Chapter 1
Introduction

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In the abundant literature on the topic of water, *Globalized Water* offers an original contribution to the discourse: a collective and contemporary analysis of water resources and supply from a perspective clearly grounded in the social sciences.

The underlying idea of this book is that, in terms of water, we are facing a turning point characterized by changes in scale and time that are causing (and will continue to cause) major conflicts and modifications to management systems, public policy, and living conditions. This defining moment has occurred in a context of economic, political, and cultural globalization that have transformed the nature of water and the functions attributed to it. Several formerly cutting-edge ideas have either been sidelined or lost their luster, and new power relations in water governance have emerged.

The goals of this book are to analyze globalized water, outline the way in which its governance structures are organized, and examine the paradoxical way in which management approaches continue to be governed by local and regional concerns. The book does not provide a tome on water in the twenty-first century, but rather it offers an original perspective on the subject. It is not the aim of the book to cover the entire field of water and the social sciences or to provide a platform for all the researchers working in the sector. Instead, *Globalized Water* focuses on the scientific questions that shed light on mechanisms that dictate how the sector operates now.

Understanding this phenomenon and bringing elements of knowledge and interpretation to bear on short- and long-term changes within the sector involve the combined analysis of a number of themes that are usually studied separately such as water resources and supply. The multiplicity of approaches developed in the following pages provides a way of deconstructing and explaining the established

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discourse on water while revealing its underlying logics, contradictions, fault lines, lacunae, and, of course, successes.

There is near universal agreement that water is one of the major issues of the twenty-first century. Researchers, managers, opinion makers, political activists, and CEOs active in the market all acknowledge the fact that we are facing a "water problem" or even a "world water crisis" (Matsuura 2007). From this multiplicity of voices, a degree of consensus has emerged concerning the priority that should be given to water to safeguard our common good. Elsewhere, however, sometimes radical differences of opinion have become apparent, either in terms of philosophical presuppositions, objectives, methods, or even the meaning accorded to specific terms.[1] This is due to the fact that over the last 20 years, the foundations of local and national water systems have been rocked by a wave of changes: globalization, the continuing development of the European Union (EU), the liberalization of the services sector, the privatizations of the 1990s, the inevitable growth of counterpowers at the local level, the still-embryonic recognition of user opinion, and the integrated approach promoted by the advocates of sustainable development.

Confronted by the mosaic of ideas, actors, practices, and systems that characterize the question of water, this book focuses on a specific and fundamental aspect of the problem, namely the effects of globalization on the sector. This objective derives its legitimacy from the backgrounds of the authors, independent researchers and scholars affiliated with the Paris-based Centre National de la Recherche Scientifique (CNRS) Urban Water Research Network "rés-EAU-ville" (GDR 2524).[2]

1.1 Constructing a Scientific Field: Water and Society Interactions

Water establishes a fundamental social relationship.[3] To the degree that human beings cannot live without it, water obliges us all to gather together.[4] This is true for every type of environment (arid, tropical, urban, and rural). Water is at once a factor

[1] A frequently evoked false argument focuses on the abundance or scarcity of stocks or reservoirs of water that may one day run out, like oil. But since the volume of available water on the planet is practically constant, scientists prefer to think in terms of the perpetual cycle of freshwater (evaporation, condensation, precipitation, flow) (De Marsily 2009).

[2] "Rés-EAU-ville" Groupement de Recherche du CNRS (Centre National de la Recherche Scientifique)/CNRS Urban Water Research Network.

[3] Freshwater accounts for approximately 2.5 % of the Earth's water (rivers, groundwater, oceans, and ice caps). But water useful to humanity is to be found in water flows, which are a source of re-circulated freshwater (an annual 43,000 km^3) (Margat and Andréassian 2008). Globally, the freshwater used by mankind for agriculture, energy, industry, towns, and cities accounts for less than one-tenth of annually available, renewed water, or, in other words, 3,800 km^3 per year. Of the volume taken from natural sources, 10 % is used for human consumption (drinking water/domestic water) and a further 10 % is definitively consumed (not returned to the natural environment after use).

