations, 1984.

_____. *Ground Water in the Eastern Mediterranean and Western Asia*. Natural Resources Water Series, no. 9. New York, 1982.

Valette, François and Colas, Hubert. *Integrated Water Resources Management Modeling in Mediterranean Region, Rapport a la Commission Européenne*. Contribution to the Middle East Multilateral Working Group on Water Resources. Montpellier, France: Centre d'Ecotechniques du CNRS.

van Edig, Annette. *Aspects of Palestinian Water Rights*. Ramallah: Ramallah Center for Human Rights Studies, May 1999.

Venema, Henry David; Schiller, Eric J. and Iwra, M. "Water Resources Planning for the Senegal River Basin." *Water International*, 20 (1995): pp. 61-71.

Warner, Jeroen. *Kicking the Water Habit: Israel, Palestine and the New Water Order*. Amsterdam Middle East Papers, no. 8. December 1996.

Water & Environment Research & Study Center, University of Jordan. *Irrigation Management & Water Quality in the Central Jordan Valley (Baseline Survey) Water Quality Improvement and Conservation Project*. Report 3114-95-3b-05, USAID, April 1995.

Water in the Arab World: Perspectives and Prognoses. Papers from a conference sponsored by the Arab Fund for Economic and Social Development Harvard University's Division of Applied Sciences and Center for Middle Eastern Studies at Harvard University, October 1-3 1993, Harvard University Press, 1994.

Water Law in Selected European Countries, Vol. 1 (Belgium, England and Wales, France, Israel, Italy, Spain, Turkey). FAO Legislative Study, 10, Rome, 1975.

Water Law in Selected European Countries, Vol. II (Cyprus, Finland, Netherlands, USSR, Yugoslavia). FAO Legislative Study, 30, Rome, 1983.

Water Law in Selected African Countries. FAO Legislative Study, 17, Rome, 1979.

Water Legislation in South American Countries. FAO Legislative Study, 19, Rome, 1983.

"Water Ministry to Sign Agreement to Boost Treatment Plant Efficiency." *Jordan Times*, 28 January 1995.

Weber, Jacques and Reveret, Jean-Pierre. "La gestion des relations sociétés-nature: mode d'appropriation et droits de propriété." In *Environnement et Développement: Le Monde Diplomatique*. Collection: Savoirs, no. 2, July 1993.

_____. "Biens communs, les leures de la privatisation." In *Une Terre en Renaissance: Orstom et Le Monde Diplomatique*. Collection: Savoirs no. 2, October 1993.

Widstrand, Carl (ed.). *Water Conflicts and Research Priorities Pergamon Press*. Oxford, 1980.

Wishart, David M. "The Breakdown of the Johnston Negotiations over the Jordan Waters." *Middle Eastern Studies*, vol. 26, no. 4 (October 1990): pp. 536-546.

- Wolf, Aaron T. "Water for Peace in the Jordan River Watershed." *Natural Resources Journal*, vol. 33, no. 3 (Summer 1993): pp. 797-839.
- _____. *Hydropolitics along the Jordan River: Scarce Water and its Impact on the Arab-Israeli Conflict*. Tokyo: United Nations University, 1995.
- Wolf, Aaron T.; Dinar, Ariel, "Middle East Hydropolitics and Equity Measures for Water-Sharing Agreements." *The Journal of Social, Political & Economic Studies*, vol. 19, no. 1 (Spring 1994): pp. 69-94.
- World Bank. *Developing the Occupied Territories. An Investment in Peace Vol. 1: Overview*. A World Bank Publication, September 1993.
- _____. *Gestion des Ressources en eau Document de politique générale de la banque mondiale*. Washington, DC: World Bank, 1993.
- _____. *Report and Recommendation of the President of the IBRD to the Executive Directors on a Proposal Loan in an Amount Equivalent to US \$80 Million to the H.K. of Jordan for the Agricultural Sector Adjustments Operation*. Report Number P-6382-JO, 15 November 1994.
- _____. *From Scarcity to Security: Averting a Water Crisis in the Middle East and North Africa*. Washington, DC, 1996.
- The Wye River Memorandum, Washington, DC, 23 October 1998*. Occasional Document Series, no. 9. Jerusalem Media & Communication Center, December 1998.
- Yan Tang, Shui. *Institutions and Collective Action. Self-governance in Irrigation*. San Francisco: ICS Press, 1992.
- Zagha, Adel. *Foreign Aid and Development in Palestine*. Jerusalem: Jerusalem Media & Communication Centre, March 1999.
- Zahlan, A.B. *Agricultural Bibliography of Jordan 1974-1983: Selected, Classified and Annotated*. Published for the Abdul Hameed Shoman Foundation, Amman. London: Ithaca Press, 1984.
- Zahlan, A.B. (ed.). *The Agricultural Sector of Jordan. Policy and Systems Studies*. Published for the Abdul Hameed Shoman Foundation, Amman. London: Ithaca Press, 1985.
- Zeitouni, Naomi; Becker, Nir and Shechter, Mordechai. "Water Sharing Through Trade in Markets for Water Rights: An Illustrative Approach to the Middle East." Unpublished.
- Zouiten, Mounir. "Irrigation et participation paysanne." *Revue Marocaine de droit et d'économie du développement*, no. 26 (1991): pp. 55-59.

