

EDITED BY SLAVKO BOGDANOVIC

WATER POLICY AND LAW IN THE MEDITERRANEAN

AN EVOLVING NEXUS



FACULTY OF LAW
Business Academy
Novi Sad



NOVI SAD 2011

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IHP/PCCP/CP/2011/1

EUROPEAN UNIVERSITY INSTITUTE
ROBERT SCHUMAN CENTRE FOR ADVANCED STUDIES
Mediterranean Programme

WATER POLICY AND LAW IN THE MEDITERRANEAN
An Evolving Nexus

Edited by
Slavko Bogdanovic

2011
Novi Sad
Faculty of Law of the University Business Academy in Novi Sad
Faculty of Sciences of the University of Novi Sad
In collaboration with
The Water Programmes of UNESCO—PC-CP component

This publication contains the results of the European University Institute (EUI) Robert Schuman Centre for Advanced Studies (RSCAS) 10th Mediterranean Research Meeting Workshop 11: “Law of Water Management in the Mediterranean – Past, Present, Future”, held in Montecatini Terme (Italy), 25-28 March 2009

<http://www.eui.eu/DepartmentsAndCentres/RobertSchumanCentre/Research/InternationalTransnationalRelations/MediterraneanProgramme/Index.aspx>

PREFACE

The book you are about to open and hopefully read is entitled “Water Policy and Law in the Mediterranean”. However, the title is somewhat misleading. The book, although consisting of eleven specific case studies from all over the Mediterranean (and a bit beyond), is far wider in scope than one might assume. Water policy and law cannot be taken separately from other aspects of Integrated Water Resources Management (IWRM), and this broadens the scope of the book considerably. Despite huge differences between the regions of the world (*e.g.* The Danube River Basin vs. the Mediterranean) the guiding principles as well as the obstacles to implementation of integrated water resource management are simply universal.

Integrated Water Resources Management is the practice of making decisions and taking actions while considering multiple viewpoints on how water should be managed. These decisions and actions relate to situations such as planning of new capital facilities, controlling reservoir releases, regulating floodplains, and -developing new laws and regulations, which was the principal focus of this book. The need for multiple viewpoints is the consequence of competition for water resources and complex institutional constraints. The decision-making process is often lengthy and involves many participants. IWRM considers the perspectives of various stakeholders, factors of the human environment, and aspects of natural water systems. Furthermore, it uses structural and non-structural measures to control natural and human-made water resources systems for beneficial uses. Structural components used in human-made systems control water flow and quality and include conveyance systems (channels, canals, and pipes), diversion structures, dams and storage facilities, treatment plants, pumping stations and hydroelectric plants, wells, and appurtenances. Elements of natural water resources systems include the atmosphere, watersheds (drainage basins), stream channels, wetlands, floodplains, aquifers, lakes, estuaries, seas and the ocean. This book, however, mainly discusses non-structural measures of integrated water resource management, such as legal frameworks and regulatory programmes, pricing systems and incentives, public interest, and institutional mechanisms.

Ideally, water-control facilities and environmental elements work together in water resources systems to achieve water management objectives. In other words, integrated water resource management builds upon the concept of ecosystem goods and services. And this is where we come to the book’s subtitle

– an evolving nexus – which introduces the concept of ecosystem goods and services developed to aid our understanding of the human use and management of natural resources. Our health and wellbeing depends upon the services provided by ecosystems and their components: water, soil, nutrients and organisms dependent on them. Therefore, ecosystem services are the processes by which the environment produces resources utilised by humans such as clean air, water, food, and materials, and absorbs human wastes or acts as sink.

In Europe, the Water Framework Directive (WFD), which is seen as a modern Bible for water managers, promotes the concept of integrated river basin management – a process of co-ordinating of conservation, management and development of water, land and related resources across sectors within a given river basin, in order to maximise the economic and social benefits (*ecosystem services*) derived from water resources (*ecosystem goods or functions*) in an equitable manner while preserving and, where necessary, restoring freshwater ecosystems. Integrated river basin management includes water demand and supply, trans-boundary aspects, upstream-downstream linkages, water and environment, development (including poverty alleviation), and organisational and institutional aspects at different scales. During 2009/10 the first generation of River Basin District Management Plans and Programmes of Measures was adopted. Now, the challenge is to implement these plans and programmes, which is exacerbated by the requirement to down-scale the plans to the sub-basin or catchment level. In the case of an international river basin district extending beyond the boundaries of the Community, Member States shall endeavour to produce a single river basin management plan entailing measures of basin-wide importance, which would simultaneously set the framework for more detailed plans at the sub-basin and/or national or even local level. In addition, there will be severe problems everywhere: in the water-abundant Danube Basin, where flood protection is still one of the major issues to be addressed by water management, or in the Mediterranean region, where people face the problem of water scarcity. Without an ecosystem approach, integrated water resources management remains only a concept, if not a vague vision, while in real life there are water-related conflicts of interests that need resolution in the most pragmatic, yet feasible and sustainable ways.

This is exactly why this book is valuable. It is not a travelogue, although it takes us on an exciting journey to places from Tunisian deserts to the fertile flood-plains of the Tigris and Euphrates. It is a compilation of extremely diverse, specific cases of the world's common disease - water related tensions and conflicts. It only seems to be biased by the most extreme cases, which derive from a troubled region such as Mediterranean, with all historical and political burdens in the background, although it does not differ from yet another troubled region – the

Balkans, for example. Therefore, it is applicable everywhere in the world, because the conflicts between agriculture and urbanisation, between energy production and water abstraction, between flood protection measures and wetland restoration plans are so painfully common. It is neither a cookbook on how to resolve water related conflict, as there is no a single one-size-fits-all solution. Yet, from each of the eleven case studies we can learn the same key message: (Good) water legislation is only one prerequisite to the sound implementation of integrated water resource management, which relies entirely on three pillars: communication, adaptive management and participatory principle.

Novi Sad, January 25th, 2011

Ivana Teodorovic

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ACKNOWLEDGEMENTS

All good will of co-directors and editorial efforts invested in publishing in the monograph of papers submitted and discussed during the Workshop titled “Law of Water Management in the Mediterranean – Past, Present, Future” (Montecatini Terme, Italy, 25-28 March 2009) would not have been sufficient enough if there had been no encouragement and wide support received from a number of members of international scientific community and other professionals. Professor Stefano Bartolini, Director of the Robert Schuman Centre for Advanced Studies (RSCAS) at the European University Institute (EUI), Florence, Italy, supported organising the Workshop and encouraged publishing of Workshop results. Dr. Aleksandra Djajic Horvat, Scientific Co-ordination, EUI RSCAS provided substantial help to co-directors in organising the Workshop. Her optimism really kept us moving and not giving up the hope that the initial idea shall be developed and implemented in all its aspects, including publishing this book.

The peer review of all the chapters was performed during the summer and autumn of 2010 by: Dr. Hami Alpas, Associate Professor, Food Engineering Department, Middle East Technical University, Ankara, Turkey; Mr. Fuad Bateh, Palestinian Water Authority, Independent Advisor, Palestine; Dr. Jovan Despotovic, Professor, Faculty of Civil Engineering, University of Belgrade, Serbia; Dr. Ivana Ivancev Tumbas, Associate Professor, Department of Chemistry, Faculty of Sciences, University of Novi Sad, Serbia; Dr. Ilda Mannino, Scientific Co-ordinator of the Research Activities of the Centre for Thematic Environmental Networks (TEN) and of Environmental Management Training Programs, Venice International University, Venice, Italy; Dr. Richard Meganck, Professor and former Rector of the UNESCO IHE TU Delft, the Netherlands; Dr. Massimiliano Montini, Director, Environmental Legal Team, University of Siena, Italy; and Dr. Atila Salvai, Director, Public Water Management Company “Vode Vojvodine”, the Autonomous Province of Vojvodina, Serbia.

Dr. Ivana Teodorovic, Associate Professor, Department of Biology, Faculty of Sciences, University of Novi Sad and IAD Vice-President, conducted the peer review of several chapters, and additionally spent a lot of time in discussions on numerous issues during the editorial work on this book sharing the enthusiasm with me, and also wrote the Preface to the book.

Léna Salamé, Programme Specialist, Co-ordinator of the UNESCO's Programme "From Potential Conflict to Co-operation Potential (PC-CP)" contributed in many ways to implementation of this project as the co-director of the Workshop. Together with me she actively participated in implementation of all aspects of this project through designing, co-ordinating and facilitating the all steps. Her contribution was precious in particular in organising the peer review of the authors' contributions and the editorial work. Brock Gill, intern, PC-CP Programme, UNESCO helped in correcting the texts and editorial work in the final phase.

Dr. Marijana Caric, Professor and former Rector of the University Business Academy in Novi Sad and Dr. Bozo Dalmacija, Professor at the Faculty of Sciences of the University of Novi Sad kindly provided the review necessary for publishing this book.

Dubravka Bugarski-Alimpic, BLit(t), Novi Sad and Malcolm Watson, MChem', Associate Researcher at the Faculty of Sciences of the University Novi Sad spared no time in correcting the texts of the manuscript. The contribution of Otto Simonett and Zoi Environment Network 2010, Geneva was in the form of providing the map of the Mediterranean Region (in the chapter of Alia Gana). Mirjana Dusic-Lazic, MFA in Design, Prima Design Studio, New York, created the design and made the layout of the book.

Friendly encouragement and support of all those individuals and particularly patience and readiness for collaboration of the authors of the chapters in searching for solutions of numerous publishing and editorial problems, which editing of a book like this is unavoidably faced with, and their contribution in performing various tasks in a highly professional manner, made me indebted to express my gratitude to all of them. They stayed without any reservation "on-board" with me all the time during this time-consuming and patience-requiring undertaking.

Finally, several institutions strongly supported publishing the results of the Workshop. The Faculty of Law of the University Business Academy in Novi Sad and Faculty of Sciences of the University of Novi Sad, Serbia decided financially to support and publish the book in collaboration with Water Programmes of UNESCO—PC-CP component, while Public Water Management Company "Vode Vojvodine" also provided some sponsorship enabling smooth publishing of the book. There is no need to further elaborate the importance of this kind of support for the project.

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ACRONYMS AND ABBREVIATIONS

AA(s)	Association Agreement(s)
ADR	Alternative Dispute Resolution
AFD	<i>Agence française de développement</i>
AME	Arid Middle East
ARWR	Actual Renewable Water Resources [Middle East]
ATO	<i>Ambito Territoriale Ottimale</i> [Italy]
AUEA	Agricultural water users' association [Morocco]
bm ³	billion cubic metres
CBD	Convention on Biological Diversity
CEO	Chief Executive Officer
CIPE	Inter-Ministerial Board of Economic Programming [Italy]
CNRS/LADYSS	<i>Centre national de la recherche scientifique / Laboratoire Dynamiques Sociales, et Recomposition des Espaces</i> [France]
COP	Conference of the Parties [e.g.: to a convention]
COVIRI	<i>Il Comitato di Vigilanza sulle Risorse Idriche</i> [Italy]
CRDA	<i>Commissariat de développement agricole</i>
DERD	The Directorate for Agricultural Training, Research and Development [Morocco]
DGGR	Directorate General of Rural Development [Tunisia]
DRM-CREPA	<i>Dauphine Rechercheurs en Management</i> [France]
DRPE	<i>Direction de la Recherche et de la Planification de l'Eau</i> [Rabat, Morocco]
DTI	Department of Trade and Industry [UK]
E.P.	<i>Établissements Publics</i> [Tunisia]
E.P.N.A.	<i>Établissements Publics Non Administrative</i> [Tunisia]
EAEPE	European Association for Evolutionary Political Economy
EC	European Community
EEA	European Environmental Agency

EEC	European Economic Community
EGP/LE	Egyptian Pound
EGPA	European Group of Public Administration
EMP	Euro-Mediterranean Partnership [Barcelona Process]
EMWIS	Euro-Mediterranean Information System
eq.	Equation
ESCWA	[UN] Economic and Social Commission for Western Asia
EU	European Union
EUI	European University Institute
FAO	Food and Agriculture Organization
FUNDEA	Euroarab Foundation for Higher Studies
GAP	Southeastern Anatolia Project [tr.: <i>Güneydoğu Anadolu Projesi</i>] [Turkey]
GAP—GOLD	GAP—General Organization for Land Development [Turkey]
GAP-RDA	GAP Regional Development Administration [Turkey]
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GIC	Grouping of Collective Interests
GOE	Government of Egypt
GPI	<i>Gestion participative de l'irrigation</i> [program of participatory irrigation; Morocco]
GWP	Global Water Partnership
GWAP	Groundwater Action Plan
GWMAP	Groundwater Management Action Plan
HM [Treasury]	Her Majesty [Treasury]
HEPP(s)	Hydroelectric Power Plant(s) [Turkey]
IAD	International Association for Danube Research
ICJ	International Court of Justice
IGD	<i>Institut de gestion déléguée</i> [France]
ILC	[UN] International Law Commission
JTC	Joint Technical Commission / Committee
JWC	Joint Water Committee [Israeli-Palestinian]
IMF	International Monetary Fund

IUCN	International Union for Conservation of Nature
IWLRI	International Water Law Research Institute [University of Dundee]
IWRM	Integrated Water Resources Management
M&I	Municipal & Industrial
MAEWR	Ministry of Agriculture, Environment and Water Resources [Tunisia]
MDGs	Millennium Development Goals
MEDA	<i>MEsures D'Accompagnement</i> [the main financial instrument of the Euro-Mediterranean partnership]
MedWet	The Mediterranean Wetland Initiative
MENA	Middle East and North Africa
MoU	Memorandum of Understanding
MRC	Mekong River Commission
NGOs	Non Governmental Organisation(s)
NPM	New Public Management
O&M	Operation & Maintenance
OECD	Organisation for Economic Co-operation and Development
Ofwat	Office of Water Services (UK)
ONEP	<i>Office National de l'Eau Potable</i> [Morocco]
ORMVA	Regional Offices of the Agricultural Development
ORMVAG	Regional Offices of the Agricultural Development of Gharb
PC—CP	From Potential Conflict to Cooperation Potential [UNESCO Programme]
PEEN	Pan-European Ecological Network
PKK	Kurdistan Workers Party
POLIBIUS Project	Inventory of Academic Resources in the Field of Governance and Public Administration in the Mediterranean Region
PPCC	Prespa Park Coordination Committee
PPP	Purchasing Power Parity
PPP	Public Private Partnership
RAB	Return on Asset Base
RAC/SPA	The Regional Activity Centre for Specially Protected Areas
RBAs	River Basin Agency(ies)

ROR	Rate of Return
RPI-X	Price Cap Regulation [pricing model]
RSCAS	Robert Schuman Centre for Advanced Studies [of EUI]
SAA	Stabilisation and Association Agreement
SEE	South Eastern Europe
SEHUMED	<i>Sede para el Estudio de los Humedales Mediterraneos of the University of Valencia</i>
SMAP	Short and Medium-Term Priority Environmental Action Programme
SONEDE	<i>Société Nationale d'Exploitation et de Distribution des Eaux [Tunisia]</i>
STRP	Scientific and Technical Review Panel [Ramsar Convention]
SUR	Seemingly Unrelated Regression [methodology]
UfM	Union for the Mediterranean
UK	United Kingdom
UN	United Nations
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environmental Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention on Climate Change
UNGA	United Nations General Assembly
UN/ILC	United Nations International Law Commission
US	United States
USAID	United States Agency for International Development
USD/\$	United States Dollar
UWWT	Council Directive of 21 May 1991 concerning urban waste water treatment (91/271/EEC)
WFD	Water Framework Directive
WHO	World Health Organization
WUAs	Water Users Association(s)
WWF	World Wildlife Fund
YR	Yemeni Rial

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- 64 Agriculture Settlement Law, 2010
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INTRODUCTION

I

Climate change, population growth, pollution of waters, depletion of available water sources, worsening of ecological conditions, problems in satisfying growing demands for water for different uses (including public utilities) and efforts of the countries and regional organisations to formulate adequate responds – are some pieces of a puzzle marked as integrated water (resources) management. Ongoing integrative processes such as association with the EU and development of the Union for the Mediterranean are the most powerful driving forces contributing to joint efforts to develop and realize appropriate policy and legal solutions to challenges. These integrative processes also encourage the search for good water management models in national and transboundary frameworks of the region. An increasing interest for legal and institutional aspects of water management, together with always scientific management issues, is an additional feature making the regional background, that can be marked as an emerging nexus in the Mediterranean, more complete.

The Workshop titled “Law of Water Management in the Mediterranean - Past, Present, Future” was organised as a part of the 10th Mediterranean Research Meeting by the European University Institute’s (EUI) Robert Schuman Centre for Advanced Studies (RSCAS), and held in Montecatini Terme, Italy, from March 25th to 28th, 2009. The Workshop was coordinated by Slavko Bogdanovic, University of Business Academy in Novi Sad and Léna Salamé, Co-ordinator of the UNESCO Programme, from Potential Conflict to Co-operation Potential (PC-CP), Paris. It was attended by fourteen participants from Belgium, France, Israel, Italy, Lebanon, Morocco, Portugal, Tunisia, Serbia, Syria, Spain, The Netherlands and Turkey, who presented eleven original papers dealing with various aspects of (fresh) water management in the Mediterranean, Middle East and North Africa (MENA) and South Eastern Europe (SEE) countries.

The main goal of the Workshop was an in-depth analysis of the impact of law on water resource management, co-operation, and conflict resolution and prevention. By exploring the numerous sources of law applicable in the Mediterranean region, papers delved into the multiple facets of legal regimes, including the customary and contemporary, formal and soft, public and private, and national and international. The agenda of the Workshop was not designed as a closed

list of issues. It left enough room also for investigation of respective policy and institutional issues.

The water (management/governance) research fora usually gather hydraulic engineers, scientists, water policy makers, water managers but rarely lawyers. Fortunately, the RSCAS research framework provided an excellent possibility to read on and discuss, beside law and policy, also the outputs of disciplines not typically interested in water management issues (*e.g.* ethnology, cultural anthropology and political economy). This Workshop has indicated the importance of a truly broad multidisciplinary approach in the search for a better understanding and formulation of promising policy, legal, institutional and managerial frameworks for water management in conditions so strongly cumulatively affected by natural and anthropogenic factors.

II

This publication provides the insight into the various impacts of customary, traditional, international and evolving law on water resources management, co-operation, and conflict resolution and prevention. Put together, the eleven chapters reflect similarities and the common problems of water resources in the Mediterranean region – scarcity, environmental degradation, economic development, pricing mechanisms, and water security to mention but a few. Moreover, the contributions are far-ranging in their analyses of the recursive relationship between the law and the field it influences. They presented here the complex interplay between the law and the broader social, economic, and governmental environment – be it modern or traditional. The result is a rich compilation that should or might aid in the development of policies informed by law and science as well as a foundation for future research in the Mediterranean, but also in the neighbouring MENA and SEE countries.

The East Mediterranean has been considered as a water-stressed region and a zone conducive to water-related interstate tensions. The existence of water shortages, both in quantity and quality, is clearly visible particularly in big cities. The expansion of industrial estates around those big cities has for its part contributed to deterioration of ecological conditions. In response to such a threat, domestic and international law is permanently adjusting in order to counter this critical situation. In their chapter, Salamé and Kharouf-Gaudig presented a study regarding water resources in a few East Mediterranean cities, indicating that scientific and technical means should be taken into account in order to counter

the threat of fresh water shortage, whereby focussing on the role of the law as a factor of conflict resolution.

Starting from the position that water has become a world strategic issue, principally due to the increasing risk of scarcity and contamination, Gana pays attention to an additional dimension of such risk in the Mediterranean region, where climatic hazards exacerbate the possibilities of crisis and where unequal distribution of resources contribute to strengthening of competition between farm irrigation and domestic and urban needs. Depending on the country, and the political and institutional contexts, the implication of this “integrated management” approach takes extremely different forms and is expressed in a series of experiments with organisational tools (local assemblies, water users’ associations, local property owners, etc.), which lead to the creation of new areas of action (upstream/downstream, river basin, etc...) and constitute a source of greater complexity in the water management systems with their combination of legal, technical and political aspects. Drawing on the results of a comparative research conducted in four countries of the northern and southern shores of the Mediterranean, this study examines the socio-institutional changes brought about at a local level through implementation of new water management policies and regulations.

Haouari and van Steenbergen investigate and discuss the phenomenon they call “the blind spot in water governance in large irrigation systems” that occurs in some countries of the MENA region – conjunctive management of groundwater and surface water. In conjunctive management, groundwater is used in combination with surface irrigation – with groundwater making up for the unreliability of surface supplies – thus being an important additional resource. This is multiplying productivity and sustaining economic growth and national stability that otherwise would not be there. Conjunctive use of groundwater and surface water sustains several of the breadbasket regions in the Middle East and North Africa and is a part of the recipe for high water security.

Shorr analyses in detail the situation in Ein Gedi nature reserves in the light of positive Israeli water law and its implementation. Israeli water law was once held up as a model of enlightened public control of water resources. However, the reality of Israeli water management has been continued mismanagement, environmental degradation and inequities and inefficiencies in water distribution. Using the conflict among Israeli groups over the waters of the Ein Gedi nature reserve as an example, the author describes the gap between the rhetoric of public ownership of water in Israel, and the creeping judicial and legislative recognition of private rights in water, a recognition that is at odds with important environmental values. The tension between public and private rights in

Israeli water law is relevant to other legal systems in the Mediterranean basin as well, in particular given the contemporary push for integrated management by government bodies. The Israeli case demonstrates that public control of water resources is not sufficient to ensure optimal realization of public interest.

Cherrabi El Alaoui presents the results of her ethnographic research into the existing system of water management in the concrete case, the Ghorfa area in the Tafilalet Oasis, Morocco. Both modern and customary water law are present in practice there, contributing to a complex and confusing system of water management and different perception of stakeholders of local problems connected with waters and modern measures undertaken to satisfy demand for water in an environment exposed to risks of impact of unpredictable natural occurrences, such as floods and water scarcity.

The region of the Middle East known as Cradle of Civilisation, the Euphrates-Tigris River Basin, divided during twentieth century between Turkey, Syria and Iraq and becoming in our times the cause of political conflicts between the riparian states, is the subject matter of scrutiny in the chapter of Açma. Recent development plans implemented by Turkey threaten to deny water historically utilised by the downstream countries of Syria and Iraq. Water scarcity in the Middle East and historic political rivalries are also fertile soil for emerging conflicts. As a result, the three states have sought to securitise their rights over Euphrates and Tigris waters. The author defends the argument that the riparian states have widened their respective conventional security concerns to include water, creating a hydro-political security complex in the region. The chapter goes on to examine why efforts to co-operate in the Euphrates-Tigris River Basin failed and looks into the validity of the current international law as a water management tool. It concludes by suggesting an ethical framework for environmental management of water in the Euphrates-Tigris River Basin.

Bogdanovic tried to identify the most important international policy and legal regimes that apply to the management of protected natural areas, in particular those that include or are adjacent to transboundary wetlands and lakes in the Mediterranean Region. The chapter examines the role of law, its significance, potentials and limits and suitability of certain legal instruments for up-grading institutional arrangements, and indicate their possible effectiveness in serving as the basis for expected developments.

Canelas de Castro focuses on the EU water policy and legislation. This policy, stemming from the early 1970s, actually stands as a forerunner in the context of its policies devoted to the protection of the environment and the use of natural resources. The Water Framework Directive promises to break up with this poor

record of ineffective legal instruments, maladapted to the needs posed by reality and the expectations of the Europeans. He analyzes the main pillars of this new conceptual construction of European waters management, looking in particular at key notions or solutions and assessment of practical relevance of these solutions for new water management in Europe. Additionally, he strives to highlight the main mechanisms whereby this concept, strictly speaking a European Union one, has a more far-reaching impact, thus equally influencing other European territories outside the European Union.

The study of di Cosmo contains empirical results investigation of the impact of financial leverage on the efficiency of a sample of 66 Italian water companies. In order to disentangle the sources of inefficiencies she adopted both a Classical and a Bayesian stochastic frontier approaches. She tests firstly, if a positive relation exists between the regulated firm indebtedness and the firm specific inefficiency, and secondly, if the ownership of Italian water companies really matters in determining the firm's performance. Thereafter, she investigates if the recent consolidation process between different water companies affects the economies of scale that characterise the Italian water sector, as highlighted by other authors.

Martinez-Fuentes and Pattyn deal in their chapter with the New Public Management principle of autonomisation developed and implemented in the OECD countries, which is being gradually incorporated into the MENA countries' managerial systems for distribution of potable water. Whereas a combination of global processes, international pressures and national phenomena encourage MENA countries' governments to implement the autonomy principle through the reforming programmes for modernisation of the water sector, an amalgamation of historical, environmental, cultural and structural-instrumental factors obstructs such attempts. This dialectic actuality is particularly notable in the Tunisian casuistry.

Yousfi deals with Public Private Partnership which has been recognised as a universal management mechanism to allow for an efficient solution of the problem of providing water services in the Mediterranean countries. Using an ethnographic approach and drawing on a management contract for drinking water in Lebanon, the author challenges conventional view of homogeneity of the partners' interpretation of contracts in co-operation between private sector and public partner. She argues that partners would have specific perceptions of their contractual obligations and Public Private Partnership regulation principles, depending on their local practices and their cultural framework.

III

In their studies, ranging from analyses of current policies to a call for reform, authors have contributed to the growing and critical body of knowledge regarding law, policy and institutions governing water resources management in the Mediterranean. The readers might be left with the impression that the scope of this book could be much broader and further enriched with studies on many other important issues. The co-directors of the Workshop and editor could only agree with such observation.

The two-year endeavour for realization of this *pro bono* project was surrounded by the atmosphere of a broad support and friendly encouragement – provided by institutions, colleagues and professionals and followed by enthusiasm of the authors and peer reviewers involved in the project activities. We see this support as an indication that the Workshop itself and this publication as a final product of the project activities have been perceived as a valuable contribution to many actual professional efforts aimed at searching for appropriate answers to contemporary challenges in water management which a region such as Mediterranean is faced with.

Novi Sad—Paris, 15.02.2011

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WATER LAW IN EAST MEDITERRANEAN COUNTRIES: The Imperative of a Holistic Approach

I. INTRODUCTION

This article is an attempt to explain the water management problems experienced by some East Mediterranean countries (Jordan, Syria, Lebanon, Israel, and the Occupied Palestinian Territories), particularly in the big cities. It shows how the failure to prevent or resolve conflicts stems from the incoherence of the legal framework for water management, especially in the cities of the Mediterranean, which thereby becomes an obstacle to the development of the countries concerned.

In the first part, we discuss the increasingly critical water situation in several large cities of the East Mediterranean. Being faced with worsening ecological conditions due to pollution on the one hand and population growth and the influx of people to urban areas on the other hand, big cities have a hard time balancing a limited supply and an increasing demand for drinking water. Indeed, as centres of human consumption and economic and industrial activity, they concentrate the critical factors that lead to water resources being threatened by both over-exploitation and pollution. Sophisticated and often costly technologies that meet the requirements of sustainable development are not an option for East Mediterranean countries, being for the most part located in developing countries - this in turn, reinforces the water stress affecting the region.

The second part of the paper focuses on the role of the law as a factor in conflict prevention and resolution. In response to increasingly scarce and deteriorating water resources, legal mechanisms were set up in national and international law for the purpose of regulating water management. These legal mechanisms, which reflect societal patterns, must be adapted to the new water usage and consumption figures. At the beginning of the 21st century, the domestic laws of East

Mediterranean countries need to evolve, as international water law is evolving, to preserve water resources and rationalise consumption.

Moreover, the paper explains the importance of Alternative Dispute Resolution techniques and the creation of an environment for negotiation and cooperation to avoid conflicts by turning potential conflict into cooperation. The large cities of the East Mediterranean crystallise the seriousness of the region's water issues. In order to provide food security and meet the requirements of sustainable development it is imperative to harmonise domestic laws and develop regional multilateral agreements. These actions are a prerequisite for the attainment of any water-related equilibrium in this difficult, if not downright conflictive, context, which affects both regional and international security and peace.

II. THE SUSTAINABLE DEVELOPMENT CHALLENGE OF WATER MANAGEMENT IN THE CITIES

The majority of the East Mediterranean capitals can serve as examples of the water stressed situation which characterises the region. In Amman for instance, the population has access to running water only two or three days per week. In Damascus, water is rarely available all day long and the population is required to build up reserves. The population of the Damascene urban area, which currently numbers 3.7 million inhabitants, will reach 5.2 million inhabitants by 2040. Such growth - which all Mediterranean cities are expected to experience - could be faster still with the progressive liberalisation of the economy, attracting an increasing number of investors.

On top of the issue of water scarcity and over-exploitation comes that of deteriorating quality of water resources due to surface and groundwater pollution as a consequence of the leakage of sewage on the one hand and poor industrial waste management on the other hand. Actually, given the unity of the water cycle and the interconnection of the various resources that are part of it, the consequences of overexploitation and pollution go beyond the geographical urban area and they can also affect rural areas. For example, these effects threaten the primary user of water resources, the agricultural sector, which uses up to 67% of water in Lebanon, 63% in Israel, 44% in the Palestinian Territories, 64% in Jordan, and up to 90% in Syria.¹

1 Bendelac; Clarke & King; and Allan.

In addition to the consequences of population growth and pollution, Mediterranean countries are directly affected by climactic changes and worsening ecological conditions, notably in the form of increased drought. The East Mediterranean region, the biggest part of which is semiarid, is subject to irregular and on the whole insufficient rainfall. Rainfall is concentrated within quite a short period, from November to March, with a good portion of it evaporating at the surface or lost to the sea. It is, in fact, not sufficient to replenish groundwater.²

In that regard, it is most interesting to note that some big cities such as Damascus, Jerusalem, Ramallah, and Amman are mainly dependent on rain-fed groundwater. In view of the insufficiency of rainwater, the use of unconventional resources (recycling, desalination, water transfers from less critical areas to harder hit areas) becomes unavoidable. However, such projects are subject to technical or financial problems, which developing countries cannot easily overcome.

For instance, water desalination, which is the main source of fresh water in some Gulf countries, is much less important in the East Mediterranean. Still, it remains the region's most common unconventional resource. In Israel, approximately 10% of consumption comes from desalinated water, and there are plans to increase this figure to 50% of household consumption, *i.e.* approximately 350 million cubic meters, by 2010.³

The development of this resource, as of other unconventional resources is all the more essential as it will enable East Mediterranean countries to reduce their interdependence in water matters, since most conventional resources are often shared between riparian countries. For instance, the region's main surface waters are made up of international watercourses distributed as follows (where the percentage corresponds to the area of the basin in each country):

- Tigris – Euphrates – Shatt al-Arab:
Turkey 24.80%, Syria 14.73%, Iraq 40.48%, Iran 19.70%,
Jordan 0.25%, Saudi Arabia 0.01%;
- Orontes: Turkey 49.94%, Syria 44.32%, Lebanon 5.74%;
- Jordan: Jordan 48.13%, Israel 21.26%, Syria 11.45%, Golan Heights
3.50%, West Bank 7.48%, Egypt 6.31%, Lebanon 1.33%.⁴

2 UNESCWA.

3 Bendelac.

4 UNEP.

In the future, this interdependence must encourage countries to cooperate and show solidarity, which is absolutely necessary to attain regional equilibrium and guarantee both water security and economic prosperity for the whole region. However, in the current conflictive context, with no true political will to share resources, concerted action in the common interest and balanced management are still a faraway prospect.

Thus, water resources today are governed by each country's domestic legal mechanisms, such management being deemed inseparable from the question of national sovereignty.

III. FROM PRIMACY OF SOVEREIGNTY TO IMPORTANCE OF HARMONIZING LEGAL FRAMEWORKS

Water management in the East Mediterranean cities is governed by the states' general water strategy and is therefore subject to national and international policies. The purpose of water management is to regulate the use of water resources within society (consumers) and to impose penalties for violations.

The existing legal tools for proper water management in the East Mediterranean region take the form of legal texts of domestic law and international agreements related to water issues, regarding:

- Legal status (ownership);
- Management and protection against depletion or control of extraction and use on the one hand, and protection against pollution on the other hand;
- Alternative Dispute Resolution.

1. Water as Public Property

When water is publicly owned or controlled by the state, the government has almost absolute authority regarding the way water resources are to be managed and utilised. It is not so in the case of private ownership which limits the public authorities' control over the use of water, especially groundwater. When they attained independence after the Second World War, several East Mediterranean countries integrated some of the legal mechanisms contained in the *Ottoman Civil Code*, or *Mejelle*⁵ in their legal systems, including Syria and Lebanon where

5 Mallat.

articles 1234 to 1328 on water management are still in force. In this text of Islamic tradition, water is defined as a common good whose ownership can be private only in certain cases. In accordance with article 1235 which provides that

water flowing under ground is not the absolute property of any person,

groundwater is always deemed to be a public good. In Jordan and Israel, where the *Mejelle* was replaced by new legislation, this rule applies to all of the country's water resources, as asserted by the Water Authority set up by the Jordan Act:

All water resources available within the boundaries of the Kingdom, whether they are surface or ground waters, regional water, rivers or internal seas are considered State owned property.⁶

Similar provisions were adopted in the Israeli Water Law of 1959, which provides that:

The water resources in the State are public property; they are subject to control of the state and are destined for the requirements of its inhabitants and for the development of the country.⁷

During the French mandate, two texts (stemming, as with the *Mejelle*, from pre-independence legal systems) were added to the Lebanese and Syrian legislations relating to water management. These two texts⁸ give a definition of the public domain and provide for the protection and utilisation of water within this same domain⁹. These texts, which constituted the foundation for both countries' water legislations but were not exhaustive, were completed in 2005 in Syria with Act No. 31 of November 16th relating to water, whose article 2 sets forth that watercourses, lakes, waterfalls, springs, and groundwater are deemed to be a public good.

The special case of the Palestinian Territories (West Bank and Gaza Strip) should be mentioned here. Water ownership and management had been governed since the beginning of the military occupation in 1967¹⁰ by a series of Military Orders allowing Israel to acquire full control over water resources. According to these Military Orders, which were adapted to the specificities of the West Bank and

6 Jordan Act No. 18 of 1988, Article 25.

7 Article 5719, Chapter One, Preliminary, Section 6.- Trollaldalen.

8 Order No. 144/S of the High-Commissioner of June 10th, 1925 and Order No. 320 of May 26th, 1926.

9 Lebanese Republic, Official Journal, 2001.

10 United Nations Security Council Resolution 242 (S/RES/242 of 22 November 1967), and Resolution 338 (S/RES/338 of 22 October, 1973).

of the Gaza Strip, only the Israeli authorities had the power to grant drilling authorisations, prohibit water extraction, or close down the existing water installations.¹¹

With the peace process, the water-related legal mechanisms in the Palestinian Territories have progressively evolved. For instance, the agreement of May 4th, 1994 provides for a transfer of authority from the Israeli military government and the civil administration to the Palestinian Authority regarding drinking water and sewage management in the Gaza Strip and the Jericho Area¹². These arrangements were broadened by the Interim Agreement of September 28th, 1995¹³ which also includes new provisions relating to the management of the West Bank's water resources¹⁴.

An analysis of the legal mechanisms relating to water management in the Palestinian Territories shows that the Oslo II Agreement constitutes a limited transfer of authority. Despite the fact that the Oslo II text provides that:

The Israeli side shall transfer to the Palestinian side, and the Palestinian side shall assume, powers and responsibilities in the sphere of water and sewage in the West Bank related solely to Palestinian¹⁵,

several sub-articles limit the Palestinian Authority's action within its territories. For instance, the transfer of powers only concerns the Palestinians themselves, not the Israelis living in the colonies of the West Bank. Also, the transfer does not apply to the issues of ownership of water and of sewage in the West Bank¹⁶, for which arrangements shall be laid down only within the framework of the final negotiations¹⁷.

The institutions related to the Joint Water Committee¹⁸ which is in charge of coordinating the common actions of Israelis and Palestinians in the matters of water resource management, are subject to other constraints. Notably, their role

11 Van Edig.

12 Agreement on the Gaza Strip and the Jericho area, May 4th, 1994, Annex II Protocol concerning civil affairs, Art. II § 31.

13 Oslo II.

14 Israeli-Palestinian Interim Agreement on the West Bank and the Gaza Strip, Washington, September 28th, 1995, Annex III, Protocol concerning civil affairs, Appendix 1, Article 40.

15 Annex III, article 40, § 4 of Oslo II.

16 Sub-article 5.

17 Sub-article 4.

18 JWC.

is to “deal with all water and sewage related issues in the West Bank”¹⁹, *i.e.* to manage the aspects excluded from the Palestinian Authority’s competence by sub-article 5 and to settle any disagreements in that regard. Since the JWC is composed of an equal number of representatives from both parties and decisions can only be made by consensus, the Palestinians’ leeway for their actions in the West Bank is again severely limited.

For instance, any Palestinian initiative relating to water management (licensing, drilling, increasing extraction) can be blocked by the simple opposition of the Israeli members pursuant to the committee’s voting mechanism, even when the contemplated projects concern areas populated mainly by Palestinians, notably the Ramallah and Nablus urban areas. This “right of veto” also applies to decisions relating to proper Palestinian resources such as the Eastern Basin of the Mountain Aquifer. Such failings become especially blatant when compared with the lack of any similar voting mechanism for the prevention of Israeli action regarding the exploitation of transboundary water resources such as the Western Basin.

Nevertheless, some of the provisions of the Oslo II Agreement seemed to constitute a real advance towards the recognition of Palestinians’ right to water. For instance, Article 40 § I provides that:

Israel recognizes the Palestinian water rights in the West Bank.

However, these rights are not specified in the text, which simply announces that they will be taken into consideration only in the final status negotiations. To make it even worse, by stipulating that “both sides agree” to maintain the “existing quantities of utilization from the resources”²⁰, the text refers to the legalisation of the existing situation resulting from the military occupation, which is characterised by the unfair use of water resources to the advantage of Israel, especially those of the Mountain Aquifer²¹.

Another important shortcoming of the Oslo II Agreement is the lack of precision regarding the application of the precautionary principle in the exploitation,

19 Sub-article 12.

20 Sub-article 3 § IV.

21 For instance, in the 1990’s, the Israelis used up approximately four times more water from the Mountain Aquifer than the Palestinians (440 to 550 mcm/year for the Israelis and 116 to 121 mcm/year for the Palestinians). According to Nasser.; *Cf.* World Bank.

management, and utilisation of water resources. Although Article 40 § 3a recalls that both Parties undertake to prevent the deterioration of water quality and take

all necessary measures to prevent any harm to water resources, including those utilized by the other side,

this principle takes only the protection of the resource itself, not of the other Party's rights, into account.

Lastly, the Oslo II Agreement emphasises that the water quantities allotted to Israeli military sites and colonies, both for household and agricultural usage, should be maintained.

The problems resulting from these legal shortcomings and the accompanying lack of any Palestinian territorial sovereignty are preventing the coherent management of all water resources in the Occupied Territories. Therefore, in the case of the Palestinian Territories, where the exercise of the Palestinian national territorial sovereignty is linked to the development of the peace process, the legal and administrative shortcomings arising from bilateral agreements are preventing the global management of water resources. This formed the ambiguous background for the passing of the Palestinian Act No. 3 on July 17th, 2002. Its purpose is to increase the capacity of the Palestinian Territories' water resources and to improve their protection against pollution and over-exploitation risks. To that end, the Palestinian Territories' water resources are declared to be a public good and their utilisation and exploitation is from now on restricted. Each new extraction for commercial purposes must be authorised first.

Given the limited autonomy which, for the aforementioned reasons, the Palestinians have in applying their water policy, it is in many cases a purely theoretical act. Therefore, it is not surprising that it focuses on water resources as such, much more than on institutions in charge of their management, such as the National Water Council and the Palestinian Water Authority, which is the author of the above-mentioned texts drawn up following the Oslo Agreements.²²

2. Regulation of the use of water resources

Although the development of the national legislations of East Mediterranean countries has led to water being branded a public good, when it comes to its management, it is necessary to differentiate between surface water and ground-

22 Palestinian National Water Policy, 1995, and Water Resources Management Strategy, 1998.

water. Where surface waters²³ seem to be inalienable from the public domain, groundwater which is often exploited from a private property²⁴, may on the contrary evade control by the public authorities. In order to counter the resulting threat to this vulnerable, and for the region's big cities, essential resource, the respective countries' national legislations provide for a number of specific mechanisms intended to protect groundwater from pollution and overexploitation. However, such mechanisms are the exception in national legislations which still only rarely differentiate between surface waters and groundwater.²⁵

2.1 Protection against pollution

The Israeli Water Drilling Control Act of 1955 prohibits all forms of pollution, which it defines in a very broad manner. According to the Act, pollution includes

... a change in the properties of water in a water resource in physical, chemical, organoleptic, biological, radioactive or other respect, or a change as a result of which water is dangerous to public health or likely to harm animal or plant life or less suitable for the purpose which it is used or intended to be used.²⁶

In Jordan, the quality of water is controlled by the Ministry of Water and Irrigation²⁷. The extraction authorisations granted by this administration entail an obligation not to cause any pollution to groundwater.

In Lebanon, the Act No. 337 of December 14th, 2001 includes general provisions relating to the protection of groundwater but falls short of proposing any specific measures.

In Syria, the Act No. 31 of November 16th, 2005 includes the following provisions relating to protection of groundwater:

Public water quality control and pollution prevention are coordinated by various ministries and public institutions; the administration in charge of quality control, which belongs to the Ministry of Irrigation, carries out the controls.

23 natural watercourses, canals, lakes, etc.

24 wells, drillings, etc.

25 Burchi; Caponera.

26 Article 1 A, section 20A, chapter 2 of the Water Drilling Control Act 1955.

27 Article 4 A of Underground Water Control By-Law (By-law No. 85 of 2002); text available at the website of Ministry of Water and Irrigation in Jordan - www.mwi.gov.jo.

Any pollution identified according to the standards and criteria in force is notified to the Ministry of Environment and to the city in order to determine the cause of pollution.

Administrative proceedings are then initiated and the pollution case processed within the framework of the Act No. 50 of 2002²⁸. For instance, deliberate pollution of a water spring or intentional damage to public irrigation works is punishable under criminal law by one to three years of imprisonment and a fine in the amount of SYP 200,000²⁹.

Whether relating to groundwater or surface waters, the existing legal mechanisms relating to the protection of water in East Mediterranean countries only apply within the geographical territory of the state and are only rarely the subject of concerted action between the states. This situation is all the more detrimental as the interconnection between the constitutive components of water basins facilitates the diffusion of polluting substances³⁰ beyond political borders. It is therefore in these countries' interest to harmonise the laws relating to the protection of water quality, especially regarding groundwater, which is more critical because of its slow replenishment rate and their often hard to monitor mobility.

2.2 Protection against depletion

In the riparian states of the Jordan River Basin, groundwater extraction and exploitation are subject to domestic laws regulating the issuing of drilling authorisations on the one hand and quantity control on the other hand, as follows:

- Jordan: Underground Water Control By-Law³¹;
- Israel: Water Drilling Control Act of 1955;
- Lebanon: Act No 221 of May 29th, 2000 organizing the prospecting and use of groundwater³²;
- Syria: Act No. 31 of 2005.

The Syrian law (the most recent) sums up the concerns shared by all riparian states regarding the difficult monitoring of this “hidden treasure”. It notably provides that:

- All extraction projects shall be subject to prior authorisation;

28 Article 50 of the Decree relating to the Act No. 31 of November 16th, 2005.

29 Article 35 A, Chapter 7 of the Act No. 31 of November 16th, 2005.

30 industrial waste and salt water.

31 By-Law No. 85 of 2002.

32 Lebanese Republic, Official Journal No. 25 of Jun 8th, 2000, p. 1949. [Translated from the Arabic by the authors.-Ed].

- Extraction in protected areas (aquifer replenishment areas) shall be prohibited;
- The drilling of new wells shall be prohibited, unless exceptionally authorised by the Ministry;
- A specific administration equipped with modern technical means shall enforce these mechanisms;
- If the law is broken, serious penalties are provided for under criminal law³³.

Even though these very strict mechanisms relating to protection against depletion forbid new wells being drilled and authorised water quantities from wells being exceeded, it has to be acknowledged that instances of both have multiplied in the past few years. For instance, private Jordanian wells, which represent approximately 60% of the total number of wells, are not subject to control for the main part, or are equipped with broken water-meters³⁴. In Syria, according to the FAO estimates, there were 53.453 unauthorised wells in 1997, *i.e.* approximately half the total figure for the country³⁵.

In Israel, the report by the State Comptroller on the Management of the Water Sector of 1990 noted that over-exploitation of coastal and mountain aquifers was the first cause of water quality deterioration. In the same report, the emphasis was placed on the fact that, despite both aquifers undergoing depletion, additional extractions had been authorised by the Water Commissioner in charge of water management, in total contradiction with the new, alarming water figures³⁶. At this point, we can only note the continued over-exploitation of water resources which the public authorities have difficulty controlling and acknowledge that, as things stand, it is not possible to check the dramatic deterioration and depletion of these resources. Despite this situation there are very few bi- or multilateral agreements in this region that address the challenges related to the quantity and most importantly the quality of water resources in shared basins. When they exist, such agreements do not always provide guidance for the resolution of water related disputes beyond that of the classical litigation process.

Furthermore, the litigation processes are usually long and costly, and although their results are enforceable, the level of compliance is normally low.

33 Water Legislation Act No. 31 of November 16th, 2005”, Syrian Official Journal, *Techrin*, November 2005. [Translated from the Arabic by the authors.- Ed].

34 Stephan.

35 FAO; available at www.fao.org/nr/water/aquastat/main/indexfra.stm.

36 Adam.

The alternative dispute resolution techniques give the parties in dispute ownership in the processes. Hence there will be higher chances for the solutions to be implemented, and disputes to be anticipated, prevented and resolved.

3. Alternative Dispute Resolution³⁷

Given the central importance of water resources to all human communities, it is natural that disputes arise regarding access, allocation, development and management of the resource. Thus, anticipating and preventing disputes as well as dispute resolution techniques are important measures to avoid or resolve disputes. Corresponding national and international legal frameworks should promote and facilitate these measures. ADR techniques were developed in the West in the 1970s as an acceptable alternative to the dominant approach of litigation, with its focus on confrontation and the “winner takes all” principle.³⁸

The ADR process includes a set of approaches and techniques aimed at resolving disputes in a non-confrontational way. The broad spectrum of techniques ranges from party-to-party engagement in negotiations as the most direct way to reach a mutually accepted resolution, to mediation, arbitration and adjudication, where an external party imposes a resolution. In most cases, the outcome is equivalent to a win-win equation and although the decisions are not enforceable, the compliance rate can be quite high. An ADR process is usually less costly, less complex, much shorter than litigation and imposes a preference for confidentiality. Furthermore, it allows for the desire of some parties to have greater control over the selection of the individual or individuals who will decide their dispute. It is based on more direct participation by the disputants, rather than being run by lawyers, judges, and the state. In most ADR processes, the disputants outline the process they will use and define the substance of the agreements. This type of involvement is believed to increase people’s satisfaction with the outcomes, as well as their compliance with the agreements reached. In fact, participating in an ADR process will often ultimately improve, rather than worsen, the relationship between the disputing parties³⁹.

In the water resources context, ADR is most easily applied on a limited geographic scale, where users are limited, uses are not complex and there is a common culture in place. So, cooperation along streams and (ephemeral) rivers in rural, low consumption world settings are most amenable to ADR methods.

37 ADR

38 Salamé *et al.*

39 Goldberg.

However, most of the East Mediterranean's water resources lie in highly complex settings with many stakeholders, many competing uses and different languages and cultures. Power is also unequally distributed throughout these settings. At a national level in mature capitalist, democratic societies dispute resolution relies heavily on law and legal precedents.

In some areas of the East Mediterranean there are limited avenues for popular participation in dispute resolution; these are largely limited to inter-elite dialogue that tends more toward power politics than respect for international law. In order to move water resources management in the East Mediterranean away from its inherent conflict potential toward cooperative behaviours, there is an urgent need to train actors in ADR within the field of dispute resolution and negotiation for water resources management. There is also a need to guarantee that national laws and regional bilateral or multilateral treaties provide a framework for the implementation of ADR, since national and international legal frameworks along with political will, are important requirements for the success of ADR.

For example, the agreement between Syria and Lebanon on the Nahr-el-Kabir of April 20th, 2002 suggests to the parties to resort to arbitration in case of disputes. Although this agreement, applying the UN Convention on the Law of the Non-navigational Uses of International Watercourses⁴⁰ is a good example of the integration of ADR tools into a bilateral agreement related to the shared water resources, it remains an exception in the region. Political will is indeed the most crucial ingredient for the development of such an agreement.

On the other hand, looking around the world, one can find a multitude of examples of such international agreements providing for the resolution of transboundary water disputes in a peaceful manner, using ADR techniques. An example worth mentioning is the Mekong Agreement signed in 1995 by the lower riparian countries of the Mekong. The Agreement creates the Mekong River Committee⁴¹ and includes a chapter on "Addressing differences and disputes". In event of a dispute between two or more parties to the Agreement, the text provides that the Council, a permanent body of the MRC⁴², should address and resolve the problem at hand. In case disputes occur between two regular sessions of the Council, the text suggests that the issue should be resolved by the Joint

40 New York Convention (1997).

41 MRC.

42 composed of one member from each participating riparian State at the Ministerial and Cabinet level.

Committee, another permanent body of the MRC⁴³. The Agreement goes even further and suggests that in case the MRC bodies are not able to resolve the dispute in question, the Governments should, resort to negotiation using normal diplomatic channels or request the help of a mediator, which would be mutually agreed upon.

The Indus Waters Treaty signed in 1960 by India and Pakistan is yet another example of a long standing agreement that has been implemented and respected by both signatories. This agreement also created the Commission known as the Permanent Indus Commission that worked throughout two wars between the riparian states. The Commission's prerogative, *inter alia*, is to resolve disputes that can arise over the management of the transboundary water resources of the Indus between the riparian States. In case the Commission cannot resolve the dispute in question and depending on the issues at stake, the Treaty suggests that the parties should use the services of a neutral expert or resort to direct negotiation or mediation. It also provides for arbitration through the establishment of an arbitration court according to a certain number of rules also provided for by the Treaty in one of its Annexes.

If a given national law does not set the stage for the implementation of ADR indeed, it is all the more important that the involved parties themselves create such a setting. This can be done along the lines of the agreements described above through the examples of the MRC and the Permanent Indus Commission, where stakeholders can regularly meet and communicate with each other regarding interests, needs and objectives to avoid disputes. Creating and maintaining open channels for dialogue in politically fraught settings is as important as actively promoting de-escalation of negative, winner-take-all behaviours.

Whether the pertinent legal system(s) provides or not for ADR as a resource for the anticipation, the prevention or resolution of water related disputes it is essential to create through capacity building, an environment and culture of cooperation and a dialogue that enables stakeholders to participate in policy dialogues, subsequent planning and the design of necessary processes. Such an environment is a *sine qua non* for building a common and holistic strategy for the joint management of shared water resources.

43 composed of one member from each participating riparian State Head of Department level.

IV. CONCLUSION

In view of water over-exploitation and pollution issues, national law must meet the requirements of sustainable development by reinforcing water-related legal mechanisms. It is also necessary to harmonise water-related national legislations with the aim of acting efficiently against the threat to this vital and universal resource. International water law developments must take this target into account and encourage states to cooperate.

The most recently codified legal texts pertaining to international water law - the UN Convention on the Law of Non-Navigational Uses of International Watercourses as well as the Resolution of UNGA on the law on transboundary aquifers⁴⁴ - emphasise the concept of the unity of water sources and general principles of the obligation not to cause significant harm, of equitable and reasonable utilization and participation, and of the obligation to notify, consult and negotiate.

Legal frameworks must also facilitate dispute resolution management through various relevant and pertinent techniques aimed at addressing disputes in a non-confrontational way. To turn dispute potential into cooperation it is essential to create an environment for negotiation, where stakeholders can exchange interests, needs and objectives in order to alleviate their differences. It is particularly urgent to put these principles into practice in the Mediterranean region, where the current problems shared by all the countries cannot be settled fairly without cooperation and solidarity. However, the persisting conflictive context which strengthens the states' attachment to the principle of absolute sovereignty (although that same sovereignty is lacking for the Palestinians) makes fair management difficult to organise.

In order for water to become a source of cooperation, provisional solutions must give way to a global, future-oriented strategy in compliance with sustainable development principles. Such a strategy must be founded on laws based on hydrological, economic, social and cultural studies, and its implementation needs to be guaranteed by harmonious policies coordinated by all the riparian countries.

To take all the elements of the water management into account when making future decisions is an unavoidable prerequisite for the sustainable management of water resources. This concerns cities in particular, where, given the popula-

44 Resolution adopted by the UN General Assembly on the Law of Transboundary Aquifers, at its Sixty-third session 2009 (Agenda item 75), A/RES/63/124.

tion density, stakes are the highest and the water issue is showcased in all its complexity.

The example of the East Mediterranean and its cities demonstrates that the challenge of urban water management calls for new and sustainable methods to be implemented which, like the water cycle and the interconnection of its components, will bring all of the countries concerned together for the purpose of drawing up a coherent and harmonious legal framework.

