Legislation on Use of Water in Agriculture

Afghanistan • Argentina • Brazil • Chile • Egypt • Iran • Iraq • Israel • Kyrgyzstan
Lebanon • Libya • Mexico • Nicaragua • Saudi Arabia • Tajikistan
Turkey • Uzbekistan • Venezuela • Yemen

October 2013

The Law Library of Congress, Global Legal Research Center
(202) 707-6462 (phone) • (866) 550-0442 (fax) • law@loc.gov • http://www.loc.gov/law

Contents

Comparative Summary 1

Afghanistan 6

Argentina 10

Brazil 15

Chile 22

Egypt 32

Iran 36

Israel 44

Kyrgyzstan, Tajikistan, and Uzbekistan 47

Lebanon, Yemen, Saudi Arabia, and Iraq 55

Libya 58

Mexico 60

Nicaragua 64

Turkey 67

Venezuela 80

Comparative Summary

Gustavo Guerra
Senior Foreign Legal Specialist

I. Scope of Project

This report summarizes legislation concerning the agricultural use of water in nineteen countries in Latin America, the Middle East, and Central Asia.[1] The individual country surveys provide a brief summary of the laws that govern the agricultural use of water, the government authorities in charge of the administration of water for agriculture, requirements for licenses to use water for this purpose, and relevant guidelines on conservation and quality. In addition, some of the surveys provide information on intercountry disputes over the use of water.

II. Water Ownership

In most of the surveyed countries, water is considered national property. The Water Law of Afghanistan provides that water is owned by the public and the government is responsible for its management and protection. The Constitutions of the republics of Kyrgyzstan, Tajikistan, and Uzbekistan provide that water resources are the inalienable and exclusive property of the state.

In Saudi Arabia, sources of water are generally considered public property. Nicaragua's Civil Code establishes that lakes, rivers, ponds, canals, and freshwater streams are public, and that anyone is allowed to use them within the restrictions imposed by law. According to Iran's law, all water bodies are public property. Israeli law provides that water sources are controlled by the state and publicly owned.

Although most of the surveyed countries' laws provide for the public ownership of water resources, the following jurisdictions allow individuals to appropriate water:

- The Turkish Civil Code indicates that waters may be classified as either public waters, which are available for public service and utilization under the government's direction and possession, or private waters, which are available for personal ownership as private property.
- Chile's water is in the public domain under the Water Code, but users may enjoy proprietary rights over it and allocate it for different purposes, including agriculture.
- In Argentina, the Civil Code provides that practically all water is under public domain, but landowners have exclusive rights over water that rises and ceases in the same property, or rain water that remains in the land where it falls.

[1] The countries covered are Afghanistan, Argentina, Brazil, Chile, Egypt, Iran, Israel, Kyrgyzstan, Tajikistan, Uzbekistan, Lebanon, Iraq, Saudi Arabia, Yemen, Libya, Mexico, Nicaragua, Turkey, and Venezuela.

Conversely, Venezuela's Water Law of 2007 establishes that waters are public property and may not be appropriated by any individual or entity but water rights can be assigned for specific purposes.

III. Water System Administrators

The surveyed countries generally have one government authority that serves as the main point of contact for the administration of their water systems, although some countries have a number of authorities involved. The following table provides country-by-country details:

COUNTRY	WATER SYSTEM ADMINISTRATOR(S)
Afghanistan	Ministry of Agriculture, Irrigation and Livestock in collaboration with other government agencies
Argentina	Local governments
Brazil	National Irrigation Secretariat (SENIR) within the Ministry of National Integration manages system for irrigated agriculture
Chile	General Water Directorate
Egypt	Ministry of Water Resources and Irrigation
Iran	Ministry of Energy issues permits for agricultural and industrial uses of water Ministry of Agriculture distributes water among farmers and collects water fees
Israel	Minister of Agriculture determines amount of water allowed for agricultural purposes Governmental Authority on Water issues licenses specifying allowed amount
Kyrgyzstan, Tajikistan, & Uzbekistan	Responsibilities divided between various national ministries and departments, and local governing bodies Nongovernmental Water User Associations delegated with some authority
Lebanon, Iraq, Saudi Arabia, & Yemen	Varied government authorities: Ministry of Energy and Water plus four other public establishments manage water in Lebanon Ministry of Water Resources handles water drilling issues in Iraq
Libya	Public Authority of Agricultural Development

COUNTRY	WATER SYSTEM ADMINISTRATOR(S)
Mexico	National Water Commission (CONAGUA) with the assistance of regional offices, irrigation districts, and other entities
Nicaragua	National Water Authority (ANA)
Turkey	General Directorate of State Hydraulic Works within the Ministry of Forestry and Water Affairs
Venezuela	National Water Authority (ANA) as well as other national, state, and local agencies

IV. Licensing and Permits

A. Types of Licenses

In a number of surveyed countries water is used under licenses issued by water system administrators. Often, the types of licenses issued depend on the intended use of the water. For example, Afghanistan issues licenses for commercial and industrial purposes. In Brazil, certain irrigation projects require the issuance of an environmental license. Libya's law limits the use of water to drinking, agriculture, and industrial activities. Nicaragua's Water Authority grants, extends, suspends, and terminates concessions and licenses for using water. Venezuela's government grants water concessions and assignments for different purposes, including hydroelectric generation and industrial, commercial, and agricultural activities.

B. Licenses for Drilling

Some country surveys indicate that drilling wells to access water requires government authorization. Afghanistan issues licenses for "digging and installation of shallow and deep wells for commercial, agricultural, industrial and urban water supply purposes." Libya prohibits drilling wells without authorization from the Public Authority of Agricultural Development. Lebanon, Yemen, Saudi Arabia, and Iraq require that owners obtain permits for drilling wells.

C. Special Requirements for Licenses

Some of the surveyed countries have special requirements that applicants for water licenses must meet. For example, Argentina's water laws require applicants for water permits to provide certain information, such as "the extensions of land for irrigation, how many properties are involved or affected, the volume of water to be used, the manner in which water would be delivered [and] works needed to capture water." In Chile, applicants must demonstrate the absence of legal impediments for granting the concession, provide technical evidence indicating that there are enough water resources at the natural source, and show that the concession does not overlap with other concessionaires. In Israel, water use and production require licensing, compliance with efficiency requirements, and the maintenance of water equipment.

V. Intercountry Disputes Concerning the Use of Water

Eight country surveys provide information on intercountry disputes over transboundary water resources.