[4] Water is conditioned by its environment (climate, geomorphology), which dictates the amount of time required to obtain it. Certain properties of water have a decisive influence in terms of social

of social and territorial cohesion and a source of conflict. The availability and quality of the resource largely determine the form and development of given societies. Reciprocally, the nature of society determines the function and value accorded to water, as well as the modes of access to and uses made of it.[5] From a historical point of view, such interactions exist in all societies that can be differentiated on the basis of the way in which they access water, regardless of whether they possess a centralized state.[6] Choices concerning techniques, management approaches, and the allocation of water to various sectors (agriculture, industry, energy, and human consumption) reveal much about the societies and individuals who make them (Schneier-Madanes and de Gouvello 2003). Considered from this point of view, the study of water reveals the way in which societies function and does much to illuminate a number of aspects of the process of globalization. This is the perspective that informs the work of the "rés-EAU-ville" and, naturally, *Globalized Water*.

But what are the preconditions of the emergence of a scientific field combining water and the social sciences? From a social science point of view, the field has emerged against a scientific background divided "between globalization and the subject" (Wieviorka 2007) in a context characterized by the fragmentation of major theories (Fassin 2010) and by a dramatic increase in the number of problems, sites, and regions studied in societies. In the 1980s, water was appropriated as a field of study by a number of disciplines, including economics, political science, sociology, and anthropology. Each discipline applied its own methods and analytical categories. Within this perspective, readers will notice that several of the chapters in this book make use of the theory of international relations and the nation-state (water and Europe). Others refer to major social theories (Marxism, structuralism), take inspiration from various theories of the notions of conflict and power, or draw on analyses opposing the primacy of the system to the individual strategies applied by actors. Concepts derived from the discipline of geography are also central to the book's approach and the book presents, beyond naturalistic notions (river lines, watersheds), historical and social aspects of the question before moving on to examine the issue of the territorialization of public policy.[7] Meanwhile, engineering—a discipline integral to the distribution of water and the provision of wastewater disposal services—has contributed a number of concepts and paradigms, including the "network model,"[8] which is central in many chapters.

Today, water research in social sciences is structured around distinct water objects corresponding to specialized fields with few links between them. Among

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and spatial organization. Its fluidity makes it an ideal transporter; its direction of flow establishes what is upstream from what is downstream, etc. (See also CNRS 2009).

[5] The paradox of agricultural irrigation in Nepal—"an abundant resource, carefully distributed"—can primarily be explained in reference to social and familial relations (Aubriot 2004).

[6] For the impact of the development of water distribution systems on the emergence of the centralized state, see the debates over the work of Witfogel (1942) and Palem and Wolf (1972).

[7] See Chap. 3.

[8] For a summary of the network approach, refer to Chaps. 7 and 9.

these are water as a resource, water distribution services, and the economics of water (and natural resources).[9] But whatever its objects of study—the functioning of water companies, territorial management, individual values, or social movements—most of this kind of research attempts to elucidate the relations between society and its actors. Needless to say, the list is not exhaustive.

The question of water often generates ambiguous situations in which social sciences research plays the role of an auxiliary of management.[10] Indeed, research sometimes occasions decidedly negative reactions. Thus, the mediating function attributed to the social sciences has contributed significantly to the development of water as an object of study.[11] In fact, management issues and objects of research constantly interact with one another.

Within social sciences, which gradually have delved into water, three major influences—water sciences, the global vision of water, and world public opinion—have contributed to the definition of this new field of water and society. First, the social sciences perimeter of work is strictly delimited by the highly structured field constituted by the "water sciences," a field that includes hydrologists, hydrogeologists, hydraulic engineers, chemists, meteorologists and climatologists, and, more recently, management scientists (Vauclin et al. 2008; Lawford et al. 2003). The relationship with the water sciences constitutes a major issue for social scientists that involves defining the conditions in which relationships with other disciplines can be established, and vice versa.[12] The question of "interactions between social systems and natural systems" (CNRS 2006) has generated a new perspective on the way in which different registers of knowledge—notably knowledge about nature on one hand and society on the other—should be articulated (Morin 1977; Lascoumes 1994; Latour 1999; Pickett et al. 2007; Robbins 2004). Within this perspective, the study of the interactions between human and social factors and the logics of the living world can lead to the emergence of new ideas. Indeed, from the point of view of the interaction between two types of science—experimentation and observation—and of their formalization, it is clear that the intellectual times in which we are living offer researchers a number of exciting opportunities (CNRS 2009). This is especially true in that water has become a sphere of dialogue between disciplines and a site for the construction of a resolutely interdisciplinary approach.

