

GROUNDWATER LEGISLATION PRINCIPLES

Antonio Embid

Faculty of Law, University of Zaragoza, Spain.

Keywords: Aquifer; Groundwater; Ownership; artificial groundwater recharge; sustainability; intensive use; over-exploited aquifer; Community of users; use; perimeters of protection; environmental impact assessment.

Contents

1. Introduction
 2. Regulatory framework
 3. The ownership of groundwaters
 4. Organisation of users
 5. Management of groundwaters
 - 5.1. Generalisation of a permit system
 - 5.2. Hydrological planning
 - 5.3. Price for water use
 - 5.4. The technique of aquifer over-exploitation
 - 5.5. The territorial scope of groundwater management
 - 5.6. Perimeters of protection
 - 5.7. Artificial recharge of aquifers
 6. Environmental considerations: Environmental impact assessment legislation
 - 6.1. Outflows into groundwaters
 - 6.2. Environmental impact assessment of certain measures that directly or indirectly affect groundwaters
 7. Groundwaters and the European Union: International groundwaters
- Glossary
Bibliography
Biographical Sketch

Summary

It is very difficult to give a general and abstract description of groundwaters, since such a description is closely linked to the physical characteristics and historical evolution of each country. However, there are common trends in modern water law, such as the prevalence of public ownership of groundwaters and the scant attention given to private ownership; other common trends are the extensive intervention by the public authorities into public and private water, as well as legislation that is heavily orientated towards environmental protection. The general characteristics might also include the value of hydrological planning in the regulation of water management and the problems in adapting this management to the limits of a particular basin, although this normally applies to surface waters. Neither can it be said that law has exploited all the possible consequences of the principle of the hydrological cycle which would then call for a substantially similar legal framework for surface and ground waters, and the promotion of joint management for all of them. In the international context, one can find many more conventional norms devoted to surface than to ground waters, where these

regulations are an exception. At any event, the growing use of groundwaters means that we can certainly expect an improvement in the legal regulations over the next few years, at a domestic as well as international level.

1. Introduction

It would be a good idea to begin this chapter by establishing some of the characteristics of the object of this study that have specific consequences for the consideration of the legal framework. Thus, from the legal viewpoint, which is what we are concerned with here, a methodical and ordered discussion on groundwaters is a noticeably complex problem—much more so than with surface waters. This might, in principle, be termed an apparent paradox, since, within the context of modern regulations for continental waters, almost all of them based on the principle of awareness of the hydrological cycle, there is no reason why there should be substantial differences between the legal framework for surface waters and that of groundwaters. However, this is hardly ever the case, which leads one to think that, at least in the context of law, not all conclusions have as yet been drawn from this evident circulation and transferability of water that is involved in the hydrological cycle, and which forms the basis of many contemporary legal systems, both expressly (such as specifically laid down in Spanish Law in article 1 of the revised Water Act, approved by Executive Order 1/2001, of 20th July) and implicitly.

What is probably the case is that in the context of Law, the myths and ignorance concerning groundwaters, which have been around for a long time, are being prolonged, albeit artificially of course. In spite of the fact that scientific and technical advances have meant that the understanding and management of groundwaters is virtually comparable to that of surface waters, this is not wholly reflected in the legal system, which of course causes complications when putting it into practice. Thus, there is much more scope, as far as user activity and water availability is concerned, in the field of groundwater than of surface water. At the same time, there are greater complications for the public authorities in monitoring possible abuse in the field of groundwater.

As we shall see later on, these discrepancies and difficulties are noticeable in all sectors of the regulation system under consideration: these include problems of ownership (private or public ownership), the powers of the Public Authorities (regulatory, policing powers) closely linked to environmental monitoring, how the users organise themselves (compulsory or voluntary, and under what scheme), and the economic/financial system, if a payment to the Authorities for water use is involved. As we shall see throughout this paper, there are specifics in the regulatory framework which may be difficult to explain in the light of technical criteria, but easily understandable from other viewpoints, especially if we bear in mind the historical evolution of regulatory frameworks in which there have always been special measures affecting groundwater.