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Alia Gana

PERCEPTION OF RISKS AND SOCIO-INSTITUTIONAL
CHANGES IN THE MANAGEMENT OF WATER RESOURCES:
A comparative approach of local dynamics
in the Mediterranean*

I. INTRODUCTION

As pointed out in recent international debates, water has become a globally strategic issue, mainly because of the increasing risks of scarcity and contamination of this vital resource. The risk issue has an additional dimension in the Mediterranean region, where climatic hazards reinforce the possibilities of crisis and where the unequal distribution of resources, and thus of water shortages, contribute to increased competition between farm irrigation, on the one hand, and domestic and urban needs, on the other hand.

However, when we use the term “crisis”, we are forced to admit its multifaceted nature and wide range of implications - the crisis, or rather the crises, is ecological, institutional, economic and social. It is expressed in a variety of ways according to the context and (more particularly) according to the economic structure of each country, the demographic situation or the greater or lesser scarcity of water, and according to the scale of the territory. This leads us to examine the institutional and political aspects of the crisis, the value of water, and the legitimacy and validity of the ways in which water is used. This broader perspective is particularly important in the context of the implementation of reforms focusing on water demand management and on the participation of water users.

In addition, the water crisis is more and more approached in relation to the issue of sustainable human development, which integrates, besides the ecological and socioeconomic aspects of the development process, those aspects dealing with

* This paper draws on preliminary results of the project WATER CRISIS AND RISK PERCEPTION IN THE MEDITERRANEAN, and on contributions by Belhassen Abdelkafi, Mohamed El Amrani, Jean-Paul Billaud, Marianne Cohen, Stéphane Ghiotti, Anne Honegger and Yves Luginbuhl.

social justice and fundamental human rights. With the integration of ethical issues as a condition of sustainable development and the rise of the notion of environmental justice, the issue of inequality extends to that of inequality in face of risks. In this context, the water issue gets to be framed not only in terms of equal distribution of the resource, but also in terms of access to clean water, considered as a fundamental human right to be secured.

Two trends are currently emerging from the contemporary water resource debate. First, it appears that the development of new sources of water supply (such as the reuse of waste water after treatment or the importation of water) will not be able to keep pace with the growing demand. The solutions, which are advocated in the Mediterranean basin, such as measures to save water by addressing the problem of inefficient irrigation systems and by recommending farmers to switch to crops requiring less water, presuppose first a better integration of environmental issues into the processes leading to the adoption of more intensive farming. They also imply changes in behavior - especially among irrigating farmers - which will only be possible and sustainable if there emerges a new "shared awareness" of water-related issues.

The other trend is the decline in the opposition between "private" and "public" which was the major organizing principle adopted for water policies, particularly in the Mediterranean countries. We are witnessing a series of experiments with organizational tools¹, which are leading to the creation of new spaces of action² and are growing within existing structures for dialogue or negotiation between the different types of water use. Therefore, the emergence of an integrated water management system, as an alternative to the major water supply system and the higher levels of technology it supposes, is likely to be a source of complexity in the mechanisms which structure the relationships between the territories and the water management authorities.

A whole body of research in the social sciences has already dealt with the issue of water resources management in the Mediterranean. However, the socio-institutional and anthropological aspects have received less attention and, in particular very little work so far has focused on the perception of risks related to the use of water in its local and social dimension and from an environmental justice perspective.

1 local assemblies, associations of local communities or local property owners, etc.

2 upstream/downstream, river basin, etc...

II. RESEARCH OBJECTIVES AND METHODOLOGY

By seeking to combine the social and environmental sciences, the research project which this paper is based on, sets out to contribute to a new understanding of how risks related to water resource management are perceived by the people immediately concerned. This analytical approach offers a way to tackle the issue of the management of scarce regional resources and, in particular, to study integrated approaches regarding the planning and management of water supplies that are both friendly to the natural environment and implemented in a participatory mode. In this context, two main objectives were pursued by the research:

- Analyze how farmers perceive and hierarchize risks related to the use of water (farm irrigation);
- Analyze the situations that characterize the relations between producers and water managers with regard to water distribution and to arbitration between different types of uses.

The main research questions were the following:

- First, how and to what extent a “shared awareness” of water-related issues can be built among the different actors; and
- Second, in which ways new approaches to the issue of water resources can modify the management systems with their combination of legal, technical and political aspects.

The methodological approach adopted to tackle this set of questions associates different types of scientific expertise³ and combines the use of qualitative and quantitative methods⁴. Two main levels of analysis were employed: the farm household level to identify water use practices and farmers’ perception of risks, and the level of the local community to analyze water management arrangements. Finally, the research was carried out in four countries of the northern and southern shores of the Mediterranean⁵, thus allowing for a comparative approach of the water crisis and of socio-institutional changes of water resources management.

3 social sciences, agronomy and biogeography.

4 interview guides and questionnaire survey.

5 France, Spain, Morocco and Tunisia.

During the first phase of the project, the research has been carried out in five field sites:

- *In France:*

(a) The Marais Poitevin area, where current problems correspond to those of the management of humid areas and of the circulation of water, in a context of growing contradictions between a highly intensive cereal based agriculture (using irrigation in some areas) and the requirements of the protection of the natural environment;

(b) The Valley of the Hérault (Gignac Canal), where the maintenance work of the canals, created during the phylloxera crisis⁶, is still secured, but where changes in farming practices towards mixed farming is leading to a shift from the use of surface irrigation to that of spraying, against a background of urban expansion linked to the growth of Montpellier, which exacerbates the conflicts related to the use of water;

- *In Spain:*

The region of the Guadalquivir Delta and, more specifically in the Algaida Colony, to the east of San Lucar de Barrameda, where water has become a major social issue⁷, and is aggravating the tension between the need to protect the environment on the borders of the Doñana National Park and the increasingly intense demand for water for urban and tourist uses. In addition, the underground waters are increasingly contaminated by salt, and soil-based parasites⁸ are proliferating, leading to a race for greater productivity using increasingly sophisticated technology⁹;

- *In Tunisia:*

The Zaghouan region, located approximately 60km southeast of Tunisia. The region belongs to the semi-arid zone and farming systems are predominantly based on cereal production and extensive animal husbandry. In the last 15 years, irrigated farming¹⁰ has developed, supported by agricultural extension and credit programs. In relation to these programs geared towards

6 [The phylloxera crisis refers to a North American aphid that caused severe damage to French vineyards in the 1850s. One method of combating the infestation was to submerge the roots for long periods of time – thus requiring the construction of canals.- Ed].

7 conflicts between the extensive areas irrigated by the large farms and the small market-gardeners in the colony.

8 nematodes, in particular.

9 soil replacement, hydroponic crops, for example.

10 fruit and vegetable production.

developing irrigated farming, new water management systems, based on a participatory approach and the promotion of producers' associations, have been adopted. Irrigated farming in the region is today confronted with problems of overexploitation of water resources, soil degradation (salinization) and pollution related to the more intensive use of chemical fertilizers;

- *In Morocco:*

The Gharb region, one of the most important irrigated farming areas of the country, where problems are related to the conflict between major water-supply systems, involving large, increasingly silted dams built for the benefit of export crops, and the pastoral activity of small farmers, who also produce food crops. In relationship to processes of liberalization and state disengagement, new forms of water resource management have been recently introduced, based on a participatory approach and aiming at promoting water users' associations. So far these experiences have not been successful in ensuring a more sustainable management of water resources.



III. WATER PERCEPTIONS AND WATER MANAGEMENT ARRANGEMENTS

The five case studies carried out in the first phase of the research clearly highlighted the multidimensional character of the water crisis in the Mediterranean. Beyond the problems of scarcity and contamination of the resource, it is primarily a crisis of water management systems. This crisis is closely connected with the development of new water uses, as well as with new economic and institutional conditions of access to water resources. It leads to redefinition of the social and territorial bases of water management systems. It is also associated with a crisis of technical models of hydraulics, which is expressed in increasing contradictions between the technical conception of the hydraulic infrastructure¹¹, users' needs and the requirements of participative management. It is finally a crisis of the social reproduction of certain forms of irrigated agriculture, particularly in the countries where this once represented a means of social advancement for small farm households¹².

The research results also reveal the close links between the perception of water and the systems of hydraulic management. In France, the redefinition of water uses is linked both to urbanization and to the rise of environmental concerns. In this context, we observe a shift away from a perception of water as a resource for production to multiple use water and to water as environment. This dynamic leads to an extension of the functions assigned to water management organizations. In the Marais Poitevin region, the reorganization of the humid area management system is expressed in the search of new forms of cooperation between different categories of actors and stakeholders¹³, allowing for a better integration of environmental needs in water management.

In the Languedoc-Roussillon area (France), the *associations syndicales autorisées*¹⁴ are increasingly associating not only farmers but also residents of periurban areas. As a result, their functions integrate more and more the provision of water for domestic and leisure related needs (swimming pools) and the management and protection of the environment. The search for new forms of cooperation between different actors raises the question of the coordination between old and new water management arrangements and that of the share of charges and responsi-

11 large public hydraulic infrastructure.

12 In Tunisia, Morocco and Spain.

13 intensive cereal farmers, cattle farmers, mussels' producers, environmental associations, etc.

14 Water Users' Associations.

bilities. This also contributes to a new positioning of actors and stakeholders in the decision-making process and in the system of power relations.

In La Algaida (Spain), water perception has a close connection with problems of access to the water resource and of its sharing between the farmers of the different irrigation perimeters. It is also linked to water quality (salinity). From a management perspective, this perception reflects the lack of autonomy of water users' associations and raises the issue of how to articulate the tension between centrally planned water management systems and local users' organizations.

In the Maghreb countries (Morocco and Tunisia), farmer's perception of water is linked to recent changes in the conditions for accessing the resource¹⁵ and refers back to an increasing feeling of uncertainty among farmers in the face of the re-organization of water management systems. This situation raises the issue of the necessary conditions for ensuring an effective participation of water users in the management of the resource and securing the autonomy of their associations¹⁶.

Links Between Water Perceptions and Water Management Arrangements

Water perceptions	Water management arrangements	Country/region
From water as economic resource	Extension of the functions of water use associations	Valley of Hérault
To multiple use of water, and	Share of responsibilities	
	Type of coordination between old and new water management organizations	
To water as natural milieu	Individual strategies	Marais Poitevin
Water as a factor of inequality (access to and quality of water, share of water)	Coordination between central, regional and local water management organizations	Al Gaida (Spain)
Water as a factor of increased dependence (new conditions for accessing water) and social injustice	Lack of autonomy of water users associations	Al Gaida (Spain), Morocco, Tunisia
	Shared costs management or privatization	
Water as a threat	Individual and informal adaptation strategies	Morocco, Tunisia

15 higher prices, integration into water users' associations, state-disengagement.

16 technical extension, financial support, marketing networks.

IV. THE PERCEPTION OF RISKS

Individuals' assessment of a threat or a hazard takes part of a process involving their perception of the seriousness of the problem and, therefore, what they know about it and their personal experience of the problem, in addition to the standards adopted by their social groups, and what they think they know about ways of behaving in a similar situation. The factual knowledge about the risk or the uncertainties inherent in a threat seems to have less impact on behavior than individuals' value system and the collective consciousness shared by their group or by their network of social relations.

The research results show that the perception of risks generated by the water crisis assumes different forms according to national and local contexts and types of farmers. First of all, risk refers back to diverse realms¹⁷. It also expresses a feeling of loss of independence and power. Second, within those different realms, farmers evoke various types of risk.

The environmental risk integrates everywhere climatic risks, particularly drought related risks in all research field sites. It includes equally nature and landscape degradation. This one is particularly put forward by extensive livestock producers in the Marais Poitevin area, who express this way their hostility towards the increasingly dominant model of farm intensification based on the use of drainage techniques. In all studied areas, farmers mention the pollution of water due to the use of chemicals and/or to industrial wastes. Salinity of water and soil degradation are particularly put forward by farmers of Algaida area (Andalusia) and Bir Mcherga (Zaghouan, Tunisia). With regard to the latter group, the emphasis on risks represented by water salinity and its negative impact of soils (degradation) expresses farmers' strong criticism towards the new water management system - involving their integration into users' associations - and is used as a way to justify their refusal of irrigated agriculture, which they consider as a source of increased dependency and risks.

In Tunisia, Morocco and Spain, farmers consider the organization of irrigation systems as the main factor of risk. In fact, collective water management networks are very frequently associated with loss of autonomy and are considered as being a source of greater vulnerability, as they place the members of the water users' associations in a situation of mutual interdependence¹⁸. Moreover, farmers feel risks related to the organization of water services as a threat to their existence. In Morocco and Tunisia in particular, the crisis of water management systems

17 environmental, social, and economic.

18 distribution of water, maintenance, payment of fees, etc.

is closely linked with processes of liberalization, which redefine the conditions for accessing water and reorganize farmers' relationships to the state and to the private sector.

While economic risks are barely mentioned by French farmers, they are particularly felt by farmers in Spain, Morocco and Tunisia. It is first of all about higher production costs generated by the increase of water prices and the decrease of subsidies. It also has to do with input supply and marketing problems¹⁹. In Morocco, farmers express grief about their being increasingly dependent on agro-food factories²⁰, which impose on them constraining conditions²¹, a situation which they perceive as a consequence of state disengagement.

The risk is finally technical. It is about problems brought about by shifts in production systems, from dry farming cereal cultivation to irrigated horticulture and fruit production, which requires a mastery of new techniques²². It is finally risks that are linked to the conception of hydraulic infrastructure and which no longer meet farmers' needs. This is particularly the case in Morocco where, due to crop pattern liberalization and diversification, regular access to water is no longer secured. In fact water is released by the regional water agency in priority to farmers fulfilling the conditions of minimum surfaces to be irrigated and in favour of "strategic" crops²³.

V. HOW TO SHIFT FROM STATE-PLANNED TO PARTICIPATORY WATER RESOURCES MANAGEMENT?

Tunisia and Morocco are among the countries of the Mediterranean that have the most mobilized their water resources. The farming sector is the first beneficiary of water policies and consumes 80% of mobilized waters. Increasing water needs, linked to population growth, rapid urbanization and the diversification of economic activities today call into question the predominant place of agriculture in the consumption of water resources.

In Tunisia, the comparison between the current needs of the various sectors and the available resources shows already a situation of water shortage. Projections

19 unorganized marketing networks, low prices.

20 sugar beet, sugar cane, rice.

21 low prices, quality criteria.

22 sowing, fertilization and irrigation techniques.

23 beets, sugar cane.

foresee a decline of available water resources per capita in the next decades, from 459 cubic meters per year (cm/yr) in 1999 to 310cm/yr in 2025. Also in Morocco, projections of the Ministry of Environment²⁴ anticipate a decrease of available water quantities per capita from 830cm/yr in 1990 to 411cm/yr in 2020.

In addition to the scarcity of water resources, which imposes a decrease of the share consumed by agriculture, the degradation of the quality of available water is becoming a serious concern. In Tunisia, the quality of available resources is generally lower than the sanitary or agronomic international standards of salinity, as only half of the resources have a salinity level lower than 1,5g/l and 34% of them a salinity level between 1,5g/l and 3g/l. In some coastal areas this phenomenon, which is often linked to over-pumping, is further aggravated by marine intrusion into the aquifers. Thus, a significant proportion (20%) of the ground water located in the north of Tunisia is overexploited and 16% of the underground resources are affected by the occurrence of marine intrusion. In Morocco, problems of water pollution by nitrates and pesticides are particularly serious in some irrigated areas. Studies carried out in the Tadla and the Sebou regions reveal that an important number of wells have nitrate concentrations exceeding the national standard of drinkability (50mg/l), which represents a real danger for public health. Water contamination by toxic substances (pesticides) is also becoming a major concern and it is estimated that 0,5% to 1% of phytosanitary products enter river systems. The situation is even more alarming considering that groundwater often constitutes the only available resources, in particular for rural populations.

Increasing demand and growing competition for water resources have imposed a reform of hydraulic policies in the two countries since the nineties. Inspired by the models advocated by international organizations²⁵ these policies call for a shift from the management of water demand to the management of water supply. They aim at “rationalizing” water uses through the adoption of saving techniques, the implementation of a tariff policy and the development of non-conventional resources²⁶.

Until the late 1980s, a centralized system of agricultural water management prevailed in Tunisia and Morocco. Public development agencies²⁷ were in charge of agricultural extension, input supply and marketing of farm products in irrigated

24 from 1999.

25 World Bank and IMF.

26 treated water and desalinization.

27 *Offices de développement.*

areas. New water policies called instead for institutional reforms aimed at promoting participatory water management through the consolidation of users' associations, for the management of both irrigation and drinking water.

In Tunisia, the implementation of structural adjustment policies in the late eighties led the state to disengage from the direct management of irrigated schemes. In addition, the distribution of water and agricultural extension were decentralized and transferred to regional development institutions²⁸. Finally, groupings of collective interests²⁹ were put in place since the early 1990s as a means to foster the responsibility of water users.

The GIC are associations of owners and users endowed with the civil responsibility and financial autonomy for the exploitation and maintenance of irrigation and drinking water systems realized by the government. The number of GICs for irrigation more than doubled between 1993 and 2001, rising from 438 to 1077. They cover a land area of 135,000ha (60% of the public irrigated areas) and are due to extend to all publicly irrigated perimeters.

In Morocco, the Regional Offices of the Agricultural Development³⁰, created in 1966, were in charge at the same time of the management of agricultural hydraulic infrastructure, the distribution of water, agricultural extension, supply of services and marketing of agricultural products. The approach adopted in the field emphasized primarily technology transfer as a means of ensuring the self-sufficiency of the country in basic agricultural products, the social and institutional dimensions were neglected. Central to the scheme was the system of obligatory rotations imposed on the farmers by the development offices.

In Morocco, the Water Law of 1995 represented an in-depth reform of water management systems through the decentralization and transfer of management responsibility from the Ministry of Equipment to the Basin Agencies, whose new mission includes since then the mobilization, management and protection of the water resources. In addition a large program of participatory water management³¹ at farm level was launched in the mid-nineties, foreseeing the creation of agricultural water users associations³². Between 1995 and 2004, the AUEA created at the ORMVA level³³ went from 157 to 490 regrouping 160,000 users

28 *Commissariat de développement agricole* (CRDA).

29 *Groupes d'intérêt collectif* (GIC).

30 *Office régional de mise en valeur agricole* (ORMVA).

31 *Gestion participative de l'irrigation* (GPI).

32 AUEA - *Association des usagers de l'eau agricole*.

33 *state-funded irrigated schemes*.

and covering a surface of 384,260ha, in addition to the 1032 AUEA regrouping 120,000 members on 218,000ha in small and mid-size irrigated schemes.

VI. MAJOR DYSFUNCTION AT LOCAL LEVEL IN SPITE OF THE REFORMS

In Tunisia as in Morocco, experiments of water management transfer from state to users' associations have generated increased interest among social scientists. Most studies however emphasize the serious functional problems which these local organizations are facing. In Tunisia, these authors underline the obstacles which hinder the consolidation of irrigating farmers' organizations and their difficulty in attaining real autonomy. In Morocco, various research reports on participatory irrigation management converge towards the same conclusion, that of the failure of AUEA experiment. As will be seen, the research carried out in the areas of Belksiri (Morocco) and Bir Mcherga (Tunisia) largely confirms this conclusion.

In Tunisia, the survey was carried out with farmers belonging to the irrigated perimeters of Bir Mcherga (Zaghouan region), located downstream of the Bir Mcherga dam. The creation of these irrigated perimeters in 1997 aimed primarily at promoting the agricultural development of the area, through the mobilization of available water resources, as well at improving family farmers' incomes, through shifting from dry farming³⁴ to irrigated farming³⁵. The irrigation infrastructure, which is entirely financed by the state, cover a surface of 450ha, divided into three perimeters of 150ha each (Ain Morra, Houinit El Borj, Houch Gdem). A canal network brings water from the dam to the farms, which are equipped with individual terminals. Irrigation equipment³⁶ are the individual property of the farmers and are generally financed by subsidized loans. Under the initiative of the regional administration, three groupings of GIC were set up for the management of the irrigation network. The GICs associate all farmers of the three irrigated perimeters³⁷ and are managed by a committee of three elected members³⁸. Beyond their management role³⁹, the GICs intermediate between the farmers and the regional administration, the latter continuing, in theory, to

34 cereal cultivation and extensive livestock production.

35 horticulture and dairy farming.

36 sprinklers and drip irrigation equipment.

37 a hundred in total.

38 president, treasurer and general secretary.

39 collection of memberships, sale of water vouchers, and payment of electricity invoices.

be responsible for the maintenance of the network and the provision of technical support to the farmers.

However, despite the creation of GICs, there are still serious management problems. First of all, the GICs have to deal with the technical management of the perimeters. Breakdowns of the networks are frequent and the GIC neither have the technical skills nor the necessary financial means to carry out the maintenance and the repairs. Thus the GICs remain dependent on the regional agricultural services, which often refuse to pay maintenance expenses, considering the latter as being the GICs' responsibility.

The GICs suffer from serious financial problems as they are not endowed with any capital. Their only income is generated by the sale of water vouchers and from the financial contributions of their members. However, the members often refuse to pay their membership fees because the water provision, in quantity and quality, is not always ensured. Moreover, they consider that the price of water is too high and that its quality is poor. The price of water actually corresponds to the costs of water distribution services⁴⁰ and the refusal of some farmers to pay their contributions generates troublesome deficits, which aggravate the problems of water distribution.

The proper functioning of the GICs also is hindered by the lack of management skills of the water users associations' representatives, and the farmers denounce the absence of regular keeping of accounting and financial records. They often dispute the accurateness of the water-meter readings and acts of sabotage on behalf of the farmers are very frequent⁴¹. As a consequence of their difficulties to ensure sound management of the irrigation perimeters, GICs suffer a serious lack of legitimacy. Only a minority of farmers attend the rare meetings convened by the administration council of the GICs. In fact, the power of decision-making and intervention remains largely in the hands of the regional administration, which often replaces the GICs for the most important decisions.

Similarly, in Morocco water management systems continue to face serious problems. These are related mainly to the erosion of the former model of management in which the public development offices occupied a central role. Indeed, in spite of the constraints imposed on the farmers⁴², this system ensured a certain level

40 electricity expenses, maintenance, wage of the pump assistant.

41 altered, destroyed water meters.

42 obligatory crop rotations.

of protection and safety to the farmers⁴³. This is no longer the case with state disengagement and the consequent attempts to transfer hydraulic management to water users. As we will see, the main constraints hindering the implementation of the program of participatory irrigation⁴⁴ include farmers' lack of experience as regards the management of AUEA, the insufficient technical and managerial capabilities of the AUEA, the paucity of financial resources at their disposal, the insufficiency of the human and material means mobilized by the ORMVA to support the AUEAs, and finally the absence of incentive mechanisms to encourage users to adhere to the principles of participatory water management.

The case study was carried out in the Belksiri area, located in the Gharb region, which is the main irrigated region of the country and where important hydraulic infrastructure, based on the construction of large dams, were implemented by the state since the late 1970s. In the Belksiri irrigation scheme, the water delivery system varies according to the type of irrigation technique. In the gravity as well as in the sprinkler irrigation systems, the distribution of water continues to be organized by the Office of Development of Gharb, through the District of the irrigation networks management, who employs and supervises the staff in charge of releasing water. On the farmers' side, the *Najib*⁴⁵ is in charge of forwarding water demands formulated by the farmers to the Office. In the rice sector, where irrigation is practiced by immersion, the distribution of water is based on negotiations between the ORMVAG⁴⁶ and AUEA. The AUEA's role is to organize the distribution of water between the irrigating farmers, to ensure the farmers maintain the irrigation canals, and to represent the farmers at the development office. Another important actor of water management in the schemes are the processing factories⁴⁷, which recently have been given the responsibility for setting the water fees on the production delivered by farmers at the end of the crop year.

Surveys carried out in the Belskiri irrigated perimeter show that current problems of water management arrangements differ according to the irrigation technical system. In flood irrigation systems, the main problem is that of the access to water. In fact, water distribution continues to be organized by ORMVAG, according to a scheme that proves to be unsuited to farmers' needs since the

43 stable prices and ensured marketing circuits, technical extension, maintenance of the irrigation network.

44 GPI.

45 farmers' representative.

46 ORMVA Gharb

47 sugar beet and cane.

liberalization of crop rotations. Water demands formulated by farmers are the most important from April/May to September/October. To be able to irrigate, farmers growing the same crops have to regroup in order to present their water demands to the Belksiri District each Friday. The release of water by the District occurs on Tuesday and Wednesday of the following week, but is submitted to the condition that the total demand of water formulated by farmers makes it possible to justify the technically acceptable water volume, *i.e.* a water demand corresponding to a minimal surface of 500—600ha. In addition, priority is granted to farmers who grow sugar crops, as this allow for ORMVAG to get back the water fees from the sugar refineries to which the productions are delivered. However, since the liberalization of the crop rotations, the farming systems are more diversified and less homogeneous. In addition, as the majority of farmers have only small land areas, they experience difficulties to pull together the required minimal area in order to access water - even when they try to regroup.

In sprinklered irrigation systems, problems appear to be related to the gap between the technical organization of water distribution, which was conceived for a system of obligatory rotations, and the new needs generated by the liberalization of crop rotations. Problems also result from the disengagement of state agencies from tasks, such as the maintenance of irrigation infrastructure and equipment, and marketing of farm products. An important problem, which farmers are facing within the sprinklered irrigation system, is the degradation of the mobile irrigation equipment, primarily made up of pipes and sprinklers. The deterioration of this equipment causes enormous losses of water at the level of the irrigation terminals, which translates in farmers being over charged for their water consumption. This problem affects especially farmers who are located at the tail end, since the ORMVAG calculates the fees on the basis of volume of the water released. Another problem is generated by the fact that, in order to be able to irrigate, all farmers belonging to the same irrigation block have to set up their mobile equipment at the same time. However, in practice, since the cropping systems are more diversified, farmers' water needs are no longer homogeneous. The new system generated by crop rotation liberalization no longer obliges the farmers to collaborate to benefit from irrigation. Moreover, some farmers no longer care about the maintenance and repair of their irrigation equipment, thinking that repairs should be taken care of by the processing factories, which release wastewater in the irrigation canals. All farmers who practice spray irrigation mention water pollution and the fact that sprinklers are clogged with dirt as important problems.

Facing these constraints, farmers' adaptation strategies consist in disengaging from the collective network through eliminating irrigated crops or setting up individual water pumping systems, a practice that has

significantly developed in the sprinklered irrigation sector. It should be underlined that in the two types of irrigation schemes just referenced, the attempt to implement AUEAs was a failure, due to a multitude of problems:

- Lack of financial means;
- Lack of representativeness and legitimacy;
- Low capacity of intervention leading the farmers to move away from collective action in favour of individual solutions.

The system of immersion irrigation is practised on rice acreages and involves submerging the crops with water running by gravity. This system comprises four percent of irrigated areas. Before each crop year the farmers who want to grow rice have to present an application for accessing water to the local ORMVA. Water demands are then examined by the office, taking into account the level of debt of the farmers and the working condition of the sprinklers available in each plot. The requests are then recorded and contracts are signed with the processing factories. The office gives priority for water access to farmers who have signed contracts with the factories because this offers more guarantees that the farmers will pay for water at the end of the crop year. Before each crop year the office calculates the area of the rice fields in order to adjust the quantities of water to be distributed. The rice growers of the same rack (in each rack, there are in average eight plots which can be managed by eight different farmers) must thus sow at the same time because water is released for the entire sector, rack after rack. At the beginning of the crop year, water releases are planned by the office according to the delivery of seeds by the factories. The irrigation campaign is supposed to be planned in agreement with ORMVA and AUEAs, which are present in the rice sector.

Within the framework of GPI, the office encourages rice growers to get organized in AUEAs. The tasks assigned to AUEA are to organize water distribution and sharing between farmers, to manage the problems of “water robbery”, to make sure that the maintenance of the irrigation canals is taken care of by the farmers, to mediate between the office and the farmers in the event of conflict⁴⁸, to intervene for the release of the financing means necessary for the maintenance of hydraulic infrastructure. In the rice sectors, there is one AUEA by secondary canal. According to the ORMVAG representatives, the AUEAs of the rice sector are currently the only ones in the Gharb area which are functional. However, according to our field observations, the farmers, who are also members of the land reform cooperatives, are actually obliged to organize collectively, because

48 in particular for water releases.

of their localization on the same irrigation blocks. In fact, they do not consider themselves as voluntary members of the water users' associations.

Once water is released by the ORMVA, farmers organized in AUEAs irrigate by water turn. This irrigation system generates fewer problems as regards water management, both according to the farmers and to the water managers. However, rice growers have to face serious market problems, which are reflected in the important decrease of cultivated areas (from 12,000ha to 3,000ha).

VII. ATTITUDES REGARDING IRRIGATION IN THE CONTEXT OF STATE DISENGAGEMENT

The dysfunctional characteristics observed in water management systems at the local level often aggravate risks experienced by irrigating farmers. Interviews carried out in the Bir Mcherga and Belksiri areas indicate that the perception of risks related to irrigation differs according to the situation from each farmer group and to the problems this one is faced with.

In Bir Mcherga, two main attitudes are to be observed. Among smaller farm households, problems generated by integration into the collective water management systems generally lead to a negative perception of water management and rejection of irrigation. This group of farmers put forward the increased risks and loss of autonomy as a consequence of the shift from cereal and livestock based production systems to irrigated farming, in terms of:

- Unsecured access to water; Bad quality of water leading to soil salinization;
- Insufficient knowledge of irrigated farming techniques;
- Growing production costs⁴⁹;
- Marketing problems⁵⁰;
- Risks linked to increased indebtedness; and
- Difficulties to reimburse loans contracted for the acquisition of irrigation equipment.

49 water, seeds, fertilizers, etc.

50 low prices and unorganized marketing circuits

Risks are finally related to a feeling of being increasingly dependent on a collective water management system, which not only are inefficient but also generate additional costs for the farmers.

In addition to causing a deep rejection of irrigated farming, this negative perception of new water systems generates a profound feeling of injustice, especially when these farmers compare their situation with that of the private agricultural companies and some large farmers, who are able to secure an autonomous and regular supply of water, without having to pay for services, by setting up their pumping stations directly on the Bir Mcherga dam.

Among farmers with more important production capacities, the perception of risks linked to the use of water does not lead to a rejection of irrigation farming. Water management, which is perceived in a more positive way, is regarded as a means of consolidating the farm unit and benefiting from state aids and subsidies. Contrary to farmers of the first group, who put forward risks linked to the high degree of water salinity and the consequent degradation of soils in order to justify their rejection of irrigated farming, this type of risk is rarely mentioned or nuanced by mid-size farmers. In general, problems of water quality, those related to the use of new farm techniques, to increased production costs, or to the lack of organization of marketing circuits do not seem to be considered as a major obstacle for the development of irrigated farming, insofar as they are regarded either as momentary phenomena⁵¹, or as elements which can be controlled⁵². In fact among this second group of farmers, risks are clearly stated as being mainly related to the dependence on an ineffective water management system, which does not ensure regular access to water.

In the irrigated perimeter of Belksiri, risks involved in water management systems are perceived by farmers as being mainly linked to processes of liberalization and to shifts in public policies. The issues mainly revolve around the cuts to farm subsidies and the disengagement of the regional development office of the Gharb from its role of water service provider. It is also about the liberalization of crop rotations, which theoretically “release” farmers from the obligation to conform to cropping plans recommended by the Gharb development office, but which actually places farmers in a situation of multiple risks.

First of all, access to and availability of water is not always ensured in sufficient quantity and at the right moment. Indeed, as already mentioned, the technical organization of the irrigation network distributes the water to individual farmers

51 rise of the degree of water salinity.

52 irrigated farming techniques, sale of farm products.

subject to a certain number of conditions. Requests for water provision presented by farmers who belong to the same irrigation frame must correspond to a surface area of at least 250ha to justify the flow of 300l/s. In addition, certain crops, such as fruit plantations, in particular citrus fruits or sugar crops have priority in the distribution of water. These limitations imposed on water access involve serious risks for farmers, such as loss of harvests, in the event they are unable to irrigate at the right moment. Problems of access to water which are manifested in insufficient volumes and flow, the difficulty to irrigate when necessary, and the failure to correctly plan water turns constitute the many factors which encourage “deviating behaviours” such as water stealing or the deterioration of irrigation equipment. The farmers recognize the illegal character of these acts, but justify them through the difficulty they face in accessing water and the absence of viable alternatives.

In addition to water access problems, farmers frequently evoke environmental risks related to the quality of water. These risks involve pollution of groundwater due to the intensive use of fertilizers and pesticides, which generate serious health problems for the local population, such as:

- Children’s diseases;
- Skin irritation;
- Repeated diarrhoeas, etc.

In addition, excessive water pumping causes the rise of groundwater and generates water and soil salinization. Lastly, surface waters, which are used for irrigation, are polluted by industrial wastes and urban wastewater from domestic origins. The oil mills and the sugar refineries discharge their wastes containing chemicals in the tributaries of the Sebou River. This category of risks is in the principle due to the absence of regulation as regards the use of chemical inputs and the management of urban and industrial wastes. The presence of these risks is clearly identified by farmers as a failure of public intervention as regards the protection of producers and local populations from environmental harms.

The risks mentioned by farmers of Belksiri also arise from the new rules of the marketplace. Whereas markets and output prices were formerly guaranteed by development offices, the liberalization of marketing channels place farmers in a direct relationship with agro-food processing enterprises⁵³. The latter are in fact more and more in a position which allows them to impose their condi-

53 sugar cane, sugar beet, rice.

tions on farmers⁵⁴. The same holds for rice producers who face serious marketing problems, which drives them to go back to dry farming of grain. In fact, deregulation and liberalization have totally called into question the former conditions of agricultural activities and the former model on which the development of irrigated farming was based. These changes contribute to exacerbate conflicts between farmers and development institutions, as well as between farm producers and private marketing organizations⁵⁵.

In this context, family farmers are denouncing social injustice and are calling on the state and development offices to seriously consider their situation and their needs. They often declare they regret “the old days”, where crop rotations were obligatory but where the ORMVA guaranteed the prices, market delivery and dealt with the maintenance of the network. Meanwhile, strategies put in place to adapt to the new context consist of abandoning or reducing a certain number of crops, in particular industrial crops, or finding alternative solutions for accessing water⁵⁶.

The two case studies carried out in Morocco and Tunisia clearly demonstrated that the water crisis in these two Maghreb countries is far from being limited to a problem of availability of hydraulic resources. To a large extent it is associated with a crisis of institutional arrangements for water management and appears to be closely linked with processes of liberalization and state disengagement. It is more precisely related to the redefinition of the conditions for accessing the water resource, and to the reorganization of the relationships between farmers and the state on the one hand, and between farm producers and the private sector, on the other hand. This crisis redefines at the same time the social and territorial bases of hydraulic management. If institutional reforms and the implementation of a participatory approach to water management constitute a major component of water policies since the early 1990s, we are nevertheless forced to admit that its concrete application at local level creates serious problems and places farm communities in a situation of increased risks.

In the Zaghouan area, the implementation of water users’ associations indeed redefines the relations between the regional administration and the farmers, but place the latter in an increased dependency *vis-à-vis* the collective organization. Without a real transfer of the decision-making power to GICs, institutional reforms lead in fact to the opposite results of those anticipated. Rather than the

54 quotas, low prices, undervaluation of the sugar content of beet and cane, etc.

55 sugar refineries, rice mills, dairy processing companies.

56 pumping water from the river or from the public channel, digging private wells, etc.

reinforcement of collective action, an exacerbation of individual strategies and increased differentiation among farmers are to be observed. The search for greater autonomy with regard to the collective network, by means of the construction of individual wells, also contributes very often to increase environmental risks related to irrigation⁵⁷.

The failures of institutional water management arrangements not only call into question the environmental sustainability of irrigated farming, but also its social sustainability. In the absence of a local management system, which can secure family farmers' access to water, irrigation indeed ceases to be a means of social redistribution and tends to reinforce the differences between various farmers' groups. Only for those who can secure their autonomy as regards water provision, does irrigation represent a means of developing their farming activities. On the contrary, the least equipped farmers are placed in situations of increased dependence and more unfavourable positions *vis-à-vis* the risks of shortages and contamination of the water resource.

In Belksiri, the reconfiguration of the social and institutional bases of water management is also accompanied by water actors' repositioning in the system of decision making and power and modifies farmers' perception of social justice. Institutional reforms have disorganized the delivery system of water, without replacing it by a more efficient one. Today, only farmers who have important land areas and who continue to cultivate priority crops⁵⁸ have guaranteed access to water. Liberalization of crop rotations and marketing circuits deeply modified farmers' relationships to the market, placing them in direct relationship with the agro-food enterprises, which impose their price and quality standards.

As shown in the two case studies, the "new" water management system creates a paradoxical situation, characterized, on the one hand by the difficulty of certain categories of farmers to access water in sufficient quantity, on the other hand by an under-exploitation of water resources, as the low rate of intensification of irrigated areas attests. This situation illustrates the complexity of the problems involved in the current crises of water management in agriculture. In particular, it outlines the difficulties to set up the institutional, economic and political conditions that allow for the implementation of a system of co-management of water resources involving both the state and water users associations.

57 overexploitation of the ground water, use of bad quality water, etc.

58 cane, beet, citrus fruits.

VIII. CONCLUSIONS

Preliminary results of the five case studies conducted in the framework of the project bring to light the relevance of a North/South comparative approach for the analysis of the perception of the water crisis, and for the evaluation of the socio-institutional conditions of sustainable management of water resources in the Mediterranean. They bring to the foreground a common question, that of the reorganization of the institutional water management systems, which takes on various aspects.

On the northern shores of the Mediterranean, what is at stake is how to shift from the management of water as an economic resource to a concerted management of water by a multiplicity of users. It is also about how to rearticulate the dialog between old and new water management arrangements and how to redefine the partnership between public and private actors.

In the two Maghreb countries, the main question is about how to shift from state centralized water management systems to participatory management by local users. Liberalization processes has brought about major disturbances in the water management system without replacing it with a more efficient one. The reform of water policies has called into question the social model of irrigated agriculture, which was mainly based on family farms. The reconfiguration of the institutional foundations of water management does not assure the autonomy of farmers who remain dependent on state agencies and are increasingly submitted to the conditions imposed by agro-food enterprises. In this context, we observe an exacerbation of the conflicts between farmers, public institutions and marketing organizations. Inequalities in access to water, risks of shortage and of contamination contribute to develop a deep feeling of injustice. In Morocco and Tunisia, numerous farmers are asking for a return to the old state-managed system, considered as more protective and less risky. Others develop individual strategies or informal organisations mobilizing family and neighbourhood ties to secure access to water through pumping stations, well construction, and private drilling.

Everywhere, these questions bring forward the issues of the territorial bases of water management, as well as the linkage between the technical conception of hydraulic infrastructure and the socio-territorial bases of water management. The implementation of participatory and concerted approaches to water management also raises the issue of knowledge transfer, specifically the sharing of information and skills. Finally, common questions are concerned with the link between irrigation and socio-environmental sustainability and raise the issue of whether irrigation always generates risks and irreversibility.

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THE BLIND SPOT IN WATER GOVERNANCE: Conjunctive Groundwater Use in the MENA Countries

I. INTRODUCTION

In many areas of the Middle East and North Africa¹ intensive aquifer use has been the single major factor that transformed the rural economy in the last 25 years. It has boosted crop production and improved access to relatively clean drinking water. The use of wells has a long history in the region and so has groundwater governance. In early Muslim jurisprudence, there was reference to groundwater regulation under the so-called minimum distance rule², which specified a minimum distance between two wells, depending on soil conditions. Yet the scale of groundwater use in the last thirty years is unprecedented. Some authors have observed that whereas almost all surface irrigation infrastructure in the Mediterranean can be traced back to origins many centuries ago, the only thing that is new is what is being pumped – and this is quite substantial.

The miracle created by intensive aquifer use in many parts of the MENA region is under severe strain. Overuse of groundwater is by now documented in several rural economies in MENA countries and can lead to alarming consequences varying between places – declining, sometimes vanishing water tables, entire rural economies in peril, saline water intrusion, and destabilized coastal regions. In some countries even national stability may be at stake. The President of Yemen has stated that water security is the second priority next to national security.

This paper tries to document the importance of groundwater. It focuses specifically on conjunctive use of groundwater and surface water in Morocco, but uses examples from Yemen and Egypt as well. The paper makes the point that amazingly with all attention regarding governance and regulation in the MENA

1 MENA.

2 *Harim*.

countries, the emphasis has been on procedures, processes, laws and institutions, whereas large part of the agenda is left blank. This is not just a theoretical oversight but an area of missed opportunities and induced disasters.

II. CONJUNCTIVE WATER MANAGEMENT IN MOROCCO

1. Groundwater in Morocco

The groundwater in Morocco was for a long time a blind spot – but with catastrophes such as the collapse of the Guerdane Aquifer, groundwater management could no longer be ignored.

In May 2008, the King Mohammed V declared groundwater protection as a national priority and instructed the government to prepare a National Water Strategy. After intensive consultation with relevant government units, the Water Resources Department⁵, as part of this strategy, produced a national Groundwater Action Plan⁶ consisting of 30 actions (including demand management and supply-side actions, stakeholder participation and institutional strengthening).

Water has been a constraining factor for economic development throughout the history of Morocco. For the last three decades the emphasis in Moroccan development policy had been to maximize the capture of the country's surface water and to provide infrastructure for its use in agriculture (86%), potable water supplies (8.5%) and industry and energy production (5.5 %). Even in normal years, rainfall is distributed unevenly across the landscape and it varies from more than 1,800 millimetres per year (mm/yr) in the northern part of the country to less than 200mm/yr in the southern part. Besides its uneven spatial distribution, the rainfall in Morocco also exhibits an uneven and erratic temporal pattern owing to its large year-to-year variations. Insufficient rain and droughts are fairly frequent. Seven of the last ten years had hydrological deficits of varying intensities. In 1982, Morocco received less than 60% of the long-term mean rainfall. In 1994, on the other hand, six of eleven hydrological basins in Morocco had more than a 50% deficit in their water balance.

The uneven rainfall pattern naturally creates highly variable flows over time and space causing severe uncertainty in water availability to both domestic users and farmers alike. It is to minimize these risks and uncertainties associated with

5 DRPE.

6 GWAP.

water availability that Morocco, like most countries, relies heavily on water storage. Of the average annual precipitation of 150 billion cubic meters (bcm) received by Morocco only 30bcm are stored. Unfortunately, not all water captured by these sources is readily available for use. For instance, the water resources actually available for use are estimated to be 16bcm from surface sources and 3–4.5bcm from groundwater sources.

Over the years, the country has established a diversified body of both formal and informal regulations to govern water resources allocation, utilization and management in response to increased pressure on limited water resources. Reflecting what had historically emerged, in 1995 by law, top priority was assigned to ensuring the security of the potable water supply. By 1990, most urban households had been provided secure access to a water supply whereas only 14% of rural households had secure water supplies, even by 1995. As the demand for potable water is concentrated in water-scarce basins, the issue of meeting a rapidly rising demand for potable and industrial water poses a major challenge. In many locations, efforts to satisfy urban and industrial demand imply inter-basin water transfers or inter-sectoral water transfers from agriculture.

At the same time, like in most developing countries, irrigated agriculture is fundamental to the economic and social development in Morocco. In order to achieve its irrigation and agricultural objectives, the government has built modern and relatively efficient infrastructure for water development, conveyance and distribution. It has also supported farmers through a comprehensive administration of irrigation perimeters and a strong system of legal and economic incentives. Irrigation has the dominant share of 85% of the total water resources developed in the country. There is considerable scope for improvement in water use efficiency and conservation. The 2020 Rural Strategy of Morocco underlines the need for more efficient use of irrigation water and the conservation and protection of water resources.

As a major response to the changing water conditions and future economic requirements, the government passed the Water Law of 1995⁷. The overarching goal of this law was to integrate and coordinate the allocation and management of all water sources and users under a single but decentralized institutional arrangement centred on river basin agencies⁸. The RBAs have authority to manage surface water storage and allocation, groundwater pumping and water pollution and quality. The RBAs work with water sector “partners” or stakeholders

7 Law No. 10/95.

8 RBAs.

in the basin area such as Regional Offices of the Agricultural Development⁹, the National Authority of Potable Water¹⁰, the representatives from environment, health and provincial officials and, more importantly, the water users associations¹¹. In a sense, the RBAs act as wholesalers of bulk water to ONEP and ORMVAs which, in turn, retail water supplies to urban and rural water users. RBAs now have authority to control and monitor water from all sources. For example, the wells owned by ONEP for potable water supplies, which were autonomous earlier, are now under the yet to be defined RBA authority. This is also true for water in public irrigation perimeters, which were once under the sole responsibility of ORMVAs.

From an overall planning and managerial perspective, the main responsibility of the RBAs is to prepare, with significant input from the national government, river basin management plans based on the principles of integrated water resources management¹². The Water Master Plan¹³, as specified in Chapter 4, Article 16 of the Water Law, is a constituent part of the National Water Master Plan¹⁴. It must be formally approved by decree. The twenty-year Master Plan summarizes available water supplies in a river basin and proposes allocations to municipal, industrial and agricultural users. The plan also provides for groundwater exploitation through granting of permits to water users. As per the new Water Law, the Master Plan can be reviewed and amended every five years if changing conditions warrant amendments. The RBAs have considerable managerial and regulatory responsibilities besides their role in developing and supplying water. They can monitor and regulate water use and water quality as well as plan and organize flood control and water-related emergencies within their respective basins.

As mentioned, groundwater falls within the mandate of the RBAs. This is a major change, as in the past the ORMVAs were the only “kids on the block” in water management, but their preoccupation was and still is only with surface irrigation. The RBAs still have a way to progress – one unresolved issue is that they charge the ORMVAs for bulk water supply, but that ORMVAs are unable to pass the same on to the WUAs. From 2007 onwards three of the RBAs have started to work on preparing a first draft Groundwater Management Action

9 ORMVAs [agencies responsible for irrigation- Ed].

10 *Office National de l'Eau Potable (ONEP)*.

11 WUAs.

12 IWRM.

13 Known as the *Plan Directeur d'aménagement intégré des ressources en eau*.

14 Chapter 4, Article 19.

Plan¹⁵ for three pilot aquifers, respectively Bahira, Souss-Chtouka and Haouz. The development, let alone the implementation, of the GWMAPs is hampered; however, by the meagre capacity in the RBAs and their sometimes conflicting relations with the principal water users in the basins, *e.g.* the ORMVAs.

Table 1 provides information both on the sources of water supply and sector allocation of water resources across the important hydrological basins of Morocco. As can be seen from Table 1, although surface sources are dominant in the total supply of most basins, groundwater sources are very important because of their spread and ability to support both agriculture and domestic water needs in areas lacking sufficient supply from surface sources, as well as overcoming shortfalls within irrigation perimeters. Water for municipal and industrial purposes is more important in some regions than in others and tourism is increasingly becoming an important sector in certain areas, particularly in the south¹⁶.

Table 1
Supply of and Usage for Water in Eight Basins in Morocco in 1990

Basins	Supply of water		Total	Demand for water			Total	Balance
	Surface	Ground Water		M&I	Irrigation	Other		
Loukkos	630	90	72	1	380	230	7	0
Moulouya	930	230	1,1	7	1,090	0	1,	0
Sebou	1,690	350	2,0	2	1,560	60	1,	160
Bou Regreg	310	250	56	3	160	30	5	30
Om-er-Rbia	3,010	280	3,2	1	2,490	80	2,	360
Tensift	880	850	1,3	1	1,300	150	1,	-80
Souss-Massa	300	590	89	6	890	0	9	-60
South of Atlas	710	290	1,0	2	1,330	0	1,	-350
Total	8,260	2,73	10,	1,	9,190	10,9	6	
		0	99	2	53	30	0	

While current water supply and demand are in balance in two of the eight basins, for the remaining basins, there is either a water deficit (3) or surplus (3). As the total of the surpluses in three basins exceeds the total deficits of the other basins, there is scope for inter basin transfers and this is happening in some instances.

The major response to droughts and water shortages has been the development of groundwater irrigation. Following the droughts during 1980–1985 the government reacted with a number of policy changes. Foremost was the government encouragement provided to individual initiatives and groundwater expansion.

15 GWMAP.

16 [Included in the column "Others".- Ed].

This encouragement took the forms of both a waiver on well authorization from the Ministry of Public Work, as well as subsidies for private investment in irrigation. The policy change had a remarkable impact on private-oriented and groundwater-based irrigation expansion. The extent of private irrigation has, in fact, surpassed all previous official estimates. For instance, the Rehabilitation Project of Large-Scale Irrigation funded by the World Bank has estimated the area under private irrigation to be about 60,000ha by 1991. However, according to the High Council of Water and Climate, this area was estimated to be about 170,000ha. But according to the information from the 1996 agricultural census and a recent survey conducted by the Ministry of Agriculture, the area under private irrigation reached 583,039ha in 2003. Of this total, 481,322ha were irrigated by groundwater either fully¹⁷ or partially for supplemental irrigation¹⁸.

The expansion of private and groundwater-based irrigation did minimize the impact of droughts as well as expand and stabilize farm production. But it is not without its negative effects. The rapid increase in private irrigation, especially in the absence of effective regulatory arrangements, has resulted not only in aquifer depletion, but also in serious decline in the flow of several springs and watercourses that support medium- and small-scale irrigation perimeters. Regarding the magnitude of the latter effect, it is estimated that the expansion of private and groundwater-based irrigation has reduced the irrigated area in the small- and medium-scale irrigation perimeters to the tune of 150,000–200,000ha. As a consequence of aquifer overdraft, well depth is increasing at an alarming rate causing the abandonment of agricultural activities. For instance, in the Guerdane perimeter of the Souss region, the water table is declining at a rate of 1.7 meters per year (m/yr) leading to an average well depth of 100m. In view of groundwater overdraft, the water deficit of this region has increased from 185 million cubic meters (mcb) to 358mcb between 1976 and 1998. The result was the abandonment of plantations which is common, particularly in the traditional citrus exporting region of the Souss.

2. Conjunctive water management in Tadla¹⁹

Whereas overuse of groundwater outside irrigation areas has led to problems as flagged above, the development of conjunctive use of groundwater within

17 As in the case of 376,662ha located outside the large scale irrigation perimeters.

18 As in the case of 104,700 ha located within these perimeters.

19 [The Tadla Plains are a large and important agricultural area of Morocco. They are located in the Oum Er-Rbia River Basin. The area of Tadla is one of the 16 economic regions of Morocco located in the central-eastern part of the country. – Ed].

the irrigation systems has had a different and more balanced route. The liberalization of crop patterns in large-scale irrigation perimeters after 1980 Structural Adjustment Plan, though desirable for efficient water and land use, was severely constrained by the rigidities of existing water distribution networks and allocation procedures. As the production in these perimeters was oriented towards import-substituting crops and heavily dependent on state intervention for cropping decisions as well as input and output marketing, it was ill-prepared to benefit immediately from the relaxations. The issue became complicated by the lack of input supplies, marketing channels and extension services needed for alternative crop options. Moreover, the irrigation infrastructure and the water billing system were more suitable to a homogeneous crop pattern and rotation than to a liberalized system with a diversified cropping pattern. Thus, the fundamental issue that was yet to be resolved was how to move from a supply-centred arrangement to a demand-oriented system of water resource allocation and use. Conjunctive use of groundwater has largely addressed this, and has made it possible to continue old-style surface irrigation management, while increasing productivity and growth.

An example of the importance of conjunctive use of surface and groundwater in the Tadla Irrigation Scheme is provided below. In the Tadla irrigation scheme, irrigation is an essential element of farmers' livelihoods and an important aspect of the social life of water users. Issues of equity of distribution and water productivity are very important matters that are widely discussed between water users, especially during dry years. Water allocation during dry years has two problems:

- The supply is unsecured due to insufficient dam reserves; and
- The water allocation is unfair because there are crops that have priority due to political-economic reasons like sugar beet, alfalfa, trees and cereal crops and thus receive more water than others – beans, maize and vegetables.

Before the crop year 1980, water available for the irrigation system of Tadla exceeded requirements and the distribution of irrigation water was based on farmer demand independently of crop rotation practiced. On-demand water distribution however intensified a certain number of problems such as the rise of the water table and salinization. Since the beginning of the 1980s, the surface water resources in Tadla have shown a clear decline in water availability, a trend that continues until now. Certain factors are the cause of this severe scarcity of surface water:

- Decrease of rainfall by about 30% and more frequent drought periods;

- Population growth (urban and rural) has induced a competition on water between different sectors – irrigation, industry and hydropower;
- The irrigation networks are getting old and inefficient irrigation techniques lead to important loss of water resources;
- Non rational water use caused by some policies like under-pricing;
- Reduced capacity of surface reservoirs as a result of siltation, due to deforestation in the mountains causing erosion and snow losses.

Consequently the ORMVA of Tadla shifted its policy from the allocation of water according to the farmer's demand to a distribution according to water availability and estimated crop requirements. After the drought in the beginning of 1980, farmers started to use groundwater to fulfill their need for irrigation. Due to the falling groundwater table, shallow wells in the unconfined aquifer were used for drilling holes into the deeper layers to satisfy the irrigation requirements and thus maintain the same crops.