[9] Definitions of these different forms of water (resource, supply, network) can be found throughout the book.

[10] Chapter 17 represents an effort to advance the combination of hydrological and social sciences approaches.

[11] The management of a population hit by natural catastrophes (floods, etc.) or water-borne epidemics, for example.

[12] The challenge for social sciences is to be recognized as a science with its own scientific objectives and methodologies. In terms of water sciences, social sciences refer to the human dimension associated with governance, policy, and management.

The second and defining influence is that of a global vision of water. This vision has gradually been created by international agencies, governments, lenders, and private operators (most of them European, and, more specifically, French),[13] as well as the media and multiple bodies and networks exerting scientific, political, and economic influence.[14] This international doxa shapes contemporary approaches, professional practice, and national and local policy. Since Stockholm,[15] Earth summits, water forums, and international conferences such as those held at Mar del Plata, New York, Rio de Janeiro, Dublin, Marrakech, The Hague, Bonn, Johannesburg, Kyoto, Mexico City, and Istanbul have brought this vision into focus.[16] We thus have observed the emergence of a consensus, either tacit or explicit, built on the foundations of this doxa and shared by actors informed by very different worldviews, including sustainable development as a world philosophy and water as a commodity,[17] with its corollary of privatizations. Original concepts such as mutual responsibility and affordability[18] (Frérot 2009), "good governance" (World Bank 1992), and arbitrage as an international legal system (Dezalay and Garth 1996) also have emerged. Environmental issues such as integrated water management (Maksimovic et al. 2001), preservation of the resource, and global water governance also have become central (Saunier 2009).

Finally, the growing public perception of the strategic importance of water has influenced the redefinition of the role of social sciences in the water question. In the

[13] Of the 10 multinational water companies, nine are European (the two largest, Suez and Veolia, are French). The French "majors" are the Compagnie Générale des Eaux, now Veolia Environnement, and the Société Lyonnaise des Eaux, now Suez Environnement, a subsidiary of GDF Suez. SAUR is another major group but is less active in the water sector. The world's two largest bottled water companies are also European. In addition, Europe boasts the world's largest private investment funds specializing in the water sector as well as the most dynamic water infrastructure construction firms (dams, processing and desalination plants, artificial islands, etc.).

[14] World Bank, IMF, OECD, WTO, United Nations/UNESCO International Hydrological Program, World Health Organization, various lobby groups and networks, Global Water Partnership (GWP), Académie de l'Eau, Aquafed, European Water Partnership, RIOB (Réseau International d'Organismes de Bassin), etc. The European actors in the water sector (France, the Netherlands, Sweden, and Germany) define the agenda in a number of different ways and play a central role in driving the process forward.

[15] United Nations Conference on the Human Environment, 1972.

[16] Notably thanks to the organization of the Water Decades: International Hydrological Decade (1965–1974); International Drinking Water Supply and Sanitation Decade (1981–1990); International Year of Freshwater (2003); International Decade for Action "Water for Life" (2005–2015); United Nations Decade of Education for Sustainable Development (2005–2014); and a designated World Water Day on March 22.

[17] Two major events occurred in 1992 that effectively laid the foundations of the international doxa: the Earth Summit at Rio de Janeiro, where it was declared that "a global management of freshwater is . . . absolutely indispensable to any action in the decades to come . . .", and the Dublin Water Conference, which established that "water in all its competing uses . . . should be recognized as an economic good."

[18] Affordability is a new concept in the business world reflecting the link between a good or service and the income of the household that wants to buy it.

1990s, the sector was hit by two shockwaves. The first was a dramatic increase in the number of anti-globalization movements and conflicts over water, including struggles to defend public services and management in Europe (Lobina and Hall 2008; Le Strat 2008; Finger et al. 2007)[19]; the fight against privatization in Latin America, including the water wars in Bolivia, for example (Jouravlev 2004; Prinwass 2002); and conflicts in the water sector in the United States and Canada (Glennon 2002). The second shockwave was the institutionalization of local water associations, non-governmental organizations (NGOs), and a global solidarity market. At the same time, in the context of largely globalized conflicts, we witnessed the emergence of counterpowers, anchored in civil society and focusing on a new culture of water[20] (Aguilera Klink 2008), and social forums and participatory countermodels—water as a world public good, water as a human right, and the Water Manifesto (Petrella 2001). It is this last influence that converges to create today's water and social sciences research field.