A. Disputes over Dams Due to Risk of Reduced Water Supply

Some of the disputes revolve around dam projects that arguably may cause a risk of a reduced water supply for certain countries. For example, Afghanistan has disputes over water with Pakistan and Iran, who argue that Afghan dam projects on transboundary rivers will seriously affect their water supplies. Reportedly, many Iranians anticipate that Afghanistan's Khamal Khan Dam project on the Helmand River will severely reduce the volume of water that flows into Iran's Sistan Balochistan Province.

Egypt has a dispute with Ethiopia over the construction of the Renaissance Dam, which the latter is currently building. Egypt claims that this dam will put at risk its water supply by reducing the volume of water flowing into Lake Nasr. Reportedly, a governor from Mali has accused Libyan authorities of building a project on Malian territory aimed at diverting a large amount of water from the Niger River to increase farmland areas. Turkey has had an ambitious plan to construct dams and hydroelectric power plants since 1975, and has been accused by other countries that share the Tigris-Euphrates Basin (including western Iran) of hoarding water.

B. Dispute over Water as Part of Broader Negotiations

In Israel, a dispute over transboundary water resources is ongoing in a broader context, instead of being a dispute focused only on that issue. Indeed, the distribution and control of water is one of the contested issues between Israel and the Palestinians, and it is subject to the parties' negotiations on a peace agreement. Much of the water supply in the region flows from a shared aquifer located beneath the West Bank and Israel. The parties disagree on the distribution and control of water, appropriate consumption levels, the development of new water sources, and the treatment of sewage.

C. Solutions Pursued by International Water Commissions

In some of the surveyed countries, disputes over transboundary water resources are reportedly being addressed by international commissions formed by the parties involved. For example, the International Boundary and Water Commission (IBWC) is a binational entity that comprises a Mexican section and a United States section tasked with the distribution of the waters of the Colorado River and the Rio Grande between both countries. According to the US section of the IBWC, Mexico currently is not setting aside the water allocation that must be delivered every year to the United States, per applicable treaties. It has been reported, however, that the Mexican government is developing regulations that would require setting aside water to meet its obligations to the United States.

Furthermore, reports indicate that after the Soviet Union collapsed, conflicts arose between upstream Central Asian countries (such as Kyrgyzstan and Tajikistan) and downstream countries (such as Uzbekistan) over the control and use of common water resources. In an effort to

forestall further potential conflicts over water, these countries negotiated several agreements, one of which lead to the establishment of the Interstate Commission for Water Coordination (ICWC). The ICWC is comprised of water officials from all Central Asian countries, who frequently meet to discuss water quotas and allocations, and to resolve disputes.

In 2009, Turkey reached an agreement with Iraq and Syria to establish joint water monitoring stations and water education programs in connection with the Tigris and Euphrates rivers.

Afghanistan

Tariq Ahmad
Legal Research Analyst

SUMMARY Eighty percent of Afghanistan's water supply comes from rivers that are fed by snowmelt from the Hindu Kush Mountains. Due to water mismanagement and wastage only 20% of the population has access to a safe water supply. Afghanistan enacted a Water Law in 2009 that regulates ownership, fees, rights, permits, and usage with respect to water.Afghanistan has ongoing disputes over water with two of its neighbors—Iran and Pakistan. Both neighbors fear that Afghan dam projects on major rivers will seriously reduce their water supply.

I. Background

Afghanistan is landlocked, being surrounded by six countries including Turkmenistan, Uzbekistan, and Tajikistan to the north; China to the northeast; Pakistan to the east and south; and Iran to the west.[1] Afghanistan's land area extends to over 652,230 square kilometers, of which about 78,000 square kilometers (12%) is arable.[2] Approximately 80% of the area is either mountainous or desert area.[3] It is situated in an arid to semiarid region with a dry climate.[4]

The country's population is approximately 32 million, of which 77% reside in rural areas. The majority of the rural population are small subsistence farmers who live off of small plots of land. Therefore, "management of water resources is a vital factor for the economic growth, for maintaining the rural livelihoods, and for meeting the people's needs for food and fiber."[5]

More than 80% of the country's water resources originate in the Hindu Kush Mountains.[6] According to the United Nations Environment Programme (UNEP),

> Afghanistan is naturally arid, dominated by desert or semi-desert. Virtually the entire supply of water for irrigation, drinking, and maintenance of wetland ecosystems is carried by rivers. Most of these are fed by rainfall and the seasonal melting of snow and permanent ice-fields in Afghanistan's 'water towers', the Hindu Kush mountains. The

[1] Asad Sarwar Qureshi, *Water Resources Management in Afghanistan: The Issues and Options* 1 (IWMI Working Paper 49, Pakistan Country Series No. 14, 2002), http://www.afghaneic.net/library/hydrological%20surveys/wor49.pdf.

[2] GLOBAL WATER PARTNERSHIP SOUTH ASIA, TECHNICAL REPORT ON ISSUES RELATED TO WATER AND AGRICULTURE IN SOUTH ASIA 8 (Feb. 2012), http://www.gwp.org/Global/Activities/South%20Asia/gwp-apan-technical-report-issues-water-agriculture-south-asia.pdf.

[3] *Id*.

[4] *Id*.

[5] *Id*.

[6] *Id*.

> supply is intermittent, however, leaving Afghans in a perpetual state of water insecurity. A series of recent droughts have lowered water tables and dried up rivers and wetlands. Poor water management has threatened supplies for households, for agriculture and for maintaining populations of wild plants and animals.[7]

Due to water resource mismanagement, "Afghanistan uses just one-third of its potential 75,000 million cubic meters of freshwater annually, inefficient use and wastage mean that most of the population regularly experiences scarcity, and just 20 percent have access to a safe water supply."[8]

II. Legal Framework

The Water Law of Afghanistan, which came into force on April 26, 2009, regulates ownership, fees, rights, permits, and usage with respect to water. Article 1 of the Preamble of the Law stipulates its purpose:

> This law is to enforce the principles of Article Nine of The Constitution of Afghanistan for the purpose of conservation, equitable distribution, and the efficient and sustainable use of water resources, strengthen the national economy and secure the rights of the water users, in accordance with the principles of Islamic jurisprudence and the praiseworthy customs and traditions of the people.[9]

Article 2 states that water is owned by the public and the "government is responsible for its protection and management."[10] The Law outlines the responsibilities of a number of government institutions with respect to the management and protection of water resources. According to article 8(5),

> [d]etermination of irrigation norms in different river basins, irrigation drainage systems and other related research for water use for agriculture and irrigation are the main responsibility of the Ministry of Agriculture, Irrigation and Livestock with the cooperation from Ministry of Energy and Water, Ministry of Transport and Aviation, Ministry of Public Health and National Environmental Protection.[11]

Duties and responsibilities of the Ministry of Agriculture, Irrigation and Livestock are further detailed under article 11.