Irrigated agriculture in the Tadla plains is now characterized by a conjunctive use of environment. Farmers are increasingly using groundwater resources in addition to available surface water resources. Recent research suggests that today, an annual volume of 500 – 600mcm comes from groundwater, which is more than the surface supplies, and about 50 % of the farmers have access to this resource. Two main questions related to the evolution of irrigated agriculture should be addressed:

- Firstly, the sustainability of the exploitation of groundwater resources is questionable. The groundwater quality is heterogeneous, and some farmers irrigate with saline water. There is concern on its adverse impact on soils and groundwater. Groundwater levels are falling, prompting farmers to exploit the captive aquifer with questions on its sustainability. Also, the viability of farms not having access to groundwater is threatened due to severe restrictions in surface water supplies;
- Secondly, Tadla is a leading innovator in Morocco in experimenting with a wide range of technical innovations, economic incentives and institutional arrangements to reduce water stress. However, despite certain advances, farmers use more water than they did 10 years ago and technical innovations are not adopted by a majority of them. Water users associations do not assume much responsibility in water management. Questions related to farmers participation in the formulation and application of water saving policies, and the scope for collective action in

water saving at the grass roots level need to be addressed, to ensure a more sustainable water use for a viable irrigated agriculture.

Farmers with financial capital cope with the Tadla's increasing water scarcity by using alternative water sources (digging wells to access groundwater). The principal strategy of farmers is to free themselves from the constraints of water turns and "priority" crops, to manage their rotations freely. This practice is common among large farmers even if the cost of groundwater is higher than that of the water from the dam²⁰. As one can see on the ground, a great number of farmers with farm sizes higher than 2.5ha were freed from the constraints and the rigidity of the water turns by taking recourse to pumping, and able to cultivate other crops – sesame, niora, mint, etc.

The exact quantity of water withdrawn from the aquifers is not really known, but over the year, rising and falling water tables can be monitored in an irrigation perimeter. Some surveys in the irrigated perimeter of Tadla showed that there are more than 8,300 locations where water is pumped from the aquifers. Also in the zone outside the irrigated perimeter there are more than 4,500 pumping locations, of which more than 1,300 wells pump from the Eocene aquifer²¹. Besides, the sustainability of the groundwater use can only be assessed by a thorough geo-hydrological survey of the aquifers. Such an assessment is recommended to quantify the available resources in the aquifer in combination with measurement of the abstractions by the thousands of wells. It is also recommended to improve the measurements of the pumped groundwater by installation of water meters on the wells.

Tube well water is currently not charged for by the government yet, but well-owners pay the full cost of development and operation and maintenance – often preferring diesel because of the high cost of electricity. Most pumps have a discharge of 15l/s (54 cubic meters per hour; cm/h) and consume 2.0l/h of oil for a well depth of 20m (that is 1,3\$/h). The cost of groundwater is more expensive than canal water. Nevertheless pumping still increases, but is restricted because of the high salinity of water.

Pumping groundwater is officially prohibited without an authorization and restricted – as farmers are not allowed to pump below 40m but this is actually subject to very weak control and the "ostrich" approach appears in place here. The majority of farmers install their wells without obtaining the required

20 Between 0.35 and 0.60 Dirham/cm for groundwater compared with 0.22 Dirham/cm for canal water

21 [In the Oum Er-Rbia Basin.- Ed].

authorisation – and this is a good thing probably, given the boost it is giving to food security. Pumping varies widely between the years due to large variations in rainfall – signifying the importance of groundwater as a drought mitigation measure. The current policy of unenforced regulation shows that conjunctive groundwater management is still a blind spot. Unfortunately it should not be put in the domain of restrictions and controls, but be approached pro-actively to maximize the impact and equity effect of this type of water use.

To ensure sustainable groundwater extraction, supply and demand of groundwater should be balanced. Existing policies²² are not very effective due to insufficient controls. The administrative costs to be charged for extraction on the basis of the number of pumping hours, as currently proposed, seems to be rather high, and will not guarantee a reduction in usage. What is required is not a negative, sacrificial attitude to resource management, but a pro-active, positive approach. There is large scope to improve recharge by adjusting surface irrigation deliveries – how much, where and when. Surface supplies are the main source of recharge and should be adjusted to areas where recharge is most needed. So far irrigation management is in an extremely narrow domain – not looking at even the most immediate other uses, such as groundwater management. Clearly as pressure on water resources multiplies this limited agenda is a luxury one can ill-afford.

III. CONJUNCTIVE WATER MANAGEMENT ELSEWHERE IN MENA

1. Yemen

The water problems in Yemen are well known. Over the last twenty years the use of groundwater has intensified tremendously, often feeding high value agriculture – qat, bananas, and mangoes. Groundwater is being pumped at a rate approximately four times that of natural recharge. This has brought prosperity to rural areas, but it is not sustainable. Water tables have fallen worryingly in many of the highland areas, but also coastal plains suffer from overuse of groundwater. The problems in the lowlands are also aggravated by a reduced inflow from the highlands. Studies suggest that the reduced surface flows in Wadi²³ Zabid and

22 Restriction to pump below 40m and authorisation to install wells.

23 [Arabic *wādi*: (1) the bed or valley of a stream in regions of southwestern Asia and Northern Africa that is usually dry except during the rainy season and that often forms an oasis; (2) a shallow usually sharply defined depression in a desert region.- Miriam Webster Dictionary, <http://www.merriam-webster.com/dictionary/wadi>.- Ed].

Wadi Tuban may be in the order of 20-30% and may be related to the development of upstream micro-dams.

There has been considerable work in water policy formulation and legislation in Yemen in recent years. Highlights are the National Water Strategy, the Water Law and the Irrigation Policy Statements. Similarly the National Water Resources Agency has been established with branch offices in several governorates. Given the large problems in the water sector this attention for new institutional arrangements is very timely. There is no lack of governance initiatives. The main challenge now is to translate these policies into effective institutions and programmes on the ground and here expediency is sometimes lacking.

Given the water scarcity in Yemen, one would expect that most investments in Yemen would be directed to improved water efficiency and regulating water use. Farmer interviews also highlighted the importance of such interventions²⁴. Instead the larger share of investments is directed at the development of structures. The two main sources of investment are the regular budget of the Ministry of Agriculture and the Agriculture and Fisheries Development Promotion Fund. The amounts spent annually are substantial. From the budget of the Ministry of Agriculture YER²⁵ 600 million²⁶ was approved for 2004 to be spent mainly for dam structures. From the Agricultural Promotion and Fisheries Fund YER 2,278 million was spent on average annually in the period 1996-2002). Over this period 801 water management structures (mainly small dams and water harvesting structures) have been built by the Fund. Other sources for the funding of water structures are the Social Development Fund and some bilateral donor funds. There is some small funding for irrigation networks in the latter programmes, but overall investment in surface irrigation systems is very small. Even worse – on several of the rivers (Wadi Surdud, Wadi Tuban), investment in large dams has been considered – fortunately in some cases these plans were later withdrawn. What these investments would have done would be replacing of highly productive conjunctive resource systems with using spate (temporary floods) irrigation and groundwater.

Even though after national security, water security is the primary concern in Yemen, very little is happening in terms of actual water resource management in the country at a national level. There has been no lack of studies, research, and drafting of legislation, but real regulatory initiatives are lagging behind.

24 See Table 2.

25 [YER - Yemeni rial - Ed].

26 Over 200 MEUR (on 30.10.2010) - [Ed].

The same applies to water management at a local level²⁷. In fact in some of the most overstretched areas farmers now demand the government, in this case the National Water Resources Authority, to take more effective action against illegal drilling. It was observed in the late 1990s that in contrast to land disputes conflicts over water were scarce – even though the writing was very much on the wall even at that time. These days the situation is completely reversed and violent conflicts with drilling companies are frequent.

Table 2
Main Water Management Issues
identified in Wadi Tuban and Wadi Zabid in Farmer Focus Groups

Wadi Tuban	Wadi Zabid
<ul style="list-style-type: none"> • Increasing inequity in water distribution; • Random drilling of wells; • Increasing misuse of water (drinking water for irrigation); • Increasing pollution and salinity; • Weakness of extension; • Continued expansion of agriculture while there is no water. 	<ul style="list-style-type: none"> • Decreasing inflow into the system – probably related to the increase of dams upstream; • Sedimentation of the spate system resulting in land going out of control, sand deposition in fields and heavy sedimentation in canals; • Increasing inequity in water distribution – related to the increase in banana and mango cultivation; • Decreasing groundwater table.

Two major opportunities to promote water management at the local level are decentralisation, which started with the announcement of Law 4/2000 concerning Local Authorities, and the new institutional arrangements for local water management introduced by the Water Law 2002. According to the Law on Local Authorities, local councils have a role in supervising the implementation of water policies and protecting water resources from overuse or pollution. They are, moreover, to generally have a role in “controlling the applications of the laws in force”. Another new development is the Water Law 2002 creating the possibility of establishing Water Basin Committees and Water Zone Committees. The composition and task of these committees is still under debate, but the Law makes an explicit reference to the need of dovetailing the Committees with the work of the Local Councils. A first few activities in setting up such committees have been undertaken in Sa’adah and Taiz.

Conjunctive use of spate irrigation and groundwater is also common in coastal Yemen where cropping patterns in many coastal spate systems in the wadis, *e.g.* Tuban and Zabid, have changed dramatically since the 1980s due to a remarkable increase in shallow wells. As a result, the area under banana cultivation has increased from 20ha in 1980 to more than 3,500ha in 2000 in Wadi Zabid,

27 See Table 2.

while about 2,300ha are used for high value vegetables in Wadi Tuban. Many spate irrigation areas have been transformed into areas of high value agriculture, with bananas and mangoes as the main crops, dependent on the combined use of spate flows and groundwater.

Groundwater quality in coastal Yemen is generally good enough for irrigation. Two types of aquifers are important in the spate irrigated area. In valley bottoms one finds strip aquifers. The alluvial sediment deposits consist of generally unsorted, but coarse and un-cemented material with high permeability. The deposits are found in a strip along the river bed that may vary in width from a few meters to a few hundred meters. Strip aquifers have very favourable recharge conditions and are recharged from infiltration of spate flows and from springs and seepage zones along the wadi bed. Because of their small volume and high permeability, the strip aquifers are quickly depleted. Another type of aquifer is found in the lowland systems at the alluvial fans and on the plains. They are actively recharged by the wadis and may be several thousand feet thick. They may not be homogeneous and instead consist of a number of independent groundwater flow domains, with their own recharge and discharge zones and with varying water quality. In recent years in Yemen these coastal aquifers have been intensively developed.

Since the modernization of the Wadi Zabid system in Yemen, the area under cultivation has increased substantially. This seems to be strongly related to the increase in groundwater use, rather than any increase in the diversion efficiency provided by the new structures in the spate irrigated areas. In Wadi Zabid, wells are used conjunctively with surface supplies, as well as a single source of irrigation water. Since the 1970s there has been a rapid increase in well development, mainly shallow wells with some extension. 1,411 wells were recorded in Wadi Zabid in 1988 of which 1,221 were pumped. These were predominantly used for irrigation, but at the same time served as an important source of drinking water. Most well development had been along the axis of the wadi, and most wells are located in the lower wadi areas near the coast, where the water table is higher. Saline water intrusion was already a factor in Zabid, and a recent water resource study observed that it would be difficult to reverse. The consequences are in several cases quite dramatic. A large area of date groves in coastal Tihama for instance has been destroyed. This happened as the spate flows no longer reached the coastal areas with the modernization of diversion infrastructure upstream. Earlier an occasional runaway flood would replenish the coastal aquifer and would keep water tables high – so that the date palms were largely served from the high soil moisture. As these floods made their appearance less and less frequently in the coastal areas, farmers turned towards groundwater irrigation for the date palms. This lowered groundwater tables even more, and

made it uneconomical to sustain the entire area with pumping, especially as soils are outright sandy. The neglect of part of the palm groves meant that the area gradually fell prey to the heavy wind erosion in this area, with two storm seasons lasting a combined five months. This turned the date palm areas into a desert landscape of moving sand dunes – accelerating the downfall of the area.

The large importance of spate flows for recharge rather than irrigation is also reflected in the recent debate on water distribution in Wadi Zabid. In Wadi Zabid, a time allocation system is in place. Under this regime, the downstream command area is entitled to floods in the off-season only. As the occasional spate flows are able to recharge wells for a long time, downstream land users are now requesting for a share of the floods in the peak season.

The intense use of groundwater and the higher “water productivity” of groundwater-based irrigation raises questions on the relation between spate irrigation and groundwater recharge. The issue is whether the best spate water management strategy would maximize recharge, or agricultural productivity of the spate irrigated areas. The relationship between spate diversion and recharge is not well studied, although some information is available from water balance studies carried out in spate irrigated areas in Yemen.

It is generally accepted that recharge mostly occurs through infiltration in the wadi beds rather than from channels and fields. Recharge may be enhanced by spate irrigation where diversions flatten the river slopes, and in the case of diversion bunds, produce ponding, and reduced flow velocities. Another important practice is to leave the stone armouring of wadi beds intact, as the presence of large stones and boulders reduces the water velocity and encourages river bed recharge. For the same reason one may expect infiltration rates to be higher in the upper section of the ephemeral streams rather than at the lower ends where bed material is often clayey and silty.

The ephemeral river beds also carry a substantial subsurface flow which is often the main source of well recharge. Again, this is generally not understood and certainly not managed. Extreme caution is required not to interfere with these subsurface flows through cut-off weirs or impervious bed stabilizers, as downstream well water supplies depend on these hidden flows. An example of a spate irrigation project gone wrong in this respect is the Wadi Siham in Yemen. The weir was extremely ill-designed system interfering and cutting-across the traditional flood channels, blocking the subsurface flow in the river, and depriving a large number of downstream well-owners of their secure source of water.

Hence the overall conclusion of all these examples is similar to the case in Morocco: although conjunctive use is the backbone of the coastal farming

systems it is not managed. It is in fact worse as many interventions are allowed that effectively jeopardize the highly productive conjunctive system of ground-water and surface water management in coastal Yemen.

2. Egypt

At present in Egypt the annual expenditure on water services absorbs up to 10% of the GOE's total public expenditures. A recent public expenditure review showed that about LE²⁸ 12 billion²⁹ per year of public finances were spent on national irrigation infrastructure and water resources related programs, while the annual public financing of operation and maintenance in the irrigation sector is approximately LE six billion. The National Water Resources Plan till 2017 envisages that the required investments in the sector are about LE 165 billion, of which 35% would be designated for irrigation and drainage projects.

Groundwater is not a major feature in water policies or management plans in Egypt at all – even though the entire Nile Basin systems depends on an intensive reuse of water – with the shallow water tables feeding the surface flows, and water being used many times before it reaches the Mediterranean.

In less than a decade, starting in the 1990s, the West Delta area – less than 50km from Cairo - was transformed from empty desert into a groundwater-based high value export agriculture area. In this case deep fossil groundwater was used. Groundwater permits were given to investors and the West Delta area was very much part and parcel of the fast growth and modernization that transformed a large part of the Egyptian economy in this period. The West Delta hosts numerous horticultural export firms, industries and also resorts and golf resources. By 2005 the various activities in the area supported an economy of \$300 million annually, employing directly and indirectly 250,000 persons. Persistent depletion of groundwater – the very resource forming the basis of the mirage – however, threatened the loss of this agricultural area and a premature end to the fast development. To counter this, the West Delta Canal Project was conceptualized – to be funded by international loans and private capital. The project concept is to substitute the groundwater supply with a surface water channel serving the entire West Delta area (100,000ha including the 47,000ha already developed). Both the investment costs and the operation and maintenance costs of the West Delta Project are to be recovered from connection and service charges as well

28 [EGP (Egyptian Pound).- Ed].

29 [Approximately 1.5 billion EUR (on 30.10.2010) .- Ed].

as from land development near Sadat City. Private operators are expected to operate the main infrastructure.

The water from the West Delta Canal will come from the Nile Valley. The allocation for the West Delta is justified on the basis of the assumed savings caused by the so-called Irrigation Improvement Project, which introduced, among other things, shared farmer-operator pumping units and improved field level canals in the lower Nile Basin.

Whatever these savings, the concept overlooks the current conjunctive water management practice in the Nile system – where water is reused many times before it reaches the Mediterranean. By channelling water out of the Nile Basin to the West Delta the scope for the reuse of this water in the Nile system is foregone, whereas the scope for reuse in the West Delta with its deep aquifers is small or practically non-existent.

IV. CONCLUSIONS

The three examples show that groundwater management in the MENA area is only recently gaining attention at a policy level – but that operational management of groundwater is still some time off. This is in spite of the importance of groundwater in bringing about a turn-around in agriculture – sustaining not only an expansion of cultivated areas but also a move to high value crops. Whereas groundwater is still largely unmanaged in the MENA region, the conjunctive management of shallow groundwater is completely *terra incognita*. Shallow groundwater – which is the main water resource in agriculture - falls entirely between the cracks institutionally and technically. In Morocco groundwater is off the radar screen for the ORMVAs. It is in the domain of the River Basin Agencies, who are the main institutional embodiment of the move towards integrated water resource management, but these agencies, like elsewhere, are still in the early stages and relatively weak because of a focus on coordination and regulation, rather than on implementation and service delivery.

The picture in Yemen is somewhat similar. Here groundwater is high on the political agenda – and the President has even stated that water security is the next important thing to national security. A Water Law is in place but the implementation and operation is time consuming. For groundwater the focus is on regulating deep wells. This is difficult enough – and requires the development of a whole new interface among users and between users and government. The management of shallow groundwater again is not in the picture, in spite of its importance in the current farming system in the Tihama coastal plains, which

comprise 35-40% of national food production. The National Water Law does not require licensing for wells with a depth of less than 60 meters. In some of the coastal plain areas local governments have made restrictions on shallow well development but this is piecemeal and *ad-hoc*. More importantly, no operational water management strategies have been put in force – that would acknowledge and maximize the value of shallow groundwater in coastal Yemen, particularly to safeguard the recharge at the tail end areas of the wadis.

Finally, in Egypt the groundwater management is not an issue as all attention is on surface water supply and irrigation. This overlooks the intricacy of the Nile Basin where no water is lost as also seepage is reused. Taking part of this flow out of the Nile Basin to the desert West Delta area, means foregoing opportunities for reuse.

In all countries there has been a frenzy of restructuring water management organizations and putting in place new laws and policies – the overriding theme being integrated water resource management. There has been much attention to new laws and policies as well as moving towards multistakeholder processes.

But, is this governance? How come blind spots continue to exist – something that cannot be explained by the lack of importance of the blind spots? Reuse of groundwater has been a driver for agricultural development, but opportunities to manage it better (for instance readjusting irrigation schedules in Tadla) are not forthcoming. Elsewhere, things are made worse (West Delta in Egypt, Wadi Surdud Dam in Yemen) because of ignorance. What is governance then all about?

Though important, there is a risk of groundwater being cast in special new institutional arrangements – new laws, bylaws or agencies. The consequences of this are time lost and a sense of urgency thwarted, as in the meantime nothing happens on the ground. There seems in general to be a large pre-occupation with institutions, coordination and laws – process outputs, that though tangible are not necessarily effective in addressing the immediate challenges, if the agenda is not right. What is still missing from the picture is the mainstreaming of water management strategies that give due cognizance to the strategic value of groundwater and the contribution it can make – particularly the effective recharge, retention and reuse of shallow groundwater. So the question is what is governance? Is it the positioning of players in an arrangement of accountability or regulation, or is it creating short-links between responsibilities and results?

We think the latter – more dynamic and messy. It seems the issue is not good or bad governance but the effective presence or complete absence of it.

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David B. Schorr

PRIVATE RIGHTS IN PUBLICLY-OWNED WATER: The Pathology of Israeli Water Law*

I INTRODUCTION

Israel is currently undergoing a process of creeping, albeit partial privatization of the country's waters. The privatization process raises fundamental distributive and environmental questions, but also raises the possibility of a new water regime that will be not only more economically efficient, but also better from an environmental standpoint.¹

The purpose of this paper is neither to examine water privatization in Israel in general nor to discuss its desirability, but rather to call attention to a problem created by the unchecked process of privatization, under which insufficient protection is being given to the public interest in water. The source of this problem is that the privatization trend is accompanied by the traditional rhetoric of public ownership of water. As a result, private interests in water have been enjoying ever-increasing legal protection, while public rights have not been receiving the protection they deserve.

An example of the problem can be seen in the case of the Ein Gedi springs, which have been the source of public controversy in Israel in recent years. While the Ein Gedi Kibbutz claims the right to use the local streams' waters for its own needs and business ventures, environmental and social activists have been opposing these uses, especially the "Ein Gedi" mineral-water bottling business and the tropical botanical gardens, operated as a tourist attraction. The activists claim that the public, or nature, has a right to enjoy the natural flow of the streams in the local nature reserve. The property-rights rhetoric surrounding the case emphasizes the question of the private or public nature of Ein Gedi's waters. While opponents of the bottling plant have emphasized public ownership of

* Acknowledgement: Thanks to Hanoach Dagan, Orly Sela, Ofer Kot, and Issi Rosen-Zvi for their helpful comments, and to Hadar Yuhas for her research assistance

1 For discussion of water privatization in general, *see, e.g.*, Cheow; Dosi & Easter; and Gleick.

the country's waters and of its nature reserves, the kibbutz has claimed private rights in the waters of adjacent streams, including the right to divert and use water for any purpose it sees fit. Recently, the kibbutz and the Israel Nature and National Parks Protection Authority (which has authority over the Ein Gedi Nature Reserve) have attempted to reach an agreement over the allocation of water in the desert oasis, but the draft "convention" drew intense public criticism, and has so far not advanced beyond the draft stage.

Against this backdrop, this paper aims to point to an aspect of property law that has so far been absent from discussions over water law in Israel, namely the property rights of the public which deserve legal recognition, even in a regime of private property in water. In other words, even if we accept the proposition that the law should allow private parties to acquire property rights in water, such a legal regime should still recognize the power of the public to acquire similar water rights, for ecological, cultural, tourist and similar purposes. In such a regime, under which the protection enjoyed by rights acquired by the public would be no less protected than private rights, public interests would prevail in many water conflicts, including the current Ein Gedi controversy.

In order to illustrate the possibility of implementing such a regime, I will briefly describe the system of water prevalent in the western United States, which, while based on private property rights, allows the public as well to acquire water rights. Under this regime, the law grants the public protection against serious harm to nature-related values connected to water, even when the harmful activities have state sanction. Were a similar system to be implemented in Israel, the law would require water to be released in the Ein Gedi Reserve, even at the expense of the kibbutz's water and tourism businesses.

The second part of the paper will briefly outline two pure models of property in water – one of private property rights and one of public ownership. The third part will show that despite Israel's water being publicly owned on paper, in practice claims to private property rights enjoy partial recognition, a phenomenon which helps explain the Ein Gedi controversy. Part four will examine the doctrines developed in the western US to protect public interests even under a radical regime of private property, and will claim that the transition to private property in Israel's water, if it continues, should include adoption of similar doctrines to protect nature and other public values.

II. TWO MODELS OF PROPERTY IN WATER

An important parameter of property rights in a given resource or asset is the extent to which they are private. Property-theory literature typically places great emphasis on the classification of resources as private, common or public, though it should be noted that these forms of property are merely ideal types; in practice, a wide spectrum of intermediate forms exists, and it is rare to find a resource with the characteristics of one of these types alone. Nonetheless, as with other resources, property regimes in water can be divided into three general models: private, public and common.² Though the commons approach is of great theoretical and practical interest, it will not concern us in this paper; the focus here is on the private and public models of water ownership.

In legal systems with private property rights in water, an individual can acquire private, definite rights in water. The classic example of such a system is the “prior appropriation” regime of the western United States³ (though this system, like others based on private property, has as well certain public-property characteristics.)⁴ Under prior appropriation, a system which developed in the mid-nineteenth-century, a private right to a defined amount of water can be acquired by diverting water from its source to beneficial use. Diversion and use invest the appropriator with the perpetual right to this amount or flow, as long as the right is not abandoned. The right of the appropriator to continue receiving the same amount of water, though, is subject to the superior rights of appropriators whose appropriations were made prior to his. In other words, *A*, the owner of a senior right, has the legal right to insist that *B*, the holder of a right junior in time to his, cease diverting water, if *B*'s diversion prevents *A* from exercising his own right. The name of the doctrine – prior appropriation – reflects the fact that the value of a water right derives not only from the quantity defined, but also from its priority in time, since in times of scarcity senior rights take priority over junior ones.⁵

The doctrine of prior appropriation arose in the United States particularly in relatively arid regions (similar in climate and hydrologically to many areas in the Mediterranean basin, including Israel), in which stream flow is generally not sufficient to irrigate all potential arable lands, and annual precipitation is highly variable. As a result, in years of average precipitation many junior appropriative rights provide their owners with no water at all, and in

2 See IUCN; UNITED NATIONS; and Caponera.

3 See Anderson & Hill; and Dunbar.

4 See Schorr.

5 See Wiel.

dry years the situation is obviously even more severe. Nonetheless, proposals to change the system to one of more egalitarian or proportional allocation have been consistently rejected by both users and lawyers, as reflecting serious breaches of the constitutional right to property of senior right-holders.

The purpose of this highly schematic description is simply to lay the basis for this paper's claim (in fourth part) that even a system of private rights in water can and should recognize property interests of the public in the resource. At the opposite end of the property spectrum lies the model of public property, in which water is owned by the state. State ownership does not necessarily mean that the state directly controls all water uses; it may, in fact, grant permits to individuals or corporate bodies to divert or use water. Nevertheless, in this model the ultimate right of ownership resides in the state, and the private rights are created at the administrative level.⁶ This distinction has practical significance, preserving state control over water and strengthening its involvement in water allocation. Not only does it allow the state to set the terms of water use more easily than under other property regimes; the fact that water rights are based on administrative permits or licenses, not property rights, generally means that the rights are limited in time. Moreover, the state's ownership gives it the power to allocate water in accordance with economic and other policy objectives, as opposed to the prior appropriation system, under which water is allocated by the market, generally unaffected by government policy.

On its face, Israel belongs to the large group of states that have adopted the public/administrative form of water ownership.⁷ Already under the British Mandate all streams, springs, lakes and other standing water were declared the property of the High Commissioner, held in trust for the Government of Palestine,⁸ and Israeli legislation further broadened public ownership. Section 1 of the Water Law, 5719-1959, states that "the water sources of the State are public property," with Section 2 giving an extremely wide definition to the term "water sources": "The springs, streams, rivers, lakes and other flowing and gathered waters, whether surface or subsurface, whether natural or controlled or built, whether flowing or standing permanently or intermittently, including drainage and sewage waters." As the Israeli Supreme Court described it in the leading *Pardes Hanna* case, the Water Law "nationalized the water sources and made them state property."⁹

6 See UNITED NATIONS at 8.

7 As noted by the U.N. survey, *id.*, 51-52.

8 Article 16e of the Palestine Order in Council, Palestine Gazette, 1940, Supp. 2, 666.

9 H.C. 221/64 Pardes Hanna Local Council v. Minister of Agriculture, P.D. 18(4) 533, 539 (1964).

State ownership finds its expression in the legal restrictions on private rights in water. Extraction and supply of water are permitted only with a license, which the authorities can refuse to give, make conditional, change or cancel.¹⁰ The license sets forth the identity of the consumer, and the state can order a permit-holder to supply water to any consumer under any conditions.¹¹ The state sets quantities of water to be used, as well as their quality, price, conditions of supply and use, and the right to water is extinguished if there is a change in use.¹² Water allocations are not transferable, and while transfer of extraction licenses is in principle allowed by law, it is limited in practice.¹³ Similarly, the state may set the maximum amounts of water to be applied to various uses, as well as set priorities among uses.¹⁴

The legal situation, at least on paper, is thus clear: water in Israel is owned by the state, which allows private sector use in accordance with the state's considerations and the conditions it sets. There is no apparent connection between the Israeli system and the private property model.

III. PARTIAL PRIVATIZATION OF WATER IN ISRAEL

As with statute law, Israeli case law has tended to stress public ownership of water. In the aforementioned *Pardes Hanna* case, the Supreme Court upheld the state's right to mix high-quality water from a local aquifer that farmers had previously used, with the more saline water of the National Water Carrier, reasoning that the implication of state ownership of all water in the country is that the consumer has no vested right to receive water from a specific course or of a certain quality:

There is no logic in distinguishing between well-watered areas and arid areas, perpetuating their existing conditions. The Water Law is aimed at ameliorating as far as pos-

10 Water Law §§ 23-25, 29 (2010). See also Civ. App. 293/65 Hatis v. Water Commissioner, P.D. 19(4) 71 (1965) (upholding decision refusing extraction permit).

11 See Civ. Cl. (Dist. Jer.) 6166/04 Zabarei Orli Farm v. State of Israel (2006), para. 10; Water Act § 34 (2010).

12 Water Law §§ 6, 21, 112 (2010).

13 Agricultural Settlement (Limits on Use of Agricultural Land and Water) Law, 5727-1967 § 3 (2010); Civ. App. 410/75 Shatzman v. Givat Ada Water Supply Company Ltd., P.D. 30(1) 330 (1975) (water right not assignable); Water Law § 28 (2010) (license transferable with notice to Water Authority); Hatis, *supra* note 11 (license not transferable to new location).

14 Water Law § 37 (2010).

sible the water shortage in the country and bringing about greater balance between the various regions, between those who have, and those who have not.¹⁵

State ownership of water, explained Berenson J., was intended to bring about a situation under which water was allocated to all Israelis on an equal basis: “Thus may the great goal of the Water Law be achieved, that the country’s water sources will serve the needs of all the land’s inhabitants and the development of the entire country.”¹⁶ In another case the same justice explained that public ownership is the basis of the requirement for a license from the Water Commissioner (the predecessor of today’s Director of the Government Water and Sewage Authority) as a condition for production or supply of water.¹⁷

In the relatively recent case of *Blum v. Minister of Agriculture*, the High Court of Justice rejected the suit of a water user who claimed a right to continue receiving water as he had in the past, with the Court emphasizing public ownership of water. It explained that “water sources are public property (section 1 of the Water Law), and the need to conserve them is derived not only from the principles of good government, but from the protection given to this valuable and limited property, common to all the citizens of the state.”¹⁸ The decision cited to an influential California case, declaring the superior property right of the public in the state’s waters, even after they had passed, on paper, to private hands.¹⁹ Israel’s Water Court, too, tends to base its decisions on public ownership of water. For instance, when rejecting a claim that permits granted under the Water Law are property rights, the court mentioned that permits are tied to circumstances and subject to cancellation.²⁰ Recently, in a well-publicized case concerning a polluting factory, the Water Court ordered the cessation of discharges into the Naaman River, explaining that “the value of protecting public property and the public’s right to clean water and a pollution-free environment” outweigh the values of private property, freedom of occupation and protection of places of employment.²¹ In the Yarkon River case, as well, the Magistrate Court based its

15 Pardes Hanna, *supra* note 9, at 451.

16 *Id.*

17 Civ. App. 726/72 Ha Haklai Agricultural Cooperative Society Ltd. v. Shapira, P.D. 27(2) 589, 592 (1973).

18 H.C. 1773/01 Blum v. Minister of Agriculture, P.D. 56(3) 320, 326 (2002).

19 National Audubon Soc’y v. Super. Ct. of Alpine Cty., 658 P.2d 709 (Cal. 1983) (hereinafter: Mono Lake).

20 App. Comm. (Water) 105/02 Ben Ezer v. Water Commissioner (2005).

21 Misc. Mot. (Water) 427/06 Miloban M.C.P. Ltd. v. Water Commissioner (2006).

decision to allow a class-action suit on behalf of all the citizens of the state to go forward on the country's streams being public property.²²

Yet alongside these judicial pronouncements are others which seem to point to a nascent recognition of private rights that are at least what Charles Reich famously referred to as “new property.”²³ In *Water Commissioner v. Perlmutter*, for instance, while the Supreme Court stated that water sources are dedicated to public needs, it nonetheless ruled that the farmers in the case had the right to continue receiving water as long as they remained on their lands.²⁴ In another case the Water Court ruled that while treated sewage is the public's property, the local authority that carried out the treatment has a “special connection” to it, given expression in legislation allowing it to sell its sewage, and that this special connection supersedes the Water Commissioner's policies.²⁵ Even in the *Blum* case, which recognized water as the common property of the state's citizens, the High Court of Justice ruled that under certain circumstances the allocation of water may create “a reliance interest worthy of recognition,” *i.e.* an interest the derogation of which would entitle the consumer to damages.²⁶ While it can be argued that these judicial *dicta* do not reflect an intentional policy or a coherent view of the topic, the signs of legal recognition of private rights in water are nonetheless evident.

Israeli legislation, too, reflects the fact that water allocations to the agricultural sector function in practice like property rights (or “new property”). Thus even though extraction permits generally allocate water for a single year, the allocations typically renew on an automatic basis, with each permit based on the previous year's (subject only to across-the-board cuts to the sector).²⁷ This is seen by agricultural users as creating a “reliance interest” (the court's phrase in *Blum*).²⁸

22 Civ. Cl. (Mag. T.A.) 119663/01 *The Greens – Ass'n for Environmental Protection v. Yarkon River Auth.*, paras. 6-7 (2005).

23 Reich.

24 Civ. App. 535/89 *Water Commissioner v. Perlmutter*, P.D. 46(5) 695 (1992).

25 *Local Authorities (Sewage) Law, 1962, § 15; Misc. App. (Water) 103/01 Ayalon Regional Auth. (Sewage, Mosquito Elimination and Waste Removal) v. Water Commissioner*, P.M. 5750(2) 273 (2001), citing *Local Authorities (Sewage) Law, 1962, § 15* (2010).

26 *Blum*, *supra*, note 18, at 325-26.

27 *Water Rules (Water Use in Rationing Area), 1976, §§ 2(b), 3, 8a(2), 18(a)* (2010); *Zabarei Orli*, *supra* note 11.

28 Note that the reliance argument is somewhat circular, as the farmer's reliance will be worthy of protection only if he were justified in believing that it would be protected. Where the law does not recognize his reliance, it is *ipso facto* unjustified.

The basing of rights on priority in time, and the preference given to senior uses and users over new ones, are venerable property institutions.

The Water Law also was recently amended to allow free transfers of extraction permits, something that was previously impossible.²⁹ Even though there is no necessary connection between alienability of a right and its definition as a property right or not, this granting of power to permit-holders to transfer rights weakens the state's control over the water resource and underlines its private nature.

Moreover, practice in the water sector indicates a quasi-private-property view of water. As Neta Ziv has shown in her research, even in the urban sector recent years have seen a trend of water privatization and commodification,³⁰ but the trend is most evident with regard to agriculture. Even though the Water Authority is supposed to allocate water among Israel's farmers, allocation is in fact carried out by the Agriculture Ministry, which effectively represents the farming sector.³¹ Farmers' reliance on previous allowances receives constant encouragement by the practice of "compensating" them for "cuts" to their allowances from previous years, as if allowances were private property being expropriated by the state for the general good, not public property for which use permits are granted on an annual basis. The feeling among agriculturists, at least as expressed by their representatives, is that they have a property right in water, plain and simple.³² This view finds expression in their insistence that the financial support granted them by the government be called "compensation," not "subsidies" – the term preferred by the Finance Ministry.

The privatization trend is evident as well with respect to the fees charged to permit holders. Until the late 1990' there existed a "balancing fund for water charges," the egalitarian purpose of which was "to minimize the differences between water charges in different regions."³³ The fund was financed by balancing fees, inversely related to the extraction costs of each supplier, with the purpose of bringing the price of water in areas with low extraction costs closer to the national average. The fund was used to subsidize suppliers in areas with high production costs, in order to lower the price to the user in those areas. This arrangement no was doubt inefficient from an economic point of view, but the principle

29 Water Law § 28 (2010).

30 Ziv.

31 See Zabarei Orli, *supra* note 11.

32 See, e.g., Ben-Meir.

33 Water Law § 116(a), Sefer Hahukim 166 (repealed 1999).

was clear – as water belongs to the state, there is no justification for users in one area to benefit from the low extraction costs in their area while others need to pay more for their water. Water, as a publicly owned good, should be supplied to citizens on an equal basis. The scheme, however, was cancelled in 1999, the balancing fund and fees were replaced with a standard extraction charge, and the attempt to equalize conditions and prices in different regions was abandoned.³⁴

It should be noted that state ownership presents no theoretical barrier to the recognition of private use rights; in other property relationships, such as that between a lessor and lessee, or between dominant and servient estates, property rights in an asset are divided among two or more parties. Similarly, in the western United States private water rights are subject to the superior navigation right of the federal government, and often to public rights of access and recreation as well. Yet we still can attempt an overall characterization of the Israeli system: Is it a regime of public ownership, with private rights pursuant to administrative permits, or is it primarily a system of private rights, with all that this entails from both the legal and the rhetorical points of view? The answer would seem to be that water in Israel has not yet completely lost its public character, but that on the crude but still useful public-private axis of property rights, it is moving in the direction of private property.

The Ein Gedi case is a particular example of the broader phenomenon of increasing recognition of private water rights. The area in the Judean Desert known as Ein (Hebrew for spring) Gedi is in fact an oasis fed by four springs. Beyond its historic and cultural significance (from Biblical and Roman times), and its popularity for tourism and recreation among the beautiful landscapes and impressive archaeological remains, the site is important for its unique ecosystem: The combination of the hot, dry climate and location in the Syrian-African Rift, typical of the Dead Sea area, with the fresh water of the springs cascading down the desert slopes, has created a habitat attractive not only to flora and fauna endemic to the region, such as the ibex and the hyrax, but also those typical of tropical environments, for which Ein Gedi marks the northern boundary of their distribution. The unique ecology of the area is absolutely dependent on the waters of the Ein Gedi oasis.

Since its founding in the 1950', the Ein Gedi Kibbutz has been diverting large quantities of water from the springs for its own uses. Over time, the continued diversions caused significant desiccation of the flora in the David and Arugot Streams, and hit particularly hard the vegetation fed by the "Ein Gedi Spring" on the slope between these two streams, overlooking the remains of an ancient

34 Water Law §§ 116-120 (2010).

synagogue. In recent years the kibbutz has moved the diversion location in Arugot further downstream, restoring the natural flow within the nature reserve, and a similar move is due to take place in the David Stream. Yet the kibbutz continues to take 40% of the waters of Ein Gedi Spring for its bottling operation, alongside continued diversions for other uses. The ecological harm, including the drying up of rare tropical tree species, has therefore remained unabated. And the situation is likely to worsen, as the kibbutz plans increased pumping in order to increase production at the bottling plant.

The water privatization trend allows us to better understand the positions of the parties in the Ein Gedi controversy. Many of the kibbutz's critics base their arguments on public ownership of the spring water. In their view, the diversion by the kibbutz of publicly owned water from a place of special natural beauty is unacceptable, particularly when the diversion's purpose is a commercial activity such as mineral-water sales. The kibbutz, on the other hand, insists on its right to take water from local water sources for whatever use it sees fit. In the past the kibbutz used the water allocated by the state for agriculture, and now it wishes to use it for other, more profitable uses, as any property owner may do with his property.

Ironically, it is the kibbutz's position that has received support from the government. Official support reached its zenith in 2007, when the Nature and National Parks Protection Authority attempted to sign a water use agreement with the kibbutz. The document recognized the kibbutz's right to decide on its own how to consume "its share" of the water, free from intervention of the Authority. When two Members of Knesset pointed out in a letter to the Authority that the agreement was seemingly in derogation of section 6 of the Water Law, which states that the right to use water is always connected to a specific use,³⁵ the Authority responded, instructively for our purposes: "Experience has shown," wrote its Chief Scientist, "that the agreement is in accord with customary norms with regard to water in Israel. Such a division of water is the practice in many cases... If the norm were different, it is possible that there would be no need for this agreement."³⁶ Water privatization is so much a legal fact that at least some arms of the government see it necessary to negotiate with private users in order to obtain water for public use, and the Water Law, which clearly establishes public ownership of water, is seen as something of a dead letter.

35 Letter from MKs Melchior and Khenin to Eli Amitai 7/3/2007 [Hebrew].

36 Letter from Yehoshua Shakdi to Eli Amitai, 15/3/2007 [Hebrew].

To sum up, the Water Law states that water in Israel is public property – ownership which should give the state, by way of the permits and allocations granted under the law, control over water uses. In practice, though, permit holders, particularly in the agricultural sector, act as if the water was their own, and the rights granted them under law seem more and more like private property. Thus the public debate over the negative effects on nature of the Ein Gedi kibbutz’s uses has been channeled into a discourse of property rights. The opposition to the kibbutz’s use of spring water for commercial uses, which has seriously harmed both the ecology and look of the nature reserve, is based to a large extent on the public ownership of the waters.

IV. PROPERTY PROTECTION FOR PUBLIC RIGHTS IN A REGIME OF PRIVATE WATER RIGHTS

Yet the appeal to public ownership of water is problematic. This Part will attempt to explain why, to sketch some doctrinal tools with which American law has been able to protect public rights even in the private-property regime of the western United States, and to examine their applicability in the Israeli context.

1. The Problem of Public Ownership

Public ownership is no panacea for poor and unjust management of natural resources, as the Israeli experience with water demonstrates. Despite public ownership, water has been managed in a particularly damaging and wasteful way.³⁷ Moreover, the considerations motivating water policy are generally not related to the public good, but rather those that advance the agenda of a particular sector, agriculture.³⁸ Thus water is officially owned by the state, but the authorities entrusted with its allocation do as they wish – traditionally, as the farmers wish. The farmers wish for the water to be managed as if it were their private property: with preference given them in both allocation and pricing, even when they use the water for non-agricultural purposes, such as bottling and tourism.

None of this should really surprise. For decades, scholars of public administration have warned of “agency capture,” a phenomenon that accompanies nearly every administrative body, and public choice scholars have offered an explana-

37 For an analysis of water pollution in Israel as a case of tragedy of the commons, see Adam.

38 Fischhendler; and Menachem.

tory theory.³⁹ One need not accept all the elements of the theory that sees the state as responsive primarily to special interests, nor its normative conclusions, in order to nonetheless recognize in practice many of the negative phenomena predicted by capture theory, and there is perhaps no better example than Israeli water management. Even if one believes (as I do) that true public control would lead to better results than those we have today, one must admit that the current situation, in which public ownership is actually camouflage for private appropriation in practice, is undesirable. Below I argue that, paradoxical as it may seem, a regime of true private property, in which the law explicitly recognizes private rights in water, could provide better protection to public rights.

2. The Reserved Rights Doctrine

As explained above, water law in the western United States is based on private property rights acquired through appropriation and use, under the “first come, first served” principle. Property theory literature generally considers this regime to be a paradigmatic case of private rights in a natural resource.⁴⁰ Yet in this privatized system, the state, and the public, whose uses include navigation, fishing and ecological conservation, are not discriminated against. Just as a farmer or a factory can acquire a water right through diversion and use, the state may appropriate a water right for the public, and preserve the natural flow of a stream by filing notice of its “appropriation” of this right.⁴¹

Recently the Israeli Water Law was amended to add to the list of approved purposes of water use the purpose of “conservation and restoration of natural and scenic values, including springs, streams and aquatic habitats.”⁴² Technically speaking, it seems that from a practical and legal point of view this amendment was unnecessary, as water had been allocated to nature preservation even before the statutory amendment. The fact that the legislature saw a need to explicitly enumerate conservation as an approved use shows that the idea that the water authorities are obligated primarily to advance the public interest has become a foreign one. At least now, with the law’s amendment, there can be no doubt that the government has the authority to allocate water to nature. The question is what will happen if it does not exercise this authority, or exercises it at

39 See Wiley Jr. For public choice, *see* Becker; Elekund Jr. & Tollison; Macey; and Olson.

40 *See, e.g.*, Anderson & Hill.

41 *See* Blumm; and Boyd.

42 Water Law § 6(6) (added 2004). It should be noted that there is still no mention in the Law of uses related to recreation, though it could be argued that these would be included under “public services,” mentioned in § 6(5).

a suboptimal level – can nature or an important ecological site acquire water rights for itself?

While the muddled, semi-privatized state of Israeli water law does not allow a clear answer to this question, the law of the western US, in which private property rules, is clearer, and actually better advances the interests of the public. The leading case is *Cappaert v. United States*, in which the US Supreme Court applied the doctrine of “implied reservation” to nature conservation.⁴³ In this case a small Nevada lake known as Devil’s Hole had been declared part of Death Valley National Monument, partly in order to protect a species of fish endemic to the lake. Some years later local farmers had begun pumping water from wells on their lands. When it became clear that the pumping was causing the water level in the lake to sink, thereby endangering its fish, the federal government sued the farmers, asking the court to enjoin the pumping. The Supreme Court affirmed the lower court’s injunction, ruling that the government was entitled to a water right in the amount necessary to advance the purposes of the reserve, and more importantly – that this right had a priority of the date of the Monument’s declaration. As a result, the government’s water right was senior to those of the farmers, even though the farmers had acquired their rights through the procedure laid out by Nevada law, while the federal authorities had never invoked the water appropriation procedure. The court explained that when the government reserves land for a specific purpose, such as nature conservation, it implicitly also reserves the water rights necessary to advance this purpose.

The “implied reservation” doctrine not only *allows* the government to assure an appropriate supply of water to nature, it may even *require* it to do so. A recent example was the decision of a federal district court, which prohibited the federal government from relinquishing water rights – acquired by implied reservation for a national park – in favor of private users in the area. The court based its decision in part on a general prohibition on administrative agencies divesting themselves of government property without legislative sanction.⁴⁴

The implied reservation doctrine has been applied in American law in other contexts as well. For instance, it was held that the statute creating the Rocky Mountain National Park impliedly reserved all its water for the benefit of its ecosystems,⁴⁵ and that the declaration of the Black Canyon of the Gunnison as a national monument reserved the waters necessary to “conserve and maintain

43 426 U.S. 128 (1976).

44 *High Country Citizens’ Alliance v. Norton*, 448 F. Supp. 2d 1235 (Dist. Colo. 2006).

45 *United States v. Denver*, 656 P.2d 1 (Colo. 1982).

in an unimpaired condition the scenic, aesthetic, natural, and historic objects of the monument, as well as the wildlife therein, in order that the monument might provide a source of recreation and enjoyment for all generations of citizens of the United States.⁴⁶

Should a similar doctrine be developed in Israeli law? In the traditional view, in which water belongs to the state, which apportions it in accordance with users' needs, the doctrine would seem to be superfluous, since there are no private property rights competing with important public interests such as nature conservation. Moreover, from a policy standpoint, there is no *a priori* reason to privilege older uses over new ones. Yet in practice, as we have seen, private interests in water enjoy a status in Israel that is at least one of "new property," and property law attaches great importance to the question of temporal priority. If these private interests enjoy heightened, quasi-property protection based on their priority, then it is only proper that the public's interests in the natural environment, too, enjoy similar protection, and that the public's rights should at least prevail over private ones when they preceded them in time. In other words, even if the trend of investing private rights in water with property status continues, in a sort of Israeli prior appropriation system, Israeli courts should ask themselves the question being asked by courts in the western US: Did the declaration of a nature reserve or other land use impliedly include the reservation of the amount of water needed to achieve the purposes for which the declaration was made?

On this view, the Ein Gedi case is a perfect one for applying the implied reservation doctrine in Israeli law. While the declarations of Israel's Interior Minister which created the nature reserve do not mention its purpose, it is obvious that any possible purpose we could attribute to these declarations – ecological preservation, recreation in nature or scenic preservation – clearly depend on the spring waters of the reserve. Were it not for these springs, Ein Gedi would be no different than the hundreds of square kilometers of arid desert surrounding it. Can we attribute to the government the intent to reserve the lands around Ein Gedi without its waters, its unique tropical vegetation, or the fauna dependent on the bounty of the oasis? Recognition of the prior right of the reserve would ensure that it receive the water necessary for the survival of its unique ecosystem.

46 *In re: The Application for Water Rights of United States of America*, 101 P.3d 1072, 1075 (Colo. 2004).

3. The Public Trust Doctrine

An additional avenue for protecting the public interest in water is the public trust doctrine. According to at least some states' versions of the doctrine, it operates as an exception to the ranking of property rights according to seniority, with certain rights of the public always enjoying priority.

The state, according to the doctrine, holds its waters in trust for the public. Its trustee status means that it cannot do anything – including transferring title to private hands – in a manner that harms the trust. In other words, private rights in water will always be subject to certain public interests that the trust is supposed to protect. The trust is a powerful, quasi-constitutional instrument; it can prevent even the legislature from alienating trust property free of trust obligations, and it subjects administrative decisions regarding the property to judicial review.⁴⁷

This doctrine, with its roots in the common law and Roman law, for years found its main expression in protection of the state's rights in the seabed. In the nineteenth and twentieth centuries, American law extended its reach to other water bodies, as well.⁴⁸ In the second half of the twentieth century it was further extended in some states, especially in the West, subjecting private property in water to environmental considerations and allowing the public access to otherwise private water sources for recreational purposes.⁴⁹

The doctrine reached its zenith in the famous *Mono Lake* case, handed down by the California Supreme Court in 1983.⁵⁰ The case involved a petition by an environmental group against the continued diversion by Los Angeles of five streams

47 See, e.g., *Ill. Cent. R.R. Co. v. Ill.*, 146 U.S. 387 (1892); *Long Sault Development Co. v. Kennedy*, 105 N.E. 849 (N.Y. 1914). See also *San Carlos Apache Tribe v. Super. Ct.*, 972 P.2d 179, 199 (Ariz. 1999) (legislature cannot abrogate trust doctrine); *In re Waiola O Molokai, Inc.*, 83 P.3d 664, 684 (Haw. 2004) (doctrine has constitutional status therefore court empowered to interpret and protect it).

48 In the nineteenth century American law applied the doctrine to “navigable” waters, and in recent years the term “navigable” has been extended in some states to include any water body capable of public use. See *Ausness; Southern Idaho Fish & Game Ass'n v. Picabo Livestock, Inc.*, 528 P.2d 1295, 1297–98 (Idaho 1974); *Montana Coalition for Stream Access v. Curran*, 682 P.2d 163, 169–70 (Mont. 1984).

49 See *Mono Lake*, *supra* note 20; *Southern Idaho*, *supra* note 49; *Montana Coalition*, *id.*; *State v. Red River Valley Co.*, 182 P.2d 421 (N.M. 1945); *Day v. Armstrong*, 362 P.2d 137 (Wyo. 1961); *Marks v. Whitney*, 491 P.2d 374, 380 (Cal. 1971); *United Plainsmen v. N. Dak. St. Water Conservancy*, 247 N.W.2d 457 (N. Dak. 1976). For the doctrine in general see Sax.

50 *Supra*, note 19.

in the northern part of the state for the purpose of municipal water supply. The diversions, which had begun (with proper permits) in 1940, caused a significant drop in the level of Mono Lake, harming not only scenic values, but also the delicate ecological makeup of the lake, a major nesting ground for birds, as well as habitat for species on which they feed.

The state supreme court ruled, in a groundbreaking decision, that the public trust doctrine requires the state to take into consideration the public's right to the ecological integrity of a water body. Private parties may acquire rights in the state's water, ruled the court, but they do so subject to the trust, and the trust remains in force even after the water rights have passed into private hands. This analysis leads to two conclusions: First, that the authorities are entitled to protect public interests in water, even when such protection interferes with longstanding private rights (and without a duty to compensate); and second, that the state is *obligated* to act to protect trust interests, in accordance with its fiduciary duties as trustee for the public.

Does Israeli law recognize a local version of the public trust doctrine? Israeli courts have not yet recognized a quasi-constitutional trust duty, as some American courts have. Nonetheless, Section 1 of the Water Law may serve as a statutory basis for a public trust, as it declares that “the water sources of the State are public property, under the control of the State and dedicated to the needs of its inhabitants and the land's development.” A plain reading of the section accords with a model under which water in Israel is owned by the *public*, and the *state*, which has been given control of the resource, acts as trustee. The implication is that the state may not transfer to private hands rights that harm the public interest.

What is the meaning of this trust from the point of view of environmental and other public interests? Obviously “the needs of its inhabitants and the land's development” might include uses which harm the environment.⁵¹ Yet the split ownership of water – with title held by the public and the state acting merely as a trustee – creates a legal regime different from the simple state ownership model. When deciding on water allocations, the state must – not only as a matter of administrative law, but as a matter of property law – take into account the good of all its inhabitants, not only of special interests. Even if the public interest requires allocating water to a use which harms some protected interest, the state is obligated to minimize the harms as much as possible. Were the state to

51 Compare the law in California, where it was ruled that not all public purposes satisfy the public trust; only those connected to uses and activities in the vicinity of the water body in question meet the trust standard; Mono Lake, 723-24.

recognize the public's property rights in water, and structure its decisions regarding Ein Gedi in this way, it is highly doubtful that the drying up of the unique oasis would have been allowed.

The advantage of the public trust, as opposed to classic public ownership, would lie in the substantive rights held by the *public*, as opposed to the state. While the state is in any case obligated to represent the various interests of the public, in Israeli public law its decisions typically benefit from a presumption of validity, as long as they do not stray too far from some zone of reasonableness. The trust doctrine, on the other hand, would give the public the power to insist on a higher level of concern for the public weal by the state, and the latter would be obligated to justify its actions with regard to trust property. Practically, this would mean a heightened level of judicial scrutiny with respect to trust property: Rather than striking down decisions only when they exceed the wide bounds of reasonableness, the state would be forced to prove to the court that its actions were indeed consistent with the interests of the public.⁵² In the Ein Gedi case, recognition of public property rights in the spring waters, as distinguished from the state's power to allocate water, would give better protection to the interests of the broad public. In particular, recognition of the trust would strengthen judicial oversight of the authorities' decisions.