This also involves another type of consequence that directly affects an article like this, bearing in mind the type of publication (an Encyclopaedia that aims to be a reference for different social and legal systems and to be read and consulted in widely varying countries). This consequence is the difficulty in finding homogeneous regulatory systems with regard to institutions and their effective regulatory schemes. Law in

general (although what I am about to say is applicable to water law, it is applicable to any other type of law) has a substantially national basis, at least in the current phase of our political and cultural evolution. Water law, with its wide-ranging viewpoints and nuances, can only be explained in terms of physical characteristics (the regulatory system of a country with abundant rainfall is not the same as that of a country with regular drought problems) and, above all, in terms of how each country has evolved historically—an aspect that is often unrepeatable, impossible to transpose to other countries, and also very hard to place within a rational framework.

This means that legal science has a characteristic that is not normally found in other sciences. Thus, in the field that concerns us here, knowledge of hydrology, abstraction techniques, the ways of defining aquifers, the principles of coordinated and integrated management between surface and groundwaters, the chemical composition of waters, the struggle against pollution, etc. are universal. Experts in the various fields, regardless of their countries of origin or places referred to in their research, immediately have common tools (starting with terminology and the same sources of knowledge). This helps communication between them enormously, and gives rise to a seamless interchange of solutions and, especially, means to tackle problems.

But in law, you do not get this terminological or conceptual homogeneity, and of course, the sources of knowledge are completely different in their origin and presentation. This means that when jurists want to find or construct trans-frontier elements of communication—as is the case today in most fields—we are forced to give very general descriptions, quoting only the most pertinent national legal regulations, and they are pertinent for our purposes because that is where groundwaters receive the highest profile because of their generalised use.

However, there are certain causes or problems that are moving towards a process of standardization between the various national legal systems. These are mainly aspects referring to the environment. Prevention principles applied to the quality of groundwaters and ecosystems linked to them, or sustainable development principles in general (see Marchisio *et al* in the Bibliography), have given rise to a certain type of social acceptance (by users of, or those generally involved in, groundwaters or simply continental waters), and acceptance by the public authorities which, in the end, are incorporated into law, as may easily be seen in various legal reforms that have taken place in recent years and which usually have this common characteristic. This is where we shall gradually find—in a process that will become more intensive in the future—the necessary line to follow in the standardization of groundwater law. Of course, this is something that will take time to achieve, but it is, nevertheless, worth pursuing.

At any event, it should always be borne in mind that within the specific field of environmental protection, there are clear trends in legal regulations to apply many more precautions with regard to the use of groundwaters than with surface waters. Outflows are a clear example of this—the regulations for groundwaters are much stricter than those for surface waters. In European countries, this is closely linked with the Community Regulations, and the recent Directive 2000/60/EC, which I shall examine in more detail later, makes a distinction (in the environmental objectives laid down in

article 4) in its handling of groundwaters as against surface waters, something which should be borne in mind at all times.

Finally, what is true is that, as the most reliable sources show, the use of groundwaters is increasing everywhere (see Shiklomanov I., in the Bibliography). There are ever more irrigation areas using water that was originally groundwater (and studies show, furthermore, that these waters are economically and socially the most profitable, because they call for more economy and rationalisation from users) and good many urban supply services use water originating from groundwater because it is usually of better quality and fresher than surface water, and thus is easier to treat. All this adds to the need to examine the legal reality of waters that are increasingly to be found in the economic life of widely diverse countries, since science and technology have, in the second half of the twentieth century, made it easier to abstract this resource, thereby affording more profitable usage.

2. Regulatory framework

I shall now touch on matters that are always to be found in any text about law: the defining of the sources of knowledge, which I shall put simply here under this heading of the “regulatory framework”. In some countries, groundwater is mentioned in the Constitution, although this does not happen very often. For example, groundwaters are mentioned in the Constitutions of Brazil (1988) and Mexico (1917, with modifications in this respect in 1943).

It is more common for a Constitutions to refer to water resources in general, including, of course, references to surface as well as groundwater. This is the case with the Constitution of The Netherlands (1956). Elsewhere, especially in countries whose government structure is based on political decentralization, water may be mentioned in the sections on power-sharing between the State (Federation) and the decentralized States. This is how the Spanish Constitution (1978) should be read, with art. 149, 1.22, which I shall come back to later.

A completely different, and more complex, matter would be to examine mentions of groundwaters that might be found in the Constitutions or Statutes of Autonomy (or similar designations) of Federated States (Ländern, Regioni, Comunidades Autónomas, etc.), a subject that cannot be gone into here for reasons of space.