---

[7] United Nations Environment Programme, UNEP in Afghanistan: Laying the Foundations for Sustainable Development 5 (Jan. 2009), http://www.unep.org/pdf/UNEP_in_Afghanistan.pdf.

[8] *Afghanistan's Water Resources Under Stress: UNEP*, OOSKANEWS (May 24, 2013), http://www.ooskanews.com/daily-water-briefing/afghanistan-s-water-resources-under-stress-unep_27682.

[9] Water Law of Afghanistan art. 1, OFFICIAL GAZETTE No. 980, Apr. 26, 2009, https://ronna.apan.org/Lists/Submitted%20Content/Attachments/120/Unofficial%20English%20Translation%20of%20Water%20Law.pdf (unofficial translation)

[10] *Id*. art. 2.

[11] *Id*. art. 8(5).

Article 19 prohibits the use of water resources without a permit, except for the following purposes:

(1) Drinking water, livelihood and other needs, if the total daily consumption does not exceed 5 cubic meters per household.

(2) Use for navigation provided no damage occurs to the banks and right-of-way area of the river and there is no adverse impact to the quality of water exceeding permissible norms.

(3) For fire extinguishing.

(4) Existing water rights until Article Twenty, item (1) is in effect and implemented.[12]

Moreover according to article 21(2) a usage license or activity permit, including for government projects, is necessary in the following circumstances:

1. Surface and groundwater use for newly established development projects.
2. Disposal of wastewater into water resources.
3. Disposal of drainage water into water resources.
4. Use of water for commercial and industrial purposes.
5. Use of natural springs with mineral contents or hot springs for commercial purposes.
6. Digging and installation of shallow and deep wells for the commercial, agricultural, industrial and urban water supply purposes.
7. Construction of dams and any other structures for water impoundment, when the storage capacity exceeds 10,000 cubic meters.
8. Construction of structures that encroach the banks, beds, courses or protected rights-of-way of streams, wetlands, Karezes [water management systems], and springs.[13]

According to article 5 water conservation is to be guided by national water policy and strategy in accordance with the Water Law. Article 24(2) stipulates that the "water quality standard for agriculture will be established by Ministry of Agriculture, Irrigation and Livestock."[14]

[12] *Id*. art. 19.

[13] *Id*. art. 21.

[14] *Id*. art. 24(2).

III. Intercountry Disputes Concerning the Use of Water

Afghanistan has ongoing disputes over water with two of its neighbors—Iran and Pakistan. Both neighbors fear that Afghan dam projects on major rivers will seriously reduce their water supply.[15]

Though Afghanistan and Iran have had a water treaty covering the Helmand River since 1973, the treaty provisions are seen by some as being "inadequate and inconsistently enforced."[16] As a result, disputes over water continue to raise tensions between the two countries. Many fear that Afghanistan's Khamal Khan Dam project on the Helmand River will "severely affect the amount of water that flows into" the Sistan Balochistan province of Iran.[17] Similar concerns have been raised about the Salma Dam, a major hydroelectric dam being constructed in Herat province, which some believe will significantly affect the flow of the Harirod River into Iran.[18]
There is no water sharing agreement or treaty between Afghanistan and Pakistan. According to news reports, "close to 17 million acre-feet of water enters Pakistan from the Kabul River every year."[19] Planned hydroelectric projects on the Kabul River and its two main tributaries, the Kunar and Panjshir rivers, "would ultimately irrigate an additional 14,000 acres in Afghanistan on top of 12,000 acres at present."[20] However, according to some estimates, "construction of 13 dams on the Kabul River would reduce Pakistan's water supply from Afghanistan by 16–17%."[21] Pakistani efforts to build dams and the construction of the Kalabagh Dam have also been sources of tension. Several failed attempts have been made to draft a water treaty or agreement between Pakistan and Afghanistan.[22]

---

[15] Fatemeh Aman, *Afghan Water Infrastructure Threatens Iran, Regional Stability*, AL-MONITOR (Jan. 7, 2013), http://www.al-Monitor.com/pulse/originals/2013/01/afghanwatershortageiranpakistan.html.

[16] Paula Hanasz, *The Politics of Water Security Between Afghanistan and Iran* (Future Directions International Strategic Analysis Paper, Mar. 1, 2012), http://www.futuredirections.org.au/files/The_Politics_of_Water_Security_between_Afghanistan_and_Iran_-_March_1_2012.pdf.

[17] Aman, *supra* note 15.

[18] *Case Study 2: Water for Hydroelectricity and Irrigation in Herat Province*, *in* RENARD SEXTON, AFGHANISTAN WATCH, NATURAL RESOURCES AND CONFLICT IN AFGHANISTAN 19 (July 2012), http://www.watchafghanistan.org/files/Natural_Resources_and_Conflict_in_Afghanistan/Natural_Resources_and_Conflict_in_Afghanistan_Full_Report_English.pdf.

[19] Aman, *supra* note 15.

[20] *Id*.

[21] *Id*.

[22] *Id*.

Argentina

Graciela Rodriguez-Ferrand
Senior Foreign Law Specialist

SUMMARY Provinces have been assigned specific authority to legislate on matters related to natural resources in their territories while the central government has the authority to regulate the internal river navigation and commerce as well as the setting of minimum environmental protection standards. All water is public property with few exceptions. At the national level there is no water law but each province has adopted water legislation. The highest level of water consumption is in agriculture. Water use rights may be acquired by permit, by concession, and, under some province's laws, through authorization.

I. Legal Framework

A. National Legislation

Argentina's National Constitution (Constitución Nacional, CN)[1] establishes a federal form of government, setting the basis for the distribution of competencies between the central government and the provinces.[2] The provincial governments have the authority to legislate in matters related to the creation of regions for social and economic development.[3] Provinces have also been assigned specific authority to legislate on matters related to natural resources in their territories.[4] However, the central government has the authority to regulate internal river navigation and commerce as well as the setting of minimum environmental protection standards.[5]

According to the CN, provinces retain the right to forge agreements among themselves with regard to their economic interests and projects of mutual interest in matters of waterways affecting the territory of more than one province.[6]

The Civil Code (Código Civil)[7] determines that practically all water is under public domain,[8] defines the lines of the banks,[9] determines the legal consequences of changes in land caused by

[1] CONSTITUCIÓN NACIONAL DE LA REPÚBLICA ARGENTINA [CN], BOLETÍN OFICIAL [B.O.], Dec. 15, 1994, http://infoleg.mecon.gov.ar/infolegInternet/anexos/0-4999/804/norma.htm.