V. SUMMARY AND CONCLUSION

The Ein Gedi case is but an example of broader processes currently affecting Israel's water (as well as other elements of the national economy). The public property established by the Water Law is being replaced, step by step, with a regime of private rights that can be classified as "new property," if not full-blown private property. In addition, the preservation of the rhetoric of state ownership allows strong interest groups, such as the Ein Gedi kibbutz and the beverage company with which it is associated, to treat the water as its private property, while harming nature and the broad interests of the public.

Comparison to the law of the western United States shows that the weak protection afforded public water rights by Israeli law is not necessarily the result of the resource's privatization, but of the unofficial and partial way in which this is being carried out. Recognition of private rights in water in the western US has not prevented the law from developing tools to protect the public's interest in water allocation to nature and other public uses. Legal doctrines have been developed

52 See Waiola, *supra* note 47, at 685, and sources there cited.

which allow the public to require the government (as well as private parties) to properly consider its interests. Moreover, property law gives liberal recognition to “appropriation” by the public for nature, even when the appropriation has been made outside of the usual channels of diversion and registration of rights.

Do the Israeli and western American cases hold broader lessons? I believe they do. Buzzwords like “integrated management” and other reform proposals typically assume a large degree of control, if not outright ownership, by state agencies. Yet the Israeli case, in which water has been subject to state ownership for half a century and more, shows that state control can lead to haphazard and harmful allocation of water. What may be needed is the grounding of legal rights in the public, as opposed to the state, in order that the state may be constrained in its decision-making and forced to advance the public interest.

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TRADITIONAL & MODERN WATER MANAGEMENT IN THE TAFILALET REGION: The Case of the Ghorfa

I. INTRODUCTION

The Tafilalet Oasis located in the southeast of Morocco is one of the largest in North Africa. Throughout history, it constituted a target region for trade and economy, particularly the city of Sijilmasa. In addition, water in the Tafilalet area has been a major concern for the population inhabiting the city and even the nomads crossing it for various purposes. Water in that particular area has been managed through traditional means. However, water management has changed in this region, which is today affected by severe drought, from a completely traditional way to a new management system that includes both modern and customary practices.

Although water management in Islam inspired many states to implement a distribution system of a certain type, oases have their own rules.¹ Since the Roman times, water was always distributed in oases by measurement of water flow by hour. However, for the oases of the Saharan Maghreb, there still exist two methods of water distribution – the share by volume, per unit of water, *habba* or *qirat*, or by amount of flow by unit to time, *nouba* which corresponds to the use of water during half a day². Both of the methods are sometimes used through a hierarchical rank of water distribution especially in large oases where first the volume is considered and then the time.³

Considering where they originally come from, the Oases of Medina or Mekkah, the Arabs have long been concerned with water distribution since it has always been a natural resource, both privileged and sacred. First, they have developed

1 Ambroggi.

2 *Op. cit.*

3 *Op. cit.*

laws that designate resources as property of a certain community which is to be transmitted to future generations. Then came the time for dams that were also considered to be resources that belong to an entity, which had privileges over those who do not own it⁴.

This last small detail explains why the farmers interviewed preferred not to talk about the various caste differences existing in the oasis. In the past, water has been managed by tribes. Within a particular tribe there have been several divisions – the *Shurfa*, the *Abrar*, the *Harratin*, and the *Abid*. The first category usually holds political power and therefore controls the management of water. According to Ambroggi, it gives the *Shurfa* some privilege over the other categories. The Moroccan Law in this area does not make sense since people manage themselves by who they are. As an example, a *Shrif* will always be highly ranked even though he is poor and a *Hartani* will always be poorly ranked even though possessing a fortune. Concerning the *Harratin*, it is the caste that has traditionally been in charge of farming since they knew the palm trees well, they knew the irrigation system and they were strong enough to dig⁵.

The second category is the *Abrar*, which are free people who have property rights and also had a role in managing water. When the *Harratin* started leaving the oasis and going elsewhere for better opportunities, the *Abrar* needed to work themselves as farmers on the land. They could not do so since the *Harratin* used to do it and it was considered to be degrading⁶. Although the government has tried hard to take charge of water management, and change it from a traditional to a modern one, a lot of challenges are still in place. For example, the users themselves create the water problems by not respecting their turns and their successive order. Maybe those people do not see it as fair and equal to get the same amount of water as a lower class person who recently bought land. In a closed society like the Tafilalet, implementing new laws may take decades to be accepted by the people which only results in complete confusion and bad management of resources.

In 1971, King Hassan decided to construct the Hassan Addakhil Dam that was conceived to help the region overcome drought and manage water in a better way. This technology was introduced in a medieval, traditional area without any study or assessment of its necessity. The purpose of constructing this dam was to manage the inundations that were responsible for the destruction of many

4 *Op. cit.*

5 Ensel.

6 *Op. cit.*

*Qsur*⁷. Since its construction, the dam has been a major concern of the impacted entities. There have been many arguments regarding the benefits it provides compared to the size of the problems it causes.

From September 2008, precipitation has been abundant across the country including the Tafilalet region and the dam was 100% full for the first time. This event gave hope to the population of the area, and influenced a change in public opinion concerning this modern way of managing waters. This research was expected to demonstrate if hope is really given back to the people and if the dam does more positive things than negative ones. Now, the research in the area has shown that the people interviewed are aware that the dam would help future years to be better ones. Although this new construction in a traditional area may seem today as an effective one, for years, it has been seen as a crisis created by outside factors interfering with a closed, correctly managed society.

This paper presents findings of the research which was built upon previous research in an attempt to answer the questions: how is water managed in the Tafilalet area, and who are the different actors involved in both the traditional and the modern ways of managing water.

II. METHODOLOGY

1. Methods used

The first method used in this exercise is the problem-oriented approach. This type of organizing research is similar to the deductive method that Berg⁸ calls the theory-before-research approach. The problem-oriented approach was very

7 ["In their conceptual definition, a formerly political and sometimes armed, opposition to the "nomadic" (Berber and Arab) groups, the *qsûr* dwellers—*Harâr* and *Harâtin*—are associated by their common interests, their sedentary "urban" lifestyle, and their larger identification with the *qsar*, the *qbâla*. For while the term *qbâla* in the context of the sedentary organization of the *qsûr* it simply indicates the *qsar* community as a whole (*abl l-qsar*, "the people of the *qsar*") defined territorially. For a comparative historical account of the social organization of the *qsûr* society in another area of southern Morocco, see Mezane, La Tafilalet." (Italics by editors.) See Stefania Pandolfo, IMPASSE OF THE ANGELS—SCENES FROM A MOROCCAN SPACE OF MEMORY, Chicago, University of Chicago Press, p. 325 (1998); accessible (20.09.2010) at: [8 Berg.](http://books.google.com/books?id=XnUt6akQeFQC&pg=PA325&lpg=PA325&dq=qsur&source=bl&cots=FFZQdCSItl&sig=VdMgzGv3vj_A6_hfqEGT5n9vQI&hl=en&ei=T5CTTMuGKoeRswbhteH6CQ&sa=X&oi=book_result&ct=result&resnum=5&ved=0CCcQ6AEwBDgU#v=onepage&q=qsur&f=false.- Ed].</p>
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helpful in this research considering the time constraint in conducting it. It was absolutely necessary to frame the problem prior to going into the field to be able to suggest solutions to the issues after analyzing the findings.

The second method used was a survey questionnaire that consisted of fifteen questions. The majority of the questions framed were open-ended in order to allow the interviewee to interpret the question in his/her own way⁹. Additionally, there were some close-ended questions such as asking about the sources of water available in the area, which only had one option and it would not be anything else. Additional open-ended questions were used in order to prevent the interviewee from feeling that a certain framework was imposed on him/her especially considering that the research aims at finding out the worldview of the interviewee¹⁰.

The third method used in this research was semi-standardized interviews. This method consists of combining both the standardized and unstandardized interviews to give a more flexible structure. This type of interview requires the preparation of a number of questions presented as the question guide for a specific topic¹¹. While conducting the interview, the interviewer is allowed and “expected” to not strictly follow the questions previously prepared, but to ask more questions depending on the answers of the interviewee¹². While preparing the questions, careful attention was given to choose the right vocabulary such as *Saqiat*, to designate a specific water mechanism, *Sheikh Saqia* to designate a person involved in the water management and so on. It was crucial to use the correct words in order to guarantee an understanding of the questions and the answers received from both the interviewer and the interviewee. Semi-standardized interviews offered another opportunity, which is the ability to discover new unexpected ideas with the interviewee and at the same time obtain the desired responses to the prepared questions¹³.

The fourth method was the use of photographs of palm trees, land, water canals, dams and agricultural fields with aim of providing a persuasive documentary basis during research and to demonstrate the situation of water use and management as it was at the time of conducting the research. As Berg¹⁴ suggests,

9 O'Reilly.

10 *Op. cit.*

11 Berg.

12 *Op. cit.*

13 O'Reilly.

14 Berg.

photographs have significant value in research either as data by themselves¹⁵ or as an illustration device in interviews.

2. Problems encountered during research

There were a few problems encountered during the research. First, time constraints made it difficult to interview more people and use other methods to collect more data. Second, the area where the research was conducted was very limited. As a matter of fact, the data collected could only be attributed to the Ghorfa and the research would not represent the whole Tafilalet Oasis. It was realized during the research that each region in the oasis has its own specific problems and characteristics. Moreover, the Ghorfa has always been a lucky area, as the inhabitants mentioned, since geographically it is located at a lower place compared to other places which provides more water. This can explain the enthusiasm of the farmers interviewed. Thus, if research would have been done in the City of Erfoud or in other areas, which suffered the damage, the responses would have been completely different. The third problem was the people interviewed who seemed to not be severely concerned with water issues. This would be due either to the fact that the dam was full now and water was abundant, or to the fact that they were wealthy farmers. It would have been better to meet poor farmers or sharecroppers, both of whom would have had different points of view.

Moreover, it might be an assumption of the research, which went with hypotheses, that the situation was very crucial and the population was severely concerned. The fourth problem is related to the unavailability of governmental officials because the research was conducted on a Saturday. Although, they are meant to work Saturday morning, the governmental officials in Rissani¹⁶ were not available.

The methods used also helped in collecting valid data since semi-structured interviews provide the opportunity to go back to a point and clarify it. This ensured that the data given were accurate. O'Reilly¹⁷ made the necessary point of checking if the data collected makes sense, and this research absolutely does, although the fact that people regained hope in the Hassan Addakhil Dam was not expected since for years they have considered it to be their main source of trouble. In the analysis part, enough information is provided to let the reader

15 Dowdall & Golden.

16 [The city (former capital) in Tafilalet.- Ed].

17 O'Reilly.

judge the accuracy of research. Concerning reliability, Hammersley and Seale¹⁸ consider replicability to be an unrealistic and non-preferred tool to check reliability. Still, it would be interesting to redo the research with the same people in an attempt to get the same results. However, it is necessary to note that all interviewees were men and the interviewer was a woman which may have pushed them to be affected by this detail and affect the research lightly.

3. Time and setting

The research was conducted on Saturday, November 29th, 2008. In one area, the data were collected from some interviewees while doing their activities in the fields. In another area the data collection was made during a previously arranged meeting. The majority of the data were collected in Rissani more precisely in the Ghorfa area, located in the south east of the oasis and in the governmental offices in the City of Erfoud.

In the Ghorfa region, the data were collected in some agricultural fields that were directly affected by the issue of water management. Concerning this research, it was necessary to arrange a set time and place with certain gatekeepers. However, the interview conducted in the City of Erfoud was partially spontaneous because the government officials that were to be interviewed were in Rissani, but they were not available. As a matter of fact, the person that was first contacted to meet with in the Ghorfa was busy Saturday morning and assigned another person to help the researcher. Concerning the target population, it was previously planned to interview farmers because they are directly affected by the situation, and a government official to listen to the version of the entity lobbying for a modern water management. During the field trip, each local expert helped in finding another one that might contribute to the research. Concerning the interview conducted with the government official in Erfoud, it was done with the government official in charge of water and irrigation.

III. RESULTS OF INTERVIEWS

The issue of water management has many components involved in it. In fact, to investigate how water management is dealt with and who are the different entities implicated in it, it was necessary to ask questions about the water council, *Majlis Sqa* that plays the role of a lobby group for the farmers, that speaks in

18 According to O'Reilly.

their name to the government. In addition, questions were asked about *inter alia* the water resources available in the region the way water is distributed, the amount of water given to each person, the problems encountered in distributing water in both a traditional and modern way, the law applicable to the water distribution, the responsibility for canals, the difference between water management before and after the construction of the Hassan Addakhil Dam, and the different types of sanctions for violators. Other questions were added into the discussion depending on the answer of the interviewees. The data collected can be divided into distinct variables, with occupation as a variable that provides clarity to the answers given. Namely, depending on the occupation of the participants a different response was given. The variables are data collected from farmers, government official and an NGO worker that knows agriculture well. During the interviews, the researcher was informed that there are four sources which the region has been getting water from. These are the River Ziz (which is the site of the Hassan Addakhil Dam), the River Ghريس, the River Aoufous, and the River Rmel. The Ghorfa region consists of fourteen rather smaller villages, and each *Qasr* gets its part from the two hundred hours given to the Ghorfa region. Before the construction of the Hassan Addakhil Dam, the water was distributed by turns – each *Qasr* of the Ghorfa had to wait its turn that will come on one day of the week. Rivalry always was present between the Gorfa region and other areas, rooted in Gorfa’s geographic position and due to that, its ability to get more water than others.

Sheikh Saqya explained that farmers elect the *Sheikh* through voting. He is authorized to represent them before the government. Concerning water management and distribution, according to him, the main problem is scarcity of water. The Hassan Addakhil Dam has never been 100% full since its construction in 1967. In the eyes of people, the dam was a bad investment. However, such opinion was prevalent only in times when there was no water. Concerning the functionality and maintenance of the canals, the Ministry of Agriculture is the one that has responsibility for that. Political parties have nothing to do with the water issue in the region.

The Ghorfa region, composed of four areas – Sarghini, Abderahmani, Jadidi and Massifi, has four shares in water (4/4), and each area gets $\frac{1}{4}$ of the whole share (“one gets the night, another gets the morning”). Concerning the water coming from the Hassan Addakhil Dam, the Ghorfa gets twenty days distributed among four shares. When there is enough water, there is no problem. Problems occur during times of water shortages. An opinion was expressed during interviews that the amount of water today has been reduced in comparison with the time before construction of the dam. However, the water was considered well-managed since everybody receives an equitable share of water depending

on the lands and the population of the place. The state is involved in the water management to ensure that each person in the area will get his/her part of water. Actually, it is not how water is managed but rather how much water there is to be managed. Depending on the amount of water is a good social environment or tension between people.

According to a governmental official at the *Centre Régional de Mise en Valeur Agricole* in Erfoud, the Centre was established by the Ministry of Agriculture in support of agricultural production and irrigation in the region. The irrigation system shifted from a traditional one to a modern one after earlier floods in the region. King Hassan II constructed the Hassan Addakhil Dam for the purposes of economic development of the area and prevention of damages caused by floods. Before the dam there was traditional management of water, although thirteen small dams already existed. There are two types of dams in the region. The first are called derivation dams, which were constructed by the efforts of each tribe. The others are called retention dams, the purpose of which is holding the water and not delivering it to a specific location. One can obtain the right to water through implementation of both the tribes' and the state's law. Concerning the *Orf*, which is the traditional customary law applicable to water distribution, the Ministry of Agriculture is not considered responsible for enforcement of it, but the tribes.

When the reservoirs behind the dam that is linked to the Ziz River is full, the water distribution by the government shall be done in accordance with the plan of water distribution, made by the Centre. The water could take up to thirty hours to arrive at certain places since the water flows at 20 m³/second. Each bank of the river has a chief regulating the water discharge into specific canals. The main problem occurs after opening the dam. Once this step is done, each user has to wait his/her turn, which is not usually done respectively. The problem is that users do not respect who is first on the list to get the water. Another problem occurs when users irrigate their land more than they should. In that regard, the situation was very good considering that year (2008) users gained trust in the dam that year since it was 100% full. They were conscious that if there was no dam, then the whole area would have been damaged by the strong rains. Noted is that farmers started using the drip technique of irrigation (*goutte-à-goutte*) which consumes less water. They also use the *Khattarat*, a way to pump the water from underground to the surface (the technique exists also in Iran where it is called *Karaz*). Many *Khattarat* that were out of use were now used again.

IV. DISCUSSION

In Islam, water law has developed so quickly that even a specific vocabulary was born to define terms related to water and law such as the right of the flow of water, the right to drink, the right to have water and so on¹⁹. According to Azb, the scholar's approach²⁰ considers that the law on water is related to the amount of rain water that a man can capture, because that amount of water captured consists of what a man has the right to have. As a matter of fact, the ownership of water in Islam is very limited according to the principle that what can be captured is what can be considered the property of the person who captured it. Therefore that person has the freedom to do whatever he/she wants with it – sell it, donate it, inherit it or use it²¹. In Islam, water distribution should be firstly done through measurement and, in case it is difficult, through mutual agreement between different users. It is similar to the traditional water management in the Tafilalet where water distribution is done through the *Majlis Sqa*, the water council that assembles farmers of the tribes in a certain region²², such as the Ghorfa. The farmers are represented by *Sheikh Saqya*. When the water comes from the Ziz River into the Hassan Addakhil Dam, it shall be then distributed through different *saqya*²³.

Finally, if no mutual agreement could be achieved, Islam suggests going to the judge²⁴.

It can be concluded from the data collected during research that the traditional way of water distribution is inspired by Islam. In fact, Morocco has three different systems of water law. The Islamic Sharia which suggests that water is a collective good, the *Orf* which gives privilege to the source over the future use of the water, and finally the temporal law considering that water is a dominant good belonging to the state. The farmers interviewed explained that there is not enough water to satisfy demands, that the state is controlling it because each area gets water depending on the land to be irrigated and on the demographic standards. On the other hand, the government official said that distributing the

19 Azb.

20 Based on views of Abou Abass Noufoussi, a scholar who lived in Tunisia (that area of North Africa is actually similar to the Tafilalet Oasis.) and researched in-depth water law. In fact, the majority of water resources depend on precipitation and the water gained from it. In other words, human beings can have rights in means of capturing water and not in rain water as a source itself.

21 Azb.

22 A millennium ago, in Valencia (Spain), court specialized in water issues was created. It is functioning continually until today.

23 [Arabic: *Saqya* – waterwheel.- Ed].

24 *Op.cit.*

water through the canals and having it controlled by the state is far more efficient. One can see how the Moroccan Government is favoring modern water management over the traditional water management which does not always have a positive outcome, having in view the conservative nature of the Tafilalet region.

Concerning water distribution, it can be said that both traditional and modern means are used in the Ghorfa region. The *Sheikh Saqya*, along with the water council, manages the twenty hours given to the Ghorfa by the Ministry of Agriculture. The region of the Ghorfa as in other regions in the Tafilalet would not have any problems if there is water enough to satisfy the needs of the whole population. Thus, the main problem is the scarcity of water. In the year 2008 the rain was very strong and the Hassan Addakhil Dam was 100% full. Enough water was distributed in the Ghorfa fields and some signs of optimism could be observed in the Ghorfa region.

Despite the fact that the Ministry of Agriculture is responsible for canals, one can observe many issues relating to the canals. The canals are made of cement and uncovered, which makes the water evaporate during hot days. The water sector in Morocco is a concern that is political, economic and social because of the complexity it constitutes.²⁵ Contrary to the opinion of many interviewees, who had seen the main problem in the fact that there was not enough water, Balafreg²⁶ agreeing with them that it is true that Morocco does not get enough water compared to other regions, points out that inappropriate way in which water is managed makes the situation worse. According to him, to address water issues properly in Morocco, it is necessary to find out better ways of managing water through the use of proximity by involving economic instruments and as simple users.

V. CONCLUSION

Water management in the Tafilalet Oasis, more precisely in the Ghorfa region, is a very complex issue since many different entities are involved. For instance, the Ministry of Agriculture takes care of the canals and distributes water to the Ghorfa region, the water council of the Ghorfa distributes the assigned amount of water in terms of time among the different *Qsur*, and the *Sheikh Saqia* works as a mediator between the government and the farmers. Finally, the water users always expect better. This complex organization has been based on the law of water and its distribution that is a combination of many laws including customary law and modern law which also creates a lot of confusion. This situation makes

25 Balafreg.

26 *Op. cit.*

the life of the inhabitants harder, especially the vulnerable ones who do not have any power. In addition, one should not forget the strong existence of a caste system that everybody knows and feels, and that everyone follows even though the government claims the non-existence of any racial favoritism. The Tafilalet Oasis is a closed society that was impacted by the implementation of many modern laws and modern techniques that made water management more difficult.

The interviews conducted oriented the research in a way that answered the research question that aimed at finding out about the different entities involved in the water management system as well as how this water is managed. In fact, it was found that the water is managed through both traditional and modern water law that people feel compelled to follow. They still see in this modern law a problem because it gives them less water than in the past but on the overall the Ghorfa is in better conditions than other areas. One can note that more research is encouraged to investigate how the fact that the Hassan Addakhil Dam is now one hundred percent full for the first time since its construction will affect the agriculture of the area.

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Bülent Açma

WATER SECURITY IN THE MIDDLE EAST: A Case Study of the Euphrates and Tigris Rivers

I. INTRODUCTION

The “Twin Rivers”, as they are sometimes called, make their beginnings in the 3,000 meter-high mountains of Turkey, amazingly barely 30 kilometres (km) from each other. The Euphrates and Tigris Rivers begin their journey in a much different climate than they end it. Turkey’s Anatolian Plateau gives a cool and humid Mediterranean sub-tropical climate within rugged mountains and valleys, visited by autumn and spring rains and winter snows, with annual precipitation levels close to 1,000 millimetres (mm) per year. From there, the Twin Rivers run a circuitous path into a wide, flat, hot, and poorly drained plain, the Mesopotamian Plains where the climate takes on a more semi-arid or arid nature, where precipitation levels can average less than 250mm per year, midday temperatures rise above 50°C and relative humidity stay below 15%.¹

Considering climatic variations across co-riparians, the annual rainfall is less than 250mm in 59% of Syria while 70% of Iraq receives less than 400mm. Given the semi-arid and arid regions of Syria and Iraq, evapotranspiration is a massive contributor to water loss in the Mesopotamian region of Iraq and Syria. Heavy evapotranspiration, as well as evaporation consequently reinforces water salination processes in the Mesopotamian plains, adding to problematic land use policies in Iraq and Syria.

The Euphrates River², is the longest river in the Southwest Asia west of the Indus and transverses the distance of 2,700km, of which some 40% lies within Turkey’s borders. Correspondingly, 25% remains in Syria and 35% in Iraq. The Euphrates produces a mean annual flow of approximately 30 billion cubic metres per year (bcm/yr), 10bcm/yr at its entrance to Syria, and having gained the

1 Saggs.

2 Named Furat in Arabic and Firat in Turkish.

flows from the Balikh and Khabur, flows around 32bcm/yr at the Syrian-Iraqi border, after which it gains no further tributaries from Iraq.

The Tigris River³ also originates from the southern Anatolia in Turkey and is the second largest river in the Southwest Asia, travelling some 1,900km. Twenty percent of the Tigris waters lie in Turkey, 78% in Iraq and only 2% lie along the northeastern corner of Syria, forming the 32km border between Turkey and Syria. The Tigris mean annual flow before it enters Iraq ranges from 20bcm/yr to 23bcm/yr, and while in Iraq collects an additional 25 to 29bcm/yr from its left-bank tributaries, totalling a yearly average flow of 50bcm/yr. The combined annual flow of the Euphrates and Tigris rivers totals in the region from 80,0 to 84,2bcm, 65,7bcm coming from Turkey (78,1%), 11,2bcm from Iran (13,3%), 6,8bcm from Iraq (8,1%) and 0,5bcm from Syria (0,5%). Looking at just the Euphrates, up to a massive 98,6% (26,5-32,2bcm/yr) comes from Turkey alone, thus lending weight to Turkey's claims over its extended use. However, the Tigris is a different story, with slightly under 65% coming from Turkey (28,0-33,5bcm/yr) and the other portion coming from Iraq and Iran through its tributaries (18,0-20,7bcm/yr). The flow regimes of Euphrates and Tigris separate into three seasons – high discharge, from March to June, low discharge, from July to October, and average discharges from November to July.

The two rivers constitute the ancient and mighty Euphrates-Tigris River Basin. Their riverbeds are laden with silt, as much as three million tons of eroded soils advect from the highlands in a single day. Much of the deposited alluvium forms the fertile soils of the Mesopotamian Plain. However, large deposits on the riverbeds cause river instability, aiding the Euphrates and especially the Tigris to burst its banks or change courses frequently while in spate.⁴ Finally, the Euphrates-Tigris River Basin supports a diverse number of cultures and peoples, and has done so for nearly 6,000 years. Although a cultural and geographical study of the basin is outside the scope of this paper, it is worth underlying the difficulty in meeting the needs of such a diverse assemblage of peoples. In the lowlands live peasant cultivators, fellahins who irrigate lands along the banks of the rivers. Nomadic deserts Bedouins graze their flocks on the arid plains, and semi-nomadic Madan, or “Marsh Arabs,” reside in the swamps and marshes. In addition, an increasing number of urbanites who inhabit the cities are using water for domestic uses. Such basin diversity demands regional cooperation for its

3 Its name comes from the Sumerian Idigna, Tigra in Old Persian, Dijla in Arabic and Dicle in Turkish.

4 Schulz.

survival. In the following sections, the analysis of contemporary water security for Turkey, Syria and Iraq is examined in detail.⁵

II. WATER SECURITY IN TURKEY

Turkey is preoccupied with water works, in particular water development in Southern Anatolia and the Euphrates-Tigris Basin. Turkey's most significant project since its founding has become a bitter source of resentment to its southern neighbours, Syria and Iraq. Turkey's security complex with Syria over the PKK is examined in detail, particularly its links with water or "hydro-significance" and a wider look at Turkey's image and difficult financial situation at home and abroad is discussed.⁶

1. Priorities for Water Use in Turkey

Turkey is rich in water resources in absolute terms and relative to its neighbours. Average precipitation is just under 600mm per year (460bcm/yr), and internal renewable resources are estimated to be 225bcm, 186bcm of which are surface fed. FAO estimates indicate that of this 225bcm, 110bcm are actually available for use. Likewise, Turkey's dependency ratio is less than 1%, as compared to 83% and 53% for Syria and Iraq, respectively. As of 2000, Turkey uses nearly 38bcm or 35% of its exploitable potential, 74% of which goes to agriculture, 15% domestic use (drinking water, etc.) and 11% to industry. The Euphrates and Tigris Rivers account for nearly half of Turkey's usable surface water, and a potentially sizable portion of hydroelectric capability.⁷

2. Energy Concerns

Before describing the Southeast Anatolian Development Project program, justification for such a colossal project should be put into perspective with regards to energy. As Turkey approached the mid 1970s it became painfully aware that its energy needs and consumption were outstripping energy production. As a result, imports of petroleum increased dramatically, costing over \$5,7 billion over a ten-year period, and growing fast with a bill amounting to \$2,6 billion in 1988 alone. Efforts to pull oil from the Mosul oil fields, which extend from

5 Amery & Wolf.

6 Adams M.

7 Ünver.

Iraq into southern Anatolia, failed and other efforts to increase coal mining were too dangerous and expensive to pursue. Turkey was reaching a crisis; energy production was growing at 33% while energy consumption skyrocketed 172%. The exploitation of Turkey's natural resources was approaching an asymptote, save the nation's rivers.

The results from the 2001 GAP report indicate the project contributes nearly half of all hydroelectric energy produced in Turkey, and 9,3% of Turkey's total electricity production, with a planned 20% coming from the GAP region by 2010. Considering energy demands increasing 250-300% for the near future, it is doubtful that Turkey will let up on its plans to harness the Euphrates and Tigris Rivers.⁸

3. The Southeast Anatolia Development Project⁹

A major source of tension between co-riparians on the Euphrates and Tigris rivers has been the construction of the Southeast Anatolia Development Project. The project directly encompasses six provinces in the southern region of Turkey (Anatolia) covering an area of 73,863km², or 9,5% of the territory of Turkey – Adiyaman, Diyarbakir, Gaziantep, Mardin, Sanliurfa¹⁰, Batman, Kilis, Sirtak and Siirt.¹¹

3.1 Objectives and Technical Details

The GAP project's overall development objectives are to:

- Raise the level of income in the GAP region by improving the economic structure of the region and thus reduce regional development disparities;
- Enhance productivity and employment opportunities in rural areas;
- Enhance the population absorption capacities of big centres in the region; and
- Contribute to economic growth, social stability and export promotion as national objectives by the efficient utilisation of resources in the region.¹²

8 GAP ADMINISTRATION (1993).

9 In Turkish: *Güneydoğu Anadolu Projesi (GAP)*.

10 Referred to as Urfa.

11 GAP ADMINISTRATION & UNDP.

12 GAP ADMINISTRATION (1996).

The official government statement is that the project is expected to harness 30% of the total water potential of Turkey, irrigate 1.7 million hectares (mha) of land and producing 27.5 billion kWh of electric energy annually on an installed capacity of 7,485MW. The GAP project includes some 22 dams, 25 irrigation projects and 19 hydroelectric power plants.¹³ It is divided into thirteen major sub-projects, seven located on the Euphrates River and six on the Tigris River. On the Euphrates, the Lower-Euphrates is the largest sub-project, encompassing the Atatürk Dam and Sanliurfa Tunnels together with five smaller sub-projects. The furthest upstream project is Keban Dam, the first in the series of hydroelectric power plants on the Euphrates, though officially not a part of GAP from the beginning. Constructed during 1965-74, it has the height of 211m, a storage capacity of 30.0bcm and produces 1,240MW of power. The Karakaya Dam, 165km south of Keban, was built in the period from 1967 to 1988 and produces 1,800MW. The Atatürk Dam, also the linchpin of the GAP project, is located 180km south of the Karakaya Dam near Bozova and produces a considerable 2,400MW of power, or one-third of GAP's electrical power. It also has the potential to irrigate over a half-million hectares of land via the Sanliurfa Tunnels.

The Atatürk Dam is a significant source of conflict between Turkey and Syria. Filling the reservoir in 1990, Turkey stopped the Euphrates flow for a month. This incident is discussed in a section below. The Sanliurfa Tunnels are another major addition to the project, each 7.62m in diameter and 26,400m long. They are designed to take water away from the Atatürk reservoir at a rate of 328 cubic meters per second (cm/s), or five million gallons per minute, to irrigate 150,000ha on the Sanliurfa-Harran plains, as well as producing 50MW of power. Total electrical capacity on the Euphrates is estimated at 6,538MW, and irrigation totals for eight project centres around a million hectares. More importantly to Turkey's downstream riparians, projects planned for the Euphrates could reduce the mean flow on the border by 30% or 10,9bcm. This is obviously the apex of concern for Syria and Iraq, and estimates of Turkey's withdrawals are the subject of intense controversy amongst politicians and academics.

The Tigris development is less dramatic realising a third of energy produced by the Euphrates and irrigating half as much, but is also significant part of GAP. The Dicle Kralkızı project includes two dams - the Kralkızı Dam that will generate 90MW and the Dicle Dam producing 110MW. Both dams will irrigate 126,080ha. The Batman Project also includes two dams and HEPPs, producing 185MW and irrigating 37,744ha on both banks of the Batman River. The Batman-Silvan and Garzan projects involved the construction of two dams,

producing 300MW and 90MW, respectively and irrigating 273,000ha combined. The Ilisu Dam, a large dam, envisaged for producing electricity only, will generate 1,200MW. Moreover, the Cizre project and HEPP, located just upstream from the Turkish-Iraqi border, produces 240MW and will irrigate 121,000ha of land in the Silopi-Nusaybin-Cizre region. The total area planned to be irrigated by the Tigris portion of GAP is estimated at 557,741ha, consuming some 35% of the Tigris River flow, or 7bcm.¹⁴

Controversy over amounts and timing of GAP plans to divert water from the Euphrates and Tigris River Basins are the primary concern between co-riparians. Most commentators agree that when all GAP projects are up and running on the Euphrates, natural flow to Syria will reduce by over 30-55% (10-16,9bcm/yr), and as much as 80% (25,6bcm/yr) to Iraq. The Tigris withdrawal estimates are less contentious, because the river only briefly adjoins Syria's border and Iraq and its tributaries contribute over half of its flow. Nevertheless, estimates range from 10-14% of its total flow (5-7bcm/yr), total flowing being near 52bcm per year where the Tigris meets the Euphrates and flows into the Shatt al-Arab. The issue is particularly acute for northern Iraq in irrigated areas north of Mosul, where 5-7bcm/yr accounts for a 25-35% of reduction in flow at the Iraqi-Turkish border.¹⁵

GAP started out as purely hydroelectric and irrigation scheme, but has transformed into an enormous multi-sectoral, socioeconomic regional development program.

Expected high potential in both industry and agriculture will increase the income level of the region fivefold and create employment for 3.5 million people in the region whose population is projected to reach more than 7 million in 2010.¹⁶

GAP's goals and strategies have changed with the times, and more recently they have been influenced by global thinking on social, cultural, economic and environmental projects, reflected by debates held at the 1992 Conference on the Environment¹⁷ and the 1995 World Summit for Social Development¹⁸. Being concerned about its image and funding for the project, Turkey has

14 *Ibid.*

15 SA PROJECT (2001).

16 SA PROJECT (2008).

17 United Nations Conference on the Environment and Development (UNCED), Rio de Janeiro, 3-14 June 1992; <http://www.un.org/geninfo/bp/enviro.html>.

18 World Summit for Social Development Copenhagen, March 1995, organised under the aegis of the UN Department of Social and Economic Affairs; <http://www.update.un.org/esa/socdev/wssd/index.html>.

tried to incorporate some of these ideas into the GAP Regional Development Administration¹⁹. GAP-RDA's strategy is expressed in the GAP Master Plan:

- To develop and manage water and land resources both for irrigation and also for urban and industrial use;
- To improve land use by introducing better farm management, agricultural practices and crop patterns;
- To encourage manufacturing industries by giving special weight to agriculture related and local resource based production lines;
- To improve social services and urban infrastructure facilities to better respond to the needs of local people and to attract and keep qualified personnel in the region.

From a project aimed only at producing vitally needed energy, emerged a massive domestic and political tool, a symbol of national pride gaining support across all parties and ideological orientations (and budgets), except, of course, in Syria and Iraq. Çarkoglu and Eder express this idea in terms of Turkey's perceived security:

The high saliency of the project both from a regional development perspective and from the perspective of national integrity and security, makes it a policy area that keeps the attention of the ruling parties focused.²⁰

Original planning for the GAP project focused primarily on hydroelectric facilities and later included irrigation schemes. More recent modifications and expansion to GAP redefine the project as a socioeconomic regional development program, emphasising Turkey's needs to transform Southern Anatolia from a "backward society" to one of economic growth and social prosperity.²¹

3.2 Regional Development of Southern Anatolia

The nine provinces of the GAP region (Southern Anatolia) had over 6.6 million inhabitants in 1998, growing at 2,5% *per annum*, not quite twice as fast as Turkey's average population growth. Equally, urbanisation is also increasing twice that of Turkey as a whole. However, probably the most important in terms of socioeconomics is the fact that nearly 30% of economy in the GAP region comes from agriculture, with close to 75% of rural areas working in agriculture. Only 17.4% come from industry, compared with the rest of Turkey, which

19 GAP-RDA.

20 Çarkoglu & Eder.

21 GAP ADMINISTRATION (2002).

averages of 14.5% for agriculture and 25.3% for industry. Similarly, the region produces only 5.2% of Turkey's GDP. The social indicators express the same concern, with life expectancy of 2.5 years below Turkey's average, overall human development index at 0.61 compared to 0.72, adult literacy of 20% below Turkey's 83% value, and probably the most remarkable, real GDP *per capita* (\$PPP) at half of what it is for Turkey, *i.e.* \$3,384 compared to \$6,339.47.

The figures give justification to major investment to the area and are somewhat represented by the Turkish government's claim to "increase the income level of the region fivefold and create employment for 3.5 million people." However, there is also another significant domestic political factor behind the government's interest in Southern Anatolia - votes. Given the low GDP, population and human development figures, money and development into the GAP regions corresponds to votes. High electoral volatility suggests that votes in the region are easily mobilised, where some 95% of some villages vote for one party or candidate. In addition, given the long struggle to handle the violent and highly visible Kurdish insurgency in the south, this fact completes another piece of the puzzle and explains the widespread commitment within the Turkish government to develop the region.²²

III. SYRIAN AND IRAQI WATER SECURITY

Water security for Syria and Iraq are more similar to each other than they are to Turkey. This section first looks at the water security situation in Syria, paying close attention to indicators of Syria's struggling economy. The development on the Euphrates is then analysed relative to Syria's needs for irrigation and domestic water, and links between rebel groups and Syrian foreign water policy with Turkey are revealed. Political links are also related to Syria's claim over the Hatay Province in Turkey. Iraqi water security begins with a historic look at Mesopotamian hydraulic culture. Likewise, Iraqi history of development on the Euphrates and Tigris are investigated, paying special attention to deteriorating water quality, followed by the analysis of Iraqi water resources and needs. Like Syria, Iraqi food security is tenuous and places great demands on water and land use. Finally, Iraq's international conflicts are discussed with reference to its economy, followed by political arguments. The section concludes with the analysis of two specific conflicts over water - the first between Syria and Iraq in 1975, and the second between Turkey and both Syria and Iraq in 1990.²³

22 GAP ADMINISTRATION (1998).

23 Soffer.

Interestingly, Turkey's continued development on the Euphrates has brought Syria and Iraq together in a protest. Filling Atatürk Dam in 1990 sparked Iraq and Syria to sign a treaty giving 58% of Euphrates flow to Iraq and 42% to Syria. Differences over security perceptions and political rivalries cause conflict of interest, and major water security clashes between Turkey, Syria and Iraq occurred in 1975 and 1990.

1. Water Security for Syria

Agriculture has always been a significant factor in the Syrian economy, relying largely on irrigation supplied from the Euphrates River. Nearly 95% of water withdrawn in Syria goes to agriculture, 3.3% for domestic use and 1.8% for industry. In the mid 1950s, agriculture accounted for 50% of national GDP. Now it accounts for only 22.5% of the labour force and 28% of GDP. With the agricultural labour force decreasing, and increases in urban population of 3.5% *per annum*, Syria had put itself into the position where it had to quickly boost food production importing large amounts of food to feed its people.

Since the late 1970s Syria has increased its incoming goods over \$32 million each year. Imports of food and livestock in 2,000 were over \$880 million, 22% of which were cereals, accounting for 4% of the total imports. Even though Syria produced over 3.3 million metric tons of cereals (\$450m) on over 3 million hectares in 1999, it fell short of feeding Syria's 15.8 million inhabitants requiring Syria to import another 1.36 metric tons of grain, spending \$185.5 million to get it, while at the same time requiring significant amounts of food aid. Attempts to increase production have largely failed due mostly to inefficient equipment and implementation techniques, but also to ineffective land reforms that reduced the size of holdings, disempowering landowners and failing to boost production output. At the end of the day, Syria has to import between a third and one-half of its cereal needs from outside its own borders, and it is costing over a billion dollars a year to do it. Given the fact that it has a mighty river running right through its upper fertile crescent it is no surprise that Syrian politicians, planners and engineers are spending millions and playing hardball with Turkey for rights to harness Euphrates water for their own use.

2. Iraq and Water Security

2.1 Ancient Mesopotamia and Hydraulic Culture

Evidence of the most ancient and extensive waterworks in the world are found in the lower Mesopotamia going back to 6000 B.C. Forming a patchwork of

tangled canals, seemingly without reason, they are the result of endeavours of many diligent and ingenious societies over a period of millennia. The most ancient canal, the great Nahrawan, built in the sixth century, was 120 meters wide and over 320 km long.

Water security in Iraq has many dimensions, the first of which concerns the land use policies and the ever-increasing problem of salinity. This is followed by Iraq's water resources and withdrawals and how they are impacted by upstream depletions. Iraq's economy is discussed next, paying special attention to food security, and Iraq's relationship with the international community. Iraq's political rivalry with Syria ends the section. Note that the relationship between Kurds in northern Iraq is not discussed. This is intentional, as a high level of cooperation between Iraq and Turkey to suppress Kurdish movements resulted in little apparent links to water issues, although there is no doubt that local rivalries over water did exist.²⁴

2.2 Iraq's Water Resources

Most of Iraq receives less than 150 mm of rainfall a year or 65.7km³, most of which runs off in the Tigris River. The bulk of Iraq's water resources come from the Euphrates and Tigris, both of which originate in Turkey. Ninety-two percent of Iraq's water withdrawal is for agriculture and three percent for domestic use. Consequently, management of these two rivers has clearly been the highest priority of agricultural development strategies, seeing a number of dams and barrages built during the 1970s, 1980s and 1990s, creating large storage lakes for irrigation use. These projects are ambitious and widely seen as successful from a hydrological perspective, but getting water to the fields efficiently is not straightforward. Most of Iraq's agricultural land, except northern fields, lies dead flat, creating yet another major obstacle to successful farming - drainage. In addition, mean temperatures in Iraq can run in the excess of 50° C, forcing huge evapotranspiration and evaporation rates. Not only does this accelerate water salinisation in the Mesopotamian Plains, but it also accounts for up to 10% of water storage losses throughout Iraq's vast and complex series of reservoirs and man-made lakes.

As mentioned in the first section, the Euphrates and Tigris constitute 40% and 54 % of total basin drainage area respectively. Average surface flows into Iraq provide around 28.5bcm from the Euphrates and 50.0bcm from the Tigris, subject to seasonal variations, which can vary up to 30%. However, Iraq only

24 Güner.

contributes around 13% to the Tigris discharge, and nothing to the Euphrates, and therefore has capitalised on nearly 2,500km of the river from both the Euphrates and Tigris running through the country, building dams, barrages and reservoirs in order to store water irrigation, domestic uses and flood control. Tributaries of the Tigris are important contributors to Iraqi surface resources. Groundwater resources are estimated at 1.2bcm.

Iraq's total actual renewable water resources²⁵ then works out to be 75.5bcm, 46.6% internal renewable resources (35.2bcm) and the remaining 40.3bcm from external sources, such as the Euphrates and Tigris. However, Iraq dam storage capacity is 50.2bcm, but due to evaporation, Iraq loses 10% to that, or 5bcm/yr. The discrepancy between internal and external renewable water supply, or dependency ratio of 53%, is at the heart of Iraqi fears that Turkey's GAP projects will reduce flows to a point where Iraqi irrigation schemes will become redundant. Due to GAP, Iraq's ARWR could reduce to 51bcm by 2040.

2.3 Recent Water Works in Iraq

Barrages, reservoirs, lakes and canals are extensive in Iraq. The most significant off-river reservoirs are the Habbaniya, Abu-Dibbis (Ar-Raz-zah) and Lake Tharthar. Both Habbaniya and Abu-Dibbis Lakes were built in ancient times and were designed to control flooding on the Euphrates, with a combined storage potential of 46.0km³. Lake Tharthar was built in 1950 to prevent flooding from the Tigris. It effectively diverts water from the Tigris River to the Tharthar depression, linking it to the Euphrates River via a canal. This project and resulting functionality is a source of contention for Turkey and Iraq. Turkey maintains that this links the Tigris and Euphrates River Basin, thus determining downstream water budgets holistically. Iraq does not maintain this position for fear that the waters on the Euphrates would suffer, losing irrigated land on the banks north of Al-Ramadi. Taking into account Turkish and Syrian withdrawals on the Euphrates, Iraq has more water that is available from the Tigris River.²⁶

Major dams in Iraq provide most of major irrigation works in the country. The Haditha Dam²⁷ on the Euphrates has a 6.4km³ storage capacity and irrigates around one million hectares of land. Likewise, the Tigris irrigates an estimated 2.2 million ha, most coming from the Mosul (Saddam) Dam (10.7km³). A number of other dams, mostly on the Tigris add another 13.7km³ of water storage.

25 ARWR.

26 Alnasrawi.

27 Renamed Q-disiyah.

Total on-river storage for the Euphrates and Tigris Rivers is approximately 8.2 km³ and 42.0km³, respectively.

However, the Bakham Dam was completely destroyed during the Gulf War, and bombing by coalition forces caused extensive damage to Iraqi infrastructure. Other dams that were destroyed include the Darbandikhan (50%), Dokhan and Haditha (75%), where the Ramadi barrage and Samarra dams were completely knocked out. Other water targets that were hit were pumping facilities, water treatment plants and power stations, severely affecting food production and access to safe drinking water. Crops for the following year were down by 50% and following years suffered too due to shortages of inputs. A notable tragedy was the failure of the national date crop, a source of national pride, due to raw sewage dumped into the Tigris.

2.4 Iraqi Water Withdrawals

Agriculture is the biggest user of water, soaking up nearly 39.4bcm per year in Iraq. Official total irrigated area in Iraq is estimated to be near 3.5mha, but Jaradat suggests that only 1.94mha were actually being irrigated in 1993, 220,000ha of that by groundwater. Figures indicate that the actual number is probably closer to 3mha - 2mha on the Euphrates and 1mha on the Tigris. Iraq is currently using more than 15bcm from the Euphrates for irrigation, and 32bcm from the Tigris. By 2040, they predict withdrawals will increase to 16bcm and 40bcm for the two rivers, respectively.

Domestic and industrial withdrawals are estimated to use approximately 1.5 and 3.0bcm, respectively, and predicted to increase to rise to 2.5bcm and 3.6bcm by 2040. Total withdrawal currently figures to some 50bcm, however by 2040 it jumps to near 62bcm. These numbers are staggering, particularly when considering use versus supplies. Currently, there is the surplus of 28.9bcm; however, by 2040, the predicted deficit amounts to over 20bcm of water annually. This is nearly equal to 18.6bcm of reduction expected due to Turkish and Syrian depletions on the Euphrates.²⁸

2.5 Agriculture and Food Security in Iraq

The state of agriculture in Iraq closely reflects the region in which it is located, with the possible exception of Turkey and Sudan. Agriculture contributed to over 70% of Iraq's GDP in the 1920', which steadily decreased to 42% in 1981,

18% in 1990 and a mere 6% in 2001. The percentage of arable land in Iraq is approximately 20-30% of the total land area or 11.5mha, of which only 8mha is usable for agriculture (17%), half of that cultivated (8,5%). Of cultivated lands, half is dry land, or rain-fed, while the remaining surface is irrigated.

At one time, Iraq was self-sufficient in cereals, but over the last forty to fifty years, it has become a net importer of agricultural goods, importing up to 80 percent in the late 1980s. The shift was due to a number of reasons - rapid shift to oil economy (and subsequent rising standard of living, including massive inflation), persistent drought, increased industrialisation, migrations of farm workers to urban centres, population increase, reduction of government spending on agriculture, and loss of soil productivity in poorly drained areas of the south. Not only history gives Iraq its hydraulic culture, over half rainfed fields subject to hugely unpredictable precipitation schedules coupled with an arid climate made getting water to crops a vital endeavour. Nearly twenty years of war have ravaged Iraqi infrastructure, society and vital health indicators.²⁹

2.6 Iraq's Economy and Relations with the International Community

The Gulf War and subsequent economic sanctions greatly injured Iraq's GDP, reducing it by 75%. Iraq's oil makes up over 61% of the country's GDP, and 99.6% of foreign earnings, with proven reserves over 125 years. It is no wonder that cutting off oil supplies by 85% in 1991 had such a large impact on the Iraqi economy, not least the effects of war on society, and on water resources. The combination of all these and other factors left over a 53% food deficit in Iraq. The response by the Iraqi government was to increase food production, thus putting more stress on water resources in the country³⁰.

IV. SCARCITY AND SECURITY—

Implications on Management of the Euphrates-Tigris Basin

The combination of increasing populations and fixed water supply results in decreasing water amount available *per capita*. Gleick predicts that by 2025 over 30 countries will be unable to provide at least 1,000m³ per person per year, a figure regarded as the minimum necessary for an adequate quality of life in a

29 Jaradat.

30 Alnasrawi.

moderately developed country, and 19 will be unable to provide even 500m³ per person per year. What is precipitating these alarming trends?

A number of factors are contributing, but primarily the fact that the Middle East is suffering from a combination of wasteful and ineffective water use, unabated population pressure and geopolitical water availability disparities. Worldwide in 2000, agriculture accounted for some two-thirds of total freshwater withdrawal, and 86% of its consumption. Currently, Turkey uses 74% of water for agriculture, with plans to increase it to 85%, half coming from the Euphrates and Tigris Rivers doubling Turkey's irrigated land. In Syria and Iraq, 95% of water withdrawals go for agriculture, combined with population growths of over 3.5% and with accompanying needs growing at alarming rates, the oncoming clash between needs versus wishes is approaching quickly. Nation states, some new and others ancient, have to adapt to an increasingly challenging set of preconditions and development constraints. Often their economies are failing to adapt to these rapid changes. Water conflicts are occurring in many places – India and Bangladesh, Slovakia and Hungary, Israel and its neighbours (including Syria again), Egypt and Ethiopia, the US and Mexico, and others. Water shortages are replacing oil as the source of conflicts.³¹

What is different about the Middle East? Why is water such a contentious issue? First, water is not a plentiful resource in the Middle East, the Arid Middle East³² that is. Actual renewable water resources for the AME are only 600cm per person per year (ppy), the highest being Syria with 1,791cm ppy and dropping as low as 13cm ppy in Kuwait. Figures for Turkey and Iraq both show massive amounts of water *per capita* in comparison, giving 2,967cm and 3,688cm ppy, respectively. The figures show a huge disparity between the water scarce AME and water rich Turkey, Iraq, and Iran, although with the exception of Iraq, the three have the largest populations in the Middle East. Why is there a conflict between such water “rich” countries in a water scarce region?

Second, over 50% of populations of the Middle East (and North Africa) depend on rivers that transverse an international boundary before reaching them. Two-thirds of all Arabic speaking people in the Middle East rely on water from the rivers flowing to them from non-Arabic speaking countries, 24% have no rivers and depend on the diminishing wells or expensive desalinated water from the sea. Given nearly three-quarters of the large area of arid land between Morocco and Iraq is desert, settlements have concentrated near riverbanks and coastal

31 Lowi.

32 AME.

areas. To underline this point, including Libya in the equation, the Arab world embraces the total area of over 2.5 million km² without having one permanent river or stream in it.

Third, population growth in the Middle East is over three percent annually. Syria's birth rate was at a world high at 3.7% at one time, the population of Damascus alone increasing 8-fold over the last 40 years. Increases in the West Bank, Gaza and Jordan have been at least 3.5% *per annum*. The population of the region is around 225 million.

Fourth, water use in the Middle East is characterised by over-use, wasteful practises and polluted groundwater and aquifers. Over-irrigation and flooding of fields have raised water tables polluting soils with salinated water, even impinging into the root zone causing crop failures. Massive dependence on agriculture and heavy dependence on irrigation, fertilizers and chemicals, combined with largely sandy and gypsiferous soils, have caused massive leaching of chemicals into the groundwater. Subsequent overpumping of wells has exacerbated the problem, especially in coastal areas, where seawater has begun to penetrate underground aquifers. Major development and hasty irrigation projects have sent polluted and highly saline return flows into the river water, as is the case in the Euphrates River upstream from Syria and Iraq. As if these issues are not enough, inefficient use of clean water is widespread throughout the Middle East, with most countries accepting water delivery efficiencies and quality well below 50%.³³

Finally, history in the Middle East has told a story long threaded with mistrust, suspicion, zero-sum diplomacy and conflict. Middle East economics directly relate to the Middle East politics, ethnic conflicts and social inequalities. Relatively "new" states have vehemently defended their borders, played hardball politics and stood on the premise that "water for one means less for the other". Zero-sum foreign policies have translated into overzealous self-sufficient policies, many resulting in failure at the expense of neighbouring countries. The result of which can be seen with Turkey's position of "sovereign right" to its waters and Israel's drive for occupation of "historical lands" in the West Bank. Moreover, the obvious historical religious and ethnic conflict between cultural groups in the Middle East has often been the context from which problems have been defined, rather than conquered.

These conditions, among others, have turned the Middle East into a hotbed of endlessly intertwining conflicts. States have obsessively pursued fanatical water development projects aimed directly at preserving their rightful access to water.