(Of course, despite the absence of any express mention of water, we should never ignore any references to natural resources [of which water is one] or the environment in general which each Constitution might contain, especially the more modern Constitutions in which the environment is fully incorporated into their content. A good example of what I mean is to be found in art. 45 of the Spanish Constitution and its reference to the “rational use” of natural resources, where the Constitution is in line with the European Communities Treaty, in which there is also a reference to the “rational use” of natural resources, *cf.* art. 174).

It is hard to draw any conclusions, beyond what has already been expressed, on the presence or absence of references to water in the highest legal instrument of different

countries. At any event, the basic legal framework for groundwater, with regard to its configuration and direct application, may be found in the ordinary legislation which should, logically, be guided by what the Constitution says for reasons of normative hierarchy. However, what sometimes happens is that the texts of the Constitutions are by no means models of legal precision; they are open to various interpretations and may even be contradictory when it comes to the various references to water that they contain.

This, as one may imagine, causes problems when trying to decide what the content of ordinary legislation should be. Without doubt, this vagueness is caused by the fact that most Constitutions are by way of an accord or political pact, in which the type of effect sought is more than that of a wholly coherent legal norm that may be seamlessly interpreted.

A prime example of what I have just said is the Constitution of Mexico, whose unusually extensive art. 27 is open to various interpretations with regard to an issue as basic as the ownership of groundwaters, and which needs to be interpreted in terms of the wishes of the drafters of the Constitution and, especially, what ordinary legislation subsequently said (see the 1992 National Water Act and its doctrine in the work by Farias mentioned in the Bibliography) in favour of groundwaters being considered as national (public) water, although there were references in this Constitution to the possibility of private acquisition.

Thus, the predominant role is played by ordinary legislation, if we are required to define the general characteristics of the “regulatory framework”, and in most cases we come across texts that regulate jointly and uniformly all continental waters, surface as well as groundwaters.

In “old” regulations (by “old”, I mean water laws that appeared at the end of the nineteenth century and the first seven decades of the twentieth century, which still account for many countries’ water legislation), there are substantial differences in regulation between surface and groundwaters, not least their ownership, while more modern legislation is guided by similarities in their legal framework.

It is noticeable that many countries modified their water legislation at the end of the twentieth century (Spain did so in 1985, France in 1992, Mexico in 1992, Italy in 1994, Brazil in 1997, etc.). This also enabled them to incorporate environmental considerations—today an essential component of the legal framework governing water or any other natural resource.

At any event, when talking of “ordinary” legislation, we should not just be thinking of what is usually termed in each country as “The Water Act”. Today, there are also regulations applicable to groundwaters in specific environmental impact assessment legislation, or in regulations for territorial planning or natural protected spaces (inasmuch as they affect marshlands that result from the emergence of groundwaters). Even in cases where a price is established for water usage, there are norms applicable to what we are concerned with here in financial legislation.

-
-
-

TO ACCESS ALL THE 18 PAGES OF THIS CHAPTER,
Visit: <http://www.eolss.net/Eolss-sampleAllChapter.aspx>

Bibliography

Please note: in view of the understandable profusion of bibliographical references that could be offered with regard to widely varying international legislation, the works presented here are subdivided into two categories: General and Spanish. Spain is afforded a separate category because of its clear influence in South America and this section contains general works on water law, not only regarding groundwater law, because therein can be found many references to the theme that concerns us here.

General Bibliography

BURCHI S. y NANNI M, How Groundwater Ownership and Rights influence Groundwater intensive use management (soon to be published).

BURCHI S. (1999). "National regulations for Groundwater: Options, issues and best practices", chapter 3 of the WORLD BANK TECHNICAL PAPER NO. 456 Groundwater. Legal and Policy Perspectives. Proceedings of a World Bank Seminar. Edited by Salman A. A Salman.

CAPONERA D. (1992). Principles of Water Law and Administration, National and International, Balkema, Rotterdam.

FAO (1999). Issues in Water Law reform, Fao Legal Office, Rome.

FAO (1998). Sources of International Water Law, Fao Legal Office, Rome.

FARIAS U. (1993). Derecho mexicano de aguas nacionales, pub. Porrúa, Mexico.

GAZZANIGA J.L., OURLIAC J.P. (1987). Le droit de l'eau, Iltec, Paris.