[2] *Id.* arts. 1, 121.

[3] *Id.* art. 125.

[4] *Id.* art. 124.

[5] *Id.* arts. 12, 14, 20, 26, 41, 75.10, 75.13.

[6] Lilian del Castillo, La Gestión del Agua en Argentina 256 (Ciudad Argentina, Buenos Aires, 2007).

[7] Código Civil (Cod. Civ.), http://www.infoleg.gov.ar/infolegInternet/anexos/105000-109999/109481/texact.htm.

[8] *Id.* art. 2340. For public limitations on privately owned rainwater and springwater, see *infra* notes 15 and 16 and accompanying text.

the natural action of water,[10] forbids diversion operations,[11] and provides for rules applicable to equitable servitudes.[12]

In Argentina, all water is public property with very few exceptions.[13] The Civil Code establishes that all rivers, springs, and waterways flowing in natural channels, and other water that is or may become suitable for general use, as well as navigable lakes, are in the public domain.[14] In exceptional cases, the Civil Code assigns the landowner the exclusive use of the water in his land if the water

(a) rises naturally and does not form a channel until it flows out of the property on which it rises (acquired rights of owners of servient land prevail over those of the dominant owner),

(b) rises and ceases in the same property,[15] or

(c) comes from rain and remains in the land on which it falls.[16]

Water, being in the public domain, belongs to the province where it is found with the federal government having jurisdiction only in certain matters, such as navigation.[17] There is no water law at the national level, but each province has adopted its own water code or statute.[18] However, current national legislation includes some provisions that are directly or indirectly related to water matters. This is the case of Law 25688 on the Environmental Management of Water, which provides minimum environmental standards for the conservation of water and its equitable use.[19] It also creates committees of interprovincial basins with the authority to decide on the sustainable use of water with environmental impact in more than one province.[20]

Law 25688 further provides a list of actions concerning water that might alter the water volume and the environment and therefore are subject to government authorization or permits issued by the provincial authorities. The list includes

---

[9] *Id*. art. 2577.

[10] *Id*. arts. 2572–2586.

[11] *Id*. arts. 2642, 2646–2653.

[12] *Id*. arts. 3002–3107.

[13] *Id*. art. 2340.

[14] *Id*.

[15] *Id*. art. 2637

[16] *Id*. art. 2635.

[17] *Id*. art. 2350; CN art. 124.

[18] MARISA ARIENZA ET AL., AGUA: PANORAMA GENERAL EN ARGENTINA 32 (Green Cross Argentina, Dec. 2011), http://www.gcint.org/sites/default/files/publication/document/Agua-Panorama-General-En-Argentina.pdf.

[19] Ley 25668 que Regula el Régimen de Gestión Ambiental de Aguas [Law 25668 Regulating the Regime of Environmental Management of Water] art. 1, B.O., Jan. 3, 2003, http://www.infoleg.gob.ar/infolegInternet/anexos/80000-84999/81032/norma.htm.

[20] *Id*. art. 4.

(a) the taking and diversion of surface water;

(b) the storage, alteration in the flow, or deepening of access to surface water;

(c) the taking of solid substances or dissolving substances from surface water that would affect water quality;

(d) discharges of substances into surface water, affecting its quality;

(e) discharges of substances into coastal waters, affecting their quality;

(f) the discharge of substances into groundwater;

(g) the taking or diversion of groundwater;

(h) the storage, deepening, or diversion of groundwater through works carried out for that purpose;

(i) actions intended to permanently alter the physical, chemical, and biological properties of water;

(j) the artificial alteration of the atmospheric hydrological cycle.[21]

B. Provincial Legislation

In furtherance of the competence that the CN has assigned to the provinces to legislate on matters of the management, use, and conservation of water in their respective territories, the provinces have enacted a number of norms on the use of water, embodied in water codes[22] that regulate the use of water and the issuance of permits for such uses; the establishment of priorities for water use; specific regulations on different types of water, such as surface water, groundwater, rainwater, or lake water; antipollution measures; norms related to hydraulic works; restrictions and limitations on ownership in order to protect the sources of water and the environment; and norms that organize water management.

> In general, [provincial] water codes adopt the following principles:
>
> - The state preserves ownership of water and issues permits for water use to individuals;
> - They establish a priority system for the issuance of permits considering the type of water consumption;
> - The permit application should include the extensions of land for irrigation, how many properties are involved or affected, the volume of water to be used, the manner in which water would be delivered, works needed to capture water;

[21] *Id*. art. 5 (translation by author).

[22] *See* MARIO VALLS, ALGUNAS CONSIDERACIONES SOBRE EL ESTADO DE SITUACIÓN DE LOS RECURSOS HÍDRICOS DE LA ARGENTINA 111–14 (Academias Nacionales de Ingeniería, Ciencias Económicas y Ciencias Exactas, Físicas y Naturales, Universitaria de La Plata, 1st ed. 2011).

- Permits may be issued for limited or unlimited period of time and may be revoked if works needed are not completed or if the water has not been used;
- Applicable fees are according to the volume of utilized water.[23]

II. Types of Water Use

There are two types of water use: one that produces a loss in water volume, called consumption use, and one that does not produce such a loss, called nonconsumption use.[24] The first type includes drinking water, industrial use, and agricultural use, including irrigation. The second type includes navigation, transportation, hydroelectric generators, and recreation activities.[25] In Argentina, the highest water consumption is in agriculture, including irrigation and cattle farming, which accounts for 73% of the total consumption use of water; industrial use, including mining, which accounts for 18%; and drinking water use, at 9%.[26]

III. Use of Water in Agriculture/Irrigation

Irrigation for agriculture constitutes the highest percentage of water consumption both at the national and international level.[27] In dry zones of the country the government has records of *concesiones* (administrative permits) for different water uses. In non-arid zones, the use is mostly private, by extracting water directly from surface or groundwater without any permit for its use, which makes it difficult to control or to determine exactly the size of the irrigated land.[28]

In general, irrigation efficiency is very low—only 40%—and even when it is carried out through permits, its use is not supervised, with the exception of the Mendoza and Río Negro provinces.[29] The consequence of this situation is that in many areas there is a deterioration of the soil due to an excess of irrigation, poor maintenance of irrigation equipment, ground soil salinity, and contamination with nitrates and other toxic substances.[30]

In zones where rainwater is scarce and water is an asset that has to be distributed and assigned by the government, the provision of water for agriculture and irrigation is subject to a fee. The price that is paid for this service is called a *canon* (administrative fee), paid yearly to the provincial authorities and determined according to the hectares of land covered.[31]

---

[23] Susana Formento & Ana Ferrazzino, *El Agua: Su Normativa Jurídica*, APUNTES AGROECONÓMICOS (Facultad de Agronomía de la Universidad de Buenos Aires, July 2003), http://www.agro.uba.ar/apuntes/no_2/agua.htm.