33 Schulz.

Given the highly charged political atmosphere and increased interdependence of natural resources in the Euphrates-Tigris basin, conflicts are increasingly likely to occur unless riparian states move towards a cooperative basin-wide regime incorporating their own interests over water security.³⁴

V. WATER RELATED CONFLICT AND THE EXPANSION OF TRADITIONAL SECURITY

The twentieth century has seen a remarkable move to self-determination and decolonialisation of oppressive regimes and dominating empires. As the result, many rivers, lakes and groundwater aquifers are shared by two or more nations. In the last twenty years, the number of international rivers basins has increased from 214 to 261, with 39 countries having 90-100% of their area within an international basin. The Euphrates-Tigris Basin is shared by six countries, of which share an additional eight basins between them. A remarkable 176 countries share two rivers between them. Likewise, Turkey has 34% of its area falling within international basins, Syria and Iraq, 73% each. Many of these disputes, and in particular the Euphrates-Tigris, are becoming involved in “high” politics, or rather being handled by heads of states, as evidenced by direct involvements by Assad of Syria, Hussein of Iraq and Demirel and Özal of Turkey. Are their methods effective to handle potential and current water conflicts? Has water become a security threat to any nation (176 of them) whose borders fall within an international river (or lake) basin? Indications of future water conflicts are damning, but not hopeless. Water resources exploited for military and political goals, particularly in the Middle East, exhibit recognisable characteristics, such as degree of scarcity, extent of shared water resources with other states, relative power of basin states (political), and access to alternative fresh water resources.³⁵

The hydropolitics of the Middle East dictates a water stringent policy on the part of lower riparians, something that brings attention to Turkey’s dominance of the Euphrates and Tigris Rivers water. Syria’s and Iraq’s perception of Turkey’s motives behind water development is understandable. Whether or not Turkey intends to dominate the Euphrates and Tigris waters is irrelevant, as perception is just as dangerous to downstream riparians as reality. Hundreds of years of conflicts and mistrust in the Middle East dictate its *modus operandi*. Perception

34 Kliot.

35 Biswas.

becomes deception, as Syria and Iraq perceive Turkey as using the Euphrates and Tigris waters as a weapon.³⁶

Evidence of using water as a weapon exists in abundance. Frequently throughout the twentieth century, countries have bombed water works and dams during wartime. Likewise, Iran bombed hydroelectric facilities in Iraq in Kurdistan during their war in the early 1980', and again with the addition of desalination plants and water conveyance systems by coalition forces during the Persian Gulf War. Iraq's "Third River" drained wetlands in southern Iraq displacing Shiite Muslims considered threat to his regime. Indeed, the impounding incidents in Syria in 1975, Atatürk in 1990, and construction of Birecik and Ilisu dams are weapons used against downstream riparians, particularly when accompanied by threats imposed by political leaders. There is little doubt that future withdrawal of water from the Euphrates and Tigris Rivers poses serious economic, social, and environmental security concerns for both upper and lower riparians, potentially causing greater conflicts now and in future³⁷

Some commentators argue that water wars are just a preoccupation of overzealous scholars and anxious media. Historically, water has not caused armed conflicts save a few minor skirmishes and disagreements between tribes or states. Over 3,600 treaties were signed relating to aspects of international waters, 145 in this century. Furthermore, war over water is not strategically and economically a viable option, perceived as "water rationality". A point made by an Israeli defence forces analyst responsible for the planned invasion of Lebanon stated:

Why go to war over water? For the price of one week's fighting, you could build five desalination plants. No loss of life, no international pressure and a reliable supply you don't have to defend in hostile territory.

These arguments certainly offer a degree of rationality to the debate; however, many authors offer an important *caveat* admitting the linking of water resource depletion to structural violence, poverty and political instability. A large *caveat* by any stretch.³⁸

Traditional security comprised of military interests is rapidly broadening into ecological, environmental and human spheres. These conceptualisations are not new, however their prominence in traditional state security and subsequent policy is on the increase. The issue of water security, debated progressively in

36 Waterbury & Richards.

37 Allan.

38 Dolatyar & Gray.

environmental terms, relates to reductions in the quality of life and sub-national, national and ethnic tensions, while also indirectly (increasingly more directly) contributing to structural violence through degradation of human security concerns such as access to clean water, waterborne diseases, poverty and sanitation.

The Euphrates and Tigris Rivers need to be thought of as an entity. They serve as a route-way to the region or the basin they serve, carrying and giving life as do their tributaries and distributaries and carrying away poisons and waste through their return flows and groundwater. How can a moving resource be under control from a point source, *i.e.*, absolute sovereignty? The attempted treaties all focus on fixed-share thinking, dividing the river into sections overlooking the dynamic of the river system as a whole. Failures to achieve a basin-wide agreement lead cooperative efforts towards only one possible conclusion – the need for a basin-wide river ethic.³⁹

VI. ATTEMPTED AGREEMENTS BETWEEN CO-RIPARIANS

1. Inert Treaties

The relations between Turkey, Syria and Iraq during the first half of the twentieth century were relatively smooth. Early negotiations began in 1920 with the Convention between Britain and France⁴⁰, stated that any plans for irrigation works undertaken by Syria that might affect Iraq were to be examined by a commission setup by the two countries. Following this treaty was the Franco-Turkish agreement signed on October 20th, 1921⁴¹ managing issues around the overdeveloped Koveik River, ensuring water supply to Aleppo. In 1923, the Treaty of Lausanne stated,

Turkey should confer with Iraq before beginning any activities that may alter the flow of the Euphrates.⁴²

The following treaty was signed in Ankara in 1926, and again in 1930 with the Commission of the Demarcation of the Turco-Syrian Frontier on the Tigris, along with commitments of joint-usage of the Euphrates.⁴³

39 Lowi.

40 Franco-British Convention on Certain Points Connected with the Mandates for Syria and the Lebanon, Palestine and Mesopotamia, Paris, December 23rd, 1920.

41 Franco-Turkish Agreement signed at Angora on October 20th, 1921.

42 Dolatyar & Gray, p. 133, 166 n. 7; and CARNEGIE ENDOWMENT.

43 Biswas & Kolars *et al.*

The Treaty of Friendship and Good Neighbourliness signed by Iraq and Turkey in 1946 offered the first real legal instrument of cooperation. It had components of cooperative agreements present in many treaties today, and was the child of what later became the Joint Technical Committee, particularly Articles 3 and 5, which state:

- (iv) Turkey shall install and operate permanent flow measurement facilities, and transmit periodically the readings and the recorded data to Iraq; [...]
- (vi) Turkey shall inform Iraq of projects for waterworks on any of the Protocol water courses, and shall consult with Iraq with a view to accommodation the interests of both countries.⁴⁴

One scholar described it as “a chaotic regime of claim and counterclaim governed more by political than legal concerns.” Nothing much happened between the three countries until 1964, when the first tripartite talks over the building of the Keban Dam occurred. Iraq indicated that it would support the project if during the impounding period the flow did not fall below 350cm/s and if the construction would not alter water usage in Iraq. The United States Agency for International Development⁴⁵, which funded the project, stipulated three conditions - no harm to downstream riparians, Turkey guaranteeing flows downstream, and that both sides agree to the plans. The World Bank, the leading financing agency for building of the Karakaya Dam, requested similar downstream guarantees, much to the chagrin of Turkish planners. It was for this “outside interference” and Turkey’s claims that international donors favoured downstream riparians that led to Turkey pursuing their own financing for subsequent projects. It also led to the establishment of the Joint Technical Committee⁴⁶ between the three countries.⁴⁷

2. The Joint Technical Committee (JTC)

The Joint Technical Committee met trilaterally for the first time in 1965, although the meeting between Syria and Turkey occurred at year earlier. The main concern at that time was filling of the Keban dam in Turkey, Syrian planning for the Tabqa Dam and the Haditha Dam in Iraq. Straight away disagreements came up over irrigation targets and water use estimates. Iraq pushed for

44 UNITED NATIONS, p. 376.

45 USAID.

46 JTC.

47 Hassan.

a permanent JTC to supervise a water sharing agreement; an ambitious task for sure seeing there was no such agreement yet. Nonetheless, the JTC continued to share hydrological data albeit *ad hoc* on the river flows, climatic information, and land use numbers. The thorny issue of diverting the Tigris River water to the Euphrates created a big stir amongst water academics, with Iraq strongly opposing to the idea, followed by Syria. The early 1970s were characterised by field trips and occasional meetings, but no one dared making reference to the water rights agreement lest a wrath of haste descended upon from all three sides.

One of the main objectives of the JTC during the early 1970s was to prepare a joint procedure for filling both the Keban and Tabqa Dams on the Euphrates, avoiding appreciable harm downstream. The JTC failed utterly to meet this objective. A part of the cause of their failure was the mismanagement of the JTC and lack of institutional support for producing a shared water agreement. The active issue regarding impounding of the Euphrates water focused around water use downstream, and no amount of data was going to make the compromising decision for either party. There was also a preoccupation of Turkey at that time with Iraq's outlandish water needs calculations, calling for some 18bcm. As the impounding date came near, the riparians even agreed to bring economic and potential agricultural loss data to the table, but efforts to harmonise the results failed again. The resulting conflicts arising over impounding have been discussed previously, both Keban and Tabqa filled within a year by each other.⁴⁸

The JTC was formed again in 1980, between Turkey and Iraq, with Syria taking part in 1983. Topics of discussion were primarily the GAP works being planned (and built) in southern Anatolia. Particular concern was the building of the Atatürk Dam and the consequences downstream. However, lemons struck the team again and after sixteen meetings the JTC concluded its last meeting in 1993. The issue, fondly enough, that terminally divided the group at this time was a quandary over the formulation of a proposal to share the "international rivers", or a regime to determine the "utilisation of a transboundary watercourse". Turkey maintains that both watercourses are transboundary rivers that cross international boundaries, but do not constitute them. However, Syria and Iraq claim that they are international rivers and that they are co-riparians, justifying an equal share of their waters. These distinctions are explained further in the following section and are analysed in the context of international law formulations relating to international watercourses, in particular to the Euphrates and Tigris Basin.⁴⁹

48 Bulloch & Darwish.

49 Wolf (1998).

3. Bilateral Attempts at Water Sharing

The attempts at water allocation or sharing through bilateral treaties have failed. The 1987 Protocol between Syria and Turkey⁵⁰ directly linked water with security. Turkey promised to allocate 500cm/s of Euphrates waters to Syria, and Syria, in principle, agreed to close the PKK terrorist camps. As already discussed, Turkey continually challenged the agreement during the 1990s, and relations deteriorated to a point where only secret talks mediated by Egypt⁵¹, in addition to Turkish threats to invade Syria, kept the two from declaring war against each other. Furthermore, the 1990 incident over the Atatürk Dam illustrates the ineffectiveness of the Protocol. The figures were continually in dispute during and after the crisis.⁵²

The conflict over filling of the Atatürk reservoir did produce a water sharing agreement between Syria and Iraq. This was a positive outcome but is also limited to the provision that Turkey sends Syria sufficient flowrates on the Euphrates. The treaty does bind Syria and Iraq together against Turkey, but does little to advance a solution to the basin-wide water sharing security dilemma.

A positive development called GAP-GOLD⁵³ includes signing of the Memorandum of Understanding on June 19th, 2002 between Turkey and Syria. The document promotes joint irrigated agricultural research projects, exchange programs, field trips, operation of irrigation projects, teaching and other joint programs. This is a positive step aimed at real cooperative works between the states. The agreement was signed, but has yet to be implemented.⁵⁴

VII. WATER MANAGEMENT POLICY VIA INTERNATIONAL LAW

1. Historic Water Law in the Middle East

Middle Eastern values surrounding water rights in most cases support communal responsibility serving the collective interests of the citizens, usually administered by the state permitting granting of rights to water use but not ownership. These

50 Protocol on matters pertaining to economic cooperation between the Syrian Arab Republic and the Republic of Turkey, dated July 17th, 1987 ("Official Gazette of Turkey", December 10th, 1987); Came into force on July 17th, 1987 by signature.

51 Adana Accords, October 20th, 1998.

52 Bershorner.

53 [GOLD – General Organization for Land Development.- Ed].

54 Uitto & Duda.

values have striking similarities to principles underlying recent international laws formulated on international watercourses. It was not until the influence of the Western law, with the emphasis on sovereignty, or ownership of water, that legal conflicts began to occur in the Middle East. It must be added also that most forms of sharia and Middle Eastern law fail to encompass contemporary international water rights due to difficulties with the concept of modern borders that cross vital historic watercourses.⁵⁵

2. Contemporary International Water Law

Before recent legal developments formulated by the International Law Commission⁵⁶, a UN affiliated body involved in the formulation of the Draft Articles on the Non-navigational Uses of International Watercourses⁵⁷, drainage basins shared by two or more states (successive rivers) or constituting the boundary between them (contiguous rivers) define an international river. The ILC adopted the term “international watercourse,” which refers to hydrographic components such as rivers, lakes, canals, glaciers and groundwater constituting, by their physical relationship, a unified whole. The Convention states:

“Watercourse” means a system of surface waters and groundwaters constituting by virtue of their physical relationship a unitary whole and normally flowing into a common terminus; “International watercourse” means a watercourse, parts of which are situated in different States.⁵⁸

The primary indicator of an international watercourse system is the extent that the territory of one state watercourse system affects the use of waters of the watercourse system in the territory of another watercourse state. More simply, in that case, the waters are a shared resource. This is a contentious point as Turkey claims that the Euphrates and Tigris are the “transboundary” watercourses, not international. The Helsinki Rules (1966)⁵⁹ containing principles of equitable and reasonable use, prevention of harm to downstream states, provision for established rights, including pollution, sharing of data and other principles predated the UN/ILC Draft Articles. The UN Water Conference in Mar del

55 Toset *et al.*

56 ILC.

57 which served as the basis for adoption of the Convention on the Law of Non-Navigational Uses of International Watercourses, adopted in New York by the General Assembly of the United Nations on May 21st, 1997 (henceforth: UN Water Law Convention (1997)).

58 Article 2(a,b).

59 Adopted by the International Law Association (ILA).

Plata, Argentina in 1977, declared that in relation to use, management and development of international resources

[n]ational policies should take into consideration of right of each state sharing the resources to equitably utilize such resources.⁶⁰

Regardless of widespread agreement, Turkey strongly protests to calling the Euphrates-Tigris Basin an international watercourse. The claims challenge states claims to national sovereignty over their own resources. This was precisely Turkey's position, and was one of three who voted against the Convention in 1997.⁶¹ Turkey opposed the Convention from the beginning by rejecting the draft text on the basis that it contradicted international law. The delegate's criticisms went further to indicate that the law created inequality between states, and that the convention was going too far to state rules regarding the settlement of disputes. Turkey also complained that the draft did not refer to state sovereignty of the watercourse within the state territory. The most obvious unmasking of Turkey's position came with the comment that the Draft Convention should have established the primacy of the principle of equitable reasonable utilisation over the obligation not to cause significant harm, and consequently that Turkey would not sign the Convention, which would leave it with no legal effect in Turkey. However, Turkey is not the only country to take the position of absolute territorial sovereignty. The United States introduced the principle through the mechanism of the Harmon Doctrine.⁶²

3. Harmon Doctrine (absolute territorial sovereignty)

This concept gives the right to a state to use fluvial water within its own territory without limitation or concern to the effects of utilisation or injury to other states, upstream or downstream. Turkey claims the right to the Harmon Doctrine, or principle of absolute territorial sovereignty, over use of the Euphrates and Tigris River Basin.

Syria maintains a blend of the Harmon Doctrine called limited territorial sovereignty, and absolute territorial integrity, due mainly to the 24% of the Euphrates river length in the country and 17% of drainage area. They also lay claim to the Tigris, even though only 44km run along their common border with Turkey. However, referring to the Helsinki Rules their claim holds water, so to speak.

60 Watts.

61 Chow.

62 Amery.

Syria's position is less stringent than Turkey's, but does maintain the right to develop the Euphrates upstream, while also taking note of Iraqi needs. Syria's position is also influenced by the fact that other important rivers run through their territory, namely the Orontes River and upper headwaters of the Jordan including the Yamouk River. Syria, like Iraq, also claims to have acquired rights through ancestral irrigation back to antique periods (absolute territorial integrity principle, *i.e.* existing lower riparian rights first).

Lower riparians usually prefer the principle of absolute territorial integrity, which dictates that no state may utilise the waters of an international river that would damage a coriparian. This usually serves to maintain the natural regime of the river basin, be it flowrate, path, or water quality. Iraq uses this principle to state it claims to the Euphrates and Tigris river water, particular in reference to its historical water rights. In this way Iraq maintains that it deserves an appropriation of water based on its historic and established regime. The established regime recognises the existing dams, barrages, reservoirs and irrigation projects on the river.⁶³

4. Equitable and reasonable utilisation

This principle is the cornerstone and sticking point of riparian relations on the Euphrates and Tigris Rivers. The most recent codification of this principle is the Convention on the Law of Non-Navigational Uses of International Watercourses introduced by the UN. These principles, established by the ILA in the Helsinki Rules, take international watercourse law a step further towards mutual shared resource law, or common jurisdiction. Syria and Iraq both agree that this tact is in their best interest, particularly Iraq, but Turkey is objecting strongly and contends the UN convention is violating international law.

Secondly, applying the Helsinki Rules and UN Water Law Convention to the Euphrates-Tigris Basin is quite dubious, and in doing so, it is painfully obvious that interpreting between equitable uses without giving priority to one use over the other is not very fair, let alone reasonable. In any case, regardless of the previous pitfalls, the following is an attempt to perform the aforementioned exercise.⁶⁴

63 Uitto & Wolf.

64 Wolf (2002).

5. UN Water Law Convention - Application to the Euphrates-Tigris River Basin

The analysis done to determine equitable and reasonable use for each state includes each aspect of water use as outlined in Article 6 (1) of the UN Water Law Convention. As the Convention states, every use has the same relative priority and consequently has equal weight. In this case, Iraq comes out the favourite, but only by a small and probably insignificant margin, with Syria and Turkey as the second and third in terms of water needs, respectively. Only one point separates each riparian, thus good judgment would safely determine that each riparian has an equal share of the Euphrates waters.

This method is limited due to the unrealistic notion of equal ranking between uses. Reality dictates that this is seldom the case, and one use has extreme importance for one country while another may be meaningless. For instance, food security for Syria would far outweigh social needs, as Turkey's energy needs would overcome its need for irrigation. The key finding was that water security, or that matter of any political component is missing from the above ranking.

In this case, interestingly, the addition of water security factors based on analysis from the previous work equates the ranking between all three riparians. It is also interesting to note that adding environmental factors to the hydrological category, Turkey loses its superior position due to the potential to pollute the Euphrates and Tigris waters with return flows from agricultural use. This satisfies Article 7 and the "no harm" principle.

There is inherent volatility using the equitable and reasonable use principle as the method to allocate and manage an international (or transboundary) watercourse system. The system suffers from practical uncertainty of ambiguous data. Little or no cooperation over data sharing has succeeded witnessed by the failure of the JTC. Water resource information, as well as economic data are often treated as state secrets. Dispute over data has been a consistent trend over the use of the Euphrates-Tigris waters. Secondly, national priorities dictate preferential use, but political, including security concerns often dominate over economic and social factors. Turkey's use of the absolute territorial sovereignty moves the analysis from the needs based to the rights-based framework.

Finally, the framework is an admirable ideal for a cooperative framework between states, but offers no incentive to Turkey, Syria or Iraq to use it, especially if the upstream riparian, in this case Turkey, will lose out after its application.

Even if Turkey accepted the validity of the UN Water Law Convention, there is no penalty for not meeting it.⁶⁵

VII. CONCLUSION

The Euphrates and Tigris Rivers form an extremely diverse river basin, geographically, climatically, demographically, ecologically, and environmentally, and support a wide range of people, cultures, ethnicities and political ideologies. Demarcated boundaries have intersected this once balanced system into political and environmental pieces. The situation is now critical. Unless a basin-wide management scheme addressing water security for all three riparians is implemented within the next ten years, the conflict and irreversible water and land degradation are eminent. The situation illustrates the complexity of pursuing a water sharing agreement when one country (Turkey) controls the headwaters and contributes to the majority (78%) of its flow. Demarcating territorial superiority on an international watercourse contributes little to a durable national water security for riparian states.

Political and security motivations define Turkey's policy of security over water, often trump economic and social needs. Although Turkey is rich in water resources, the national and international security dilemma on its southern border has expanded to include water rights on the Euphrates and Tigris Rivers. The analysis also suggests a strong link between Turkey's image and security policy in Anatolia. Limitations to the "technical approach" to water sharing are apparent, as the 500cm/s treaty has failed to address riparian needs beyond a volumetric dimension. GAP is the hydrologist's dream for Turkey's heads of state and government, but falls far short from advancing the economic, social and cultural benefits that it claims. Water security in Turkey includes use of water as a commodity including means for coercion.

The analysis of Syrian water security is its masterful ambiguity. Syrian hydrodevelopment programs were poorly planned, ill timed and badly designed, causing huge amounts of precious Euphrates water to be wasted. Likewise, their irrigation plans were seemingly completely farfetched compared to actual needs. Fears of water shortages caused by upstream use created a "resource race" for water, solidifying a hydropolitical security complex in the region. This fact was the significant cause of failure of the JTC.

65 Çarkoglu & Eder.

Iraq's incredible storage capacity and vast complex of canals is a nightmare in terms of water efficiency. Iraq irrigates three-times more land than Syria and loses over half to inefficiency. More importantly, Iraq's continued drive for self-sufficiency and food security has led to misuse and unrealistic demands for the Euphrates and Tigris waters, as explained by Iraq's enormous *per capita* water use. International sanctions have aggravated these conditions, but the Iraqi government must change its policy and abandon potentially harmful state-centred development of the Euphrates-Tigris Basin. Iraq's case makes it clear that environmentally sound water policy not only preserves the splendour of the lower Fertile Crescent, but also meets Iraqi long-term needs for water security.

Finally, in the context of conflict, security and cooperation (or lack thereof), there is an urgent need to expand traditional security systems to encompass water and other natural resources, recognising water as critical national resource vital to preservation of the Middle Eastern states and regional security. As the research has shown, cooperation in the Euphrates-Tigris River Basin has failed due failed politics. Water scarcity in the Middle East has securitised water allocations between water-rich states, prompting water use policies to manifest at the highest diplomatic level. The UN Convention on the Law of Non-Navigational Uses of International Watercourses (1997) is a modest beginning, attempting to establish equitable use norms between co-riparians, but fails as a practical tool for water allocation.

If the basin-wide cooperation and management is to succeed, without an inclusive tripartite treaty between Turkey, Syria and Iraq, the organization must first safeguard needs for the basin, which by definition would ultimately address riparian needs.

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THE ROLE OF LAW IN THE MANAGEMENT OF SHARED WETLANDS & LAKES IN THE MEDITERRANEAN REGION

I. INTRODUCTORY NOTES

Instruments of international law and policy, relevant to various aspects of water resources management and environmental protection, could be classified in different ways. For example, concerning their territorial scope they could be global and regional, multilateral and bilateral, river/lake basin or sub-basin related etc. They could be classified as legally binding (*e.g.* international treaties, such as conventions, agreements, protocols etc), “soft-law” (representing non-binding, evolving law, law in development), or policy instruments (expressing commitments of certain entities, *e.g.* public authorities, to adopt and implement certain decisions and measures, etc).¹

It is important to note that nowadays a great variety of international law and policy instruments relate to the same natural phenomenon, focusing often on one or several of its aspects.² Compliance³ with international obligations which duty is taken over through signing of binding legal instruments is, as a rule, split between different national authorities, being competent for certain issues only (and often having different and conflicting views). Thus, an integrative (ideally it would be a holistic) approach, that would comprise such management dimensions as preservation, protection and use of natural resources in an area such as a transboundary wetland or river/lake basin, as well as economic and social

1 For more details regarding international water and environmental related legal instruments, *see* Bogdanovic.

2 It is estimated that “at the international and regional scale there are over 200 such agreements [*i.e.* which set obligations of the Ramsar Convention Contracting Parties regarding the shared watercourses-note: S.B.] which already provide a legal basis for cooperation.”— RAMSAR CONV’N BUREAU at 9. It was pointed out that at the regional level, the Convention on the Protection and Use of Transboundary Water Courses and International Lakes (Helsinki, 1992) contains important principles and rules for the development of new international treaties.—*Id.*

3 In terms of transposition, implementation and enforcement.

development (what would be based on the concept of sustainable development), is a real challenge for national authorities competent for a shared natural unit. Therefore, the issue of good governance is under rising attention whenever transboundary cooperation is at stake.

However, not only internationally accepted obligations concerning transboundary waters or natural resources management are the subject of and dependent on (non)harmonised activities split between various national authorities, regulated by specific sector legislation. Speaking specifically, a large number of different sectoral activities (*e.g.* water abstraction, watercourses regulation, pollution originating from agriculture, industry and urban areas, inland and marine navigation, fishery, forestry, investments) directly or indirectly affect wetlands.⁴ The necessity of internal harmonisation of national policies, legislation and jurisdiction of different institutions, the activities of which affect or influence national wetlands or lakes, *i.e.* national aspects of good water/environmental governance, being influenced either by international obligations or by national development reasons of Mediterranean countries - shall not be in focus of this paper.⁵

The aim of this paper has been designed to highlight more only the legal aspects of management of transboundary wetlands (and lakes) in one concrete, Mediterranean, region⁶. The role of law in the management of transboundary water resources (in its multifaceted aspects) requires permanent attention. Even in case of a specific issue such as management of transboundary wetlands or lakes⁷, it seems that approach promoting law, policy and science as constituent elements making synergy of efforts invested in search for “new pathways of

4 For more details see Shine, pp. 28—31.

5 The Series of 17 RAMSAR HANDBOOKS FOR THE WISE USE OF WETLANDS is a rich and comprehensive guidance, dealing in depth with numerous issues of such kind, aimed at assistance in undertaking of various activities and measures by the authorities of the Ramsar Convention Contracting Parties. The Handbooks are “prepared to assist in implementation of the Convention at the international, regional, national, sub-national or local levels”.

6 For the purpose of this paper, the expression “Mediterranean region” relates to the Non-EU Member Mediterranean countries, countries participating in the Euro-Mediterranean Partnership (Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Mauritania, Monaco, Morocco, Syria and Tunisia), countries streaming to integration into the EU (Albania, Bosnia and Herzegovina, Croatia, Montenegro and Turkey) and Mediterranean EU-Member countries (Cyprus, France, Greece, Italy, Malta, Portugal, Spain and Slovenia).

7 Wetlands have been a long time under global public and professional attention, in the form of promotion of conservation of specific ecosystems, by the Convention on Wetlands (Ramsar, 1971). The concept of “wise use of wetlands” which was established as an obligation of the Contracting Parties to the Ramsar Convention, has been considered as a “pioneering and ambitious objective”, that predated 1972 Stockholm Conference on Human Environment

collaboration and cooperation, across sectors and disciplines”⁸, is fully acceptable. In that sense, this paper is the result of the author’s attempt to contribute to such recognition of the role of law.

Legal, policy and institutional aspects of management of transboundary wetlands and lakes in the Mediterranean region can only be properly analyzed if a much broader international context is taken into account. Speaking only from the environmental protection standpoint, that context can be described as a two-fold one. One aspect has been determined by the specific (global and Europe-regional) international frameworks, aimed basically at cooperation of participating countries in management of the shared (transboundary; international) waters, conservation and protection of wetlands, endangered species (flora and fauna), biodiversity etc. Another aspect can be seen as the framework of the European Union integration processes, which assumes the “high level of environmental protection”⁹ in all the EU-Member States (and consequently in all the EU-Member Candidate countries). In terms of water management, the concept of (integrated) river basin management, based on an ecosystem approach, has been introduced and promoted. At the same time, all respective broader global and UNECE legal and policy frameworks are accepted, transposed and upgraded as elements of the Community *acquis*.

Wetlands (and transboundary wetlands) are in the focus and under increasing focus of the entire network of policy and legal instruments developed at global, European and EU levels.

II. GLOBAL AND REGIONAL LEGAL INSTRUMENTS

Tables Ia and Ib in the Annex attached to this paper, contain lists of binding global and regional international legal instruments applicable at the moment, *inter alia* on the entire or a part of the Mediterranean region (*i.e.* Mediterranean wetlands and lakes), with the data indicating the ratification status of the Mediterranean States. Several global multilateral conventions were developed under the aegis of the UN or its agencies and several regional multilateral conventions developed

and subsequently adopted UN World Charter for Nature and other global policy and legal instruments.-See RAMSAR CONV’N BUREAU at p. 21.

8 See WMO, Preface by P.K. Wouters and A.C. Tyagi, at p. iv.

9 See CONSOLIDATED VERSIONS OF THE TREATY ON THE EUROPEAN UNION AND OF THE TREATY ESTABLISHING THE EUROPEAN COMMUNITY, Article 174.2. — (O. J. C 321, of 29.12.2006).

in Europe by the Council of Europe and UNECE. Ratification status of the Mediterranean States is an indication of their commitment to give consent to be bound by the listed international treaties¹⁰. The commitment to implement those treaties is another and separate issue. Compliance of the Mediterranean States (those being the EU Member-States and those striving to become in future the EU Member-States) with those treaties should be seen today, as much as in the future, in the context of the EU integration processes. The reason for this is the fact that European Community is the Party of a number of them, making them a part of the Community *acquis*, which must be fully transposed into national legal systems and implemented by the EU-Candidate Member countries.

It is evident that the attached list of 14 international treaties is not exhaustive. It could be broadened, at least through adding the Barcelona Convention and its Protocols¹¹ and UNFCCC¹², which are also relevant here. The entire body of international law, established by those treaties as well as respective on-going activities and initiatives, should be taken into account in case of development of new treaties regulating transboundary aspects of the shared wetlands and lakes in the Mediterranean region.

1. Community *acquis*

The situation is significantly different when it comes to the Community *acquis*. Specific legal instruments (directives, regulations and decisions) adopted in the European Union are making the part of the Community *acquis*.¹³

It is important to note that activities and institutional developments, as rooted in certain global legal frameworks (Ramsar Convention, MedWet Initiative and

10 In accordance with Article 11 of the Vienna Convention on the Law of Treaties (1969).

11 UNEP Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona, 1976). Six Protocols were signed under the Barcelona Convention. For more details, *see* Ferrajolo.

12 UN Framework Convention on Climate Changes (New York, 1992).

13 A non-exhaustive list of the most important EU legal instruments relevant to the subject matter of this paper would comprise at least the following: Directive 79/409/EEC of 2 April 1979 on the Conservation of Wild Birds; Council Directive 86/278/EEC of 12 June 1986 on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture; Council Directive of 21 May 1991 concerning urban waste water treatment (91/271/EEC) amended by the Directive 98/15/EC - (UWWT Directive); Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources (Nitrate Directive); Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitat and of Wild Fauna and Flora; Council Regulation (EC) 3897 of 9 December

other related international treaties) have been for years parallel to the EU integration processes¹⁴. With further development of the stabilisation and association processes, wetlands and lakes in the Mediterranean countries, which are passing through the stabilisation and association process, shall become subject to the specific legal regimes developed in the EU in the same way as in other EU-Member Mediterranean countries. Due to the fact that those legal regimes rely on the consent of the States to be bound by the legal instruments imposing them (largely through adoption of the Stabilisation and Association Agreements and subsequent agreements with the European Community), they are more specific and stringent than policy or “soft-law” commitments contained in certain international instruments.

One EU-Member State participates with other Member States in the development of the Community *acquis* and shares the Community *acquis* as a part of its national law system (the EU Directives being transposed into the national legislative instruments) with other EU Member States. That means that it has an obligation to implement and enforce the legislation containing transposed requirements of the EU, and the obligation to report on compliance to the European Commission. Naturally, this is not an abstract obligation but the one that refers also to all the EU legal instruments referred to above. In terms of wetlands and lakes, including Mediterranean ones, that obligation includes identification of such water bodies in the national territories, designation of them into appropriate river basin districts, establishing of competent authorities for managing them and managing them in accordance with the Water Framework Directive and all other legislation.¹⁵

1996 on the Protection of Species of Wild Fauna and Flora by Regulating Trade therein; Directive 2000/60/EC of the Parliament and of the Council of 23 October 2000 establishing a Framework for the Community Action in the Field of Water Policy (Water Framework Directive –WFD); Directive 2006/11/EC of the European Parliament and of the Council of 15 February 2006 on pollution caused by certain dangerous substances discharged into aquatic environment of the Community (repeals Directive 76/464/EEC and partially 91/692/EEC and 2000/60/EC); Directive 2006/44/EC of the European Parliament and of the Council of 6 September 2006 on the quality of fresh waters needing protection or improvement in order to support fish life; Directive 2006/118/EC of the European Parliament and the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration.

- 14 Which are still on-going in the form of stabilisation and association processes (through Stabilisation and Association Agreements—SAAs) of several Mediterranean countries (*i.e.* Albania, Bosnia and Herzegovina, Croatia and Montenegro).
- 15 This obligation comprises planning and undertaking of complex measures for: protection of surface and ground waters (prevention of further deterioration; improvement of aquatic and connected terrestrial ecosystems and wetlands; improvement and sustainable use of water resources through their long-term protection; control and gradual decrease of emissions and loss

In case of a river basin district extending in the territories of several States that are the EU-Member and Non-Member States, EU-Member State(s) has the obligation to seek the establishment of appropriate coordination with the non-Member State(s) aimed at achieving the objectives of the WFD (and other numerous Directives related to the WFD).¹⁶

The EU integration processes were addressed by the 6th Environmental Ministerial Conference "Environment for Europe".¹⁷ Namely, the success of regional environmental cooperation was seen as based on and being deepened and extended to include *inter alia*:

- Regional cooperation in the framework of Stabilisation and Association Process;
- Implementation of the UNECE multilateral treaties;
- Biodiversity conservation and ecological network;
- Protection and sustainable development of mountain areas;
- Watershed management such as the International Sava River Basin Commission;
- Environmental management and investments at the local level;
- Cooperation with other sectors such as agriculture and tourism;
- Stronger and more dynamic coordination of donors' assistance;
- Transfer of experiences between the countries in the region and from the neighbouring EU Member States.¹⁸

2. European Union and Southern and Eastern Mediterranean Countries

Aimed at reinforcing the relations between the European Union and southern and eastern Mediterranean countries, the Euro-Mediterranean Partnership (EMP) was established in 1995.¹⁹ In 1997, the environmental ministers of the

or discharge of priority/dangerous substances through establishment of environmental quality standards and emission limit values; gradual decrease and prevention of further water pollution, etc); flood risk management; control of water pollution caused by urban and industrial waste waters; decrease and prevention of further water pollution by nitrates originating from agriculture; establishment of quality standards for surface (inland) freshwaters designated for human consumption; etc.

16 WFD, Article 3.5.

17 Held in Belgrade, September 2007.

18 UNDP, at p. 209.

19 EMP is also known as Barcelona Process, based on the Barcelona Declaration adopted at initial meeting of the representatives of the Governments of the 15 EU States (Austria, Belgium, Denmark, Germany, Spain, Finland, France, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal and Sweden), Non-EU Member States at that time (Croatia, Cyprus, Malta, Macedonia and Turkey), Governments from wider Mediterranean region (Algeria, Egypt, Israel, Jordan,

European Union and Mediterranean countries adopted the first Short and Medium-Term Priority Environmental Action Programme (SMAP) enabling financing for regional environment through the MEDA programme²⁰. This regional component has been supported by the conclusion of Association Agreements (AA) between the EU and Algeria, Egypt, Jordan, Israel, Lebanon, Morocco, Palestinian Authority and Tunisia²¹. The AA with Syria is pending for signature, while the AA is not yet developed with Libya.²² The bilateral Association Agreements have set grounds for cooperation in different sectors²³, *inter alia* for environment protection. In 2004, the European Commission adopted the European Neighbouring Strategy aimed at enhancing relationships with the EU neighbouring countries, based on the shared values and common interests.²⁴

These integrative processes led ultimately to the establishment of the Union for the Mediterranean.²⁵ In the Joint Declaration of the Paris Summit for the Mediterranean, adopted by 43 Heads of State and Government, the conviction was expressed that the Union for the Mediterranean (UfM):

[...] can play an important role in addressing common challenges facing the Euro-Mediterranean region, such as [...] degradation of the environment, including climate change and desertification [...]²⁶

Lebanon, Morocco, Syria, Tunisia and Palestinian Authority) and representatives of the EU Council and European Commission. For more details see SCADPlus.

- 20 The MEDA programme is the principal financial instrument of the European Union for the implementation of the Euro-Mediterranean Partnership. For more details see http://europa.eu/legislation_summaries/external_relations/relations_with_third_countries/mediterranean_partner_countries/r15006_en.htm. Accessed 13.06.2010.
- 21 For more details see http://ec.europa.eu/europeaid/where/neighbourhood/country-cooperation/index_en.htm. Accessed January 18th, 2008.
- 22 EUROPEAN COMMISSION (3). For details on the AA with Syria see http://ec.europa.eu/external_relations/syria/index_en.htm. For details on the current status of the AA with Libya see <http://migrantsatsea.wordpress.com/2010/05/13/eu-libya-association-agreement-negotiations/>. Accessed 13.06.2010.
- 23 Cooperation between partners has been envisaged to comprise a strengthened dialog on reform priorities, approximation of legislation, institutional support and achieving the UN Millennium Development Goals. However, environmental protection has not been prioritised consistently as the top priority by all southern and eastern Mediterranean countries – partners of EU. —EEA (2) at p. 69.
- 24 EUROPEAN COMMISSION (3).
- 25 Paris, 13.07.2008. For more details see: EUROPEAN COMMISSION (1).
- 26 Preamble.

The importance of water was also separately acknowledged, and the forthcoming Euro-Mediterranean Ministerial Conference was designated to define the Mediterranean water strategy that would promote conservation of water resources diversifying water provision resources and efficient and sustainable use of water.²⁷ The Ministerial Conference on Water²⁸, *inter alia*, adopted the guidelines for the Strategy for Water in the Mediterranean²⁹ that was drafted and submitted to the IV Euro-Mediterranean Ministerial Conference on Water held in Barcelona, on April 13th, 2010. All 43 UfM countries have agreed on the text of the Ministerial Declaration and almost on the entire text of the Strategy for Water in the Mediterranean. The Strategy “aims at agreeing on a common political, methodological and financing framework for political implementation of regional policies in the water field”³⁰

3. Other International Initiatives Relevant to the European Mediterranean Countries

In addition to the MedWet Initiative, which will be briefly elaborated bellow, other European initiatives aimed ultimately at halting biodiversity loss should also be mentioned here, as relevant to the Mediterranean wetlands and lakes. All the European Mediterranean States have been participating in those initiatives and on-going activities, expressing their commitment to achieve the goals set jointly with other participating countries. The Pan-European Ecological Network³¹ is

a non-binding conceptual framework which aims to enhance ecological connectivity across Europe, by promoting synergies between nature policies, land-use planning and rural and urban development at all scales.³²

27 Annex to the Joint Declaration, paragraph 3.

28 Held in Jordan, at the shores of the Dead Sea, on 22.12.2008.

29 See at http://www.medaquaministerial2008.net/en/press/communiqué_AR.pdf.

30 For details see <http://www.medaquaministerial2010.net>. Due to the political conflict between Israel and the Arab countries, the documents were not adopted. Nevertheless, certain UfM projects have been presented at the Marseille Investors' Forum (for'UM) on May 27th, 2010, organised by the Franco-Egyptian Co-Presidency. For more details see EMWIS Flash – May 2010, at <http://www.emwis.net>. See also *Liberté, Public dans Internationale, Edition du 15 avril 2010*. Accessed 13.06.2010.

31 PEEN.

32 Council of Europe (1).

The following was the Resolution on Biodiversity adopted at Kiev in 2003 by the Ministers competent for environmental issues, who committed themselves to identify the core areas, corridors and buffer zones of the PEEN by 2006 and put such areas and zones under favourable management conditions by 2008. The core areas have been formally established as protected areas (*e.g.* Ramsar sites, World Heritage sites, Biosphere reserves, Natura 2000 sites, etc). The Guidelines were developed for designation and development of the Pan-European Ecological Network^{33,34}

Natura 2000 is a network consisting of Special Protection Areas under the Birds Directive and Special Conservation Areas under the Habitat Directive. The European Commission Communication calls for Member States of the EU to

reinforce the coherence and connectivity of the Natura 2000 network. It also highlights the need to restore biodiversity and ecosystem services in non-stop protected rural areas of the EU. Compliance with those objectives is the key to the implementation of the PEEN within the EU.³⁵

The Council of Europe Emerald Network Initiative (1999) has been seen very successful for the EU-12 countries in preparing their contribution to the Natura 2000 network before accession. The initiative has been developed under the Bern Convention and aimed at extending a common approach to the designation and management of protected areas, equivalent to Natura 2000, to non-EU countries in Europe and countries in Northern Africa.³⁶

4. Ramsar Convention

The Convention on Wetlands was adopted as an intergovernmental treaty in the Iranian city of Ramsar, on February 2nd, 1971.³⁷ The commitment of the Contracting Parties to sign the Ramsar Convention was *inter alia* based on recognition of interdependence of Man and his environment, on assuming the fundamental ecological functions of wetlands as regulators of water regimes and

33 Council of Europe (2).

34 EEA (1) , pp. 186—187.

35 *Op. cit.* pp. 190—192.

36 *Id.*

37 The Convention was amended by the Paris Protocol of December 3rd, 1982 and the Regina Amendments of May 28th, 1987. The original title of the Convention was changed and now it reads “The Convention on Wetlands of International Importance especially as Waterfowl Habitat”. The Convention is well known under the name “Ramsar Convention”, which is mostly used in this paper. UNESCO issued a consolidated (certified) text of the Convention, dated 13.07.1984.

as habitats supporting characteristic flora and fauna, especially waterfowl, and on conviction that wetlands constitute a resource of great economic, cultural, scientific and recreational value, the loss of which would be irreparable. They expressed desire to stop encroachment and loss of wetlands and recognized that waterfowl in their seasonal migrations should be regarded as international resource. A combination of national policies with coordinated international action was seen as the way for ensuring conservation of wetlands and their flora and fauna.³⁸

The Convention set the obligation of every Contracting Party to designate at least one wetland³⁹ to be included in the List of Wetlands of International Importance⁴⁰, to promote conservation of wetlands included in the List and wise use of wetlands in their territory and to inform at earliest possible time on changes or possible changes of ecological character of wetlands in its territory included in the List⁴¹. The flexibility of the Ramsar Convention allowed for adaptation of its key concepts to later formulated concepts of sustainable development⁴². The concept of sustainable utilisation of wetlands was designed as a part of definition of wise use of wetlands, comprising

human use of a wetland so that it may yield the greatest continuous benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations.⁴³

In that sense, the Contracting Parties adopted the following definition of the Ramsar Convention mission:

[T]he conservation and wise use of all wetlands through local, regional and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world.⁴⁴

38 **Preamble.**

39 For the purpose of the Convention, wetlands have been defined as “areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters”.—Article 1.1.

40 **In accordance with Article 2.1**

41 Article 3.1 and 3.2

42 As formulated by the Brundtland Commission: “[...] development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” – See Brundtland Commission, at p. 4

43 3rd Conference of the Parties (COP3), Recommendation 3.3, 1987.

44 8th Conference of the Parties (COP8) Resolution VIII.25, Mission statement in the Strategic Plan 2003—2008.

In the same manner, flexibility of the Ramsar Convention allows for synergy with other multilateral legal instruments and enables avoiding the overlap of efforts at the international stage. The ecosystem approach, as adopted in the Convention on Biological Diversity⁴⁵, has been regarded as congruent with the Ramsar's overarching concept of "wise use"⁴⁶

The Ramsar Convention entered into force in 1975, and as of June 5th, 2010 it has 159 Contracting Parties. As of the same date, the List of Wetlands of International Importance⁴⁷, contained more than 1,889 wetlands⁴⁸, comprising 185,437 million ha.⁴⁹ The UNESCO is the Depository of the Convention. The implementation of the Convention⁵⁰ has been conferred to the Conference of the Contracting-Parties⁵¹, which convenes ordinary meetings at intervals of not more than three years⁵². The World Conservation Union⁵³ in Gland, Switzerland performs the continuing bureau duties⁵⁴. The Secretariat is supervised by the Standing Committee, which meets annually to carry out activities between triennial COP meetings. Additionally, the Scientific and Technical Review Panel⁵⁵ was established in 1993.⁵⁶

45 CBD 5th Conference of the Parties (COP5) of CBD adopted the following description of the ecosystem approach: "1. The ecosystem approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. Thus, the application of the ecosystem approach will help to reach a balance of the three objectives of the Convention: conservation, sustainable use and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources. 2. An ecosystem approach is based on the application of appropriate scientific methodologies focused on levels of biological organisation, which encompass the essential structure, processes, functions and interactions among organisms and their environment. It recognises that humans, with their cultural diversity, are an integral component of many ecosystems."—Decision V/6, Annex, Section A.— <http://www.cbd.int/decisions/cop5/?m=COP-05&id=7148&lg=0>.

46 RAMSAR CONV'N SECR (1), Appendix 1, p. 16—17.

47 Ramsar List.

48 Ramsar sites.

49 See at: http://www.ramsar.org/cda/en/ramsar-home/main/ramsar/1%5e7715_4000_0___. Accessed 08.06.2010.

50 *i.e.* its "review and implementation".

51 COP.

52 In accordance with Article 6.1 of the Convention. Ten ordinary meetings of COP have been convened until now.

53 IUCN.

54 *i.e.* the Ramsar Convention Secretariat, in accordance with Article 8.

55 STRP.

56 For more information visit: http://www.ramsar.org/index_about_ramsar.htm#intro. Accessed 13.01.2009.

The Secretariat of the Convention following each of the 7th, 8th and 9th meetings of the Conference of the Contracting Parties⁵⁷ prepared a series of 17 handbooks to assist the implementation of the Convention at the international, regional, national, sub-national or local levels.⁵⁸ The Handbooks deal *inter alia* with such issues as wise use of wetlands, wetland policy and legislation and international cooperation.

Pursuing Article 5 of the Ramsar Convention⁵⁹, the Contracting Parties adopted the Guidelines for international cooperation under the Ramsar Convention⁶⁰ according to which the cooperation between the States “should extend to all shared wetlands, whether Ramsar listed or not”⁶¹. The Guidelines also cover the partnership with other international and regional environmental conventions and agencies, sharing of information, international assistance to conservation and wise use of wetlands, sustainable harvesting and international trade in wetland-derived plant and animal products, etc.

As it was mentioned earlier in this paper,⁶² these Guidelines indicate that there is already existing legal basis for such cooperation, in the form of over 200 international treaties and the UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes, Helsinki 1992.⁶³ The Contracting Parties:

A1. [...] are encouraged to identify all of their shared wetland systems and cooperate in their management with the adjoining jurisdiction(s), through actions such as formal

57 1999, 2002 and 2005 respectively.

58 For more details, visit: http://www.ramsar.org/lib/lib_handbooks2006_e.htm .
Accessed 13.01.2010.

59 According to that Article, “[T]he Contracting Parties shall:

- “consult with each other about implementing obligations arising from the Convention, especially in the case of a wetland extending over the territories of more than one Contracting Party or where a water system is shared by Contracting Parties”;
- “at the same time endeavour to co-ordinate and support present and future policies and regulations concerning the conservation of wetlands and their flora and fauna”.

60 The Handbook 17 INTERNATIONAL COOPERATION contains those Guidelines, which Guidelines were adopted by the Resolution VII.19 of the 7th COP, Costa Rica, 1999. The Guidelines reflect other Resolutions adopted by the COP8 of the Ramsar Strategic Plan 2003—2008 and other Resolutions which supersede those reflected in the Guidelines adopted by the COP7. — See note at p. 3

61 RAMSAR CONV’N SECR (4), 2.1 under 7, p. 9

62 See *supra*, note no. 2.

63 RAMSAR CONV’N SECR (4), 2.1 under 9, p. 9.

joint management arrangements or collaboration in the development and implementation of bi- or multilateral management plans for such sites.

Likewise, there is an expectation that similar cooperation will be pursued for shared or international river basins and coastal systems through the establishment of bi- or multilateral management commissions.⁶⁴

On the 8th Meeting of the Conference of the Contracting Parties to the Ramsar Convention⁶⁵ the “Guidance to the Development of Regional Initiatives in the Framework of the Ramsar Convention” was adopted. The overall aim of the regional initiatives has been defined in these Guidelines as promotion of the Ramsar Convention in general and implementation of the Ramsar Strategic Plan in particular, through regional and sub-regional co-operation on wetland-related issues of common concern.

Furthermore, regional and sub-regional initiatives were envisaged as to be based on the a bottom-up approach, entailing from the beginning, not only participation of administrative authorities, but also of other relevant stakeholders. Such initiative was also seen as basing its operations upon strong scientific and technical background and on the network of collaboration established upon clearly defined terms of reference and seeking collaboration with other intergovernmental or international partners. In this document, a regional initiative was directed to require both political and financial support from the Contracting Parties to the Ramsar Convention, and other partners in the region. Financial support from the Ramsar Convention’s core budget was envisaged to last in principle not more than three years, and after that period, the financial support should be phased out, with expectation that such regional initiative is able to generate its own resources and become financially self-sufficient.⁶⁶

Differently from some other (relevant here) international treaties, in the Ramsar Convention there is a notable lack of a clear encouragement of the Contracting Parties to enter into bi-, tri- or multilateral legally binding agreements⁶⁷ aimed at detailed regulation of *e.g.* policy, management, institutional and financial issues regarding their shared/riparian natural resource(s), in the frameworks of the Ramsar Convention and other related global and regional international treaties.⁶⁸ For example, the UNECE Convention on the Protection and Use

64 *Op. cit.*, Section A of the Guidelines related to managing shared wetlands and river basins, p. 14.

65 Held in Valencia, Spain, 18—26.11.2002.

66 Ramsar Contracting Parties 8th Meeting (COP8), Resolution VIII, Annex I, p. 3.

67 In accordance with international law, *i.e.* with Vienna Convention on the Law on Treaties (1969).

68 Mostly listed in Tables Ia and Ib in the Annex to this paper.

of Transboundary Watercourses and International Lakes⁶⁹ provides for the Riparian Parties⁷⁰:

[...] to cooperate on the basis of equality and reciprocity, in particular through bilateral and multilateral agreements, in order to develop harmonized policies, programmes and strategies covering the relevant catchment areas, or parts thereof, aimed at the protection of the environment of transboundary waters or the environment influenced by such waters, including marine environment.⁷¹

Furthermore, this obligation⁷² was supported by additional provision, directed to the Riparian Parties only, providing for that:

The Riparian Parties shall on the basis of equality and reciprocity enter into bilateral or multilateral agreements or other agreements, where these do not yet exist, or adapt existing ones, where necessary to eliminate the contradictions with the basic principles of this Convention, in order to define their mutual relations and conduct regarding the prevention, control and reduction of transboundary impact. These agreements or arrangements shall embrace relevant issues covered by this Convention, as well as any other issues on which the Riparian Parties may deem it necessary to cooperate.⁷³

And more:

The agreements or arrangements mentioned in paragraph 1 of this Article shall provide for the establishment of joint bodies.⁷⁴

However, the UNECE Water Convention does not apply to Southern and the Eastern Mediterranean countries. The legal framework that would apply in the entire Mediterranean region is undoubtedly the UN Convention on the Law of the Non-Navigational Uses of International Watercourses.⁷⁵ This Convention

69 Helsinki, 1992.

70 For the purpose of that Convention, the term “Riparian Parties” means the “Parties” [to the Convention] bordering the same transboundary waters.—Article 1.4.

71 Article 2.6.

72 Imposed through the use of word “shall [...] enter into [...]” instead of much weaker “should” or some other (more or less conventional) expressions like “joint actions would be considered” etc.

73 Article 9.1.

74 Article 9.2.

75 The General Assembly of the United Nations adopted this Convention at its 51st session, held in New York, on May 21st, 1997. The Convention was adopted by voting of 104 countries in favour, three votes against and 27 abstentions. Mediterranean countries mostly voted in favour. Turkey voted against, while France, Lebanon and Spain abstained. Bosnia, Montenegro and Syria were not listed as voting countries. As of now Jordan, Lebanon, Libya and Syria are the Parties to the Convention. As of 06.06.2010, 18 countries ratified, accepted, acceded or approved the Convention. Several of them were or intended to be the Parties to the UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Helsinki,

is the first and the only global treaty codifying the most important international customary water law (in terms of legal principles applicable on the non-navigational uses of international watercourses). For these considerations, it is important to note that the Convention provided for the possibility to conclude “watercourse agreements”⁷⁶ between the States sharing the same waters.⁷⁷ The Convention has been seen as “the best what could be reached at the time”.⁷⁸ Its exceptional significance for the development of international water law was reflected in the ICJ *Gabcikovo—Nagymaros Case*⁷⁹. In spite of wide recognition of its importance it still has not entered into force.⁸⁰ A huge number of international organisations⁸¹ and academics are calling the countries (Signatories in the first row) to ratify, accept, accede, or approve the Convention.⁸² Entering into force of this Convention would foster the development of legal instruments (bilateral, multilateral treaties) concerning the waters shared between their riparian, littoral and basin countries.

5. Mediterranean Wetland Initiative⁸³

The Mediterranean Wetland Initiative was founded in 1991 to encourage international collaboration among the Mediterranean countries, specialised centres

1992). The UN Convention shall enter into force on the 90th day following the date of deposit of the 35th instrument of ratification, acceptance, approval or accession.

76 The scope of such agreements may comprise an entire international watercourse or part of it, a particular project, program or use etc.—Article 5.

77 Article 5. The term “watercourse” comprises certainly wetlands and lakes.

78 Lammers.

79 *Case Concerning the Gabcikovo—Nagymaros Project (Hungary v. Slovakia)*; The ICJ Judgement of 25 September 1997.

80 For details on the current status of ratification, see *infra*, Tables Ia and Ib in the Annex to this paper.

81 For more details see Luores *et al.*

82 *Example gratia*, such is WWF CALL ON GOVERNMENTS TO BRING INTO FORCE THE CONVENTION ON THE LAW OF THE NON-NAVIGATIONAL USES OF INTERNATIONAL WATERCOURSES.