Thus, to approach the subject of the globalization of water, we first need to take into account the relations, disconnections, and telescoping of several different levels (local, regional, national, and international) and the interdependencies of a wide range of actors (stakeholders) operating at those levels and examine the social dynamic of an extremely complex system. The expression "globalized water"[21] serves as a synthesis of these approaches, which although always different from and sometimes opposed to one another, all nevertheless converge on one point. *Globalized Water* proposes a metaphor of a water arena in which "concrete strategies of different actors defined by their position, their properties and their interests" interact.[22] The various interdependencies between the actors operating in this arena will be described in the book by means of the term "governance." The concept will be introduced, developed, modified, and explained (and even denigrated) by the authors, using a wide range of theoretical frameworks. With this in mind, the book is organized into two main topics—Water Management Models and Globalization and Governance, Conflict, and Participation—each of which are divided into two parts.

The chapters that make up Water Management Models and Globalization present an overview of globalization implications in the management of water resources and urban supply. The chapters explain how management models have evolved in recent years in terms of vision and values of water, scope, regional and institutional contexts, and organizational and technological changes. Main themes are contemporary water

[19] Europe plays a key role in the evolution of the international doxa through the water industry and the network of public European companies providing new management approaches.

[20] Originating at the University of Zaragoza in Spain, the "Nueva Cultura del Agua" (New Water Culture) movement proposes a new management paradigm: water as an eco-social asset, management on demand, and the unity of the river basin, with no transfers between basins and no dams. See Chap. 13.

[21] The expression was decided collectively during the preparation of the book in Paris (January 2008).

[22] See Pierre Bourdieu, "Préface" (Dezalay and Garth 1996).

debates (commodity versus patrimony, privatizations, the end of the network model), the global actors, and the water Europeanization process, all focusing on local interactions at different levels.

The chapters that fall under Governance, Conflict, and Participation aim to improve understanding of the social dynamics involved in water resources and supply management. Focusing on different interactions among stakeholders, case studies explore contractual agreements, participation programs, and consensus building as well as water wars, protests, and political competition. These international case studies from France, Portugal, Spain, Latin America, India, the U.S. and the UK open to a large discussion on governance issues.

The chapters in the book, all based in research, include comparative analyses of technical objects (dams, water transfer systems, and networks) and social dynamics (dialogue, conflict, and resistance). Authors outline different approaches to specific themes and problems. For many authors, politics is an explanatory factor. Some authors employ descriptive styles, some prefer an analytical approach, while others opt for more of a narrative. Some target a lay public, while others are more technical. Many situate the scientific questions with which they deal by speaking in terms of the international debate and evoking the collective aspect of their research.

The book provides a state-of-the-art report on water management and governance, covering research paradigms; water as an economic good or commodity or as a universal common good; liberalization or privatization (two notions that are frequently confused); technical networks; public services (services of general interest, services of general economic interest) and universal and local services; and water transfer systems and major construction projects.

Lastly, the fact that the book is divided into two main topics does not mean that the chapters it contains cannot be read and compared from other perspectives. Readers will find in these pages complete analyses of certain themes, such as the contemporary debate on public-private partnerships (PPPs) seen from the viewpoint of the public water service and resources. The book also contains analyses of water management systems and services in a number of metropolises—approaches that lend themselves to a comparative reading. *Globalized Water* can be seen as a coherent synthesis of many different points of view expressed by economists, geographers, political scientists, urbanists, engineers, anthropologists, sociologists, specialists in management science, and hydrologists who have taken advantage of the platform provided by the book to work and disseminate on a shared subject.

1.2 Water Management Models and Globalization

Water Management Models and Globalization is organized into two parts: the first presents French water management, its history, organization, and challenges under both Europeanization and globalization, which are closely related. The second

reviews the so-called French model of water supply[23] and its export worldwide through privatizations during the 1990s.

The objective of the first two chapters in the book is to examine the development of ideas about water resources and aquatic milieus and, in so doing, reappraise the analytical consequences of those ideas on paradigms of resource management and water distribution in Europe and beyond. The critical analysis of the theoretical issues of standard economics, for which water is a commodity like any other, immediately places the reader at the heart of the principal contemporary debate about water: namely, whether it is a market good or a common patrimony. French water policy serves to illustrate the potential of the patrimonial approach as a new analytical tool (Chap. 2), and it also serves to reassess conceptualization of the commons, including water.