[24] DEL CASTILLO, *supra* note 6, at 70.

[25] *Id.*

[26] *Id.*

[27] *Id.* at 73.

[28] *Id.* at 74.

[29] *Id.* at 75.

[30] *Id.*

[31] *Id.* at 88.

The water supply in areas with irrigation infrastructure is provided by the public sector in about 74% of the territory and by the private sector in the remaining 26%. Most users of groundwater for irrigation do not pay any *canon*,[32] while those with irrigation systems derived from surface water pay a subsidized tariff with very low levels of compliance.[33]

In spite of the fact that the use of water in agriculture is very high, provincial revenues derived from water fees for agricultural use have been low, amounting to only 9 to 40% of the revenues obtained by provincial water authorities.[34]

IV. Right to Use Water

Water use rights may be acquired by permit, by concession, and, under some province's laws, through authorization. Revocable permits for water use are granted for a specific purpose. A *concesión* (grant) is granted for a period of time according to its intended use and may be granted in perpetuity. *Concesiones* for water use are transferred together with the land. The *concesión* gives its beneficiary the right to use the water. The grantor does not have any responsibility for any natural decrease in the water flow.[35]

The general principle is that priority is given to domestic needs and then to railway and irrigation services. Industrial and hydroelectric needs are next in line, with water storage facilities and fish hatcheries having the lowest priority.[36]

[32] *Id*. at 76.

[33] *Id*.

[34] *Id*. at 89.

[35] VALLS, *supra* note 22, at 111.

[36] Food and Agriculture Organization of the United Nations (FAO), Water Legislation in South American Countries 11–12 (Rome, 1983).

Brazil

Eduardo Soares
Senior Foreign Law Specialist

SUMMARY Brazil recently implemented a new irrigation policy through the enactment of Law No. 12,787 of January 11, 2013. The policy's purposes include, but are not limited to, encouraging the expansion of irrigated areas, increasing productivity on an environmentally sustainable basis; reducing climate risks inherent in agricultural activities, and promoting local and regional development.

Law No. 12,787 lists the resources to be used for the implementation of the irrigation policy, including irrigation plans and projects designed to guide the planning and implementation of the policy, and the creation of a National Information System on Irrigation for the collection, processing, storage, and retrieval of information related to irrigated agriculture.

A Secretariat created in 2011 is in charge, among other things, of promoting the creation, implementation, monitoring, and evaluation of the irrigation policy and its resources.

The implementation of an irrigation project is subordinated to the issuance of an environmental license whenever a specific federal, state, municipal, or district law requires it.

I. Background

In January 2013, Brazil implemented its new National Irrigation Policy, which provides, among other things, that public and private irrigation projects may receive tax incentives, with priority given to areas with low indicators of social and economic development. Farmers who practice irrigated agriculture may have access to rural credit lines for the purchase of irrigation equipment and rural insurance.[1]

II. Legal Framework

The National Irrigation Policy was implemented through Law No. 12,787 of January 11, 2013, which revoked the previous irrigation policy enacted in 1979 through Law No, 6,662 of June 15, 1979.[2]

A. Definitions

Law No. 12,787 defines several concepts, including that of a "farmer irrigator," who is an individual or entity that practices irrigated agriculture, and whose operations may be classified as

[1] *Sancionada Nova Política Nacional de Irrigação*, AGÊNCIA SENADO (Jan. 14, 2013), http://www12.senado.gov.br/noticias/materias/2013/01/14/sancionada-nova-politica-nacional-de-irrigacao.

[2] Lei No. 12.787, de 11 de Janeiro de 2013, art. 44, http://www.planalto.gov.br/ccivil_03/_Ato2011-2014/2013/Lei/L12787.htm.

family-based, small, medium, or large, as defined by regulation.[3] A "family-based irrigator farmer" is defined as an individual who can be classified as a family farmer under Law 11,326, of July 24, 2006,[4] practicing irrigated agriculture.[5] "Irrigated agriculture" is an economic activity that explores agricultural crops, as well as related farming and cattle-raising activities that use techniques of irrigation or drainage.[6]

B. Principles

Brazil's irrigation policy is governed by the following principles:

i) sustainable use and management of land and water resources for irrigation;

ii) integration with specific policies on water, environment, energy, environmental sanitation, rural credit and insurance and their respective plans, with priority given to projects whose works allow multiple uses of water resources;

iii) the linking of the actions concerning irrigation in different instances and levels of government and between them and the actions of the private sector;

iv) democratic and participatory management of public irrigation projects with irrigation infrastructure in common use, through mechanisms to be defined by regulation;

v) prevention of waterborne rural endemics.[7]

C. Objectives

The objectives of the irrigation policy are to[8]

i) encourage the expansion of irrigated areas and increase productivity in an environmentally sustainable basis;

ii) reduce climate risks inherent in agricultural activities, especially in areas subject to low or irregular rainfall distribution;

iii) promote local and regional development, with priority given to regions with low social and economic indicators;

iv) contribute to increase the competitiveness of the country's agribusiness and the creation of jobs and income;

v) contribute to the supply of the domestic market of food, fiber and renewable energy, as well as for generating agricultural surpluses for export;

---

[3] *Id.* art. 2(I).

[4] Lei No. 11.326, of July 24, 2006, http://www.planalto.gov.br/ccivil_03/_Ato2004-2006/2006/Lei/L11326.htm, establishes the guidelines for the formulation of the National Policy of Family Agriculture and Rural Family Ventures.

[5] Lei No. 12.787, art. 2(II).

[6] *Id.* art. 2(III).

[7] *Id.* art. 3 (translation by author).