83 MedWet consists of officially appointed representatives from the following 20 countries: Albania, Algeria, Bosnia & Herzegovina, Bulgaria, Croatia, Cyprus, Egypt, France, Greece, Italy, Lebanon, Morocco, Portugal, Slovenia, Spain, Syria, Macedonia, Tunisia, Turkey, and Yugoslavia (*i.e.* now only Montenegro); the Palestinian Authority; the European Commission; the United Nations Environment Programme - Coordinating Unit for the Mediterranean Action Plan (Barcelona Convention, RAC/SPA); the Ramsar Convention Bureau; and the following seven organisations working on wetland-related issues in the Mediterranean: Bird Life International, Greek Biotope / Wetland Centre, IUCN - The World Conservation Union,

and international NGOs in protecting wetlands. It is governed by the Conference of the Contracting Parties to the Ramsar Convention, which meets once in three years to review the work that has been carried out and approve the programme of work and budget for the next triennium. The MedWet Committee is composed of 25 Mediterranean countries, Palestinian Authority, the European Commission, intergovernmental organisations, international conventions, non-governmental organisations and five wetland centres. The Committee meets once in one and a half year to review the progress in the work undertaken and advise the Ramsar Convention bodies on issues related to the Mediterranean wetlands and the work of MedWet.

The Mediterranean Wetland Initiative (MedWet) is a forum where all of its members have an equal opportunity to discuss at meetings, identify key issues and take positive action to protect wetlands, for Man and biodiversity. It is a source of information and knowledge. The MedWet helps the Mediterranean countries to evaluate economic, social and biodiversity values of wetlands, provide technical tools and ensure good management of wetlands. In 2002 the MedWet became formally recognised initiative under the Ramsar Convention.

The MedWet developed the Mediterranean Wetland Strategy (1996—2006)⁸⁴ which contains several elements significant for international cooperation regarding wetlands. Among other things:

The General Objective 4 was formulated as reinforcement of the capacity of institutions and organisations to achieve conservation and wise use of wetlands⁸⁵;

- The General Objective 5.1.2 calls for international actions aimed at establishment of wetland management committees at all major wetlands;
- The General Objective 6.2 calls for ensuring “that suitable legal mechanisms exist for the conservation and wise use of Mediterranean wetlands”;
- The General Objective 7.2 requests international actions aimed at developing cooperation on transboundary wetland sites in the Mediterranean, through identification of transboundary wetlands and discussion “through inter-governmental cooperation on feasibility of a concerted

the *Station Biologique de la Tour du Valat* (France), the *Sede para el Estudio de los Humedales Mediterraneoos of the University of Valencia* – SEHUMED (Spain), Wetlands International, and the World Wide Fund for Nature – WWF.

84 Endorsed by the Mediterranean Wetland Conference, Venice, June 1996.

85 The rationale for this objective was that the capacity of institutions dealing with wetland conservation and wise use in the Mediterranean region is often seriously limited, *inter alia* in terms of legal framework in which they operate.

approach in management” and encouraging “twinning of transboundary wetlands [...] and use of successful cases to illustrate the benefits of international cooperation”, etc.

Such policy formulations were, without any doubt, a very good basis for significant MedWet activities that led to remarkable results in the set time period. Nevertheless, the MedWet policy, being consequently in line with the Ramsar Convention, suffers from the same lack of clear encouragement of interested (*i.e.* riparian, littoral) states to enter into bilateral or, as case may be, multilateral agreements. The policy view, based on the supposition that there are enough existing legal frameworks for international co-operation conceiving wetlands, and that discussions between states on concerted approach in management would be satisfactory requirement, was proven in practice as satisfactory in the initial phase of co-operation but not as sufficiently safe ground for founding of sustainable co-operation arrangements. This will be briefly discussed below.

III. BRIEF ON THE SEE TRANSBOUNDARY WATERS

A quick checking of international legal regimes, applicable to the transboundary river basins of the South Eastern Europe⁸⁶, will show that, in addition to the above-mentioned international instruments setting legal grounds for cooperation of the SEE countries sharing the same waters, there are many bilateral and multilateral treaties specifying details of such cooperation.⁸⁷ Yet, there is room and need for concluding new treaties that would, in the frameworks of the existing global and regional legal regimes, cover cooperation between countries in several river basins.⁸⁸ In the Mediterranean part of SEE those are *e.g.* the river basins of Neretva (Bosnia and Herzegovina and Croatia), Drim/Drin (Albania, Macedonia and Montenegro), Vardar/Axios (Macedonia and Greece), Struma/Strimona (Bulgaria and Greece), Maritsa (Bulgaria and Greece), Mesta/Nestos (Bulgaria and Greece), Ergene/Evros (Turkey and Greece). In the same area there are several lakes—Skadar/Skodra (Albania and Montenegro), Prespa (Albania, Greece, Macedonia), and Dojran (Macedonia and Greece) - shared between two or three countries.

A quite recent cooperative initiative, strongly supported by the international community, led to the conclusion of bilateral agreement between Albania and

86 SEE.

87 For more details *see supra*, ref. 1.

88 UNEP/GRID-Arendal, 2007, at pp. 46—49.

Macedonia on the management of the Ohrid Lake⁸⁹. Another initiative, particularly strongly supported by the Secretariat of the Ramsar Convention and MedWet, led to the adoption of the Prespa Park Declaration⁹⁰ and establishment of the Prespa Park Coordination Committee⁹¹. PPCC was created as a “provisional” body composed of members representing national environmental authorities, local communities and NGOs from all three littoral countries of the Prespa Lakes. The Committee achieved remarkable results in its ten-year long period of operations. Yet, at its latest 11th Ordinary Meeting⁹², PPCC encouraged UNDP⁹³ to address the Governments of Albania, Macedonia and Greece with a formal request for initiating a consultation procedure for preparation of trilateral agreement on the Prespa Park.⁹⁴ It was assessed that only a trilateral agreement negotiated and adopted in accordance with international law on treaties, would provide sustainability of institutional and financial arrangements set for cooperation in management of this (trilateral) transboundary lakes basin. Indeed, the agreement concerning protection and sustainable development of the Prespa Park was signed at Pyli (Greece) on February 2nd, 2010, by three littoral countries of the Prespa Lakes and by the Commission of the European Communities. This treaty, pending its ratification, is expected to provide conditions for introduction of

standing cooperation structures that are deemed necessary to confront the wetlands’ problems and also for the sustainable development.⁹⁵

- 89 Agreement between the Government of the Republic of Macedonia and the Council of Ministers of the Republic of Albania for the protection and sustainable development of the Lake Ohrid and its watershed (Skopje, 2004).
- 90 Declaration on the Creation of the Transboundary Prespa Park and Environmental Protection and Sustainable Development of the Prespa Lakes and their Surroundings was signed by the Prime Ministers of Albania, Greece and Macedonia, at Agios Germanos on February 2nd, 2000, on the occasion of the 29th anniversary of signing of the Ramsar Convention. See http://www.ramsar.org/cda/en/ramsar-activities--major-transboundary-park-21557/main/ramsar/1-63-78%5E21557_4000_0_.
- 91 The Prespa Park Coordination Committee (PPCC) was formed at the meeting held at Tirana, from October 16th to 17th, 2000 under the aegis of the Ramsar Convention, and attended by the interested national authorities competent for environmental protection and other issues, national NGOs from three littoral countries and international organisations.
- 92 Held in Pyli, Greece from November 21st to 22nd, 2008
- 93 The UNDP Home Based FYR of Macedonia is executing agency of the GEF project INTEGRATED ECOSYSTEM MANAGEMENT IN THE PRESPA LAKES BASIN OF ALBANIA, FYR OF MACEDONIA AND GREECE.
- 94 Seizova.
- 95 For more details see <http://www.ana.gr/anaweb/user/showplain?maindoc=8374584&maindocimg=8374063&service=144>. Accessed 02.02.2010.

Bilateral relations between Albania and Montenegro concerning the Skadar/Shkodra Lake are still not based on a negotiated agreement, but some “soft law” instruments are in place.⁹⁶ Sooner or later, it might be expected that safe (in the meaning: sustainable) legal ground for cooperation will be found in negotiation and adoption of a formal binding treaty. Similar is the case of the Lower Neretva River transboundary cooperation. Precious natural values, as in all other mentioned cases, can be conserved, protected and managed only if the activities affecting them are controlled/managed on the basis of a formal legally binding treaty negotiated, signed and ratified by the riparian countries - Bosnia and Herzegovina and Croatia.⁹⁷

Current developments in the SEE countries relations, which in a number of cases are tending to be based on the binding treaties, may be interpreted as confirming those academic views according to which international law originates from customs and treaties, and seeing “soft law” as not legally binding *per se*.⁹⁸ In the same line, strongly affirming importance of bilateral, regional and multilateral legal frameworks established by numerous treaties, protocols and conventions on use, development and protection of transboundary water-courses and related ecosystems, as well as multilateral agreements which may not address solely water issues, is the position recently taken by the UN General Assembly on its Sixty-Fourth Session.⁹⁹

IV. CONCLUDING REMARKS

Wetlands and lakes shared between two or more countries in the Mediterranean region are subject to numerous legal regimes established at national and international levels, the later comprising global and regional levels. The global legal regimes applicable to the entire Mediterranean region are established by

96 Such as, for example, the Memorandum of Understanding (MoU) for the Protection and Sustainable Development of Lake Shkoder that was formally signed by the Ministers of Environment of Albania and Montenegro in May 2003.— World Bank, LAKE SHKODER TRANSBOUNDARY DIAGNOSTICS ANALYSIS, p. 116.

97 For more details see PRINCIPAUTE DE MONACO; and also MedWet SEHUMED Mission to Mostar, at http://sehumed.uv.es/revista/numero13/SEHUMED13_6.PDF; Accessed 11.01.2009.

98 Shelton at p. 6.

99 Under Agenda item 53(a) on Sustainable development implementation of Agenda 21, the Programme for the Further Implementation of Agenda 21 and the outcomes of the World Summit on Sustainable Development (Water, Peace and Security: Transboundary Water Cooperation).—UNGA, A/64/692, Corr. 1, 22.03.2010.

several UN multilateral conventions, while multilateral instruments of UNECE, Council of Europe and Community *acquis* are applicable only to the European Mediterranean countries. However, the only universal legal instrument defining/expressing principles of international law applicable to international watercourses, *i.e.* codifying international customary water law, the UN Convention on the Law on Non-Navigable Uses of International watercourses (New York, 1997), have not yet entered into force. Despite the fact that majority of the Mediterranean countries are Signatories of that Convention, there are only three of them which ratified it. Numerous are international organisations and authoritative members of the world academic community encouraging countries and appealing to them to ratify this significant Convention.

Global and regional legal instruments, establishing those legal regimes, allow and often encourage their parties to enter into bilateral/riparian/basin agreements aimed at more detailed regulation of their relations concerning transboundary waters they share. In case of the Ramsar Convention, such encouragement of the countries sharing transboundary wetlands has been limited to different cooperation aspects, never comprising suggestion of negotiation of specific treaties comprehensively regulating their relations regarding wise use of wetlands, *i.e.* their sustainable management. However, some actual developments show that between political commitments, which are naturally unavoidable in interstate co-operation (without which there would be no co-operation at all) and sustainable institutional and funding arrangements regarding transboundary wetlands and lakes, there is a gap limiting development of inter-State cooperation at a certain level. Without clear and unambiguous legal ground, the gap between clear political will and desired sustainable results cannot be bridged over. The cases of the Ohrid Lake and the Prespa Lakes Initiative clearly prove this.

The role of international law on treaties, seen in the presented context is equal to the role of policy and science, and crucial at a certain point for up-grading and fostering of international cooperation based on policy and “soft-law” instruments developed in broader frameworks, set by global and regional treaties. This is particularly important at sub-regional levels regarding transboundary wetlands and lakes in the Mediterranean region. It seems that there is a room for development of specific guidelines focussed only on the legal issues relevant for drafting, negotiating and concluding of such treaties.

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WWW	<p>WWW: WWW CALLS ON GOVERNMENTS TO BRING NIN-TO FORCE THE CONVENTION ON THE LAW OF THE NON-NAVIGATIONAL USES OF INTERNATIONAL WATER-COURSES; http://aspects.panda.org/downloads/web_public_brief_un_convention.pdf; Accessed 11.01.2010</p>

ANNEX

TABLE Ia
LIST OF INTERNATIONAL TREATIES AND THEIR MEDITERRANEAN NON-EU MEMBER PARTIES

	Albania	Algeria	Bosnia and Herzegovina	Croatia	Egypt	Israel	Jordan	Lebanon	Libya	Mauritania	Monaco	Montenegro	Morocco	Syria	Tunisia	Turkey	Notes
1	1996	1984	1992	1991	1998	1997	1997	1999	2000	1983	1997	2006	1980	1998	1981	1994	Entry into force
2	1989	1974	1998	1992	1974	1999	1975	1983	1978	1981	1978	2006	1975	1975	1975	1983	Party from
3	2003	1984	2009	2000	1978	1980	1979	-	2003	1998	1978	2006	1976	2003	1975	1996	Entry into force
4	2001	2005	-	2000	1983	1983	2001	-	2002	1998	1993	2009	1993	2003	1987	-	Entry into force
5	1994	1995	2002	1996	1994	1995	1993	1994	2001	1996	1992	2006	1995	1996	1993	1997	Party from
6	2000	1996	2002	2001	1996	1996	1997	1996	1996	1996	1999	2007	1997	1997	1996	1998	Entry into force
7	-	-	-	-	-	-	1999	1999	2005	-	-	-	-	1998	-	-	Party from
8	2005	2004	2009	2003	2004	-	2004	-	2005	2005	-	2006	-	2004	2003	2004	Party from
9	1999	N/A	2009	2000	N/A	N/A	N/A	N/A	N/A	N/A	1994	2010	2001	N/A	1996	1984	Entry into force
10	1991	N/A	2009	1996	N/A	N/A	N/A	N/A	N/A	N/A	-	2009	N/A	N/A	N/A	-	Party from
11	1994	N/A	2009	1996	N/A	N/A	N/A	N/A	N/A	N/A	-	-	N/A	N/A	N/A	-	Party from
12	2001	N/A	2008	2007	N/A	N/A	N/A	N/A	N/A	N/A	-	2009	N/A	N/A	N/A	-	Party from
13	2005	N/A	-	2009	N/A	N/A	N/A	N/A	N/A	N/A	-	2009	N/A	N/A	N/A	-	Party from
14	2009	N/A	-	2008	N/A	N/A	N/A	N/A	N/A	N/A	-	-	N/A	N/A	N/A	-	Party from

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Cyprus	2001	1975	1975	2001	1996	2000	-	2004	1998	2000	-	2003	-	-
France	1986	1975	1978	1990	1994	1997	-	2003	1990	2001	1998	2002	-	2009
Greece	1975	1981	1993	1999	1994	1997	-	2004	1985	1998	1996	2006	-	-
Italy	1977	1978	1997	1983	1994	1997	-	2004	1982	1995	1996	2001	-	-
Malta	1989	1978	1989	2001	2000	1998	-	2007	1994	-	-	2002	-	-
Portugal	1981	1980	1981	1983	1993	1996	2005	2004	1996	2000	1994	2003	-	2009
Slovenia	1991	1992	2000	1999	1996	2001	-	2003	2000	1998	1999	2004	2010	2008
Spain	1982	1982	1986	1985	1993	1996	2009	2003	1986	1992	2000	2004	2009	2009
EU	-	-	-	1983	1993	1998	-	2003	1982	1997	1995	2005	2008	2006
Notes	Entry into force	Party from	Entry into force	Party from	Entry into force	Party from	Entry into force	Party from	Entry into force	Party from				

TABLE II NOTES ON THE TABLES Ia AND Ib: TREATIES OF GLOBAL RELEVANCE	
1	UN CONVENTION ON WETLANDS OF INTERNATIONAL IMPORTANCE, ESPECIALLY AS WATERFOWL HABITAT (RAMSAR, 1971); HTTP://RAMSAR.ORG/KEY_CP_E.HTM [RAMSAR CONVENTION]
2	UNESCO CONVENTION CONCERNING THE PROTECTION OF THE WORLD CULTURAL AND NATURAL HERITAGE (PARIS, 1972); HTTP://WHC.UNESCO.ORG/EN/STATESPARTIES/
3	UN CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES OF WILD FLORA AND FAUNA (WASHINGTON, D.C., 1973); HTTP://WWW.CITES.ORG/ENG/DISC/PARTIES/ALPHABET.SHTML [CITES]
4	UN CONVENTION ON MIGRATORY SPECIES AND WILD ANIMALS (BONN, 1979); HTTP://WWW.CMS.INT/ABOUT/PARTYLIST_ENG.PDF [CMS]
5	UN CONVENTION ON BIOLOGICAL DIVERSITY (RIO DE JANEIRO, 1992); DATA AS OF 11 JANUARY 2009; HTTP://WWW.CBD.INT/INFORMATION/PARTIES.SHTML [CBD]
6	UN CONVENTION TO COMBAT DESERTIFICATION IN THOSE COUNTRIES EXPERIENCING SERIOUS DROUGHT AND/OR DESERTIFICATION, PARTICULARLY IN AFRICA (UNCCD, 1994); HTTP://WWW.UNCCD.INT/CONVENTION/RATIF/DOEIF.PHP
7	UN CONVENTION ON THE LAW ON NON-NAVIGATIONAL USES OF INTERNATIONAL WATERCOURSES (NEW YORK, 1997); HTTP://TREATIES.UN.ORG/PAGES/VIEWDETAILS.ASPX?SRC=UNTS&TABID=MTDSG_NO=XXVII-12&CHAPTER=27&LANG=EN#PARTICIPANTS
8	CARTAGENA PROTOCOL ON BIOSAFETY TO THE CONVENTION ON BIOLOGICAL DIVERSITY (MONTREAL, 2000); DATA AS OF 11 JANUARY 2009; HTTP://WWW.CBD.INT/INFORMATION/PARTIES.SHTML
COUNCIL OF EUROPE TREATY	
9	CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE AND NATURAL HABITATS (BERN, 1979); HTTP://CONVENTIONS.COE.INT/TREATY/COMMUN/CHERCHE.SIG.ASP?NT=104&CM=1&DF=1/11/2009&CL=ENG
UNECE TREATIES	
10	CONVENTION ON ENVIRONMENTAL IMPACT ASSESSMENT IN A TRANSBOUNDARY CONTEXT (ESPOO, 1991); DATA AS OF 11 JANUARY 2009; HTTP://WWW.UNECE.ORG/ENV/EIA/CONVRATIF.HTML [ESPOO CONVENTION]
11	CONVENTION ON THE PROTECTION AND USE OF TRANSBOUNDARY WATERCOURSES AND INTERNATIONAL LAKES (HELSINKI, 1992); DATA AS OF 11 JANUARY 2009; HTTP://WWW.UNECE.ORG/ENV/WATER/STATUS/LEGA_WC.HTM
12	CONVENTION ON ACCESS TO INFORMATION, PUBLIC PARTICIPATION IN DECISION-MAKING PROCESS AND ACCESS TO JUSTICE IN ENVIRONMENTAL MATTERS (AARHUS, 1998); DATA AS OF 11 JANUARY 2009 HTTP://TREATIES.UN.ORG/PAGES/VIEWDETAILS.ASPX?SRC=TREATY&ID=531&CHAPTER=27&LANG=EN [AARHUS CONVENTION]
13	PROTOCOL ON STRATEGIC ENVIRONMENTAL ASSESSMENT (KIEV, 2003); DATA AS OF 11 JANUARY 2009; HTTP://WWW.UNECE.ORG/ENV/EIA/PROTOCOL_STATUS.HTML [SEA PROTOCOL]
14	PROTOCOL ON POLLUTANT RELEASE AND TRANSFER REGISTERS (KIEV, 2003); DATA AS OF 11 JANUARY 2009; HTTP://TREATIES.UN.ORG/PAGES/VIEWDETAILS.ASPX?SRC=TREATY&ID=532&CHAPTER=27&LANG=EN [PRTR PROTOCOL]
ALL THE WEB SITES VISITED 05.06.2010 N/A = NOT APPLICABLE	

Paulo Canelas de Castro

FROM A COMMON CONCEPT TO A COMMON EXPERIMENTATION: An Assessment of the Water Framework Directive's Impact on Water Management in Europe

I. INTRODUCTION

Human and ecosystem health and development depend on the quantity and quality of water. Unfortunately, since the Industrial Revolution, European waters have become increasingly unacceptable. Most European rivers were treated as a convenient way of transporting waste, thus affecting ecosystems along thousands of kilometres of waterways, harming human health, and polluting coastal and marine waters¹. Europeans have consistently expressed deep concerns about their waters; it is their single most lasting environmental concern². Even when, in 2008, they replaced water with climate change concerns³, it is still water, to a significant degree, that they are pointing to, water policies being particularly crucial to climate change adaptation⁴. Member States of the European Union have not, over the years, managed fully to meet the challenges created by this state of affairs. On the contrary, surface waters and ground waters have generally evidenced a poor status. A recent survey of water quality found that around 60% of the European water bodies fail to meet even the minimal quality criteria and 20% of surface waters are seriously polluted, with 87% of groundwater equally badly polluted.⁵ Moreover, 60% of European water services overexploit aquifers and 50% of the wetlands are at risk due to such excessive exploitation of ground waters.

1 EEA (2007).

2 EUROBAROMETER; Water Framework Directive, Preamble.

3 EUROPEAN COMMISSION (2008).

4 Canelas de Castro (2007).

5 EEA (2003); EUTROPHICATION SG.

Against this background of common concern with water and the sense that action of a new kind was urgently needed, the consistent calls for the Community to intervene are not surprising⁶. Formal environmental protection policy was “constitutionalised” for the first time by the Single European Act (1986). Community water policy entered a new stage with the adoption of the Water Framework Directive in 2000 and subsequently the establishment of the Common Implementation Strategy. These momentous changes amount to a true paradigm-shift whereby the newer Community water policy becomes functionally oriented towards sustainable development and meeting the expectations of European citizens.

II. POLICY ON THE MOVE

In spite of not being identified as such, the European Union does have a specific policy for water matters, a fact made explicit in the caption of the Water Framework Directive as well as its preamble. The Community water policy is one of the oldest environmental protection policies and the regulation is one of the most intense amongst all environmental matters. It has also become, steadily, one of the most enduring expressions of the Community Law. The European Community water policy has continually evolved since it germinated in the early 1970s with the First Environmental Action Programme. This section examines the evolution of the Community water policy from the first Directives on protection of certain waters and the establishment of water quality objectives⁷ and emission limits for some hazardous substances⁸, to the contemporary policy framework.

1. “Constitutional” Changes

There have been some significant changes in the relevant constitutional rules within the European Union. The Single European Act⁹ addressed the environmental and therefore water policy for the first time. Apart from the general adjustment resulting from the Treaty of Maastricht (1992) together with other

6 EUROPEAN COMMISSION (2008).

7 *E.g.*, Council Directive of 16 June 1975 concerning the quality required of surface water intended for the abstraction of drinking water in the Member States (75/440/EEC).

8 *E.g.*, Council Directive 76/464/EEC of 4 May 1976 on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community.

9 1986, Art. 130-S.

policies, whereby the (main) decision-making in the field evolved from the traditional unanimity requirement towards a qualified majority rule within the Council and a co-decision procedure involving the participation of the Council and the European Parliament (thus lending this latter institution a stronger weight in the global decision-making process), the Treaty of Amsterdam¹⁰ re-numbered and revised the applicable provisions.

The demand for a more specific water policy led to the constitutionalisation of the case law of the European Court of Justice that limited the apparent unanimity requirements for water policy to quantitative water management only¹¹, leaving the general rule of co-decision enshrined in Article 175(1) for most of the water management issues, including both water quality management decisions and those where quantity management is ancillary to quality management, as well as general measures of environmental protection. The current version of Article 175 reads:

1. The Council, acting in accordance with the procedure referred to in Article 251 and after consulting the Economic and Social Committee and the Committee of the Regions, shall decide what action is to be taken by the Community in order to achieve the objectives referred to in Article 174.
2. By way of derogation from the decision-making procedure provided for in paragraph 1 and without prejudice to Article 95, the Council, acting unanimously on a proposal from the Commission and after consulting the European Parliament, the Economic and Social Committee and the Committee of the Regions, shall adopt:
 - provisions primarily of a fiscal nature;
 - measures affecting:
 - town and country planning;
 - quantitative management of water resources or affecting, directly or indirectly, the availability of those resources;
 - land use, with the exception of waste management;
 - measures significantly affecting a Member State's choice between different energy sources and the general structure of its energy supply. The Council may, under the conditions laid down in the first subparagraph, define those matters referred to in this paragraph on which decisions are to be taken by a qualified majority.

The Treaty of Lisbon preserves this balance.

10 1997, Arts. 174 to 176.

11 Loibl, pp. 113-114.

2. “Legislative” Changes

The evolving character of European water policy is even more pronounced at what may be termed the legislative level. At this level, the European Union’s attention to water matters has given rise to numerous Directives and, less frequently, other legal instruments specifically designated to water, such as, for example, the Communication on water scarcity¹². A legal scholar tends rather easily to analyze the whole set into three waves of legislation¹³. The first wave corresponds to the Directives adopted in the 1970s and 1980s and lays the foundations of the Community water legal edifice, with a particular focus on industrial pollution. The second wave developed in the 1990s and it experimented with adaptations to the previously established legal regime by enlarging its core legal choices to municipalities and agriculture. The third wave, which began with the Water Framework Directive adopted jointly by the Council and the European Parliament, is much more innovative. Amending or complementing the Water Framework Directive, is the Decision No. 2455/2001/EC taken pursuant to Article 16 of the Water Framework Directive. It sets out a list of priority substances and amends Annex X to the Directive regarding the implementation powers of the European Commission. More recent Directives include the Directive on the assessment and management of flood risks¹⁴, European Marine Strategy Directive¹⁵, a new Directive, adopted pursuant to Article 17 of the Water Framework Directive on the protection of groundwater against pollution and deterioration¹⁶. Important are also the Communication on water scarcity and droughts¹⁷, the proposed Directive on environmental quality standards and pollution control in the field of water policy also amending the Water Framework Directive¹⁸, Communication concerning the first stage in implemen

12 EUROPEAN COMMISSION (2007b).

13 Grant *et al.* (2000), pp. 152-176; Krämer; Weale *et al.* (2000).

14 Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks.

15 Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for Community action in the field of marine environmental policy (Marine Strategy Framework Directive).

16 Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration.

17 EUROPEAN COMMISSION (2007b).

18 EUROPEAN COMMISSION (2006).

tation of the Water Framework Directive¹⁹ and the Common Implementation Strategy documents, the legal classification of which is not always easy.²⁰

3. “Administrative” changes

The Community water law is thus a very dynamic construction, continuously witnessing powerful developments. Such policy and legal developments have lately been spreading to other areas and, most noticeably also translated into what may be termed the administrative implementation dimension of Community Water Law. This has been so with the devising and implementation of the Common Implementation Strategy²¹. The Strategy is a very wide cooperation and coordination effort established by the European Union Member States, Norway, and the European Commission only five months after the entry into force of the Water Framework Directive.

The rationale behind the Strategy seems to be three-fold:

- First, acknowledgment that implementation of the Water Framework Directive raises momentous technical challenges to both the Member States of the European Community and other neighbouring States as well as stakeholders and non-governmental organisations;
- Second, recognition that successful and effective implementation of the Water Framework Directive depends on the design of a common understanding and approach, particularly because many European river basins are international; and
- Third, the widespread experience of non-compliance with previous water directives thus recommending a pathway less premised on formal entitlements but more on concerted cooperative action by a wide universe of stakeholders. The experience with the first and second wave of legislation was that implementation of water law remained a purely Member State competence and, because of this, the endeavour was characterized by an overwhelming degree of outright non-compliance.

19 European Commission (2007a).

20 EU WATER DIRECTORS (2001); EU WATER DIRECTORS (2003); EU WATER DIRECTORS (2004); EU WATER DIRECTORS (2006); EU WATER DIRECTORS (2007), etc.

21 Bosenius & Holzwarth.

On the whole, the Community Water Policy has been moving, lately with much vigour and momentum, in particular after the adoption of the Water Framework Directive in 2000.

4. “Judicial” Changes

The Community water policy is also materialized in the case law. In contrast to many other areas of Community intervention, often marked by the European Court of Justice’s powerful activism, jurisprudence in the water law realm seems to have had a more modest impact in terms of innovative normative ideas, concepts, or solutions. Historically, it may instead be summarized as predominantly a case law of a repeated declaration of the Member States’ failure to comply with their obligations under that Community water law²². The only structural predicate which may be attributed to this repeated finding of Community law infringement, mostly by inaction, is that it rendered clear the need to evolve.

The most noticeable exception in this regard is the European Court of Justice’s ruling in the Case C-36/98, *Spain v. the Council of the European Communities* (2001). Spain brought an annulment case against the Council for allegedly proceeding on the wrong legal basis in ratifying the Danube Convention (1994). Fearing the interpretation of Community law put forward by Spain, several countries, also not Parties to the Convention, intervened. The ruling of the Court overcame the temptation to subjugate the main measures of the Community environmental policy to the unanimity requirement of Article 175(2), henceforth clearly conceived as a narrow exception to the general decision-making rule set out in Article 175(1), leaving Article 175(2) applicable only to water management measures of a purely quantitative nature. This eliminated the prospect of submitting the Community water policy to a veto by any Member State having a conservative approach. This more restrictive reading was later translated into the “constitutional form” by the amendment introduced by the Treaty of Nice to the relevant part of Article 175(2), thus “constitutionalising” the solution found by the Court.

22 E.g., *Commission vs. Germany* (1996); *Commission vs. Germany* (1997); *Commission vs. Germany* (1999); *Commission v. Germany* (2002).

III. A CLOSER LOOK AT THE LEGISLATIVE CHANGES

These numerous changes, particularly at the legislative level, but also, more and more, those at the administrative level, are momentous and deserve closer scrutiny.

1. The first wave of water legislation

The first wave of the EU legislation may be summarized perfunctorily in half a dozen main notes:

- A fragmentary outlook - giving attention to and protection of some waters only, usually waters of interest for human consumption (drinking, bathing, fish production);
- Shallow environmental substance - the driving force for the policy development was the construction of the internal market and the concern with the comparable terms of competition among the enterprises in meeting the obligations regarding pollution and environmental standards;
- Dilemmatic instrumental use - the quality problem is unique and mainly polarised by a fight against pollution that is premised either on the usage of emission value limits or on quality standards, with poor effectiveness in the choices;
- Limited subjective scope - mainly industries are targeted;
- Traditional State-only, powerful, command-and-control approach - the general effectiveness deficit attributed to the Community environmental law is worsened by the fact that the “tiger” on which the policy relies for implementation is, in fact, rather static and even “toothless”;
- Disparate legal instruments - the Law is made up of disparate instruments, but almost only of a hard law nature.

2. The second wave of water legislation

In spite of some progress, this situation did not change fundamentally with the second wave of legislation. Particularly representative in this regard are the Urban Waste Water Treatment Directive (1991), Nitrates Directive (1991), a new Drinking Water Directive (1998), as well as (insofar as it concerns the water sector) the Directive for Integrated Pollution and Prevention Control (1996). The scope of waters covered and sectors of activities subject to this newer discipline were enlarged. Indeed, thenceforth, they equally touch the agriculture and the municipal sectors. Furthermore, a certain sense of time, so necessary in effective water management, began to come to the fore. This is evidenced, for

instance, in the consecrating of the prevailing notion of prevention.²³ This lends or accentuates a more genuine environmental tone to the Community Water Policy. There is also sensitivity in the newer legislation to the need to integrate waters and actions that naturally are interrelated or have interrelated effects and to adopt a more encompassing treatment of water problems. These positive changes remained, however, of a mere remedial nature; they were changes in a fundamental continuity with disparate but traditional state water management, only superficially imbued with an environmental sensibility.

3. The Water Framework Directive

The same does not appear true for the Water Framework Directive, a new legal instrument purporting to make a fundamental shift in the way water management is conceived. This shift may be analytically taken as resting on ten main innovative pillars that together build an impressive body of the European freshwater law, the principles of which may also influence and support the implementation of the specific European Community secondary water law. As the Water Framework Directive reinforces, it lends coherence and, not least, “teeth” (through its more effective legal mechanisms and institutions) to this sophisticated previous and ongoing legal construction.

3.1 The Holistic Treatment of all Management Problems

Newer water policy attempts to deal with the true complex nature of the manifold problems requiring management and attention over time. Management of waters was formerly confined to some particular problems only, with the prevailing quality issues. With the Water Framework Directive, management becomes much more comprehensive, henceforth embracing both quality and quantity issues²⁴. It equally starts to include provisions related to extreme events, be they droughts or floods, or accidents²⁵. The economic implications of human actions on water are equally considered²⁶ with the contribution of the public²⁷. This

23 Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control.

24 Preamble (19), (23); Art. 1).

25 Preamble (32), (39); Arts 1(E), 4(6)).

26 Arts 5, 9.

27 Art. 14.

newer policy aspires to being premised on knowledge and scientific research, data collection, and monitoring²⁸.

3.2 Integration of the Actual Complexity of Reality/Nature

With the neutral, objective, “natural” notion of river basin²⁹, all waters, be they surface, ground, transitional, or coastal and marine waters³⁰, are considered, as well as their ecosystem relations and those with wetlands³¹.

3.3 (Integrated) River Basin Management

Water management is referred to the river basin, which works as a geographical management unit³², corresponding to the real occurring problems and more environmental friendly solutions and importing the corresponding set up of the competent authorities. With this structural choice, the Community water law and management becomes oriented by ecological criteria³³, instead of relying, as it happened in the past, on administrative or political factors, artificial criteria that frequently led to ineffective water management solutions of the issues raised by reality.

3.4 Pollution Control

Pollution control and other water protection activities are functionally oriented to the environmental objectives and in particular to the general target of attaining good water status³⁴, which is ecologically defined and ambitious, ideally in 2015, and exceptionally in 2021 or 2027, derogations being however narrowly defined and tightly subject to stringent and increasingly rigorous conditions to be set out in river basin management plans and programmes of measures³⁵.

The central notion of “good status” entails a number of objectives in respect of which the quality of water is protected. The key ones at the European level

28 Preamble (12), (49); Arts 8, 11(5), 16(2), (5), 18, 20).

29 Art. 2(13), (15). – *Cf.* IIA, Berlin Rules (2004) Art. 5.

30 Art. 1(1), (2), (6), (7).

31 Art. 1a.

32 Art. 3(1).

33 Art. 3(2), (3).

34 Arts. 1, 2(18), (20), 4(1)(ii), (2)(ii).

35 Arts 4(4)–4(7).

are the general protection of aquatic ecology, specific protection of unique and valuable habitats, protection of drinking water resources, and protection of bathing water. All these objectives must be integrated for each river basin. The last three - special habitats, drinking water, and bathing water - apply only to specific bodies of water (those supporting special wetlands; those identified for drinking water abstraction; those generally used as bathing areas). Opposite to that, ecological protection should apply to all waters – the central requirement of the Treaty is that the environment is to be protected to a high level in its entirety. For surface water, “good water status” is a function of both ecological and chemical integrity. Hence, a general requirement for ecological protection, and a general minimum chemical standard, were introduced to cover all surface waters, depending on two further standards – “good ecological status” and “good chemical status”.

Good ecological status is defined in Annex V to the Directive, in terms of quality of biological community, hydrological characteristics and chemical characteristics. As no absolute standards for biological quality can be set to be applied across the European Community, because of ecological variability, the controls are specified as allowing only a slight deviation from biological community that would be expected in conditions of the minimal anthropogenic impact. A set of procedures for identifying that point for a given body of water, and establishing particular chemical or hydro-morphological standards to achieve it, is provided, together with a system for ensuring that each Member State interprets the procedure in a consistent way (to ensure comparability). The system is somewhat complicated, but this is inevitable given the extent of ecological variability, and the large number of parameters, which must be dealt with.

Chemical protection is defined in terms of compliance with all the quality standards established for chemical substances at the European level. The Directive also provides a mechanism for renewing these standards and establishing new ones by means of a prioritization mechanism for hazardous chemicals. This will ensure at least the minimum chemical quality, particularly in relation to toxic substances, everywhere in the Community.

Other uses or objectives for which water is protected apply in specific areas, not everywhere. Therefore, the obvious way to incorporate them is to designate specific protection zones within the river basin, which must meet these different objectives. The overall plan of objectives for the river basin will then require ecological and chemical protection everywhere as the minimum, but where more

stringent requirements are needed for particular uses, zones will be established and higher objectives set within them.

Another category of uses does not fit into this picture – the set of uses that adversely affect the status of water but which are considered essential on their own terms. They are overriding the policy objectives. The key examples are flood protection³⁶ and essential drinking water supply³⁷. The problem is dealt with by providing derogations from the requirement to achieve good status for these cases, as long as all appropriate mitigation measures are taken³⁸. Less clear-cut cases are navigation and power generation, where the activity is open to alternative approaches (transport can be switched to land; other means of power generation can be used). Derogations are provided for those cases also, but subject to three tests: that the alternatives are technically impossible, that they are prohibitively expensive, or that they produce worse overall environmental result³⁹.

When it comes to groundwater, its “good status” depends on chemical status and quantitative withdrawals. The case of groundwater is somewhat different than surface waters. The presumption in relation to groundwater should broadly be that it should not be polluted at all. For this reason, setting of chemical quality standards may not be the best approach, as it gives the impression of an allowed level of pollution to which Member States can fill up. A very few such standards have been established at the European level for particular problems (nitrates, pesticides and biocides), and these must always be adhered to. However, another approach has been taken for general protection. It is essentially a precautionary one. It comprises a prohibition on direct discharges to groundwater⁴⁰, and (to cover indirect discharges) a requirement to monitor groundwater bodies so as to detect changes in chemical composition and to reverse any anthropogenically induced upward pollution trend⁴¹.

Taken together, these should ensure the protection of groundwater from all contamination, according to the principle of minimum anthropogenic impact. Quantity is also a major issue for groundwater. Briefly, the issue can be put as follows. There is only a certain amount of recharge into groundwater each year, and of this recharge, some is needed to support the connected ecosystems (irrespective if they are surface water bodies or terrestrial systems such as wetlands).

36 Art. 1(e).

37 Art. 7.

38 Art. 4(4), (6).

39 Art. 4(7).

40 Art. 4(b)(i).

41 Art. 8(1).

For good management, only that portion of the overall recharge not needed by the ecology can be abstracted - this is the sustainable resource, and the Directive limits abstraction to that quantity. One of the innovations of the Directive is its provision of a framework for integrated management of groundwater and surface water that has been introduced for the first time at the European level.

3.5 A combined approach

If dramatic results are to be obtained in the control of pollution, the whole repertoire of instruments must be jointly used; there is no more room left for the traditional disjunctive approach of resorting either to emission limit values or to quality objectives, but instead a combined approach⁴² becomes mandatory.

3.6 Planning

Planning plays a crucial role in the pursuance of the new policy⁴³. The river basin management plan foreseen⁴⁴ is a detailed account of how the objectives set for the river basin (ecological status, quantitative status, chemical status, and protected area objectives) are to be reached within the timescale required. The management plan must set out all the elements of the analysis performed, including the river basin's characteristics, a review of impacts of human activities, estimation of effects of the existing legislation, and the remaining 'gap' in meeting these objectives and a set of measures designed to fill in the gap.⁴⁵ The plan must include an economic analysis of water uses within the river basin to enable rational discussion on cost-effectiveness of the various possible measures. Behind this concept, there is a more modest understanding of capacities of traditional stakeholders involved in the process (the states), and on the other hand, acknowledgement of a need to apprehend and obtain knowledge of a much wider universe of stakeholders and general information about the river related situations. There is also apprehension of cyclical nature of such endeavours or needs⁴⁶. An effective water policy and management aimed at obtaining good status for European water bodies demands many contributions to devise the

42 Art. 10.

43 Ell.

44 Art. 13.

45 Art. 5.

46 Art. 13(7).

right route and many adaptations to the long-term route defined. For that, large participation of the public and stakeholders is granted⁴⁷.

3.7 Recovery of costs

Before adoption of the Water Framework Directive, while households and main industries were generally paying for water services they were provided with, other big consumers or polluters of water, such as agriculture, contributed very little. Water services for energy production (cooling water or hydropower), business (flood control), and navigation (river deepening and straightening) rarely pay the full cost of those services, let alone the damage to the environment. To counter this and the fact that the principle of charging for water services is not uniformly practiced throughout Europe, the Directive foresees that water is henceforth to be priced and the prices have to be sound, corresponding to true costs of the services provided in the provision of water, in wastewater treatment and discharge, and in environmental services⁴⁸. One senses that this shall open the door, without declaring so, to other solutions in terms of management of the traditional natural monopoly of water - liberalization, privatization, and public-private partnerships. The market and market incentives have to be mobilized to work for the protection of the aquatic environment; adequate water pricing is expected to act as an incentive for sustainable use of water resources and thus as decisive help to achieve the environmental objectives set forth by the Directive. It is however less clear how this demanding innovative policy shall be harmonized with the guidelines set by the last sentence of Article 9(1):

Member States may in so doing have regard to the social ... and economic effects of the recovery ...

as well as with the implication of recital 1 of the Preamble, which proclaims that:

Water is not a commercial product like any other but, rather, a heritage which must be protected, defended and treated as such.

3.8 Public Participation

In attempting to get European waters clean, the role of citizens and citizens' groups is deemed of crucial importance. There are three main reasons for the emphasis on obtaining public participation. The first is that the (difficult)

⁴⁷ Art. 14.

⁴⁸ Art. 9; Annex III.

decisions on the most appropriate measures to achieve the objectives in the river basin management plan will involve balancing the interests of various groups over time (intra and possibly intergenerational equity as well). The economic analysis requirement is intended to provide a rational basis for these deliberative endeavours, but it is essential that the process is open to the scrutiny of those who will be affected. The second reason concerns enforceability. The greater the transparency in the establishment of objectives, the imposition of measures, and the reporting of standards are, the greater the care Member States will take to implement the legislation in good faith, and the greater the power of the citizens to influence the direction of environmental protection will get, whether through consultation or, if disagreement persists, through the complaints procedures and courts. Caring for Europe's waters will require wider/more intensive involvement of citizens, interested parties, and non-governmental organizations. To that end, the Water Framework Directive, which was already approved with a wide consultation of the public⁴⁹, requires information and consultation when river basin management plans are established: the river basin management plan must be issued in draft, and the background documentation on which the decisions are based must be made accessible⁵⁰. Furthermore, a biannual conference in order to provide for a regular exchange of views and experiences in implementation will be organized. Too often in the past, implementation has been left unexamined until it was too late - until Member States were already woefully behind schedule and out of compliance. The Water Framework Directive, by establishing very early on a network for the exchange of information and experience between water professionals throughout the Community, seeks to ensure that this does not happen. The third reason partially related to the former one, is knowledge, or better yet, lack of knowledge. The new European policy acknowledges information knowledge gaps and tries to overcome them, not least by widely enlarging the basis of knowledge sources and gaining, in particular, epistemic communities. These solutions are in line and anticipate the legal empowerments foreseen by the UNECE Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (1998). Altogether, effectiveness and legitimacy are two powerful drivers

49 Canelas de Castro (1998).

50 Art. 14(1).

of this new construction, one intended to have a more human face, another to have a less technocratic nature.

3.9 Coherence, streamlining

The Water Framework Directive purports to streamline and rationalize the Community's water legislation by replacing seven of the first wave Directives – those on surface water, two instruments on measurement methods and sampling frequencies and exchanges of information on fresh water quality, the fish water, shellfish water, and groundwater directives, and the Directive on dangerous substances discharge.⁵¹ The operative provisions of these directives will be taken over in the Directive, allowing them to be repealed. Furthermore, and this owes to its framework character, the Directive aims at becoming an umbrella for all water-related European legislation, namely, the new Community legislation in the fields of flood protection, groundwater protection and priority, hazardous substances.

3.10 Internationalization, Europeanization

Most European rivers and lakes are shared internationally. Sometimes they are shared by countries other than Member States of the European Union. It is therefore equally crucial that the normative programme of the Water Framework Directive promotes cooperation and coordination among the main stakeholders involved in this international scene to ensure the application of substantive regime. This requires the establishment of international river basin districts, ensuring the appropriate administrative arrangements and assigning those basin districts to competent authorities⁵² as well as, if possible, adopting joint river basin plans⁵³ or coordinating programmes of measures⁵⁴, if necessary through the mediation of the Commission, including basin States that are not Members of the European Union⁵⁵. But this is reflected equally in the attention, elegantly but also realistically normatively prescribed, to international experiences of value, which the European Union is well advised to look at, and possibly follow⁵⁶. In this as well, the Water Framework Directive reveals a commendable attention to

51 Art. 22.

52 Art. 3(3), (4).

53 Art. 13(2).

54 Art. 3(4).

55 Arts. 3(5), 13(3).

56 Art. 3(4).

a goal of normative coherence or consistency and it inscribes itself as a normative link with a definite regional outlook in a patchy network of legal documents in the European setting, equally noticeably participated by the UNECE conventions and protocols⁵⁷ as well as several sub-regional model conventions, such as the Danube Convention (1994)⁵⁸, the Rhine Convention (1998), and the Luso-Spanish Convention (1998).⁵⁹

IV. CHANGES IN IMPLEMENTATION

A buzzword, a common conceptual denominator seems to be behind the recent water policy - integration, a holistic outlook. Indeed, the new policy demands integration in several aspects: integration of goals (protection and sustainable use), integration of waters, integration of pollution prevention and control techniques, integration of administrations and other stakeholders, integration of subject-matters (“normal” management, but also management of extreme events), integration of policies, even integration of times, by asking for long-term and cyclical planning and by lending prominent attention to not only the question or time of rule-setting, but also to the question or time of implementation. Regarding implementation, other important innovations are detectable, at both the level of processes and structures and regarding the stakeholders involved. The innovations defy classification, but seem to establish new forms of governance in the water sector, again contributing to an overall impression of the changing sea.

1. A Shared Innovative Process

Such an ambitiously integrative recent water regime naturally sets a momentous challenge. Indeed, the numerous, but also profound shifts at the legislative level are already impacting implementation, starting with the entrance into force of the Water Framework Directive. The resulting process is actually less than halfway through the most demanding challenge of ensuring good status of the European Union waters by 2015, and, for the most difficult cases, by 2021 or 2027. The first noticeable and most momentous change connected with the

57 Aarhus Convention (1998); Espoo Convention (1991); Helsinki Convention on Industrial Accidents (1992); Kiev Protocol on Civil Liability (2003); Kiev Protocol on Pollutant Release and Transfer Registers (2003); Kiev Protocol on Strategic Environmental Impact Assessment (2003); London Protocol on Water and Health (1999); particularly the Helsinki Convention on the Protection and Use of Transboundary Watercourses and International Lakes (1998) .

58 Bogdanovic.

59 Canelas de Castro (2003); Canelas de Castro (2005); Canelas de Castro (2006b).

implementation process is that it is occurring in the context of the Common Implementation Strategy that was agreed upon in May 2001, devised and in the process of being carried out jointly by the European Commission and the Member States, and sometimes by representatives of civil societies.

All of this is innovative, firstly, because implementation is formally an exclusive responsibility of the Member States. However, acknowledging the complexities of the discipline as well as difficulties that implementation may entail, but, urged by the European Commission, they decided not to repeat the past record of non-compliance, opened themselves to a coordinated venture by obeying to a dynamically updated strategy that is, moreover, joined by many other stakeholders in the shared endeavour.

2. A multi-layered, participatory, complex structure

The change also occurs in the equally innovative complex structure devised, which ensures the contribution by multiple and multi-layered stakeholders. Centred on the implementation of the Water Framework Directive and according to it, the Common Implementation Strategy is designed as an informal forum for “open cooperation” and information sharing. This cooperative mode operates through a multi-level three-fold organisational structure:

- Working groups, entrusted with technical consultation and conceiving non-binding guidance documents;
- A strategic coordination group, chaired by the European Commission along with Member State representatives, responsible for receiving the working groups outputs and advising the water directors; and
- The water directors’ meetings, twice a year, co-chaired by the European Commission and the Council Presidency and steering the whole implementation process.

As the expression of the underlying working philosophy as well as the dynamic nature of the process, this structure has already known several adaptations in the reorganization of the format and tasks of some of the organisational components, according to the evolving work plans and priorities of the moment. These modifications, which left the basic profile globally untouched, demonstrate a commendable learning capacity. In parallel to this more “bureaucratic” structure, but also maintaining an interactive dialogue therewith and modelled on the Common Implementation Strategy working groups, there is a multi-stakeholder advisory forum joined by representatives from non-governmental organisations, industry associations, and external experts along with national

representatives and the European Commission. They are equally entrusted with reflecting on the whole implementation endeavour with a view to new policy development. Some of these forums have been transformed into formal Strategy working groups in the attempt to achieve a better and more effective integration of goals and outcomes.

3. Parallels and dissimilarities with other processes

The features of such process remind us of the open method of coordination, as it is normally carried out in the realm of the Community Employment Strategy or the Community Social Policy. Similarly to these processes, policy development and implementation into the Common Implementation Strategy process equally draw on targets. The Strategy is equally premised on a substantial operational fuzziness as well as lack or insufficiency of some information. This underscores the need to obtain indicators and identify benchmarks and best practices, and on that basis draw scoreboards through peer-review and adopt non-binding guidelines and strategies in a widely participated process targeting the delivery of better public policy outcomes. Finally, in another telling parallel relating to the outputs of the process, these are normally translated into soft law instruments. But, as it also occurs in some instances of the open method of coordination, examples may equally be found of these results subsequently entering into interaction with the legislative level.

Beyond these similarities, there are equally striking differences which singularize the pathway of the Community Water Common Implementation Strategy. In particular, contrary to the Employment and Social Policies, water policy is premised on a strong, clear-cut legal competence and legal basis for decision making, typically through hard law instruments. Resort to an open method of coordination is therefore, in the Community water realm, and contrary to the employment or social ones, less natural, a “necessity” merely deriving *ex post* from a certain reading of facts, more so than of law and its normative formal requirements. This, however, also indicates that the resort to this form of new governance is conceived not so much as an alternative or a default to a traditional form of governance, but rather as a complement thereto.⁶⁰ It relates to the main legislative competence level not in a disjunctive tension, but rather in a mutually cooperative and mutually reinforcing way. The outcomes of the procedure may subsequently be “fed” into the hard law making process, through a more

60 de Búrca & Scott.

traditional system, by resorting to Article 21⁶¹, and committee structure and procedure established by the said provision of the Water Framework Directive.

4. A functionally-oriented, iterative learning process

Possibly even more innovative than the fact that States (including non-Member States) opened themselves up to other contributions and inputs in the process of implementation, even if through a soft coordination/law mode, is the structure created for the purpose. This results from the premises of and the actual dynamic “game” or interplay amongst these stakeholders. In order to apprehend them, it may be important, first, to grasp that, for all new indicators and solid representation of the building blocks of this new Community water policy, for all the normative promises involved in the functional commitment to environmental objectives and, even more specifically, the target of good water status, for all the clarity in passing the normative idea that several instruments have to be used (plans and programmes of measures, combined approach, economic instruments), the text of the Water Framework Directive does not provide all the answers. On the contrary, it sometimes rather hides what may be seen as an operational gap. Indeed, there are many undetermined concepts, just as there is, equally, much indeterminacy as to the pathways to be followed and instruments to be used to pursue the goals assigned.

Above all these, the Directive implicitly acknowledges and tries to resolve a structural problem – there is a significant lack of knowledge and information that is crucial for effective discharge of obligations imparted and goals assigned. The Directive recognises that this information, which is to be obtained at different stages in the demanding process of implementation, is to be fed back into the process itself, if it is to deliver the fruits ambitioned. The implementation process, to be successful, has to be conceived as an iterative learning process, to a significant extent an open-ended one, in spite of being, almost paradoxically, a functionally-oriented one. One of the lessons of the Member States opening themselves to other stakeholders actors and interacting with them, in spite of their formally warranted exclusive competence of implementation, is precisely the need to learn with and from others, namely with and from individuals or (epistemic) communities closer to the actual problems and holding particularly

61 Regulatory committee.

relevant information for the good, rational, sound deliberation and implementation of the Water Framework Directive that is sought.

V. FINAL REMARKS

Taken together, the legislative and administrative or implementation developments, since the implementation process is conceived as an eminently learning, dynamic process, reveal four structural options encapsulating values, axiological choices, and teleological choices. These changes are materialized in particular in the following cardinal options⁶²:

- A more environment-friendly option;
- A more economy-friendly option;
- A more inclusive-relationship-friendly option;
- More coherent but also a more diversified legally-systemic-friendly option.

In this, the water policy appears as a policy axiologically and teleologically inspired, a policy and a law with an ethos and a telos, not merely a technocratic “magic” formula immune to its philosophical, political, and social context and the choices these entail. Beyond that, we may equally recognize some of the key features of sustainable development. These momentous changes are tantamount to a profound revolution in water management, a true paradigm shift from fragmentary solutions to certain types of water and to certain human activities. The new Community water policy evolves towards a holistic project, in search of sustainable management, and, with it, the satisfaction of European citizens’ hopes for the fundamental quality of their waters.