GETCHES D. (1997). Water Law, West Publishing Co.

GUERRERO REINOSO V. (2000). "Decentralization of Water Management in Mexico by means of basin councils", Paper presented in a Workshop in Salvador de Bahia, Brazil.

HAJJI M. (1995). "Le regime juridique des zones de protection des ressources en eau potable au Maroc", Paper presented in Malaga, in a Hispano-Moroccan seminar on water law dir. by A. EMBID.

LUGARESI N. (1995). Le acque pubbliche. Profili dominicali, di tutela e di gestione, Giuffrè editore, Milan.

MARCHISIO S., BASSIOUNI F., ZUCCA C. (2002) Groundwater Law and Administration for sustainable development, Giuffrè editore, Milan.

MARIENHOFF M.S. (1996). Tratado de Derecho Administrativo, vol. VI, Buenos Aires.

SAX J.L., ABRAMS R.H., THOMPSON B.H. (1991). Legal control of water resources. Cases and materials, West Publishing Co.

SHIKLOMANOV I. (1997). *Comprehensive assessment of the freshwater of the World*. World Meteorological Organization.

VERGARA A. (1999). *Derecho de aguas*, 2 vols, Editorial Jurídica de Chile, Santiago.

Spanish Bibliography

DEL SAZ S., FORNIES J.M^a, LLAMAS, M.R (2001). *Régimen jurídico de las aguas subterráneas*, Fundación Marcelino Botín-ediciones MundiPrensa, Madrid.

DEL SAZ S. (1990). *Aguas subterráneas, aguas públicas. El nuevo Derecho de aguas.*, Marcial Pons, Madrid.

DE LA CUETARA J.M. (1989). *El nuevo régimen de las aguas subterráneas en España*, Tecnos, Madrid.

GETCHES D. (1999). "Resolución jurídica de los conflictos sobre aguas transfronterizas en los Estados Unidos", pp. 19 *et seq.* from A. EMBID IRUJO (dir.), *Planificación hidrológica y política hidráulica*. (El Libro Blanco del Agua), Civitas, Madrid. (This paper has been translated to Spanish by A. EMBID).

EM BID A. (1991). *La planificación hidrológica. Régimen jurídico*, Tecnos, Madrid.

MARTIN-RETORTILLO L. (1987). "Aguas subterráneas y aguas que discurren íntegramente dentro del territorio", *Revista de Administración Pública* 113. (Centro de Estudios Políticos y Constitucionales, Madrid).

MARTIN-RETORTILLO L., (1990). "Las aguas subterráneas como bienes de dominio público", on pp. 677 *et seq.* from *Libro Homenaje a Villar Palasí*, Civitas, Madrid.

MARTIN-RETORTILLO BAQUER S., (1997). *Derecho de Aguas*, Civitas, Madrid.

MOREU J.L. (1996). *Aguas públicas y aguas privadas*, Bosch, Barcelona.

NIETO A. (1968). "Aguas subterráneas: subsuelo árido y subsuelo hídrico", *Revista de Administración Pública* 56. (Centro de Estudios Políticos y Constitucionales, Madrid).

PEREZ PEREZ E. (1998). *La propiedad del agua. Sistema estatal y sistema canario*, Bosch, Barcelona.

SANZ RUBIALES I. (1997). *Los vertidos en aguas subterráneas. Su régimen jurídico*, Marcial Pons, Madrid.

Biographical Sketch

Antonio Embid was born in Zaragoza, Spain, in May 1952. He is married with two children. He is currently Professor of Administrative Law in the Faculty of Law, University of Zaragoza.

He graduated in Law at University of Zaragoza in June 1974 and obtained a Doctorate of Law from University of Zaragoza in 1977, with Special Doctorate Prize. He has taught Administrative Law in the Universities of Zaragoza and Valencia (in the years 1987 to 1989). He has been Professor (Catedrático) of Administrative Law since 1987.

He was awarded a research grant from the March Foundation (1980) and the Alexander von Humboldt Foundation (1981-1982). In 1982 he worked in the Max Planck Institut für ausländisches öffentliches Recht und Völkerrecht (Heidelberg, West Germany).

He was President of Cortes Aragon (Parlamento de la Comunidad Autonoma de Aragon, Espana) from 1983 to 1987.

He has published fifteen books and others articles about water law, educational law and federal law.