[8] *Id.* art. 4.

vi) train human resources and foster the creation and transfer of technologies related to irrigation;

vii) encourage private irrigation projects, as defined by regulation.[9]

D. Implementing Instruments

Article 5 of Law No. 12,787 lists the resources (or "instruments" as they are referred to) to be used for the implementation of the irrigation policy, which include

i) plans[10] and irrigation projects;[11]

ii) the National Information System on Irrigation;[12]

iii) tax incentives, rural credit and insurance;

iv) training of human resources;

v) scientific and technological research;

vi) technical assistance and rural extension;

vii) special rates for electricity for irrigation;

viii) certification of irrigation projects;

ix) Investment Fund in Infrastructure (FIP-IE);

x) National Irrigation Council.[13]

E. Water Rights

1. Water Code

For purposes of the Water Code (Código de Águas), a spring (*nascente*) is defined as waters that emerge naturally or by human industry, and run within one particular property, and even go through it, when those waters have not been abandoned by the owner.[14]

The owner of a property where any spring is located cannot impede the natural course of water to lower properties once the owner's water consumption needs have been satisfied.[15] If a spring emerges in a gap that divides two properties, it belongs to both properties.[16]

---

[9] *Id.* (translation by author).

[10] According to article 6 of Law No. 12,787, the irrigation plans aim to guide the planning and implementation of the National Irrigation Policy, in accordance with the Water Resources Plans.

[11] Article 7 of Law No. 12,787 determines that public irrigation projects must be planned and implemented in accordance with the respective irrigation plans.

[12] Pursuant to article 8 of Law No. 12,787, the National Information System on Irrigation was established for the collection, processing, storage, and retrieval of information related to irrigated agriculture.

[13] Lei No. 12.787, art. 5 (translation by author).

[14] CÓDIGO DE ÁGUAS, Decreto No. 24.643 de 10 de Julho de 1934, art. 89, http://www.planalto.gov.br/ccivil_03/decreto/D24643compilado.htm.

According to the norms of legal drainage servitude (*normas da servidão legal de escoamento*), the owners of lower-lying properties are compelled to receive water from artificial sources (*nascentes artificiais*) provided that they receive compensation.[17] This compensation, however, must take into account the value of any benefit that can be derived from supplying such water to the properties.[18]

The owner of a spring cannot alter its course when the spring supplies water to a population.[19] Spring water is determined by the point at which it begins to run upon the ground and not the vein that feeds it underground.[20]

The owner of any land may take possession of water by means of wells and pools that exist beneath the surface of his own property as long as doing so does not harm the water's existing use, or cause such water to drift or deviate from its natural course if it is public water, common water of public use, or water of private use.[21] If the use of groundwater impairs or diminishes public water, common water of public use, or water of private use, the competent authority may suspend its exploitation.[22]

The owner of a property may not open a well that is adjacent to a neighboring property without observing the necessary distances or taking the required precautions so that the neighbor suffers no harm.[23] Construction capable of polluting or rendering useless for common use the water from a well or spring of another that predated the construction is expressly prohibited.[24] Anyone who violates this provision is obligated to demolish any construction and is liable for losses and damage caused.[25]

2. Civil Code

The owner of a property has the right to build dams, reservoirs, or other works for retaining water on his property. However, if the retained water invades the property of another person, the owner of the invaded property must be compensated for the damage suffered, less the value of the benefit obtained, if any.[26]

---

[15] *Id.* art. 90.

[16] *Id.* art. 91.

[17] *Id.* art. 92.

[18] *Id.* art. 92 (sole para.).

[19] *Id.* art. 94.

[20] *Id.* art. 95.

[21] *Id.* art. 96.

[22] *Id.* art. 96 (sole para.).

[23] *Id.* art. 97.

[24] *Id.* art. 98.

[25] *Id.* art. 99.

[26] CÓDIGO CIVIL, Lei No. 10.406, de 10 de Janeiro de 2002, art. 1.292, http://www.planalto.gov.br/ccivil_03/Leis/2002/L10406compilada.htm.

Any person can build channels through third-party properties to receive water to which they are entitled and that is an indispensable necessity of life, provided that the owners are compensated and that it does not cause considerable damage to agriculture and industry, as well as to the flow of accumulated water or the drainage of the land.[27]

The harmed owner is also entitled to recover future damages caused by infiltration or irruption of water, as well as the deterioration of works designed to channel them.[28] The aggrieved party may require that the pipeline that runs through built areas, courtyards, gardens, or backyards be constructed underground.[29] The aqueduct must be built in a way that causes the least harm to the owners of neighboring properties, and at the expense of its owner, who is also responsible for its maintenance.[30]

F. Government Authorities

In 2011, the government created the National Irrigation Secretariat (Secretaria Nacional de Irrigação – SENIR) for the main purpose of setting up a management system for irrigated agriculture, establishing the various agencies that interact with the industry, supporting the private sector, and optimizing public areas as development tools for disadvantaged regions. SENIR also aims to promote irrigation as an instrument for efficient agricultural production and eradication of poverty by creating jobs and income.[31]

1. SENIR

SENIR is subordinated to the Ministry of National Integration (Ministério da Integração Nacional) and is divided into two sections: the Department of Public Irrigation and the Department of Irrigation Policy.[32]

SENIR is in charge, among other things, of

- promoting the creation, implementation, monitoring, and evaluation of the National Irrigation Policy and its instruments, which are integrated with the National Policy for Regional Development and other related policies;
- promoting the institutional participation of the Ministry of National Integration in instances representing the development of irrigated agriculture;
- promoting the business of irrigated agriculture;

[27] *Id.* art. 1.293.

[28] *Id.* art. 1.293(§1).

[29] *Id.* art. 1.293(§2).

[30] *Id.* art. 1.293(§3).

[31] *Apresentação*, SECRETARIA NACIONAL DE IRRIGAÇÃO, MINISTÉRIO DA INTEGRAÇÃO NACIONAL, http://www.integracao.gov.br/web/guest/apresentacao-ii-seminario-nacional (last visited July 31, 2013).

[32] Decreto No. 7.472, de 4 de Maio de 2011, Anexo I, art. 2(II)(b), http://www.planalto.gov.br/ccivil_03/_Ato2011-2014/2011/Decreto/D7472.htm.

- promoting the implementation of irrigation projects and agricultural drainage;
- promoting and regulating initiatives for the implementation, operation, and maintenance of public works related to irrigation projects; and
- supporting and promoting actions aimed at the administrative and operational autonomy of users of irrigation projects.[33]

2. Department of Public Irrigation

The Department of Public Irrigation is responsible for

- promoting instruments to support public irrigation perimeters;
- implementing activities that promote the coordination and integration of activities with the various organs of the federal, state, and municipal governments for the strengthening of public irrigation;
- designing, developing, promoting, and supporting the implementation of irrigation projects;
- monitoring, supervising, and inspecting the implementation of actions aimed at the use of water resources and land, together with the other organs of the Ministry of National Integration;
- overseeing the implementation of public actions of irrigation and agricultural drainage;
- guiding the development of standards and technical manuals aimed at standardizing procedures for public irrigation projects;
- supporting the operation, maintenance, and restoration of infrastructure works of irrigation projects;
- developing and implement training programs for staff regarding the management of public irrigation projects; and
- developing tools for the economic and environmental sustainability of public irrigation projects.[34]

3. Department of Irrigation Policy

The responsibilities of the Department of Irrigation Policy include

- leading the process of formulating the National Irrigation Policy and its instruments, which are integrated with the National Policy for Regional Development and other related policies;
- evaluating the performance of the National Irrigation Policy;
- coordinating the formulation of regional plans and programs for the development of irrigated agriculture;

[33] *Id.* art. 18.