Moreover, in the current stage of attempting to translate the recent common vision of water management set out in the Water Framework Directive into facts, an additional shift is operated, one consisting of recognising the momentous nature of the challenges and humbly, but also dynamically pooling resources, capacities and a broad universe of stakeholders to better meet them, with a keen attention paid to evolving circumstances. This recent form of common experimental administration of that new common concept posited in the Water Framework Directive has, so far, seemed to deliver the results expected. It may be hoped that it shall be relentlessly pursued, particularly now that the process is approaching

62 Canelas de Castro (2000); (2005); (2006a).

the critical stage of producing the management plans which should materialise good intentions into critical difficult choices as well as tangible actions and measures set to reach the overarching goal of good water status by the not too distant year of 2015. We equally venture that this amply participated learning capacity, together with the inventive usage of the optimal water management tool which the plans should prove to be, might equally reveal themselves crucial for meeting yet another prominent challenge looming large in the horizon and pressing in the political agenda of the years ahead, but one which was only indirectly and marginally addressed in both the Water Framework Directive and the Common Implementation Strategy process: adaptation to climate change.

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Valeria di Cosmo

IS THE COST PASS-THROUGH FAIR FOR THE ITALIAN WATER SECTOR?

The Italian Water Firm Performance Determinants in a Capital Structure Oriented Approach*

I. INTRODUCTION

EU Directive 2000/60/EC promotes the adoption of a final tariff that will ensure, by the end of 2010, that water resources will be available to all (ethical objective) and that water losses will be minimized (efficiency objective). To reach these objectives WFD prescribes that the pricing scheme adopted by all European countries must guarantee the full recovery of the investment costs sustained by the firms to invest in water resources and to respect all the environmental requirements.¹

In Italy, the water price is partially fixed following a cost pass-through system and partially by a price cap scheme, so that a change in the pricing rule can lead to different results both in consumers' behaviour and in company's final performance. However, the impact of the pricing scheme on the firm's final performance and on consumer welfare is not trivial, as the final price affects the capital structure choices undertaken by the regulated firm. Recent studies have analyzed the existing linkage between the regulator's pricing policy and a firm's capital structure under different regulatory regimes. In particular, Spiegel and Spulber² analyze how a firm's debt choice is influenced by the presence of a rate of return regulation, whereas De Fraja & Stones investigate the effects of

* ACKNOWLEDGEMENT: I thank Maddalena Barbieri, Pierpaolo Pierani, Andrea Tancredi, participants in conferences at the University of Turin, at the WIEM conference in Warsaw and at the EAEPE 2008 conference for helpful comments and suggestions. Any remaining errors and expressed views are my own.

1 Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000, which establishes a framework for Community action in the field of water policy (Water Framework Directive. Hereinafter: WFD).

2 Spiegel and Spulber(1994); and Spiegel and Spulber (1997).

the price cap framework by focussing on the UK utility sector. These authors demonstrate that regulated firms can change the capital structure by raising debt in order to force the regulator to shift from the price cap scheme to a cost pass-through system, which splits the risk between the firm's owners and consumers. The increase in the debt level decreases the firm's financial costs jointly with consumers's expected prices, and this increases the regulator's utility. In fact, if consumers benefit from the new risk repartition, the regulator can shift from the price cap to the costs pass-through system. This intuition is supported by Ofwat³ who found empirical evidence of a high gearing levels in the UK water and energy sectors. In the water sector the average level of debt issued by regulated firms has stabilized at around 90% of the total asset value, and in the electricity industry gearing has risen about 25% during the last 10 years.

Even if a theoretical justification for the shift from price cap to rate of return regulation is given, an analysis of the effects of changes in capital structure choices on a firm's performance is still missing, as the existing literature does not analyze the impact of changes in the capital structure on the firm's final performance. As long as a shift through a rate of return regulation scheme might influence the leverage level issued by a regulated firm, it should be useful to consider if a high leverage levels can affect the firm's performance. It should be considered that a rise in the debt level reduces the cost of capital, leading the entrepreneur to benefit from the spread between the regulated price and the realized final costs. Then, if this spread is sufficiently high to lead to some unexpected profits, there can be some distorting effects on the final effort exerted to minimize the final (real) operative costs. If the decrease in financial costs is not sufficiently high to reach the maximum profit level, the entrepreneur might decrease his effort and then his effort costs, in order to benefit from a higher profit.

To better analyze the existing links between the pricing scheme and a firm's behaviour, the first aim of this paper is to present a survey of the existing theoretical literature that links the regulatory pricing rule to a firm's capital structure choice. The second aim of the paper is to verify if a positive link between debt levels and firm performance exists, and then this paper estimates a stochastic frontier by using Italian data on regulated water firms.

The paper is structured as follows:

- After the introduction in Section I, follows Section II where the relation between rate of return regulation and the firm's capital structure is inves-

3 Ofwat (2002).

tigated and a brief examination of the existing literature on this topic is provided;

- Section III provides an analysis of the Italian water sector;
- Section IV compares the existing literature on the Italian water sector and presents an empirical analysis relating the regulated firm capital structure choice with the firm's final performance;
- Section V concludes this work.

II. COST PASS-THROUGH SYSTEM VERSUS PRICE CAP REGULATION

In regulated sectors, within the price set by the regulator impact, the firm's expected costs, the firm's financial expenditure and the firm's return to the asset base (RAB) is reckoned. Put simply, the price level set by the regulator is determined by the firm's costs during the regulated period, RAB and by the firm's allowed return, so that under the specific assumptions discussed below, it is equal to the firm's cost of capital.⁴

This rule holds both for the rate of return and for the price cap regulation, even if these regimes are quite different for the risk allocation between the shareholders and the consumers. Under the rate of return regulation (mainly adopted in the US), prices are sensitive to changes in the firm's cost structure. Thus this pricing rule does not provide the right incentives for cost reduction, but might assure a "fair return" on the invested capital.⁵

As highlighted by Guthrie & Evans and by Guthrie, this cost computation can also be unfavourable for the regulated firm, as it does not provide the right

4 The RAB is the "cost" of the asset, as defined by Guthrie & Evans, and differs among utilities and countries; for example, in the UK water sector, it is equal to the share prices averaged over the first 200 trading days from the date of privatisation. Generally, the regulatory framework for major UK privatised utilities has converged on a market value approach to determine the regulatory asset base, as noted by Grout *et. al.*

5 The definition of "fair" return is not unambiguously specified. The Supreme court has established that a regulated firm is entitled to "fair return upon the value of that which it employs for the public convenience." (*Supreme Court Decision of Smyth v. Ames*, 169 US 466, 1898). This "fair" return is not applied to all of the firm's assets, just those that are used to meet demand (that is, "used-and-useful" assets). After a long debate on the meaning of "fair", the sentence *Federal Power Commission vs. Hope Natural Gas and Co.*, *Supreme Court, 1944 (320 U.S. 591, 64 S.Ct. 281)* determines that the return should be sufficient to assure "the financial integrity of the enterprise so to maintain its credit and to attract capital". The debate to determine the exact

incentive mechanism to the firm's managers. A variety of other cost measurement methods have been suggested in order to achieve efficient rate of return regulation, which should be independent from the firm's investment decisions. In particular, these authors underline that another regulation scheme, focused on the optimized replaced costs (or optimized deprived value) of an asset can be used by the regulator in order to influence the firm's suffered risk.

A discussion of the firm's cost computation methods in the US regulated sectors is beyond the scope of this paper, but it is important to highlight that cost measurement, the cost of capital and the allowed rate base are strictly interconnected. The regulator can fix the final prices in such a way that the firm's market value equals the regulator's allowed rate base. Moreover, when regulatory settings are normalized in order to guarantee that the firm's market value equals the firm's RAB, the allowed rate of return equals the firm's cost of capital. Thus, understanding both the relation between the capital structure and regulator behaviour as well as the determinants of the firm's capital structure choice, may be helpful in determining a model regulated pricing system.

The price cap model⁶ differs from the rate of return regulation system as in this framework the regulator fixes prices for a given period in order to cover the firm's expected costs. It should be noted that after the chosen time period, the regulator can review the prices, and then adjust them to influence the firm's investments. In this way, the price cap system is simply a rate of return rule with a lag of n periods⁷, chosen by the regulator⁸.

The main difference between the ROR and RPI-X pricing systems can be found in the linkage between the firms and the regulator. In the ROR pricing scheme the firm chooses their capital structure in order to influence the prices determined by the regulator *ex post*, whereas in the price cap the prices are determined *ex ante*, and can not then change with the firm's behaviour. Moreover, the two pricing rules differ substantially by risk distribution: if the regulator chooses rate of return regulation, he implicitly leads the consumers to carry all the financial risk and the investment project is always undertaken; meanwhile if he fixes

meaning of "fair" resolves, for many US water companies, on setting the rate base as the actual cost of the firm's physical capital (adjusted for depreciation). Alternatively, regulators may allow firms to recover the cost of "used-and-useful" assets, which are those assets judged by the regulator to be necessary to service customers' demands.

6 or RPI-X model.

7 in UK n equals five years; in Italy, three years

8 Helm (2004).

prices following a price cap rule, he leaves the equity risk to the shareholders and underinvestment arises.

Besides, in the US framework, the cost of capital approximates the cost of government debt, considering that the water service is provided by a monopoly. Indeed, the risk premium given to the equity is almost equal to zero, as the investors do not carry any risk, which is completely transferred to the consumers. In contrast, in a pure RPI-X framework, the risk premium must be higher than zero, as the risk is totally (or partially) suffered by the shareholders.

During the UK water sector privatization in 1989, this consideration gave strong incentives for cost reduction and prevailed in choosing the pricing formula adopted by the regulator, which was a pure price capping system. This choice can be also understood considering that, under the RPI-X rule, the regulator leaves to the firm the gains obtained from a reduction in cost below the level assumed by the regulator in the price setting process: in this way the regulation can force the firm to raise its efficiency and then obtain lower expected prices for consumers.

Thus, the UK approach seems to give an efficient answer to both problems which emerge from the US experience – the informational problem between the regulator and the firm during the price setting process and the incentives to the utility company in the period before the price review.

However, even the RPI-X pricing system presents different drawbacks. First, there is an implicit trade-off in the price cap system between efficiency incentives and financial costs. If the regulator chooses to implement a rigid RPI-X system by assigning the risk to companies, the cost of capital increases. This effect can be exacerbated by an *ex post* regulator intervention, made to correct the initial pricing system and then to make the allowed returns rise in order to finance additional capital expenditures. Moreover, the regulated firm can issue an increasing amount of debt in order to reduce the cost of capital under the established target, and thus benefit from the financial cost reduction.

As underlined by Cowan⁹, the utilities market is characterized by sunk investment costs and if the regulator chooses to revise prices, the firm's manager faces uncertainty about future prices and can choose to delay investment or to simply under-invest.

9 Cowan (2006)

In spite of the initial enthusiasm, the recent UK regulatory experience has highlighted that the application of a pure RPI-X system can be subject to substantial failures and it has been partially revisited in recent years, especially in the water sector, but also in the electricity and gas industries.

From the works of Helm¹⁰, Ofwat¹¹ and HM Treasury/DTI¹², it emerges that especially in the water sector, there is still a lack of convergence on a theoretical framework that might be adopted by the regulator. This could be due to the relatively recent privatization experience and to the absence of strong empirical evidence. On one hand, it should be considered that as consumers are risk adverse, a pure rate of return regulation can not be adopted. On the other hand, in order to encourage the high degree of investments necessary in the water sector, a pricing rule that also leaves some guarantees to the shareholders must also be determined.

As the US and the UK experiences highlight, the application of a pure pricing system (ROR or RPI-X) can turn against the consumers' welfare due to a decrease in cost efficiency. Thus, an optimal pricing system has to consider both rate of return and price cap regulation aspects. In order to find a theoretical answer to the emerging UK evidence of an increase in firms' indebtedness level, De Fraja & Stones suggest that the firm can force the regulator to a higher rate of return pricing scheme simply by increasing its debt level, whereas Helm¹³ suggests adopting a mechanism that finances the RAB component with a RPI-X pricing system and the capital expenditure with a rate of return compensation.

The model proposed by De Fraja & Stones and Stones relies on the fundamental assumptions of symmetric information and agent risk aversion. These authors assume that both consumers and shareholders are risk adverse, that the managers are risk neutral down to their reservation utility, and that debt holders are infinitely risk adverse. The assumption on the shareholders risk preferences can be explained considering that as the debt holders are infinitely risk adverse, the regulator must guarantee that the debt will be repaid under all circumstances, and then the cost of debt is equal to the risk-free interest rate. In contrast, no limited liability is ensured to the shareholders, who bear a greater risk than the debt holders and (due to their risk aversion) require an higher return given a firm's high debt level.

10 Helm (2003); and Helm (2004).

11 Ofwat (2004).

12 HM Treasury/DTI.

13 Helm (2004).

The model is structured as a one period game – a positive exogenous shock on the firm’s cost structure occurs with an exogenous probability and then the regulator maximizes the consumer’s indirect utility function under the debt holders, shareholders and firm constraints. The maximization process leads to the determination of only the optimal price level, while wages remain undetermined. It is important to note that although in their model the authors explicitly consider the manager’s effort as a cost, the model relies on the symmetric information hypothesis and thus, for every price combination the provided effort is always set at the optimal level. In this way, the authors demonstrate that under certain conditions, the regulator can influence the capital structure chosen by the firm, simply by determining the optimal price level.

As the authors hypothesise that the equity holders are also risk adverse, the pricing rule has to shift through a rate of return compensation system: indeed, as long as the debt holders are fully insured against bankruptcy risk, it is impossible to both repay the debt and to guarantee a positive expected return to shareholders. Then, in order to also provide optimal insurance to the shareholders, the socially optimal capital structure must leave some price uncertainty.

This can be demonstrated by simply allowing the firm to choose their capital structure. In this case the authors find that the socially optimal level of debt is greater than its equilibrium level and in order to respect the debt holders constraint, prices in a bad state of nature must rise with respect to the price cap rule. It becomes clear then, that the optimal capital structure must lie between the debt equilibrium level (pure price cap system with all the risk carried by the shareholders) and the socially optimal level (rate of return regulation with all the risk suffered by the consumers). More precisely, the optimal capital structure must be set where the benefit of expected price reductions balances exactly the cost of the increase in price variability.

Some considerations can be drawn from this model. First, it can explain the recently observed UK dash for debt phenomenon – as the shareholders are risk adverse, it is convenient for the firm to substitute equity for debt, in order to increase price variability and give greater insurance to the risk adverse shareholders. This explanation is convincing only if it is reasonable to hypothesise that it is impossible to reach a sufficient risk diversification in the shareholders portfolios.¹⁴

14 If the shareholders were risk neutral, the equity premium disappears, and a risk free return can be assumed on the shareholders investment. If this hypothesis holds, the model fails to provide an explanation for the firm’s incentive in substituting equity for debt. Indeed, the derivative of the welfare function with respect to the equilibrium debt level becomes exactly equal to zero, and the debt level chosen by the firm under a price cap system can also be considered the socially optimal debt level.

Second, it is possible to compare this model with the literature referring to in the US situation. As highlighted by Spiegel and Spulber¹⁵ and Spiegel¹⁶, under the assumption of the shareholders risk aversion, the firm can *de facto* induce the regulator to change their optimal pricing strategy, in order to guarantee the limited liability constraint to the debt holders and to assure investor participation.

The second type of contribution is given by Helm¹⁷ who defines the “split” cost of capital, that is the opportunity to finance the RAB component by debt (with a lower cost of capital) and the capital expenditure by equity. In his recent contribution, Helm¹⁸ defines four different possible financial structures for a regulated firm and finds that “floated equity funds” would be optimal in order to have control over possible RPI-X problems and to unambiguously determine efficient risk allocation.

The author suggests buying the utilities with outside investors by creating an investor’s fund, without selling the firm’s assets. In this way, investors can enter whenever they choose from the floated fund without resealing the underlying companies. The equity risk is thus pooled within a portfolio, the ownership of which carries the risks.

Although the author proposes a possible solution in order to manage risk allocation, the impact of this strategy on incentives to invest must be still investigated. In other words, it is not clear how this approach can be reflected in the effort exerted by the regulated firm. The importance of a risk efficient allocation in the regulatory system emerges also in Cowan¹⁹, even if in this model the firm’s capital structure is not explicitly considered. This author analyzed a symmetric information framework, in which the firm’s owners (shareholders) are risk neutral with respect to income, but risk adverse with respect to prices. Finally, the consumers are hypothesised to be risk adverse with respect to the income and to prices. In his model, the author suggests that a two part tariff would be optimal in order to achieve both an efficient risk allocation between the firm and the consumers and allocation efficiency.

Even if the author does not consider explicitly the capital structure problem, he highlights how importance it would be to relax the rigid price cap formula in order to give to the regulated firm some insurance, which reflects the degree

15 Spiegel & Spulber (1994); and Spiegel & Spulber (1997).

16 Spiegel (1994).

17 Helm (2004); and Helm (2006).

18 Helm (2006).

19 Cowan (2003).

of consumers' risk aversion. Thus, this approach, consistent with De Fraja & Stones, implicitly encourages the Water Framework Directive prescriptions which state that final pricing setting should shift to a more cost pass-through scheme orientation. Again in this model however, the incentives given to the firm's manager are not considered in the formal analysis.

Thus, the prescription to shift from pure RPI-X rule to a combination between the rate of return regulation and the price cap can be seen as a simple demonstration of Helm's²⁰ conclusion – a change in the currently adopted UK regulator pricing system is desirable, even if some considerations should be drawn. First, the presence of perfect information supposed in the theoretical models that encourage the shift from price cap to cost pass-through does not allow consideration of the (possible) perverse effect of the rate of return regulation on the manager's incentives scheme. Second, in the water sector, the regulator may adopt measures in order to protect (up to a certain point) the regulated firm against any bankruptcy risk. Therefore, this intervention can implicitly influence the water companies to substitute equity for debt.²¹ An entrepreneur of the water firm, in order to benefit from the spread between the regulator fixed price and the firm's suffered costs, conveniently increases the firm's indebtedness level in order to reduce the cost of capital. However, for sufficiently high debt levels, and a sufficiently low cost of capital, some distorting behaviour can emerge with respect to the final firm's efficiency. More precisely, as providing effort is costly for the entrepreneur, he/she can lower his/her efficiency level and can then choose the input levels that do not effectively minimize the final operative costs. Finally, as a firm finds it optimal to reduce their equity financing component, there is also a reduction in the buffer against possible negative shocks, which is completely shifted to the consumers.

Here it is important to highlight here that the pricing rule embedded in the Water Framework Directive and which will be effectively applied from 2010, can induce some positive behaviour in terms of capital structure choice, as underlined by De Fraja & Stones, but some aspects which link the final capital structure choices and the final effort level in a cost pass-through system should be better explored.

20 Helm (2004).

21 See De Fraja & Stones.

III. REGULATION OF THE ITALIAN WATER SECTOR

The Italian water industry is composed of approximately 106 companies and is highly fragmented, as the service concession is usually assigned at the municipal level by the local policy maker. Some water companies serve fewer than a thousand customers while others serve more than a million customers. There is also great regional dispersion – some companies operate at the provincial level, others at the regional level, and still others serve several regions across Italy. It is important to consider all these differences when analyzing different macro-regions.²²

Despite the Galli Law that formally encouraged consolidation between different companies, there is still great company heterogeneity in different authorities (ATO) and quite frequently the same company serves more than one optimal administrative division. The number of companies in different administrative regions is reported in Table 1:

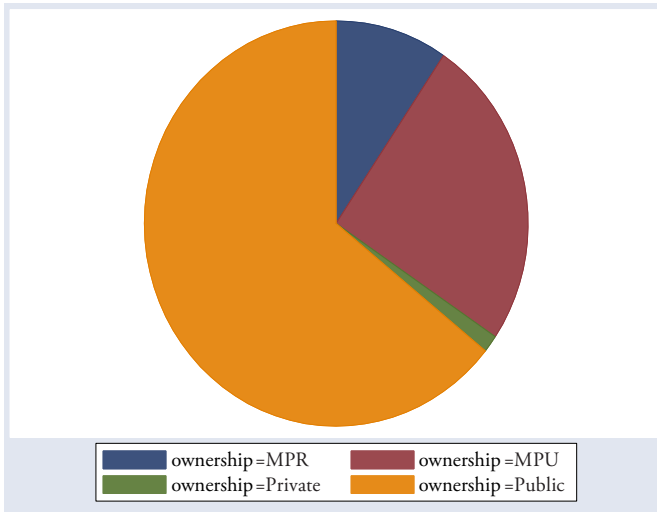
Table 1
Local Authorities (ATO) and Companies per Regions²³

Region	Number of ATO	Number of companies
Piemonte	6	29
Lombardia	6	11
Veneto	7	12
Friuli	1	1
Liguria	2	5
Emilia Romagna	9	10
Toscana	6	6
Umbria	3	3
Marche	4	6
Lazio	4	4
Abruzzo	6	6
Campania	2	2
Puglia	1	1
Basilicata	1	1
Calabria	3	3
Sicilia	5	5
Sardegna	1	1

- 22 The dispersion of service across different companies can be better understood considering that the main reform of the Italian water sector known as the Galli Law promoted a division of the Italian climate homogeneous areas into 99 sub-regional administrative divisions (ATO) that can autonomously decide their water company concession and that are coordinated by a central regulator (COVIRI) which is still dependent on the Italian Environmental Ministry.
- 23 COVIRI. Data on Trentino Alto Adige, Molise and Valle D' Aosta are not available since the ATO were not yet established.

Moreover, another source of heterogeneity arises when considering the firms ownership. The partial liberalization of the water sector introduced with the Galli Law resulted in a large fragmentation in the ownership of different firms. In Italy, the majority of the water companies are publicly owned, but there are also companies that are totally private and companies that have more than 50% of their management controlled public or private owners. Figure 1 below illustrates the distribution of of Italian water firms's ownership:

Figure 1
The Ownership of Italian Water Companies²⁴



In which:

- MPR = companies in which private shareholders hold more than 50% of the total value of the firm;
- MPU = companies that are in the majority publicly owned.

Every ATO considers the companies that serve its region as legal local monopolies. The final tariffs on the water distribution companies are determined at the local level by the 93 different authorities, following a common criterion proposed by the Inter-ministerial Board for Economic Programming (CIPE).

The Galli Law tried to both introduce the full cost pricing principle and to promote cost efficiency (accordingly to WFD), by introducing tariff regulation which at the national level is based on yardstick competition.

The final tariff is determined in two different steps. In the first step, each company defines its own tariff composed of a fixed charge and a variable component. Then, in the second step, the firm submits this tariff to the regulatory authority for approval. The tariff is approved only if the level of the variable component does not exceed a range of approximately 30% with respect to the regulator's benchmarking valuation.

In order to determine the best tariffs, the regulator adopts the CIPE criterion (expressed below as eq. [1]), calculating the "ideal" variable costs of the regulated company as:

$$c=1.1y^{0.67} * KM^{0.32} * PUMP^{0.1} * \exp\{0.2 UT\} + El + A$$

in which:

- y = the cubic meters of delivered water;
- KM = the length of the network in kilometres;
- $PUMP$ = the average pumping head;
- UT = the pro capita measure of water delivered;
- El = the expenditure for electricity; and
- A = the expenditure for water bought.

In the regulatory framework the possible linkages between capital structure choice and a firm's final performance are not explicitly considered, taking into account neither the Italian specificities in terms of ownership type, nor the number of customers served.

IV. ITALIAN WATER COMPANIES PERFORMANCE: AN EMPIRICAL ANALYSIS

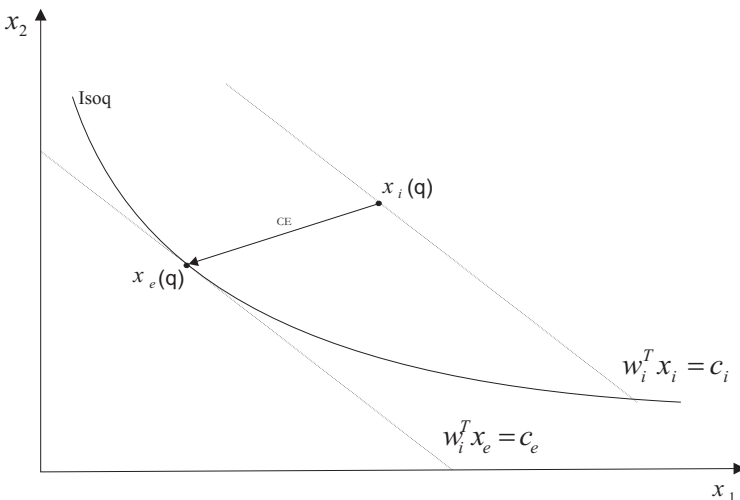
In this section, the main work that study the efficiency of the water sector are presented and an original analysis of the Italian water sector is proposed, in order to consider the peculiarities of this sector and to investigate the link between

the capital structure choices of the Italian water firms and their effects on the firms' final performance.

The existing literature on the performance of the water companies is mainly based on the estimation of the stochastic cost frontier. This technique allows the empirical distance existing between the realized operative costs and the theoretical minimum cost function to be estimated.

In formal terms, it is possible to suppose that each firm produces output $y_i \in \mathbb{R}_+$ given the vector of input prices $w_i \in \mathbb{R}_{++}^M$, and chooses a vector of inputs $x_i \in \mathbb{R}_+^M$ in order to minimize its total production cost $c_i \in \mathbb{R}_+$. The Figure 2 simply illustrates this problem, for $M=1,2$:

Figure 2
Technical and allocative inefficiency



Thus the efficient use of inputs is x_e , as this point lies both on the isoquant q and on the isocost line closest to the origin $c_e = w_i^T x_e$. By using x_e to produce y_i the producer effectively minimizes his costs, whereas to produce the quantity y_i by the inefficient input quantity x_i , the firm faces a total cost given by:

$$c_i = w_i^T x_i > w_i^T x_e .$$

Moreover, the firm has access to technology A for turning inputs into outputs and it is possible to suppose that this technology depends upon a vector of unknown parameters. The so-called cost frontier measures the minimum cost that can be obtained from a given level of input prices. In practice, the actual costs

for a firm may rise above the minimum level. The deviation of the actual from the minimum achievable cost is a measure of inefficiency.

All the works that study the possible determinants of water sector efficiency estimate this kind of frontier, assuming that the linkage between the operative costs and the production input follows some log-linear relations. It is quite common to impose that the production input enter in the cost function with a trans-logarithmic specification and then to test whether the collected data accepts or rejects this distribution hypothesis.

This specification allows comparison of the results with the methodology used by Italian regulators and described by eq. [1], since the benchmark established by the regulators is simply given by the estimation of the firm's cost function, in which the explicative variables are the total cubic meters of water delivered, the kilometres of pipelines and the expenditure on raw materials. Measuring inefficiency as the distance between the theoretical cost minimization and the firm's realized costs firstly allows estimation of the coefficients of eq. [1] and secondly computation of the inefficiency components in a two-step procedure.²⁵

There is a vast literature that studies the determinants of water firm performance. Generally, most of the contributions try to investigate the impact of different ownership on the final firm efficiency in order to test the theoretical assumption under which privately owned firms performs better than the publicly owned firms.²⁶ A seminal paper for the water industry provided by Teeple & Glycer, who estimated the performance of 92 US water delivery companies, found a weak relation between private ownership and firm's efficiency. Moreover, these authors highlighted the importance of the financing choice to correctly determine the firm's inefficiency. Although these authors do not consider the leverage level as an exogenous variable that directly affects the firm's inefficiency term, they include the firm's financing choice in the measurement of the price of capital. This work, to the best of my knowledge, is the only one that explicitly recognizes the importance of the source of financing in analyzing a firm's performance.

25 The two step procedure used to estimate the stochastic frontier is fully described in Battese & Coelli (1993), Battese & Coelli (1995), and in Kumbhakar & Lovell.

26 A group of authors, such as Clagget, Ashton, Garcia & Thomas, and Sauer & Frohberg investigate the linkage between firm's size, spatial effects and the firm's performance for a sample of US, French and German water utilities. All these authors find the presence of economies of scale and then highlight the role of vertical integration in order to improve the firm's final performance.

Furthermore, beyond the output variable, Teeples & Glycer reckon on other explicative variables, such as the connection per mile of lines, the percentage of metered connections and a water treatment index, in order to control all the possible sources of difference among different firms. This work therefore highlights both the importance of correctly specifying the financing choice and the well known omitted variable bias – in order to correctly understand the source of inefficiency, it is important to include the variables that clarify the existing relation between the cost of production and a firm's performance.

A different result is obtained by Bhataccayya *et al.*²⁷ who examined a sample of 225 public and 32 private water utilities using data from a 1992 survey on the US water industry. These authors determine that publicly owned firms are more efficient than private utilities on average, but they are also more dispersed between best and worst practices. Furthermore, the same authors analyzed in 1995 a sample of 221 companies, and found that for small companies, private ownership negatively affects the firm's inefficiency, while the reverse occurs for high output levels. Then again, the linkage between ownership and efficiency is not straightforward but depends on the size of the considered firm.

To better understand the Italian specificities, the contributions given by Fabbri & Fraquelli and Antonioli & Filippini, which also investigate the presence of economies of scale and scope in Italian water utilities, should be taken into account. However, although these works investigate the determinants of inefficiency of the Italian water sector they do not consider the importance of the choice of the source of financing. Moreover, these authors ignore the impact of the company's ownership on the firm's final performance, since they collected data before 1994, before the liberalization process took place.

Fabbri & Fraquelli analyzed 173 water Italian utilities in the year 1991. Before the publication of the Galli Law in 1994, the Italian water sector was highly fragmented, and at the time the 173 companies sampled represented only 3% of the total Italian suppliers, even though they accounted for more than 50% of the total water production. These authors firstly estimate a transcendental logarithmic equation, in which they do not consider the price of capital in order to avoid any co-linearity problems. Moreover, due to the relatively small number of observations, they include in the estimation demand share equations, and then adopt the Seemingly Unrelated Regression²⁸ methodology. Finally, imposing all the theoretical restrictions, they have to switch to a Cobb Douglas specification

27 Bhataccayya *et al.* (1994).

28 SUR methodology.

that they find better fits their data. In order to control for the size effects, they separate the companies by the number of served consumers. They find that for small companies (*i.e.* with a number of served inhabitants lower than the national average) the possibility to benefit from economies of scale exists. Otherwise, for larger companies, there are no benefits from a size increase.

Antonioli & Filippini also analyzed a panel of 32 Italian companies for 5 years, from 1991 to 1995, and estimate a Cobb Douglas efficiency frontier with a random effects estimator. Although their findings are quite similar to Fabbri & Fraquelli, they did not find any evidence that larger service areas result in scale economies in water distribution. Moreover, these authors directly include in their analysis a dummy variable that indicates the presence of chemical water treatment. A possible shortcoming of the existing literature on companies which serve the Italian water sector is to include directly in the cost function the environmental variables that should affect the inefficiency terms. It is therefore possible that their results are affected by bias due to wrongly specifying the cost function.

In order to investigate whether a linkage between the capital structure chosen by the regulated firm and the firm's efficiency exists, I follow the Fabbri & Fraquelli and Antonioli & Filippini approaches by including in my analysis a financial indicator that is an index of leverage magnitude. Moreover, in order to consider the Italian specificities presented above, I also include in my analysis a dummy variable that controls for the firm's ownership type and a dummy variable that controls for the number of consumers served by the firm.

I estimated a stochastic frontier following Battese and Coelli²⁹. As determinants of a firm's operative costs I include the cubic meters of water delivered, the price of capital (measured as the ratio between tangible and intangible assets on the total asset value), the price of labour (measured as the ratio between the expenditure on wages on the number of effective workers) and the price of raw materials (measured as the ratio between the expenditure on raw materials and the kilometres of pipelines).³⁰

As highlighted before, I suppose that some variables can directly affect the mean of the firm's inefficiency. In particular, I included in my analysis a dummy

29 Battese & Coelli (1993); and Battese & Coelli 1995).

30 In Italy there is no unified and official database that collects data from all the water companies. Moreover, there is still a lack of transparency in some of the ATO management, as data on a firm's operative costs and cubic meters of water delivered are not published by the different local authorities. I collected data for 65 different companies, which represent 60% of the totality of the Italian water companies.

variable that controls for the ownership type, and a dichotomy variable that assumes a value equal to 1 if the considered water company presents a leverage level³¹ higher than the Ofwat threshold, equal to 0.5.³² In order to correctly estimate my model, I firstly impose the homogeneity of the cost function with respect to the input prices, then I adopted the two step procedure described by Battese and Coelli³³. Table 2 below contains the estimated coefficients and the corresponding standard errors.

Table 2
Estimated Coefficients

Variable	Est. Coefficient	St. Errors
$\lg y$	0.502	0.0626'
$\lg p_L$	0.570	0.0951'
$\lg p_M$	0.212	0.0637'
D_{cons}	0.720	0.2530'
$D_{leverage}$	0.786	0.3533'

in which:

- y = the output;
- p_L = the labour price;
- p_M = the raw material price;
- D_{cons} = the dummy variable that controls for the firms heterogeneity;
- $D_{leverage}$ = the dummy that controls for firms that are heavily indebted; and
- (*) denotes a variable which is significant at the 1% level.

My results are quite intuitive, since all the coefficients present the expected signs. It may be particularly interesting to compare my results with Fabbri & Fraquelli and Antonioli & Filippini in order to better understand the differences between the different models.

31 Measured as the ratio between the company's net debt on the firm's total value.

32 In Italy, the indebtedness of the water companies has not received particular attention by the different local authorities. Thus it is not possible to find a benchmark study.

33 Battese & Coelli (1993); and Battese & Coelli (1995).

First, my empirical analysis shows that the leverage level positively affects a firm's inefficiency. This result is particularly important, since all the theoretical models that justify a cost pass-through system ignore the presence of possible distortive effects of this pricing scheme on the effort level, via the firm's capital structure choice. Moreover, WFD that prescribes the full cost recovery principle in determining the final water tariff from 2010 in all the European countries should lead the different Italian regulators to determine the optimal price such as to induce the efficient consumption of water and to encourage the regulated firm to perform efficiently. The latter point is particularly important, as the regulated firm might reduce their costs by issuing a large proportion of debt, but this implies a greater inefficiency level.

Therefore, it should be crucial for the Italian authorities to monitor the final's output level and the gearing level to inhibit the regulated firm from incurring in a dash for debt phenomenon that might lead to a decrease in the efficiency of the firm.

Second, with respect to the cost function explicative variables, some analogies can be found in my analysis with respect to the other works relating to the Italian water sector – the cost elasticity with respect to output is equal to 0.502 in my estimation whereas in Fabbri & Fraquelli it is equal to 0.673 and in Antonioli & Filippini 0.603. These results can be due to the different structure between my models and the previous works.³⁴ Moreover, the elasticity of cost with respect to material price is equal to 0.212, which is not statistically different from the results reported in the Fabbri & Fraquelli (0.11) and Antonioli & Filippini (0.2) frameworks. The difference between the cost frontier estimated in my analysis and the equations estimated by these authors is also reflected in the coefficient of the labour price, which is equal to 0.57 in my work against their results of 0.39³⁵ and 0.325³⁶. Finally, in my model, from the imposed homogeneity conditions, it is possible to derive the elasticity of the capital input as 0.22.

Third, my work highlights that the firm's size positively affects the final costs of the considered firm, with an elasticity equal to 0.72. As highlighted above, after 1994 there was a strong incentive to consolidate the Italian water companies, in order to reach a homogeneous level in the final firm's size. The presence of a posi-

34 Although I included the input prices in my analysis, Fabbri & Fraquelli did not analyze the impact of the price of capital in their work, and this can lead their results on output elasticity to be overestimated.

35 Fabbri & Fraquelli.

36 Antonioli & Filippini.

tive coefficients for this variable suggests that some scale economies might still emerge in the Italian water sector, especially for the smallest water companies.

Finally, my results show that a firm's ownership does not significantly affect the inefficiency level.³⁷ This result is confirmed by the works of Teeples and Glycer and Bhataccaryya *et al.*³⁸ which do not find clear evidence of greater efficiency in private than in public water companies. However, in order to understand this result for Italian water companies, it is important to highlight that the regulatory uncertainty strongly affects the firm's efficiency as the presence of small regulators might lead to weak or ineffective incentive schemes. The results reported in my analysis on the lack of linkage between the firm's ownership and the firm's inefficiency can dramatically change after the enhancement of the regulatory power or the rise of regulator's independence. Thus, any other consideration on water company privatization should probably be postponed.

V. CONCLUSIONS

This paper presents a critical survey on the existing theoretical literature on the linkage between regulatory regimes and capital structure of utilities companies. In particular, I focused on the water sector, and empirically estimated the linkage between the capital structure, the ownership and the efficiency of 65 Italian regulated firms.

The first relevant result is that firms which present a high debt/equity ratio present strong inefficiency levels. Then, to adhere to WFD, the regulator should consider financing investments in the Italian water sector by shifting from a price cap to a cost pass-through pricing scheme for capital expenditures. Additionally, the regulator should carefully monitor the firm's activity to check that the new pricing scheme effectively reduces the real costs instead of leading the firms to increase debt jointly with their inefficiencies.

Second, my empirical results show that no statistical relation emerged between the ownership and the efficiency of the Italian water companies. Thus, at a first glance, the sector liberalization promoted by the Galli Law in 1994 has not improved the firms' efficiency. However, this result can be easily understood as

37 The Wald test made to test whether it would be possible to impose all the ownership variable (except one, in order to avoid multicollinearity problems) equal to 0 was accepted with a p-value equals to 0.96.

38 Bhataccaryya *et al.* (1994).

in Italy there is no independent Authority for the water sector, and the Italian legislative relies on 93 different (small) local Authorities that can introduce regulatory uncertainty in the system and then encourage inefficient behaviour both in public and private firms. It should be noted, however, that the results of my analysis could change dramatically if effective independency of the Authority from the Environmental Ministry is achieved.

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AUTONOMIZATION OF DRINKING WATER MANAGEMENT SUPPLY? The Tunisian Experience*

I. INTRODUCTION

Following the New Public Management (NPM) trend in the OECD countries, the political-managerial philosophy of distributed public governance seems to be taking root in the grounds of the MENA countries' public sector¹. The efficacy, efficiency and economic principles entailed in this approach are beginning to be implemented in the region by means of “agentification” and “agency autonomization” of the public sector².

* ACKNOWLEDGEMENTS: This study builds on several collaborative research tools. First, discussions that took place during the PhD Seminar titled THE ADMINISTRATIONS AND PUBLIC SERVICES: BETWEEN FRAGMENTATION AND COORDINATION. EXPERIENCES IN THE OECD COUNTRIES, ALGERIA, TUNISIA AND LEBANON, held in Granada in January 2007 within the framework of the POLIBIUS project and with the financial assistance of the Euroarab Foundation for Higher Studies (FUNDEA). This paved the way for engaging in the field research in Tunisia in June, 2007. The authors in particular want to thank the Tunisian hosting team for facilitating the research. Finally, a pilot version of this work was presented in the European Group of Public Administration (EGPA) Phd Seminar titled PUBLIC MANAGEMENT AND PUBLIC GOVERNANCE. NEW DEVELOPMENTS IN PUBLIC SECTOR RESEARCH, held in Madrid in September 2007. An advanced version was presented in the Workshop titled LAW OF WATER MANAGEMENT IN THE MEDITERRANEAN – PAST, PRESENT, FUTURE, held in Montecatini Terme in March, 2009, within the framework of the Mediterranean Research Meeting, organized by the Robert Schuman Centre and the European University Institute. The authors would like to express their gratitude for the generous contributions received from the directors and participants of these forums of debate. Finally, the authors would like to note the substantial funding of the Anna Lindh Euro-Mediterranean Foundation for the Dialogue between Cultures.

1 OECD.

2 Savas.

Needless to say, the autonomization process is not free of complexity. After all, a neutral distribution of functions does not exist³. It involves the adoption of the principal “managerial” choices that affect the distribution of functions within the state apparatus, and which can in turn influence politics’ content, actors’ behaviour, civic culture and community development⁴. In other words: autonomization processes also imply critical “political” choices. That is the key question: the autonomization process progresses with difficulties especially when political choices must entail the weakening of the central government’s control over strategic and essential sources of power.

The complexity is even more pronounced if one considers autonomization of particular sectors in specific contexts. This is the case of autonomization of the MENA countries’ systems of drinking water distribution. Given the vital character and increasing scarcity of this resource, fresh water management has been considered to be the key challenge for the new millennium.⁵ Within the consideration of this challenge, good governance practices of agentification and agency autonomization are insistently recommended by various multilateral and bilateral international agreements oriented towards the MENA region (*i.e.* within the framework of the Euro Mediterranean Partnership and the European Neighbourhood Policy). However, given the strategic nature of this valuable resource, the governments of some MENA countries seem to be reluctant to lose substantial managerial control over it. Indeed, the range and extent of actions conducted by these central governments in this arena demonstrate certain political misgivings toward the implementation of such a governance reform.

This dialectic actuality is particularly notable in the *Tunisian casuistry*. On the one hand, the outstanding political and social value of the water resource in Tunisia is indisputable. The water sector has always had the central position in the Tunisian Government’s development agenda. Within the MENA region, Tunisia is one of the most drought-prone countries with only a limited amount of renewable water resources at its disposal. While the average level of renewable

3 Gate.

4 Putman.

5 International agreements, calling for governance reform in the sector (including autonomization) are numerous. In the aftermath of conferences such as the 1992 Rio Summit, the 1992 Dublin Conference, the 1997 Kyoto Protocol Climate Conference, and the 2002 Johannesburg Summit, all major international institutions developed their own water management policy (*e.g.* European Water Framework Directive (1998, 2009-2015); World Bank Water Resources Sector Strategy). While traditional institutions were, until the 70s primarily involved in “administering” the supply of drinking water, it is now commonly recognized that current institutions have to “manage both the supply and demand” (World Bank, 2000b).

water in the Middle East and North Africa amounts to 1.200 cubic meter per capita (cm/capita), in the Tunisian case it amounts to the average is 486cm/capita⁶. Only about 4.2bcm of water resources in total are available each year for exploitation, and these are distributed in an uneven way across the population and different economic sectors⁷. As 80% of this amount is earmarked for the agricultural sector, only 15% is left for human consumption. This precarious situation in the country is additionally complicated by two major constraints, threatening the scarcity even more: the remote location of water resources from consumption centres, and generally low water quality⁸. Given these difficulties and taking into account the vital character of water, Tunisia strongly needs to develop a bold strategy and sound management structure for the distribution of drinking water⁹.

Yet, on the other hand, despite this necessity, evidence also suggests a certain caution of the Tunisian Government towards the encouragement of any serious and definitive reforms that could go further than mere declarations of intentions and the adoption of measures without real content. While international pressure and local demands are calling the Government of Tunisia to modernize the drinking water management system, these requests have apparently not influenced the Tunisian Government's disposition at all. A truly strong strategy that applies the principles of efficacy, efficiency and economy in the water sector management, employing autonomization practices, is apparently taking a long time. Certainly the historical, environmental, cultural and instrumental conditions of the Tunisian political and administrative systems interfere in the adoption of this type of reform. However, these are not the only factors that obstruct the autonomization of the fresh water management sector. Political conventions and contingencies also seem to have influenced the adoption process to the major extent. These general observations constitute the rationale of our research design.

This paper aims to describe, analyze and explain the current state of autonomization in the Tunisian water sector. In doing so, the paper contains considerations on theoretical foundations, analytical strategy and the methodological tools that orientate the empirical study. Then, it proceeds by providing a contextual perspective of the autonomization phenomenon within the Tunisian political-administrative scenario by pointing out the features of the current stage of the Tunisian process of transition and the conditions of the modernization of the

6 Shobha.

7 SONEDE.

8 Perard.

9 Aouij-Mrad; and World Bank (2000a).

Government Administration herein. The following section outlines the specific circumstances that surround the Tunisian style of governance in the water sector. This section starts by describing the structural and functional dimensions of governance imposed on the distribution of drinking water. It continues by analyzing the level of policy, financial and managerial autonomy enjoyed by the principal Government organization that operates in this specific domain. Finally, the paper closes by summarizing the research findings, proposing the explanation for them, and raises the key research questions pending.

II. RESEARCH FRAMEWORK

1. Theoretical Considerations

Several dilemmas come together when analyzing the autonomization issue from a theoretical perspective. Any comprehensive understanding of the topic obliges us to address three specific questions. What does autonomy mean? What does autonomy entail? What determines autonomy?

Any research of autonomization within this context involves the challenge of how to translate abstract expressions into operative means. Three statements underline every attempt to resolve the theoretical controversies over the meaning of autonomy, its dimensionality and its nature. We schematized them in the following way:

- *Inclusiveness of the meaning of autonomy.* Autonomy operates at two levels. It concerns as much the level of discretion over decision-making that Government organization's enjoy¹⁰, as the exemption of any constraints on such organizational discretion.¹¹
- *Completeness of the autonomy dimensionality.* Different dimensions of the autonomy phenomenon need to be considered: managerial, financial and policy.¹² The managerial dimension concerns both discretion and constraints on decision-making about the level of salaries, conditions of promotion and the way of appointing, evaluating, promoting and discharging personnel. The financial sphere entails discretion and limitations over decision-making about loans for investments, and tariffs

10 Künneke; Christensen; Savas; Gilardi; and Christensen & Laegrid.

11 Verhoest *et al.*

12 Künneke; Christensen; Gilardi; and Verhorst *et al.*

for services or products among other aspects. Finally, the *policy* aspect refers to the result of the combination of discretion and constraints on decision-making over political questions.

- *Comprehensiveness of the nature of autonomy.* We argue that the endogenous discretion and exogenous constraints on the autonomy of the Government organizations imply a dual nature: formal and informal¹³. As such, Government organizations may have formal discretion in political, financial and/or managerial terms, but they may at the same time be faced with informal limitations, impeding the discretionary exercise of one or several of these attributions.

More questions arise when we research the subject matter empirically. Every attempt to adapt the theoretical definition of autonomy to the distinctiveness of a real and specific scenario confronts us with the difficulty of operationalizing the autonomy concept in accordance with the features of the specific research context. Challenged by the Tunisian casuistry, we decided to apply the following dual strategy:

- *Adaptation of the organizational autonomy concept in accordance with the features of the Tunisian scenario by reviewing the idea of “agency”.* We substitute the term “agency” (appertaining to the Anglo-Saxon administrative tradition) with the expression “autonomous organization”. In so doing, we focus on those Government organizations that operate within the drinking water framework, characterized by the following organizational features:
 - being part of the national Government administration;
 - being provided with a complete or partial legal identity separate from that of the state, remaining isolated within a ministerial department and relating directly to the top hierarchy of the ministry by quasi-contractual relations; and
 - being created specifically with a “mission-based function” that requires specialization, expert decision-making and a certain degree of autonomy;
- *Translation of the abstract expressions of organizational autonomy within the Tunisian political–administrative context into operative means by following the legal status criterion.* Taking into account the Tunisian legal-administrative tradition, we concentrate on those Government organizations that presumably enjoy a higher level of autonomy by definition of their legal identity. More specifically, we focus on those entities which

13 Verhoest *et al.*; and Christensen & Laegrid.

have acquired the status of *Établissements Publics Non Administrative*¹⁴ and *Établissements Publics*¹⁵.

2. Analytical Strategy

We assume that the autonomization pattern operates as a dependent variable within the broader constellation of political-administrative processes. In this respect, we hypothesize that variations in the level of autonomy are ultimately the result of structural-instrumental and political dynamics¹⁶. To test this hypothesis, our analytical strategy evolved in two steps.

The first analytical phase of our study, covered by section III, is dedicated to the review of the features of the Tunisian political-administrative scenario that frame the process of autonomization within the Government administration. The reasons why we decided to depart from this contextual approach are manifold. Different practices of autonomization within the public sector eventually lead to dissimilar doctrinal ideas about good governance principles¹⁷. It can be said that each doctrine is rooted in a particular political-administrative philosophy about “the public”. Ultimately, these practices have been influenced by specific contextual circumstances. Therefore, we agreed that a contextual political analysis must be fundamental for every preliminary comprehension of practices of autonomization that take place within the public sector of the specific case under study.

The second stage of analysis, discussed in section IV, focuses on the application of these concepts and performances to the particular organizational design of the Water Sector subdivision designated to “provision of drinking water”. Firstly, it offers a descriptive analysis of the distribution of functions between different public organizations appertaining to this subdivision. This analytical phase continues by studying the formal and informal relations that these Government organizations maintain with other Government and private bodies. It subsequently proposes a critical evaluation of financial, political and managerial autonomy that these Government bodies enjoy while fulfilling their respective functions.

14 E.P.N.A. (Non Administrative Public Establishments)

15 E.P. (Public Establishments)

16 Savas; Christensen & Laegreid; and Newman.

17 Aucoin.

3. Methodological Tools

We have employed different sources of data for the empirical phase of this research. On the one hand, we relied on data of a secondary order provided by the Government organizations and international organizations active in the MENA countries. On the other hand, we also managed information acquired during semi-structured interviews with central political and administrative Tunisian actors during a two-week research stay in Tunis.¹⁸ Additionally, we were locally supported by a team of Tunisian scholars specialized in the study of the Tunisian Public Administration, and with whom we had the chance to discuss our primary findings on the subject matter.

III. CONTEXTUALIZING MODERNIZATION OF THE TUNISIAN PUBLIC ADMINISTRATION.

Tunisia currently finds itself in a dialectic phase of evolution. Historical legacy, present needs and expectations over the future are all determining the Tunisian structure of opportunity for the achievement of economic growth, international aperture, political democratization, institutional reform and social modernization.¹⁹ Hence, within this framework, global processes, regional trends, national circumstances and local conditions are all impacting on the road taken by Tunisia to carry out its economic, political and social transition.²⁰ Similarly, international, regional and national institutions, acting on behalf of public, private, local or foreign interests, are interacting through cooperation, competition or opposition to the Tunisian constellation of collective actors.²¹ The dialectic character of the Tunisian stage of development has forced the Government to manage this complexity. On this point, Zine al-Abidine Ben Ali, the President of Tunisia, has stated many times:

The Change is a continuous process requiring endless and relentless efforts, so as to cope with the challenges ahead²².

Hence, the Executive needs to modernize its administrative apparatus not only in accordance with the OECD-inspired NPM principles, but also in compliance

18 18th June -1st July 2007.

19 Murphy.

20 Camau.

21 Testas; Cavatorta & Durac; Durac & Cavatorta; Pace; and Powel.

22 Hachana.

with the diversity and uncertainty of the political process of transition of Tunisia. In doing so, the Government has to reconsider the role of the State in the national context and in the international environment. This requirement entails the review of both the understanding of ‘the public’ and the concept of the relationship between public and private. This involves an additional layer of complexity: it obliges answering a sequence of critical questions about the required level of (in)dependence of Governmental organizations, and about the reasons and objectives of such (in)dependence.

In Tunisia, the preliminary response given to this type of questions is the result of a balancing act between various –often conflicting– demands and trends. It seeks to reconcile the contradictions between deeply rooted concepts over the “convenient” interaction between the political and administrative branches of the Executive and recently assimilated NPM principles. Thus, strategies of conservation and attempts of transformation are overlapping in the Tunisian Government agenda for the autonomization of different organizational subdivisions of Public Administration. Specifically, the autonomization process can be said to be driven by the mutual interplay of the “modernization accelerator” and the “over-presidentialization hand-brake”. Subsections 1 and 2 closely study this subject matter.

1. The modernization accelerator

The trend of modernization in terms of autonomization is leading to reconfiguration of organizational and legal dimensions of the Tunisian Government Administration. Two principal features characterize the process. On the one hand, it responds to different pragmatic requirements. On the other hand, it is heavily inspired by the formal taxonomy of the French Public Administration.

The need to decentralize Public Administration functions requires the establishment of different organizational formulas, depending on the nature and specificity of the tasks to be performed. In this regard, one could find several attempts aimed at functional decentralization and structural autonomization within the Tunisian central Government Administration. This is reflected in the creation of Non Administrative Public Establishments, and Private Law Administrations inspired by the French *Établissements Publics Industriels et Commerciaux*.

Into the bargain, Tunisia is going through liberalization and a dismantling of public monopolies. This dynamics entails the practical necessity of establishing autonomous organizations in charge of regulation of certain economic markets. This in order to facilitate the relationship between public and private sectors and to guarantee free competition between the different private operators

involved²³. Hence, this rationale clarifies the creation of Regulatory Authorities²⁴ within certain sectors of Public Law Administrations modelled along the French *Autorités Administratives Indépendantes*.

Yet, despite huge similarities, one should note that the Tunisian model of autonomization differs from the French one with regard to the nature of the link that remains between the Executive and the Administration. This observation constitutes the primary theme of analysis of the following sub-section.

2. The Over-Presidentialization Hand-Brake

As outlined above, the autonomization phenomenon can be analyzed from a managerial approach, a financial perspective or a policy standpoint. In the Tunisian case the President of the Republic interferes in all three arenas by means of domination over the Government and the Administration.

The Presidential domination relies as much on formal constitutional attributes as it does on informal Tunisian political practice.²⁵ As the Chief of Public Administration, Ben Ali has demonstrated his –barely contested– authority over the Administration by using his general autonomous regulatory power. In fact, as Ben Achour²⁶ points out:

*...l'intervention présidentielle dans l'activité administrative est devenue plus effective, plus fréquente et plus directive.*²⁷

23 EUROPEAN COMMISSION.

24 *Autorités Administratives*.