Expanding on this chapter, the application of the European Water Framework Directive, which aims to achieve "good status" for all surface waters by 2015, illustrates the potential of water management reforms. An original and constructive aspect of this trend to reform management approaches is the gradual transition from a sector-based vision focused on regional uses of water to a trans-sector vision integrating various sectors using water at the river basin level and taking into account relations between the water cycle and the spatial distribution of human activities. In a context characterized by the growing complexity of relations between inter-communal dynamics, institutional levels, management, and decision-making territories, water policy in France faces a turning point. Integrated management, cost recovery, and the participation of citizens will, in the future, be the three pillars of the new governance of water. A constant has emerged: due to its focus on the river basin, the territorialization of the water sector has become a category of analysis of public action (Chap. 3).

Whether in terms of the management of the resource and its uses (agriculture, energy, industry, domestic) or in terms of the water distribution service, the French water management system has, due to its efficiency, been internationally recognized as having provided what is known as the "French school of water"[24] or the "French model" (Chap. 7). Whenever water services managed by local authorities[25] (delegated management), or water resource management (water agency management), are mentioned, the French model is the obligatory point of reference. Those models have the advantage of being both highly structured and adaptable to various local, regional, national, and international contexts.

Due to the international market share of French private operators, changes in France and Europe impact the water market in other parts of the world. But the clue

[23] Water model describes a system of relations between techniques, economics, and management.

[24] This expression is used to describe the technico-institutional system and the water management culture by which it is characterized in France: decentralized management based on river basins, delegated management, etc.

[25] In the book, "water service" or "urban service" also refers to local public water distribution and sanitation services.

to understanding the implications of globalization in today's water world, particularly in water supply and sanitation, is the presence of two French multinationals, the water "majors," which dominate the water and wastewater sector and offer environmental services.[26] Worldwide, decision makers, water managers, and urban planners interact with them (Chap. 4), which explains why it is pertinent to speak about the multiple impacts of water globalization. Technology and innovation, for example, play an essential role in the dynamics of the water sector and over time constitute an advantage for the expansion of these majors and other companies. This point, rarely underlined in the literature, represents a key question in the regulation of delegated management agreements (PPPs) worldwide and is a fundamental factor in the globalization process. The new trend toward integrated water management, which changes technical and organizational paradigms, offers a possibility to review current regulations of PPPs and the imbalance of power between stakeholders (Chap. 5).

In France, the water distribution service is traditionally based on a delegated management model involving alliances between private companies, public institutions, and municipalities. The dynamism of the French model is today confronted by changes in the EU. These changes, however, should be all the easier to face in that the EU has not transformed water into a single market, unlike other services in the general interest (telecommunications, energy, transport). Indeed, there appears to be no intention to create such a market. At the moment, in the water sector, Europe is content to intervene at the margins, limiting itself to issue qualitative, economic, sanitary, and environmental laws and decrees for water services, or to demand a good ecological state for its rivers and lakes. However, this regulatory framework induces an adaptation in legal, organizational, and territorial systems. This is why the analysis of the French case is of interest (Chap. 6). European countries must not only take competition rules into account, but must also think about ways of encouraging solidarity and regulating monopolies. These approaches have made it possible to develop water services in France and Europe.

This analysis of French water services and resources management processes provides an insight into the major evolutionary trends within the sector. In the 1990s, major private operators, international investors, and national governments played a central role in transforming the French model into the globalized model (Chap. 7). This model was exported throughout the world with the primary aim of providing access to water for all. The model benefitted from international financial resources,[27] agreements concerning the protection of investments, and a system for resolving conflicts that did not rely on national structures.[28]

[26] See Footnote 13.

[27] Antoine Frérot, CEO of Veolia, correctly highlights that "the private sector has a reputation for being more efficient than the public sector [and] offers access to a wide range of sources of funding . . ." p. 92 op.cit.

[28] The ICSID, the International Centre for the Settlement of Investment Disputes, is the World Bank's arbitration body in Washington, DC.

In many countries, privatization was considered extremely positive in that it enabled the major water companies to use their concessions to apply their expertise to supplying the cities. From the late 1980s, in most developing countries, the failure of the public sector to fund the service and ensure universal access led to calls for reform that, to a large degree, focused on the public or private status of the operator. International organizations initially promoted privatization as a response to a thirst for efficiency before claiming that it was the most effective way of ensuring that poor neighborhoods were supplied.