[34] *Id.* art. 19.

- coordinating the computerized system for monitoring and evaluating the implementation of regional irrigation plans;
- establishing the guidelines for the preparation and management of state development plans of irrigated agriculture;
- promoting studies, research, and dissemination of technologies for the development of irrigated agriculture;
- coordinating, promoting, and reconciling studies for the formulation and implementation of a National Irrigation Policy integrated with regional development;
- coordinating, integrating, and reconciling programs and activities of SENIR with agencies and entities of the Ministry of National Integration and with other federal, state, and municipal agencies, and civil society for the strengthening of irrigated agriculture; and
- promoting the optimization of the productivity chain in irrigated agriculture with the use of financing, dissemination of management practices, and implementation of certifications, among other things.[35]

G. Licensing

The implementation of an irrigation project depends upon the issuance of an environmental license whenever such license is required by a specific federal, state, municipal, or district law.[36]

When declared by the federal government as essential for social and economic development, the infrastructure works of irrigation projects, including the obstruction of watercourses that cause intervention or removal of vegetation in an area of permanent preservation, may be considered of public utility for the purposes of environmental licensing.[37]

The use of water resources for irrigation projects depends on the prior approval of the right to use water resources by the appropriate federal, state, or district entity.[38] The institutions participating in the national system of rural credit mentioned in Law No. 4,829 of November 5, 1965, may only finance the implementation, expansion, and payment of irrigation projects that have been approved to use water resources.[39]

[35] *Id.* art. 20.

[36] Lei No. 12.787, art. 22.

[37] *Id.* art. 22(§2).

[38] *Id.* art. 23.

[39] *Id.* art. 23(§1).

Chile

Dante Figueroa
Senior Legal Information Analyst

SUMMARY The Chilean water regime has experienced important changes during the last forty years. From a state-driven system, the current legal regime gives the market the principal role in the allocation, use, and transfer of water rights. The legislation does not expressly regulate the use of water for agricultural purposes. Holders of water rights enjoy the freedom to decide to use their resources for whatever objectives they deem appropriate, including agriculture. However, Chilean legislation provides for incentives to use water for agricultural purposes, mainly for irrigation of agricultural lands. Despite recent amendments to legislation, Chile's legal framework concerning the use of water for agriculture remains open and driven by the market, reserving for the government a role largely centered on the promotion and monitoring of water use in agricultural activities.

I. Background

A. Relevant Policies

Currently, Chile's potable water and sewage services cover all or almost all of its urban population,[1] and about 72 per cent of the population of rural areas.[2] This high coverage rate is credited to the open water markets created in 1981 when the new Water Code[3] was enacted.[4] Before 1981, the state had an active role in the determination, allocation, and termination of water rights, as well as the supervision of water use. The new legal regime of 1981 eliminated most of these government powers, allowing for the free transferability of water resources. The rationale for the new system was that users, as opposed to government agencies, are the most qualified stakeholders to determine key issues related to water, including its allocation, distribution, uses, and transference.[5] Another factor that has benefitted the new legal regime is the possibility of submitting water disputes to arbitration before the board of a water users' association, without prejudice to the appeals that aggrieved users may file with regular courts.[6]

[1] María de la Luz Domper, *Chile: A Dynamic Water Market*, LIBERTAD Y DESARROLLO (Mar. 2009), http://www.fcpp.org/pdf/09-03-23-Chile.pdf.

[2] *Id*. at 2.

[3] CÓDIGO DE AGUAS [CÓD. AGUAS] [WATER CODE], DIARIO OFICIAL DE CHILE [D.O.], Oct. 29, 1981, http://www.leychile.cl/Navegar?idNorma=5605&idParte=0.

[4] *Id*.

[5] *Id*.

[6] FRANCISCO SEGURA RIVEIRO, DERECHO DE AGUAS 172 (Universidad de Concepción 2006).

B. Historical Background

The Civil Code of Chile, enacted in 1857, provided that "all waters are national goods for public use."[7] The government granted the use of waters to users under restrictive terms, that is, exclusively for approved uses, under penalty of termination of the respective concession.[8] This system lasted until 1981 with the enactment of the new Water Code, which recognized and greatly protected water rights as property rights assigned definitively and in perpetuity.[9] Under the new Code, water itself is considered as an asset independently from the land where it is located, and therefore, also independently transferable.[10]

While water remains in the public domain under the Water Code, users may enjoy proprietary rights over it and allocate it for different purposes, including agriculture, which is the most important among consumptive uses.[11] In other words, there is no separate legal regime for allocating water for use in agriculture. It is the market that determines how the water will be used, and using it in agriculture is only one possible use.[12]

The water market created with the passage of the Water Code triggered a "vibrant trading in water markets,"[13] but also a speculative environment for the transferability of water rights. In fact, competing interests, (agricultural, industrial, and private) have often engaged in local or even national "wars" over the resource. The scarcity of water experienced in certain areas of the country[14] has been followed by price increases, as private companies (rather than the government) vied to construct the infrastructure necessary to secure water and sewage services and extend them to the whole population.[15] Other powerful interests, such as the mining industry and energy producers (mainly of hydroelectric power) have competed intensely in the water market over the last three decades in Chile.[16]

Overall, the Chilean water market remains very active, and the role of the government in regulating water has remained marginal.[17]

---

[7] CÓDIGO CIVIL [CÓD. CIVIL] [CIVIL CODE] art. 595, DIARIO OFICIAL DE CHILE [D.O.], May 30, 2000, http://www.leychile.cl/Navegar?idNorma=172986.

[8] María de la Luz Domper, *supra* note 1, at 3.

[9] SEGURA RIVEIRO, *supra* note 6, at 180.

[10] *Id*. at 244.

[11] Mónica Ríos & Jorge Quiróz, *The Market of Water Rights in Chile: Major Issues*, World Bank Technical Paper Number 285, 3 (Sept. 1995), http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/1995/09/01/000009265_3961219110551/Rendered/PDF/multi_page.pdf.