25 The Presidential model of Government given to the Republic of Tunisia by the Constitution from 1957 granted to the President Bourguiba the functions of the Chief of State, Chief of the Executive and Chief of the Public Administration. The constitutional reform from 1969 broke the hegemonic executive power of the President with the creation of a new figure of the Prime Minister. The subsequent evolution of Tunisian Presidentialism between 1969 and 1987 – deeply affected by the deterioration of Bourguiba's health and the increase of political influence of the Prime Minister Ben Ali – went on accentuating the two-fold nature of the head of the political system, which was reflected in the consolidation of the political leadership of Ben Ali. However, once Ben Ali became the President of the Republic, all signs of strengthening the role of the Prime Minister vanished by means of the constitutional reform from 1988. Since then, political practice has relegated the Prime Minister's functions to merely assisting the President's manoeuvring.- Ben Achour.

26 Ben Achour.

27 The Presidential intervention in administrative activities has become more effectual, frequent and directing.-[English translation by authors.-Ed].

In addition, the over-presidentialization of Administration has led to the over-presidentialization of organizational tools designed to modernize the Tunisian Public Administration. First, the President is in charge of appointing and dismissing the heads of different Ministries and political positions that concern modernization of the Government Administration.²⁸ This is the case with the Delegated Minister – hierarchical superior of the Director General of Public Administration, the Director General of Public Service Quality and the Director General of Administrative Reform. The same situation exists for the Secretary General of the State. The latter is the hierarchical superior of the offices in charge of organization of Public Establishments and Enterprises and monitoring of productivity of Public Establishments and Public Enterprises. Second, the President is the one in charge of the supervision of key Regulatory Authorities that are supposed to be “politically independent” from the Government. Finally, the President holds general autonomous regulatory power on the base of his role of the Chief of Public Administration. He has the capacity to create Government organizations and suppress public services by the Decree. In this way, the structural and functional dimensions of the E.P.A.s, E.P.N.A.s and Administrative Authorities are subjected by the Decree to discretionary presidential definition (and redefinition)²⁹.

IV. GOVERNANCE AND AUTONOMY OF THE WATER MANAGEMENT SECTOR IN TUNISIA

Having outlined the main tenets of the administrative modernization process in Tunisia, and the inhibiting and accelerating factors, we continue by systematically studying whether, how and to what extent these factors have determined the governance of modernization of the water sector. In doing so, we analyze the formal and informal levels of autonomy enjoyed by organizations operating in drinking water distribution.

1. The governance structure of the drinking water management in Tunisia
According to the ‘Water Code’, promulgated in 1975³⁰, the Tunisian State is the single proprietor of hydraulic resources of the country, in all its varieties. Since

28 Klibi.

29 Further description of Presidential interference in the EPNAs and PEs autonomy are presented in section 3.

30 Code des Eaux, 31/3/1975.

the implementation of this Code, which is the main legislative text governing the water sector in Tunisia, the entire hydraulic domain has been placed under the supervision of the Ministry of Agriculture, Environment and Water Resources (MAEWR)³¹. The MAEWR formulates water sector policies and strategies, and coordinates investment planning and the allocation of resources.³² Several public entities are put under its control.³³ However, we shall focus our attention on the *Société Nationale d'Exploitation et de Distribution des Eaux*³⁴, since it is the major entity dealing with the distribution of drinking water in Tunisia, which is responsible for the supply of drinking water in urban areas and large rural centres (of over 500 inhabitants), and which has – in formal terms – a level of autonomy.

2. Analysis of the nature and level of autonomy of SONEDE

Contrary to what its name *Société Nationale d'Exploitation et de Distribution des Eaux* might suggest, SONEDE is not a commercial “society” in Tunisian legal terms, but an *Etablissement Publica Caractère Industriel et Commercial* – a public non-administrative entity with an industrial and commercial character³⁵. Its specific mission and responsibilities are defined in the Law no. 68-22, by which SONEDE was established in 1968. As stipulated in article 2 of this founding law, SONEDE's objective is to:

supply all the country with drinking water. It is hereto entrusted with the exploitation, maintenance and renewal of facilities for water capture, transportation, treatment and distribution.

For fulfilment of these purposes, SONEDE has explicitly been given a monopoly status, though with the possibility to partially grant concessions to other

31 Shobha; and Allaoui (2007).

32 World Bank.

33 The distribution of water in rural places, falling outside the SONEDE periphery, is being carried out by the MAEWR directly, through its General Directorate of Rural Engineering (DGGR). For the realization of water distribution in these remote areas, MAEWR has been represented since 1989 at the regional level through the Regional Agricultural Development Commissions (CRDA) (Aouij-Mrad; and El Batti). With the legal status of E.P.A., the latter are in charge of the execution of the Government's agricultural policy at a regional level, including water distribution. For their part they are assisted by the “*Local Development Groups of Public Interest*” (AIC) - water user groups handling water distribution at a local level, though under the strict control of the State (Aouij-Mrad). However, this paper will not concentrate on these bodies because these are classified as E.P.A., and consequently, *a priori* excluded from any substantial autonomy.

34 SONEDE

35 Allaoui (2004, 2006, 2007).

parties³⁶. The classification of SONEDE as a public non administrative entity³⁷ might to a large extent already suggest its relationship with its parent ministry and the level of autonomy it can enjoy.

2.1 Control and Steering

SONEDE is managed by the Board of Directors. This Board, consisting of 12 members, includes representatives from 6 different ministries, a representative of the National Sanitation Office, a representative of the Tunisian Union of Agriculture and Fishing, a union representative, three members representing the users, and the Chief Executive Officer³⁸ – who directs this Board. All members, chosen on the basis of their skills and experience, are appointed by the parent ministry MAEWR. CEO is nominated by the Decree, upon recommendation of the MAEWR³⁹.

As for all other public entities with an industrial and commercial character, a five-year contract between the SONEDE and the state sets out the general objectives and obligations of both parties. In addition, this contract details the performance targets for the SONEDE, specified by 24 technical, financial and social indicators. However, no penalties are imposed on these organizations in the case of partial implementation of the contract. There is also no explicit evaluation of the CEO⁴⁰. Although the SONEDE and the Ministry are formally jointly involved in the development of the contract, it is obvious that the objectives coincide with the general political priorities of the Government. Detailed controlling mechanisms normally ensure that the decisions of the parent ministry are respected.

While the Board of Directors is considered to be the guardian of the correct execution of the contract, it is itself monitored by two “state controllers” (a financial and a technical controller) who are nominated by the Ministry of Finance.

36 Loi n°68-22, Article 2.

37 E.P.N.A.

38 CEO.

39 Loi n°76-21, Article 4. **Specifically before the 1976 law was implemented, the position of a CEO as such did not exist within the SONEDE. Until then, the Board of Directors was chaired by the President, elected among and by the Board Members. The General Director was at that time in charge of the administrative, technical and financial direction of the SONEDE. The latter was nominated by the Board, and attended the Board meetings without a deliberative voice. Considering this evolution of the structural control of SONEDE, it can be said that the organization has, with the Presidential nomination of the CEO, become increasingly politicized.**

40 Bajetti *et al.*

Both have a consultative voice on the Board; and as such directly represent the supervising authority within the SONEDE. They advise the parent ministry of the SONEDE's investment and functional accounts, and seek their approval.⁴¹

Apart from the permanent monitoring of implementation of the program contract, the yearly financial statements are also controlled by the SONEDE's internal audit unit, as well as by an external audit institution⁴².

2.2 Autonomy of the organization

2.2.1 Strategic and operational personnel management autonomy

In examining the various changes and amendments to the law that have established the modalities of public enterprises in Tunisia, we can clearly see a gradual reduction of personnel management autonomy of those entities over time, especially with the implementation of the 1996 law. This law was specifically enacted to avoid possible misuses of autonomy and to exert more control.⁴³ In accordance with this law, and the legal texts establishing its specific operational characteristics, the SONEDE needs to submit all proposals in the area of human resources management for approval to its supervising authority (*i.e.* MAEWR). No substantial decision discretion is left within this field. The organizational chart, as well as the specific conditions and procedures for recruitment are entirely fixed by the Decree.⁴⁴ Similarly, although the SONEDE can propose the working conditions of the personnel and the levels of salaries, the overseeing ministry takes all final decisions.⁴⁵ Within the restrictions of this framework, the SONEDE is in charge of the internal evaluation of its personnel members, which takes place on a mid-yearly basis. However, no specific performance targets exist, and nor is there is no specific incentive system for performance.⁴⁶

2.2.2 Financial management autonomy

Being a public non-administrative entity with industrial and commercial character, SONEDE has its own revenues, which allows it to operate without any direct state subsidies. This does not however to any extent imply any financial

41 Loi N°89-9, Article 15.

42 Bajetti *et al.*

43 Loi n°96-74.

44 Loi n°96-74, Art. 10bis -11bis.

45 Loi n°68-22, Art. 16.

46 Bajetti *et al.*

autonomy. Structural control mechanisms prevent the SONEDE from taking any budgetary decisions without approval of its overseeing ministry. The presence of financial controller on the board is in this respect an extra guarantee.⁴⁷

Political influence is further apparent in the decision about the tariff level that SONEDE is charging. Considering water is a fundamental right of all the citizens, the Tunisian Government has opted for the so-called “progressive tariff structure”, which is uniformly applied across the entire nation. The tariff structure consists of a fixed part and a variable part which increases proportionally with the level of consumption. Thanks to generous subsidies of the Tunisian Government, this tariff structure allows all consumers to be able to afford the minimum amount of water. However, due to this subsidizing strategy, the tariff neither reflects the real economic cost of water, nor differences in costs from one region to another are taken into account.⁴⁸

The Tunisian Government itself fixes the specific tariffs, which they revise periodically but not systematically. SONEDE can submit tariff adjustment requests to its overseeing authority⁴⁹, but tariff increases have not always been granted, nor have prior formal commitments to adjust tariffs have always been respected. To date, the tariffs have been sufficient to cover the SONEDE’s operating and financial costs and to yield a surplus for financial investment.⁵⁰ However, international commentators doubt whether this model is sustainable.⁵¹ The “political” review procedure does not allow SONEDE to introduce any modifications itself, if it considers them necessary. Nor can it take out any loans, without the prior approval of the Government.⁵²

In addition to water sales, revenues also come from connection rights, which amount to 15% of SONEDE’s annual revenues. But these fees are also set and revised in their entirety by the Government. Hence, SONEDE’s financial position is extremely vulnerable and dependent on its supervising authority.

Its autonomy may be restricted even more, if we consider the increasing financial burden of SONEDE’s expansion into low return market segments (rural areas) and its investment in costly techniques for water desalination. Also SONEDE’s

47 Loi n°68-22, Art. 11-13.

48 Perard; and Allaoui (2007).

49 The MAEWR reviews tariff adjustment proposals before approving them jointly with the Ministry of Finance.

50 Bajetti *et al.*

51 Perard; and World Bank.

52 Loi 68-22, Art. 14-16.

monopolistic position is in this respect often considered to be a factor limiting the potential for flexibility and investment efficiency.⁵³ Although granting of concessions in the water sector is legally allowed, SONEDE has traditionally performed the majority of its activities through in-house service provision, including a lot of ‘non-core business activities’ that are only indirectly related to water supply. However, given the recent challenges, the Government has become aware that privatization reforms may be required to increase water sector efficiency. As such, the SONEDE has recently started to outsource part of its (non-core) activities, particularly in the case of large scale works (100% contracted out), network extensions (90%) and new connections (55%). Stimulated by the international environment (*e.g.* the World Bank), that has promoted the need for private sector involvement in a productive water sector, bigger plans for subcontracting are currently being investigated.⁵⁴

2.2.3 Policy autonomy

As is the case with other public enterprises in Tunisia, a five-year program contract sets out the strategic framework within which the SONEDE can operate, and the Board of Directors is in charge of its operational implementation. However, taking into account the wide range of control mechanisms incorporated (both explicitly and implicitly), one might question whether there is any room left for operational discretion. As it can be deduced from the law specifying the modalities of public enterprises, the Board of Directors itself does not have any real decision-making autonomy, since no action can be put into effect without the final approval of its supervising ministry⁵⁵. Furthermore, the composition of the board is designed to avoid any deviation from the pre-established political priorities⁵⁶. Finally, the permanent presence of “state controllers” is an extra safeguard for the execution of the Government’s strategy.

2.2.4 Performance of SONEDE

As argued by the NPM theories, it is often assumed that autonomy correlates positively with performance. Therefore, considering the above points made about SONEDE, one might expect weak performance. However, empirical results do not confirm this statement. Limited autonomy has apparently not impeded the

53 World Bank.

54 BANK-NETHERLANDS *et al.*; and World Bank.

55 Loi n°96-74, Art. 10.

56 *See supra* “structural control”.

SONEDE from obtaining good results, especially when compared with other countries in the MENA region.⁵⁷

Among the medium income countries in the region, and despite the difficult geographical conditions, Tunisia has achieved the highest access rate to water supply. SONEDÉ is said to rank among the most solid public operators in the region. Access to safe drinking water is nearly universal (100%) in urban areas and 85.4% in rural areas. The low rate of non-revenue water losses in its distribution systems (18% on the average) is an additional indicator of its high standards.⁵⁸ As stipulated earlier, SONEDÉ's financial performance is also enviable, so far.

Nonetheless, the SONEDÉ's successful water supply model is threatened by recent institutional, socio-economic and structural challenges. As illustrated above, the increasing costs tend to outpace the tariff adjustments, which endanger the SONEDÉ's self-financing and cost-recovery capacity.

Appropriate measures therefore need to be taken in order to maintain SONEDÉ's high achievement level. Among other factors – as privatization, decentralization, customer focus, better labour cost management and a more widespread use of outsourcing and technology – international organizations also argue for the need for more autonomization, in order to maintain these high performance rates.⁵⁹ Within this framework, the World Bank has recently agreed to fund a project for SONEDÉ, which explicitly aims for *inter alia* improved competitiveness and autonomy.⁶⁰

V. DISCUSSION AND CONCLUSION

From the 1970s the “NPM doctrine” has dominated the administrative reform agenda of many OECD countries, and is now also gradually incorporated in the MENA countries' public sectors. This article focused on exploring and explaining the state of affairs of one of the key tenets of the NPM paradigm

57 A description of the functioning and autonomization of the water sector in Algeria and Lebanon can be consulted on the website of the Euro-Med Public Administration Researchers Network: <http://soc.kuleuven.be/io/eumepar/index.htm>.

58 World Bank; Allaoui (2007).

59 World Bank.

60 “Tunisia Urban water supply project”, ID P064836; Project implementation period: January 2006-December 2011. No results are available yet for this project.

–“*autonomization*”, in one of the most vital sectors – “water”, in one of the most drought-stretched MENA countries – “Tunisia”.

The overarching hypothesis which guided the research assumed that variations in the level of autonomy are ultimately the result of structural-instrumental and political dynamics. In assessing this hypothesis, the article sought to conciliate inclusiveness and concreteness. It hereto:

- Assessed the bibliography on the NPM principle of autonomy;
- Adapted this theoretical understanding to the research interests of the present study;
- Translated the operative concept of autonomy to the particular reality of Tunisia;
- Contextualized the Tunisian process of autonomization within the framework of dialectic and transitional stage of development of the country;
- Described the structure and functioning of the water sector; and
- Attempted to explain the nature and extent of autonomy enjoyed by the Government organizations operating in this field.

Various findings were emphasized in the course of the work. The contextual analysis identified in the Tunisian modernization agenda a counterbalance between strategies of conservation, attempts at imitation and intentions of transformation. For its part, the descriptive study examined the different governance organizations involved in the water subdivision titled “distribution of drinking water” and explained the dissimilar nature and extent of formal and real autonomy enjoyed by the *Société Nationale d’Exploitation et de Distribution des Eaux* (SONEDE). In doing so, the study showed that, to date, Tunisia has only to a limited extent followed the international standards for “good water governance”.

In the undisputable good performance of its water sector, the Tunisian Government has found an excuse to postpone autonomization reforms. The characteristics of the sector itself might to a large extent explain its limited level of autonomization. More than other sectors, water supply possesses by nature many characteristics that makes it intrinsically highly political. Like no other commodity, water is essential for human life, and is even considered a universal human right.⁶¹ As such, it might be said that the one who has the right to control

61 Allaoui (2006).

water resources, has *de facto* also the right to control human life.⁶² Similarly, since water is an important input for industry and agriculture, one can also claim that control over water to a large extent involves control over the economy. Moreover, strategic character of water will increasingly gain importance in Tunisia, if one considers increased urbanization, population growth and the deployment of new industries in the country. In addition, given the social dimensions of water, the President's reluctance to autonomize the sector may be understood in the context of his inclination to dominate the Administrative apparatus of the state as a whole.

Finally, the closing stage of the research process necessitates a meta-reflection over the present work and its forthcoming developments. We realize the limitations of the current research approach. For this reason, we would plea for a continuation and enlargement of the present study in order to complete gaps of information that surround the cumulated knowledge about the research topic. In addition, it might be interesting to develop a more general and unbiased conceptual framework, allowing for more comprehensive comparative studies that include other MENA countries as well. We would also welcome the chance to see the methodological collection and treatment of data polished, in particular by expanding the constellation of actors interviewed and perfecting the analysis of the actor's discourse. Additionally, it would be interesting to improve our explanatory reflection by developing more specific methodological tools to measure the specific impact of each determining factor identified on the Tunisian process of autonomization.

62 Aouij-Mrad.

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Hèla Yousofi

UNIVERSAL MOTIVATIONS AND LOCAL INTERPRETATIONS: The Public Private Partnerships Case of a Drinking Water Management Contract in Lebanon

I. INTRODUCTION

After a short overview of the main approaches to the problem of contractual arrangements in urban services, we introduce the importance of cultural challenges behind implementing contractual choices suggested by practice. To test the propositions derived from this cultural perspective, we have investigated a case study of a management contract for drinking water in Lebanon signed by a French private company and Lebanese authorities. The results of this investigation have helped us to develop the implications of cultural analysis for dissemination and malleability of universal tools such as PPP¹ in improving water services.

1.1 Main approaches to the problem of contractual arrangements in “urban service”

The explosion of needs and the limits of public authority financing capacities are bringing pressures on the management of urban services. New organizational forms are emerging, based on closer involvement of private companies. A great variety of contractual arrangements coexist today in the provision of public utilities such as water supply, urban transportation, and electricity.² The main approaches to the problem of contractual arrangements have been developed in recent economic literature. One approach focuses on the asymmetry of information between the government and the operator as a key factor in the provision of public utilities³. A second approach emphasizes the allocation of residual property rights in the decision to outsource a service versus providing

1 Public Private Partnership.

2 Ménard & Saussier.

3 Laffont & Tirole.

it “in house”⁴. A third approach analyses the choice of a mode of governance as the search for a form that proposes relevant incentives *ex-ante* without neglecting the role of contractual hazards that will require adaptation *ex-post*. The degree of adaptability required, and therefore the form of the contract will depend on the characteristics of transactions at stake.⁵ The study of institutional elements surrounding contracts (political influence, legislation) becomes one of the most important factor helping actors to make the most satisfactory mode of governance between the large varieties of contractual arrangements.

These approaches were initially developed for analysing cooperation between firms and for explaining the trade-off between making or buying and were progressively extended to take into account intermediate modes of “hybrid arrangements”. Inter-firm cooperation that combine characteristics of market and hierarchical relations are seen as alternatives to pure market relations. This framework has been recently applied to the decision that a government must make between providing a service itself, or outsourcing it through contractual arrangements.

Thus, under economic developments, the issue of contracting has moved centre-stage in many contributions to the analysis of public private partnership in provision of urban services. A contract is considered as a way of creating a project organization in order to reduce the chance of the deceit on which opportunism depends; and to ensure the project participants are properly incited so that all the project participants do indeed share common objectives.⁶ The economic perspective puts the emphasis on the incentive mechanisms but neglects *ex-post* adaptation that requires the implementation of contractual choices.

We are provided with a vast economic literature on the choice of the mode of governance made by governments to provide a service or to outsource it (the if). Studies on the impact of its implementation (the how) on the effectiveness of relations are much less developed. However, while earlier research adopted an economic perspective and regarded inter-firm cooperation as a contractual issue, more recent socio-economic researches acknowledge cooperation as a socially negotiated construct⁷. Studies on the role of social capital, trust⁸ and repetitive interactions⁹ complements the rational agent perspective of economic

4 Schleifer *et al.*

5 Williamson (1999).

6 Williamson (1979).

7 Macaulay.

8 de Ven *et al.*

9 Granovetter.

based approaches. By following different perspectives and using different levels of analysis, scholars have tried to investigate the influence of mechanisms based on social embeddedness on contractual safeguards¹⁰. While the recent focus on the social embeddedness of partners has undoubtedly benefited understanding of the usage of contractual coordination, the literature on inter-firm cooperation still presents contrasting and even contradictory views of contracts¹¹. A contract is described at times as a “central mechanism” in inter-firm cooperation and at other times as a “secondary issue”, depending on the characteristics of the transaction and on the nature of the relationship between partners. This divergence of views may be best explained from a cultural perspective. Taking the role of contract in shaping a stable cooperation between partners from different nations as the unit of analysis, we propose to explore another way to study the usage of contract in inter-firm cooperation. We will explore in the next sections the challenges revealed by contract implementation in some projects, and we will insist on the importance of cultural perspective to shed light on the functioning of contracts in such projects.

1.2 The challenges relating to the implementation of contractual choices

The choice of the most relevant mode of governance for providing urban services efficiently, *i.e.* at a low price and with high quality, remains an open question. The basic tendency in developing countries is to open up towards the private sector. Or, there may sometimes be a lack of national public operators able to carry out projects involving highly sophisticated technology. This makes it necessary to seek the services of international groups. The many solutions adopted for urban service management and the many forms taken by the contractual system produce contrasting results. While some contracts start off on a good footing, others are negotiated under difficult conditions or even come to nothing. Experience shows that this kind of contractual agreement is difficult to implement. In Mali, a management contract financed by the French Development Agency¹² in 1995 was prematurely interrupted, following a succession of political issues as well as misunderstandings among the partners¹³. This case is not isolated, other contracts financed by the World Bank met difficulties leading to their interruption or their revision¹⁴. For example, a management contract for drinking water and

10 Blumberg.

11 Sobrero & Schradder.

12 *Agence française de développement* (AFD).

13 Hibou.

14 IGD.

sanitation services in Buenos Aires, or an urban heating system in Prague. The analysis of these experiences illustrates the importance of the socio-economic context in the operational management of contracts. Day-to-day operations raise problems and unanticipated questions such as:

- How will the private sector option affect industrial structures;
- How does regulation respond to changes in corporate organization policies;
- How to manage crucial renegotiation phases, learning the local institutional and cultural framework;
- The place of contractual obligations in mitigating opportunism and stabilising cooperation, regarding perceptual models of partners involved in the cooperation.

Therefore, although public private partnerships are shaping a new general framework, a single reproducible model does not exist. There are many challenges to be met – not only reconciling investment and profitability with access to services for the most disadvantaged but also ensuring that partners get to know, the local context, creating the conditions for mutual understanding, and meeting requirements for successful cooperation¹⁵.

We suggest that it is preferable to have a balanced, adaptive action framework to provide urban services in the best conditions, to develop networks or to make investments. Such a framework should include beyond an analysis of the institutions, rules and practices, a cultural lens that help understand the challenges faced by stakeholders in implementing contracts as well as an effective regulation. A complete understanding of the impact of national culture on PPP requires a deep analysis of the process and implementation of contracting. In the next section, we will introduce a case study used to address this question as well as the methodology that we adopted in investigating the influence of culture in implementing effective PPP.

II. DATA COLLECTION AND ANALYSIS ¹⁶

We investigated a case study of a management contract for drinking water in (Lebanon) signed by a French private company (Promostate), and a Public Lebanese Office for Drinking Water (SONAT). For issues of confidentiality, we

¹⁵ Yousfi (2007).

¹⁶ The findings were published in Yousfi, H. (2010).

use different names for the organisations concerned. The contract was funded by the French Development Agency. The role assigned to Promostate within the Contract is to manage the water facilities whereas SONAT had to supervise the provided services while keeping the legal responsibility *vis-à-vis* their clients.

For many years, the drinking water supply in “City” has been beset by problems of quality (cut-offs, shortages in summer, long repair times, etc). Added to this, the economic and financial situation was disastrous, due mainly to poor commercial management (bill collection problems). It was therefore decided to put the drinking water service up for “delegated management.”¹⁷ The preparation of this contract was executed under the auspices of the French Development Agency and was highly inspired by the French model management of water (*gestion déléguée*). “City” was chosen as the site for the first attempt at privatising state-owned water facilities. This experience was intended to prepare Lebanese authorities for new modes of management and to take lessons from the positive or negative results to improve the management of water service in Lebanon.

The research study took three years (between 2002 and 2005), during which we observed the functioning of the contractual relationship from negotiation to implementation. When carrying out fieldwork, we used an ethnographic approach.¹⁸ This consisted of going into the field and conducting interviews to understand how cultural differences interfere with the trust development process. This approach allowed us to analyse how the respondents interpret the contractual clauses as well as the way they are implementing them. We also aimed to highlight how French and Lebanese actors give “meaning” to their action when cooperating with their partner and more generally how an effective cooperation is conceived by both sides. One way of understanding this analysis is to look at discourse as a means of grasping underlying representations and taken-for-granted assumptions. According to which reference points or underlying images do people formulate criticisms and give opinions about the various actions taking place?

In order to do this, interviews (about one hundred) were conducted periodically, at various stages of the contractual relationship, available documentation was studied and meetings were attended¹⁹. Five of our regular respondents were representatives from the Promostate team in charge of managing the project and

17 *gestion déléguée*.

18 Geertz; and d'Iribarne (1996).

19 As we were bilingual, we had let the interviewees speak in their native language (Arabic and French) in order to generate data with an authentic insight into people's experience of working in this project.

five were from Promostate management team. In addition, regular interviews were also carried out with representatives from the French Development Agency and Lebanese public authorities.

Working with the transcripts of the interviews, we studied each one in detail to analyse the following points:

- The various factors that would block or help the achievement of performance objectives;
- The role played by each partner in the implementation of the management contract;
- The perception of each partner of the contract and strategies and behaviours adopted in negotiating the implementation of the contractual agreement.

To this end, we have focused on:

- The usage of the contract text according to its interpretation by each partner;
- The mutual understanding of contractual obligations;
- The forms of commitments and their link with the strategies followed by each partner and their perception of their role in the cooperation;
- The procedures of co-ordination made by daily interaction between partners.

Our analysis is based on the notion of culture seen specifically in terms of the “framework of meaning” in each society that shapes conceptions of the way people should be governed.²⁰ In every country that has preserved its unity beyond the vicissitudes of history, one finds largely convergent conceptions of what a well-ordered society is. Across cultures, representations of relations between individuals and groups, legitimate methods of exerting power and also methods of cooperation, vary noticeably. These conceptions which are largely implicit, form the foundations of the image of a “well ordered society”, but also serve as reference points for actors in their actions. More precisely, all national cultures provide reference points, by which individuals denote, classify, identify, evaluate, connect and order. They establish criteria for distinguishing good from evil — the legitimate from the illegitimate. If the existence of such oppositions seems universal, the form they take differs considerably across societies. In other words,

20 Geertz; d’Iribarne (1993); and d’Iribarne (2007).

we do not refer to culture in terms of values and attitudes but rather to implicit repertoires and guidelines that underlie the practices and discourses of people in terms of organization and cooperation. These implicit references underlie the way the members of organizations, belonging to a specific society give meaning to how they live daily:

- the hierarchical functioning, with procedures of decentralization, the control and evaluation of performances;
- cooperation among the different departments, decision-making and the management of conflicts;
- organization of relationships with customers, quality procedures, the setting up of codes of conduct, etc.

Thus local cultural context plays an important role in giving sense to the reforms at stake and more specifically may condition the effectiveness of a PPP implementation.

III. FINDINGS

1. Perception of “good cooperation”

For the two partners the contract represents an important challenge. For the French company, it represents the opening of new markets, and for the Lebanese authorities it is the first public-private partnership in the water sector. On both sides, the building of trust is presented as an essential condition to manage the unanticipated questions in the contract and to guarantee cooperation success:

We need good will and good intentions to make the contract work.

– Declares a Lebanese interviewee.

The Contract is important but we need to create a trustful relationship to work together.

– Declares a French interviewee.

However, relations soon soured. Trust was never really established and the results were disappointing as to the contract objectives. According to the consultant in charge of the follow up of the project, three main reasons could explain the disappointing results:

- First, institutional problems are caused by contradictions between public management rules and some contractual clauses as well as differences in organizational cultures (private/public);
- Second, personal conflicts and power asymmetries between partners have complicated the implementation of the contract;
- Third, a deficit of communication between the two teams created misunderstandings around the interpretation of contractual obligations as well as the role of each partner.

When asked about their perception of the cooperation issues: SONAT interviewees used expressions like “Promostate’s secrecy strategy” or “Promostate hides its true intentions from us”, to describe their relationship with Promostate. Promostate interviewees qualified SONAT behaviour as “double-faced speech” or “intrusion”, showing their doubts concerning SONAT’s will to make the contract succeed. But what exactly is the origin of these differences?

From their accounts of the difficulties encountered, the actors acknowledged the issues mentioned by the consultant, but implicitly emphasized two different visions of what “good cooperation” leading to different perceptions of what their role in the contract should be.

2. Different interpretations of the contractual clauses

Promostate: We want to be autonomous

For Promostate, a contract in so far as it is the formal definition of a governance structure, underscores the role that should be played by each partner in implementing the contractual commitments. According to this view, Promostate interviewees claim “autonomy” to execute their obligations and to honour their “expert” status specified in the contract. This “autonomy” is a sacred principle in the French conception of “delegated management”:

My hands are not free to execute my responsibilities... There is a problem of the contract’s interpretation... They must understand that we need autonomy.

However, this also implies that any questioning of their decisions by the Lebanese represents an obstacle to “good cooperation”. On encountering suggestions or questions regarding an action they have taken, they immediately feel their expertise is under scrutiny. Thus, any Lebanese involvement in their management is seen as an obstacle to the good implementation of the contract:

They should supervise the Contract, but they mix between supervision and surveillance, the supervision should be on a three months basis and they are supervising us on a daily

basis... For instance, they control the material we are using; they have imposed on us to buy a specific brand of screws which have caused a delay. Then, they have accused us of being responsible for this delay... This is not what supervision should be, it is an intrusion, they should let us free to accomplish our mission.

This is the vision of “good cooperation” in a French context developed by Philippe d’Iribarne in “Logic of Honour”. D’Iribarne (1989) explains that one finds in France another vision of a good way of living and working together. When the French speak of their work, reference to the rights and duties associated to a specific position one holds in the society, and to the rank associated to this position, is omnipresent. They speak, when hierarchical relationships as well as relationships with customers are at stake, of what seems normal to do in conformity to the customs of the *métier*²¹ that one holds. Without any reference to instructions from superiors or to a “contract”, these traditions define how to recognize a “good” way of working, what is “normal” to do, and what an individual cannot stoop to, when one is a production engineer, a lathe operator, and accountant, or some other calling. Not respecting the norms of one’s “profession” through a lack of professional awareness, or bowing to pressures from above to lower standards in the pursuit of profit, is considered an undermining of the “honour” of the professional group one belongs to. It would be degrading to be “at the service of” anyone, in particular to one’s superiors. By contrast, it is honourable to devote oneself to a cause, or “to serve with magnanimity”, particularly if one is asked to do so with due “ceremony”. This can usefully be regarded as reflecting a society whose functioning is governed by a conception of freedom, quite different from the American²² or German conceptions, attached to rights specific to a given social position. The France of the Old Regime was marked by such a conception.²³ Far deeper in history such a conception already singled out medieval France.²⁴

From this perspective, Promostate actors act according to the responsibilities implied by their status rather than to conform to their customers’ requests. They want to be judged only on their capacity to honour the requirements of their “status” in the contract.

I am a “*prestataire de service*” (service provider), not a subordinate. If I don’t honour my commitments, they can fire me... I want to be treated as a “partner” and not as a “subordinate”.

21 Profession.

22 Foner.

23 Tocqueville; Montesquieu.

24 Bloch.

We are not considered as partners, we are considered as sub-contractors, we are “*prestataire de service*” (service provider) and they want to impose their rules on us, we don’t feel we are responsible for our work, they keep complaining about our performance.

They should understand that we are a “*prestataire de service*” ‘service provider’. So, we are not here to work under their instructions but to offer our services for them.

Thus, what is interpreted as a strategy of secrecy by the Lebanese is associated to Promostate’s particular vision of cooperation. It indicates the importance of autonomy within the framework limits of a contractual role, to achieve cooperation.

SONAT: We should work as “one hand”

In contrast, SONAT interviewees stressed the importance of “group unity” to achieve cooperation – “we should work as one hand”. This metaphor is mobilized to qualify what their relation with Promostate should be as well as to describe the way they consider the procedural coordination. At first sight, this discourse may lead to the assumption that each individual sacrifices his/her own interests for the benefit of the whole community. However, many factors tend to show that individuals do not melt into the community and each individual remains strongly inclined towards his or her own personal interest. Individual suggestions occupy an important place. Each person should be able to express his/her point of view and to deliver his/her opinion on any given problem. Having their opinions taken into account in the course of the events is how the Lebanese can have their place of “honour” in the partnership.

It’s vital for Promostate that SONAT be able to understand Promostate’s problems. I’m able to answer their questions; I can bring my support to the Operator...

In the technical field, I try to facilitate Promostate’s work but they have to consider my advice, they should ask for my opinion, I gave them my comments but they weren’t taken into account.

In this way each partner can play an important role in the cooperation and has an essential contribution to the success of the project. If their opinion is taken into account, they will not hesitate “to solve” problems. As one of our SONAT’s respondents reports:

We are constrained by public rules, Promostate needs the signature of three people to order any kind of material, we are being cooperative, we close our eyes to this kind of procedure.

We see here an original combination between adherence to the same community “unity” and the defence of individual contribution “they should consider my

advice”. This echoes the Lebanese specific conception of “living together”²⁵. The ideal of the Lebanese society is marked by two tendencies that could appear at first glance as antagonists. On one side, the desire to preserve the community membership and the defence of the community’s solidarity. On the other side, an attempt to preserve the sensitive coexistence between different communities with respect of their diversity.²⁶ This contrast is unravelled by a persistent reference to the duty of “unity”. The reference to the importance of “unity” in the Lebanese discourse, framed also in terms of the “union of hearts” tends to be as important as diversity’s challenge faced by Lebanese. The resulting culture is distinctively Lebanese. Thus, the respect of differences between communities supposes a right for everyone to vigorously express their values and their feelings. Second, acknowledgement of differences between communities and individuals goes along with a passionate defence of “unity” as a basis of Lebanese society cohesion. The existence of this logic is what largely determined the Lebanese interpretation of the situations met as well as the strategies adopted.

Consequently, when SONAT members feel that their opinion is not considered, the group’s unity is broken and formal rules must prevail.²⁷

We did our best to help them, we tried to understand their problems, but they didn’t accept our help. So, we are forced to apply the public rules.

The differences between the two conceptions of “cooperation” created an uneasy tension between the partners and made it difficult to develop “trust”. Promostate perceived the interventions of the Lebanese partners in their work as a lack of respect for their status in the contract. Besides, the oscillation of SONAT between two repertoires – “we are here to help you” and “we should apply the rules” – was interpreted by Promostate as a sign of “double -faced speech”.

SONAT interviewees suggested that the Operator wanted to keep them away.

25 Lebanon evolved in 1943 a unique political system, known as “confessionalism” based on a community-based power sharing mechanism. The concept of a confessional democracy was unique and was designed to promote cooperation and conciliation among the rival confessional (religious) groups. Individual Lebanese were primarily identified with their family as the principal object of their loyalty and the basis of marriage and social relationships as well as the confessional system. This, in turn, tended to clash with national integration and cohesion.

26 Beydoun.

27 The public rules referred to here are mainly financial. These rules are very bureaucratic and constraining to Promostate’s action. Some other difficulties come from the employees’ status. Promostate was in charge of managing SONAT staff but was constrained by public rules in terms of working hours as well as salaries and incentives.

I don't understand the source of their fear! I want the work to be well done; they don't want us to see what they are doing... They are hiding their true intentions!

Consequently and after many trials to “help Promostate” by adapting the public rules or by allowing exemptions, they decided to apply the public formal rules in a rigid way.

I tried to sort out the contradictions between the public rules and the contract to make the project succeed but they didn't change their behaviour, they didn't want to listen to us ... So, now we want to protect ourselves, we are strictly applying the rules.

The differences in what is understood to be “good cooperation” implied different expectations to “trust” the partner. Precisely, when the interviewees draw on the idea of “working together”, to express praise, criticism or exhortation, they implicitly indicate the behaviour that is desired and expected from members. For Promostate's interviewees, one should trust the partner's technical skill. The status of “expert” or “professional” with a strong international reputation should be sufficient for SONAT to expect that the partner would do his best to honour his obligations.

We are here to do a *prestataire de service's* job, they bought the services of an international expert, they must trust us.

From this perspective, each partner should have the autonomy to exercise his responsibilities in a climate of trust. The duty of all to honour their “status” in the Contract should guarantee the development of trust. From the Lebanese point of view, technical skills are important but are not sufficient to build a trustful relationship. The Operator must be able to prove his good intentions by showing his capacity to find consensual solutions which “are convenient to” both parts in spite of the encountered constraints.

We need technicians but also individuals who are capable of understanding us in order to collaborate.

We did our best to help them but it didn't work out, we need people who are able to work as one hand and to find solutions that would fit all the parties.

To achieve the project's success, the Operator should allow SONAT's contribution. These expectations, in a Lebanese context, are consistent with the need to reconcile the group's unity with the expression of individual contributions. They represent the prerequisites to developing trust.

Even though, both sides were aware of their divergences in interpreting their roles in the contract, they pointed out power asymmetries or institutional problems as the only explanation to these divergences. Thus, it was difficult to grasp the implicit differences between the two partners in their conception of “good”

cooperation and their role in intensifying the encountered difficulties and undermining trust development. Power asymmetries or differing organizational cultures remain the main obstacles faced in this cooperation. Yet, cultural differences interfere in this process not as an independent variable to be juxtaposed to other obstacles but in shaping the way partners perceive difficulties and envisage solutions. Cultural differences by providing different interpretations to the problems encountered complicated the implementation of effective solutions. Regarding the difficulties in developing a trustful relationship, one of the representatives of the Lebanese Authorities declared:

I believe our mistake was that we believed that goodwill would prevail to allow the contract to function smoothly.

In the face of persistent difficulties to find practical modalities of cooperation, the various stakeholders in the French and Lebanese organizations involved in the partnership organized repeated meetings. The aim of these meetings was to establish jointly agreed rules to smooth out the cooperation. The question is: to what extent does the process of negotiating common rules help the partners to overcome their differences in interpreting their roles in the contractual relationship?

3. Dealing with differences in interpreting the contract

Several meetings were organized, in the presence of the consultant who wrote up the contract, to mitigate the cooperation's difficulties. Two strategies were adopted to work out the misunderstandings and to establish a trustworthy relationship. The first strategy focused on clarifying the contract in order to build a homogeneous interpretation of each partner's contractual obligations. The second strategy, based upon the assumption that the cooperation problems were mainly "relational", was to resort to a third party as a mediator or a conciliator to help easing the tension between the two sides. The task of this mediator was to seek consensus between the two partners.

3.1 Clarifying the contract

Our respondents share the view that the origins of the difficulties lay more in their failure of translating the contract into practical modalities of cooperation than in the contract itself. To manage these difficulties, the consultant suggested clarifying the contractual clauses. As he explains in one of his reports:

The difficulties met from the beginning of the contract are not of a substantial nature and could be overcome within the contractual framework and the resolutions we reach

in the meeting. These resolutions are subject to a cooperation between the partners. The current situation does not justify an amendment to the contract.

The clarification process was simply a question of re-specifying the responsibilities of each protagonist. Yet, in spite of the explanations provided by the consultant, a certain number of implicit divergences were not considered. The actors can agree upon a presumably homogeneous “reading” of the contract or a procedure. But when it comes to implementing the agreement, they encounter difficulties due to different ways of assessing the behaviours adopted on the ground.

The difficulty of implementing the supervision procedures is symptomatic of this type of obstacles. The supervision procedures were set up jointly by the two partners but divergences appeared in the way they were put into practice. The Promostate team showed itself particularly reluctant to respect the requirements of supervision as they were formulated by SONAT. When asked about the origin of this reluctance, our Promostate respondents pointed out that the way SONAT was exercising its supervision had hindered the cooperation’s spirit. They described the way in which SONAT had exerted its supervision as surveillance rather than a simple exercise of supervision. One of our Promostate’s interviewees’ comments:

The service provider should be autonomous and supervised from time to time, this week we were controlled three times, X sent me his assistant to control the GRH department three times, it is not supervision, it is surveillance.

Promostate reacted to this behaviour by sending a correspondence to SONAT in which, we can read the following passage:

We received the report of Miss X with her comments. We will check the reliability of the information reported and will recommend disciplinary measures for the people who did not meet their professional obligations in April. April was a transitional period for the staff. Following that, we will contact you to specify the date on which Miss X could come to carry out her “surveillance” although this is not in conformity with the spirit of the contract. Once again, I must insist on this last point.

The supervision as it was practised by SONAT seems to be far from being a simple task of control. From the perspective of our Lebanese respondents, the role of “partner” in the contract implied that they should “help” those who they supervise by “advising them” or by “guiding them” in their work. To stress this role, they often quoted an extract from the contract that stipulates:

The management team of the SONAT, should be, as much as possible, involved in the reorganization of the water service. SONAT should ensure Promostate benefit from its thorough experience on the ground.

Thus, once again we can see that what is considered by Promostate as an intrusion in their work is understood by SONAT as part of their role in the Contract:

Our mission is the success of the Contract. If we say our role is to “supervise” and we stick to a strict, 100%, application of the Contract, we will ruin the Contract. Currently, we are helping them to make this Contract a success, they need our help” explains a member of the supervision team.

Our findings show that the supervision as it was exercised by SONAT was highly dependent on their perception of Promostate’s behaviour. In periods of good relationships with Promostate, and when SONAT felt that they were working with Promostate as “one hand”, the supervision’s procedures were applied in a flexible manner. SONAT members were willing to help Promostate to carry out its work as long as they felt that Promostate was taking their opinions into account.

I am responsible for the financial supervision of the Contract, the relationship is getting better, they are listening to us so I am willing to approve Promostate’s decisions without checking, I am even pushing the staff to be flexible in the application of the rules.

Yet, when the atmosphere was “hostile” and when SONAT members had the feeling that their opinion was not “considered”, they would stick to their role of supervision practised in a very rigid way.

To sum up, even though the actors involved in the contractual relationship evoked the divergences in interpreting the contract, they did not reach the point at which they recognized the role of cultural differences and moved beyond the simple task of clarifying the contract. The persistence of conflicting views was systematically explained by power asymmetries or personal conflicts. Moreover, the action strategies of both partners were systematically and implicitly legitimised by different cultural repertoires. This cultural myopia hindered the cooperation process and the actors were trapped in a bureaucratic routine that blocked the execution of the Contract.

3.2 Using relational mediation

The second strategy adopted was no longer to clarify the contract but to resort to a mediator in order to sort out the disagreements. The aim was to encourage the partners to find pragmatic compromises for specific issues.

It seems to me that it is important that we consider appointing a conciliator or think seriously about introducing some sort of arbitration of conciliation element into the arrangement between SONAT and Promostate. As you are well aware there is no way we can make the contract work except if the parties want it to work. There was no way we could have made the contract itself fool proof. It seems that we have reached the point of irreconcilable differences.

After this “mediation”, the actors proved that they were able to arrange a certain number of problems proving that good will could help to overcome the unanticipated questions raised in daily cooperation. However, the negotiated agreements were fragile and of short duration. In this section, we will highlight the process used to negotiate common rules as well as the reasons behind their fragility.

We find evidence in the accounts of our respondents on both sides that the only way to reach consensus was to leave room for a certain freedom in interpreting the contract. In this regard, we can read the following passage in a document presented by Promostate at a meeting organized by the Minister of Water and Electricity:

The signed contract is defined as a management contract and not as a technical assistance contract. The rationale behind this is to give the service provider a certain freedom to carry out its mission.

Similarly, SONAT pointed out the importance of a certain freedom in interpreting the contract. They mention in a document presented at the same meeting:

The contract should be regarded as a sort of pilot project and as such any changes to the contract that would improve it should be considered seriously.

However, while for the French partner, free interpretation of the contract should be constrained by the rights and duties associated to their specific “mission” in the partnership, for the Lebanese free interpretation is justified by the concern of reaching consensual solutions:

The Minister of Energy and Water stressed the need for the parties involved in the contract to renew their efforts to collaborate in the smooth operation of the contract. He acknowledged that there were difficulties with the contract itself, and in the relationships it imposed. However, due the importance of the contract, he stressed that the parties were always welcome to use his good offices to find solutions that would enhance the contract and were in line with public interest.

In the same way, regarding the disagreement between SONAT and Promostate over the recruitment process, the following extract shows the importance of a consensus to sort out the encountered difficulties:

The SONAT stressed that it had no interest whatsoever in the names of those people to be recruited, as long as it agreed to their job descriptions, selection criteria and that a

budget to pay for their salaries was available. The Minister concurred with SONAT that when the rules were set at the outset and agreed to by all parties, there would be no room for disagreement later.

In contrast with the French vision emphasizing the importance of autonomy and the separation of roles, these consensual solutions are motivated by the will to strengthen the group's unity. This is well illustrated by the following extracts from the minutes of a meeting organized with the Minister:

The ministry, CDR and the north Lebanese were in effect one entity and their aim was to ensure the success of the contract.

This has led to a paradox where both sides could agree upon some rules without interpreting them in the same way. Therefore, whereas the principle of free interpretation of the contract adopted by both sides allowed them to reach consensus, respect for negotiated solutions didn't last long. In fact, the divergences over the criterion used to allow free interpretation weakened the durability of the agreed solutions. On several occasions, the partners showed that they could work together but their differences were far from being overcome. The involvement of a third party helped them to work together but failed to sort out the deep implicit divergences undermining the cooperation process.

4. To sum-up

This study reveals that even though public private partnerships in the water sector are shaping a new general framework, a single reproducible model does not exist. In fact, research in this field used to focus on challenges such as reconciling investment and profitability with access to services for the most disadvantaged as well as adjustment to the local institutional context. Yet, less attention is paid to the importance of the cultural context in designing a new institutional framework that could be seen as legitimate by local actors.

Our study shows that the issue is not only what is the most satisfactory mode of governance between a large variety of contractual arrangements that is suitable for the local institutional context but also how far does the chosen mode of governance echo local conceptions of what well-ordered society should be. The contract was not only the mechanism used to regulate the cooperation but it appears to be a source of identity. When Promostate asks: "what's our role in the contract?" The question clearly expresses a question of identity which will generate the type of behaviour which goes with it. It is the same when SONAT declares "we should work as one hand". As soon as someone is convinced that the contractual relation gives him/her a particular role, a set of taken for granted assumptions shapes the way he/she sees his/her actions and his/her partner's

behaviour. Divergences in perceiving their role in the contract led to misunderstandings over contractual clauses as well as their implementation. Therefore, it appears difficult to set up a durable cooperative relationship if each person does not have the minimum feeling of being treated as they should be. Only then can one obtain the minimum of trust and cooperation required.

Moreover, our findings suggest that cultural differences did not have an independent influence on the problems faced in the partnership; they were intimately connected to different aspects of cooperation issues. Power asymmetries, personal conflicts as well as differing organizational cultures remain the main obstacles faced in this cooperation. Yet, the effect of differences in national cultures could not be disentangled from these obstacles. By providing different interpretations to the problems encountered, they have complicated the implementation of effective solutions and hindered the repairing of trust. If the two processes undertaken to facilitate exchange and understanding between the parties did little to build or sustain trust, it is because they only addressed the explicit differing interpretations about the contract. These processes did not reach the point at which they help the partners to recognize that they have to cooperate with groups who not only have different interpretations of their contractual commitments but also have different methods of implementing them as well as different perceptions of their counterparts' behaviour. One of the main limitations of our research is that we were not able to share our empirical results with our respondents. This would have helped us to test whether an awareness of these implicit differences would have helped to repair trust.

PPP is incorporated in the way that actors conceive a “good cooperation” that echoes local shared conception of what a well-ordered society should be. For the actors, the prerequisites to trust their partners consisted of feeling treated according to their role in the contract. However, these different conceptions of “good cooperation” shaped different expectations of trustworthy behaviour. Consequently, the contract's implementation was blocked. Promostate and SONAT were mainly paying attention to the institutional dimension such as laws and regulations or the strategic dimension, rather than the cultural one. Local institutional conditions or power relations are obviously taken into account in business operations in a foreign country. Yet culturally driven social customs, local frameworks of meanings and culturally-specific societal mechanisms are not. They are familiar to the local population, but cannot be easily identified by an outsider. So, the patterns generally used by partners to build

trust either in French or Lebanese culture have created misunderstandings when in confrontation between two foreign cultures.

IV. CONCLUSION

The principles of Public Private Partnerships in the water sector gradually spread on an international scale from the 1990s onwards. The analysis of the Lebanon case shows how difficult is the transposition of the various principles guiding water sector reform, placed between financial opportunism, political blocking, institutional contradictions and cultural resistance. For shaping an efficient public private partnership, our interlocutors have so far paid attention mostly to such local conditions as laws and regulations, rather than such “soft” ones as culture. Local institutional conditions tend to be obvious, explicit aspects of business operations in foreign countries. Cultural-driven social customs, patterns of behaviour and culturally-specific societal mechanisms are familiar and unconditional to the local population, but are much less explicit for an outsider.

Hence, the exercise that partners usually make to structure the implementation of their contractual agreement which is more or less evident within an homogeneous culture, takes an other form in a confrontation between two foreign cultures. That means that those who participate in the cross-cultural activities are faced with interpreting the actions and attitudes of individuals and organizations, operating in contexts quite different from their own. They have to cooperate with groups who have not only different interpretations of their contractual commitments but who also have different methods of reaching them and different perceptions of their counterparts’ behaviour.

Thus, knowledge about cultural differences in perceiving the role of the contract as a management mechanism is indispensable for partners to shape a stable but adaptive action framework. An action framework, which allows efficient coordination by facilitating their understanding of unfamiliar mechanisms, gives them the benefit of a degree of predictability. Otherwise, blocked situations, misunderstandings or frictions may arise between the stakeholders (private firms, public authorities, users, etc.). The action framework must be adaptive, *i.e.* amenable to adjustments. Learning about other’s interpretation of contractual obligations and regulation principles may offer the opportunity for the partners to adjust their behaviour as required. Taking into account the role played by cultural differences may be an efficient way to appease strained situations and handle conflicts.

In a stable but adaptive context, learning and mutual adjustment can be made. Moreover, the objectives of reformers and the programmes of action they adopt do not exist independently of the way in which their perception of the world is organized. Their actions take on meaning, in their own eyes and in those of the people they have to rally to their cause, within a given structure of meanings. From this perspective, the question regarding good governance issues in the water sector is no longer what is the best contract or the best regulator who could ensure the effectiveness of the PPP but: what is the framework of meaning in each society that will help initiate an effective institutional framework which does not compromise the locally shared conception of a “good” relationship between individual autonomy and the collective order.

A successful transformation depends on giving a positive sense to problem-ridden situations by assimilating them to situations that, in the framework of meaning within the given society, echo positive experiences. It is a matter of organising practices in such a way that the transformation process authentically echoes the local legitimate conception of a well-ordered society. It is this kind of work that makes it possible to see beyond the resistance encountered in some countries towards imported reforms and to identify the resources offered by each culture for the implementation of effective reform strategies. An approach that is less focused on the superiority of any particular model and more cognizant of the context-specificity of desirable reforms is needed. Work on gradual improvements in institutions or in small institutional practices may help toward seeing exactly and concretely how beneficial institutional arrangements are promoted or held back, and how universal standards can be adapted to the local contexts. Such an approach may help to open up a new way of looking more realistically and more effectively at reform challenges in Mediterranean countries and more specifically in the water sector.

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COLOPHON

WATER POLICY AND LAW IN THE MEDITERRANEAN An Evolving Nexus

Edited by

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Recensions

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Publishers

Faculty of Law of the University Business Academy in Novi Sad, Geri Karolja 1, 21000 Novi Sad
www.privrednaakademija.edu.rs

Faculty of Sciences of the University of Novi Sad, Trg Dositeja Obradovica 4, 21000 Novi Sad
www.pmf.uns.ac.rs/

Design & Layout

Prima Design Studio, New York

Printing

SZR STAMPARIJA R-PRINT, Novi Sad

Printed in 300 copies

CIP - Каталогизација у публикацији
Библиотека Матице српске, Нови Сад

351.79(262)(082)
556.1:005] : 34(262)(082)

Water policy and law : an evolving nexus / edited by Slavko Bogdanović. - Novi Sad : Faculty of Law of the University Business Academy : Faculty of Sciences, 2011 (Novi Sad) R-print). - XL, 248 str. : ilustr. ; 24 cm

Tiraž 300. - Str. V-VII: Preface / Ivana Teodorović. - Bibliografija uz svaki rad. - Registar.

ISBN 978-86-6019-012-5

а) Водно право - Медитеран - Зборници б) Водни ресурси - Менаџмент - Правни аспект - Медитеран - Зборници
COBISS.SR-ID 261515527



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ISBN 978-86-6019-012-5