Appendices

Annex 1

**Agreement between Anabta Municipality and
Rameen Village Council¹**

Contract agreement between Anabta Municipality, from here on known as the First Party, and Rameen Village Council, from here on known as the Second Party

It was agreed upon by the two parties that the First Party will provide Rameen Village with its water needs from the First Party's wells, according to the following articles and conditions:

1. The First Party is committed to providing water to the Rameen Village around the clock and non-stop unless it is beyond its will and for external reasons.
2. This agreement is valid from the date it is signed by the two parties.
3. The borders of this project lie within the property of the main line, which is the main tap that is to be located on the main line between Rameen Village and Anabta near the house of Nabil Rateb Yaqoub and his own tannery.
4. Part of the main line of water which lies on the border of the project towards the Anabta Municipality West is the property of the Anabta Municipality, which is responsible for maintenance as well as replacement in case of partial or complete damage; and in the case of the need to consume more water and therefore to change the main water line with a new high capacity one, the Anabta Municipality will, upon request and on its own expense, replace in the part which lies from the starting point in Anabta until the main water meter and any place along the project lines towards Rameen Village East, which is the property of the Second Party and who is to be responsible, within the borders of the project which belongs to Rameen Village, for the maintenance as well as replacement in case of damage or the need for a bigger line in case of more consumption.
5. The Second Party will take 3,000 JD from the First Party for his water subscription. This will be a one-time payment, but according to the means agreed upon by the two parties.
6. The price per cubic meter which is given to the First Party by the Second Party is 52 Jordanian Piasters, and there will be a 1% deduction from the invoice for the Second Party's assistance.

¹ Translation by PASSIA staff.

7. The change in price per cubic meter of water which is provided by the Second Party to the First Party will correspond to the increase in price per cubic meter of water in Anabta itself.
8. In case of a water crisis in Anabta as well as a water shortage, Rameen Village will be treated equally with the rest of Anabta's neighbors; and Rameen Village will be treated equally to Anabta's neighbor with the same number of subscribers as Rameen Village, so that Rameen Village will not carry the burden of the water crisis in Anabta alone.
9. The main water meter will be read once a month in which the Second Party pays the water expenses on a monthly basis and where the timetable between having the monthly invoice and the payment will not exceed 15 days after which there will be 5% penalty for every two weeks delay and if payment exceeds two months there will be a cut of the water supply to Rameen Village until all payments are made.
10. The Second Party is committed to using the supplied water for drinking and domestic use only and not for agricultural purposes.
11. In case of any disagreement concerning the implementation of this agreement, the two parties agree to settle their differences at the office of the Minister of the Local Government and whatever is delegated by him as well as his decision will be final and obligatory for the two parties and cannot be appealed to any other party.

Signed on: Date.....Month.....Year.....

First Party

Second Party

Anabta Municipality

Rameen Village Council

Ministry of Local Government

Mr. Imad Al- Saad

General Director of
Planning and Development

Annex 2

Decree No. 38²

For the Year 1998

***Concerning the Establishment of the Ein Sultan Water Association -
Jericho***

The Chairman of the Executive Committee of the Palestine Liberation
Organization,

The Chairman of the Palestinian National Authority:

Having examined Law No. 2 of 1996 concerning the establishment of
the Palestinian Water Authority and in agreement with Decree No. 66 of
1997 concerning the internal functioning of the Palestinian Water
Authority and on the basis of the needs expressed by the public,

Decides as follows:

Clause (1)

An organization named Ein Sultan Water Association was established in
Jericho as pertains to the Palestinian Water Authority.

Clause (2)

The seat of the Association will be located in the town of Jericho -Palestine.

Clause (3)

Goals of the Association

1. The Association will work at establishing water development projects
and at improving the irrigation technique in the Jericho area.
2. To provide the Jericho area with the necessary drinking water and
irrigation water.
3. To build dams and carry out operations for water harvesting in order
to maintain the Jericho aquifer and to increase the quantity of irriga-
tion water in order to increase the cultivated area and to carry out
works that prevent water loss through leakage and evaporation.
4. To use modern irrigation methods and to save water by using smaller
quantities and by working together with the Palestinian Water
Authority and the Jericho Municipality.
5. The Palestinian Water Authority is responsible for the administration,
funding and internal organization of the Association.
6. From the moment of its proclamation in the Official Journal, everyone
is responsible to execute this decision on every specific site.

² Translated by the author.

Annex 3
Palestinian Water Authority

Annex 4

LEKA - Palestinian Water Authority Brochure

Annex 5

West Bank Water in Picture

(Photos taken by Julie Trottier)



Field prepared for flood irrigation. See chapter 3.



One of many Israeli water pumping stations in the West Bank used to extract water for Israeli consumption (including settlements). Some 82% of West Bank water is used in this manner.



Artas village.

Water in a traditional, open-air channel being bifurcated into an irrigation pool. Unblocking this point would allow the water to continue flowing through the channel. See also figure 1, chapter 3.



Ein Sultan spring, Jericho.