Summarizing the success or failure of these privatizations—privatization being the magic word of the 1990s—is a complex task. Does the withdrawal of international private operators from major cities across the world imply that the model was a failure? Focusing on Argentina, one of the emblematic cases of privatization in the water sector, Chap. 8 offers an explanation for the failure of a model based on delegating water and sanitation services to private international consortia. The authors seek to demonstrate that, regardless of what the political actors had to say, the deprivatization of the water service did not necessarily consist of a return to public management, but rather was based on characteristics inherited from the previous management approach.

Chapter 9 builds on the idea of the all-network and the post-network era in different urban contexts. Deconstructing the completed network paves the way for a critical reappraisal of the principles and relations underlying this paradigm, which is torn between technology and management laws and decrees that imply that access to water through networks will never be universal. The promotion of a new, post-network paradigm is carried out without the community of experts on urban water asking questions about this reversal of values, a reversal that means that not being connected, once a symbol of social and territorial archaism, is now the nec plus ultra of sustainable urban water distribution.

1.3 Governance, Conflict, and Participation

At all levels—local, regional, national, and global—sharing water between uses and modes of management provides a fruitful field of experimentation to approaches to governance. The analysis of disputes and critical and participatory movements reflected in discourse and practices demonstrates how multiple ideas about governance overlap and sometimes oppose one another.[29] This is at the core

[29] To move forward on the question of governance, it is useful to review the discourse on the global water crisis, which establishes an implicit link with, as well as some confusion about, the growing scarcity of resources. The discourse also raises two critical issues: the imbalance between water resources and needs and the lack of access to drinking water (or clean water). Water resources are unequally distributed around the world. An analysis of water consumption reveals that agriculture—especially irrigation—uses more water than any other sector, including energy and industry. About one billion people living in developing countries, approximately a sixth of the world's population, have no access to clean drinking water and sanitation (purifying domestic

of the two parts that make up Governance, Conflict, and Participation, which present an overview of the current European and international governance agenda.

The advent of water governance based on local structures, the main purpose of which is to ensure that consumers in a given territory can set up a dialogue between one another, is best characterized by contracts focusing on rivers, bays, lakes, or water tables. Through river contracts, for example, various water stakeholders (towns, industrial companies, and farmers) can—if they want to—pool their resources and set common objectives at the scale of the watershed. As discussed in Chap. 10, river contracts are one of the tools promoted by international agencies to further integrate resources management but have thus fallen short of environmental objectives. For the time being, however, commitment to such an approach is only moral. Within the process of building negotiation among water stakeholders, Chap. 11 presents a unique example of traditional landowner associations in the French Mediterranean region that reflects the European Water Framework Directive's call for decisions to be made "at a level as close as possible to the place in which water is used."

Several chapters (12, 13, and 17) focus on technology in Spain, Portugal, and the U.S., analyzing approaches to the offer model[30]—dams, transfers, irrigation techniques—and their interaction with society from a number of different perspectives (anthropology, economics, geography, and hydrology). In many cases, technical debates have morphed into social protest, massive demonstrations on the part of civil society, and the elaboration of a movement questioning major European decisions and international water companies. Governance is studied in this context as a way of addressing politics and management by analyzing the system and interactions between actors, as well as discourse and practices.

In the part on mechanisms of power, the study of controversies, conflicts, protests, and participation programs allows us to understand social and cultural dynamics and their potential for management. Access to water and sanitation are important objects of analysis in regard to questions about the theoretical and operational aspects of governance. The authors explore the potential for applying different reference points and emphasizing either the role of institutions and management (public/private/associative/informal) or technical or economic approaches. In these

wastewater before disposing of it in the natural environment). There is little correlation between this situation and the issue of scarcity. Indeed, water is particularly abundant in central Africa, south Asia, and Latin America.

[30] The offer model refers to the economic, technological, and management system developed worldwide since the end of World War II against a background of rebuilding, economic development, and colonial expansion. It implies that large-scale infrastructure projects sprung up all over the world: dams, irrigation systems, canals, hydroelectric plants, pumping systems, the rerouting of rivers, the transfer of water between river basins, and efforts to dry out marshland. Famous engineering schools are at the basis of the development of this model: École Nationale des Ponts et Chaussées (France), Colegio de Ingenieros de Caminos, Canals y Puertos (Spain), U.S. Army Corps of Engineers, etc. The model has since been called into question by the advocates of sustainable development.

conditions, it is hardly surprising that access to water in cities serves as a veritable laboratory of social experimentation in governance.

Drawing on case studies from Mumbai, India, and cities in Latin America, Chaps. 14, 15, and 16 analyze ways in which governance is engineered in terms of access to water. Building on the idea of governance to describe interdependencies between the actors operating in the water arena, the authors show how politics are central to urban water governance issues and focus the discussions on the role of political actors and the manner in which they carry out their actions on various scales, from the city to the locality. Encouraging access to drinking water in non-regulated neighborhoods is central to the concerns of investors and urban public policies. The process of expanding the PPP model that began in the 1990s reflected a desire to articulate economic efficiency in infrastructure management with social equity and access to water. In this context, the participation of local people constitutes a principle of good governance in regard to attaining Millennium Development Goals. The promotion of participative programs by states, municipalities, and private operators mirrors a desire on the part of developing countries to establish this approach.

Rounding out the book are two chapters and an appendix that explore emerging research and management trends: interdisciplinarity between physical and social sciences, the implications of new paradigms for research and management, and the urban form as a link between urban planning and water governance.

Chapters 17 and 18 shed light on sustainability and the role of stakeholder participation as a key component in facing the water management challenges of the future. Chapter 17 discusses the ability of integrative science and multi-resolution models to provide the basis for a decision support system, drawing on two case studies in the U.S. Southwest. Through a policy literature review, Chap. 18 explores how a new paradigm—water security—has emerged linked to the idea of sustainable water while gradually gaining geopolitical urgency.

Finally, the Appendix, Water Urbanisms: A Visual Illustration, highlights how water as a medium has been a critical agent in shaping settlements throughout history and across the globe. Through a selection of extreme case studies, the graphics and figures reveal the relationship between water and urbanization and underscore the role of urban form and its formative process as a critical component in environmental studies.

1.4 Conclusion

We have to recognize that the great debates about water that characterized the turn of the last century have lost much of their impetus and that, unlike climate change, desertification, and biodiversity, there are no international agreements

providing a framework for how water should be managed. Globalized water has the particularity of not being protected. Indeed, the water arena is, like navigation, fragmented among national and international regulatory systems.

The book *Globalized Water* examines sustainable management, the institutional dimension, PPPs, and the universal question of consumer participation in terms of their roles in the elaboration of new ways in which to imagine the public space at a new scale—in other words, at the global level. Today, the sustainable development model is demonstrating its capacity to incorporate and adapt to the primacy of the environment, the overriding concern of the twenty-first century. The trend toward an integrated urban water management approach that is designed to conserve the resource is gradually gaining ground. This approach focuses on conservation, equitable distribution, and restrained consumption and encourages the active management of pollution and wastewater and the integration of various stakeholders into the system. The legacy of these dynamics raises critical questions about management and gives clues for action toward more comprehensive and environmentally and socially concerned water management.

Should we thus surmise that nothing changes in the water sector? A tacit compromise between multiple actors operating on several different levels guarantees that water governance is global. The edifice is the result of long-term globalization, but the fact that its foundations rest in local and regional bedrock means that it is both conservative and stable. Indeed, in the final analysis, if we look beyond the intellectual and social movements that provide raw material for research, water is a central subject in the social sciences in the sense that it constitutes an important marker of the dynamic of globalization. It also provides a testing ground for approaches to governance and fresh insights into the role of research in society.

Finally, beyond the promotion of a deconstructive approach that is the primary objective of the book, the interdisciplinary perspective employed serves as a way of questioning the governance of water and the actors operating in the field: governments, private operators, associations, and residents. This is especially true in that, in this field more than in others, researchers are faced with issues affecting the lives of millions of people, placing them in a role somewhere between that of the "intellectual" and that of the "expert."[31] Researchers are constantly prevailed upon by the media, the education system, economic actors, political parties, and alternative movements. They are obliged to walk the line between their academic vocation and the pressures of social demand. As Michel Serres has commented, "it is, today, absolutely necessary for scientists to be involved in the life of the city."

[31] Schneier-Madanes, G. "L'eau objet social complexe" in Saragosse 2007, Catalogue de l'Exposition Internationale.

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