[12] María de la Luz Domper, *supra* note 1, at 2.

[13] *Id*.

[14] *Id*.

[15] *Id*. at 5.

[16] *See id*. at 2; *and* SEGURA RIVEIRO, *supra* note 6, at 199–212.

[17] María de la Luz Domper, *supra* note 1, at 4.

C. General Perception of Chile's Free Water Market

The principle of free access and transferability of water rights in Chile codified in the 1981 Water Code inaugurated a legal regime that is known as one of the world's most promarket. The Chilean water market presents the following features:

- concession of water rights that is not subject to any type of payment (with the exception of overlapping petitions for concessions, see below, Current Legal Framework – Assignment of Water Rights); unrestricted transferability of water rights, including the creation of liens (e.g., easements, mortgages);
- joint or separate alienability of water rights from land ownership;[18]
- freedom for the owner to use the water or change water use as he or she sees fit (for agriculture, irrigation, human or animal consumption, energy production, tourism, sports, etc.);[19] and
- restricted role of the state in the water rights market.

However, many criticisms against the current market-driven approach to water use in Chile have been leveled, which include the following:

- the purported goal of creating a free market where water and land rights would interact without restrictions has not been realized; in fact, water monopolies have acted negatively to destroy the Chilean water market;
- significant conflicts have arisen among multiple, antagonistic interests concerning the use of water for different purposes;
- the water market has, in effect, increasingly restricted the access of small farming communities to water rights;[20]
- the lack of a central authority endowed with effective powers to regulate the distribution and use of water in its basin has been singled out as the cause for enormous sustainability problems (or "environmental damages"), with the excessive number of concessions granted over several natural water sources leading to the exhaustion of these resources;[21]
- the ability of concessionaires to obtain water rights without paying the government for them, to hold them indefinitely without purchasing patents or paying royalties, taxes, fees, fines, or other penalties for not using water rights, and to sell them at will[22] has created a highly speculative market with water rights concentrated in the hands of only a few stakeholders; and

[18] I RAFAEL VERGARA BLANCO, DERECHO DE AGUAS 257 (Editorial Jurídica de Chile 1999).

[19] *Id*. at 268.

[20] *Id*. at 273.

[21] *Id*. at 275.

[22] *Id*. at 273.

- the existence of customary rights to water in certain areas of the country[23] has caused many conflicts between holders of water rights registered in the formal Water Registry[24] and those holding customary water rights. This dual system of customary and registered water rights generates great uncertainty in the Chilean water market.[25]

II. Current Legal Framework

A. Laws Governing the Use of Water in Agriculture

As mentioned above, Chilean law does not contain a dedicated legal regime for the use of water in agriculture. All of the statutes applicable to water in general also apply to agriculture.[26] However, there are two statutes that deal with irrigation for agricultural purposes. First, the Law on Incentives to Irrigation [Ley N° 1.123 of 1981, de Fomento al Riego] regulates irrigation for and encourages investment in major irrigation projects, both existing and new.[27]

Secondly, the Law on Incentives for Minor Irrigation Works [Ley N° 18.450 of 1985, de Fomento a Obras Menores de Riego] provides for the government to subsidize up to 75% of the costs of irrigation and drainage works, with the aim of promoting private investment in the construction and improvement of irrigation infrastructure.[28]

B. Legal Status of Waters

According to the Constitution, water rights grant their holders ownership rights over the waters.[29] Rights over surface or ground waters are granted through a government act, specifically, through a concession issued by the General Water Directorate (GWD—*Dirección General de Aguas*).[30] Water rights are registered in a government-run Water Registry maintained by the Property Registry,[31] which provides certainty to water rights.[32] The law classifies water rights in several categories, and most importantly distinguishes between consumptive and non-consumptive

[23] *See* Ley 19.253 Establece Normas Sobre Protección, Fomento y Desarrollo de los Indígenas, y Crea la Corporación Nacional de Desarrollo Indígena [Law 19,253, Establishing Provisions on the Protection, Support, and Development of Indigenous Peoples, and Creating the National Corporation for Indigenous Development] (Oct. 5, 1993), http://bcn.cl/4ncl (regulating the water rights of the Aymara and Atacameña indigenous communities).

[24] I VERGARA BLANCO, *supra* note 18, at 282.

[25] *Id*. at 282.

[26] SEGURA RIVEIRO, *supra* note 6, at 18.

[27] Ríos & Quiróz, *supra* note 11, at 4.

[28] II VERGARA BLANCO, DERECHO DE AGUAS 434 (Editorial Jurídica de Chile 1999).

[29] Constitución Política de la República de Chile [C.P.] [Political Constitution of the Republic of Chile] art. 19 no. 24 ¶ 2, http://www.bcn.cl/lc/cpolitica.

[30] CÓD. AGUAS art. 141.

[31] *Id*. art. 20.

[32] I VERGARA BLANCO, *supra* note 18, at 267.

rights,[33] depending on whether the holder may consume all or part of the water or only use it and then return it to the watercourse.

In sum, surface and ground waters are national public goods, and only after their concession do they become private property.[34]

C. Assignment of Water Rights

The assignment of water rights by the General Directorate of Water (GWD) operates under the modality of a concession that is granted free of charge to the beneficiaries.[35] Only three requirements are necessary for the concession of water rights: (1) that no legal impediments exist; (2) that technical evidence exists that there are sufficient water resources at the natural source; and (3) that there is no overlapping with existing concessionaires.

Those interested in obtaining a water concession must submit an application to the government, specifying the area where the water is located and its volume, among other criteria.[36] In the case of an overlap of petitions,[37] that is, of simultaneous petitions for rights over the same body of surface water, Chilean legislation provides for an open "auction" system in which those willing to pay the highest price for the water rights receive the concession. In the case of ground water, the auction system is restricted to those who have submitted overlapping requests for concessions.[38]

Because Chile's water rights allocation system is driven purely by the market, once an individual or company receives a concession of water rights, he or she is free to use or not use the water, or to use it for any purpose, or to transfer it totally or partially for value, or to utilize the water rights as an investment, e.g., as a capital contribution to another company.[39]

D. Rights of Riparian Owners

The Civil Code provides that the waters that "in their periodical increases and decreases alternatively occupy and vacate the land are part of the banks or the riverbed, and do not accrue to contiguous properties."[40] Under the Water Code, in turn, water user associations (WUAs) are in charge of distributing the water among their members, enforcing the appropriate use of the resource, and maintaining and administering irrigation infrastructure.[41]

---

[33] CÓD. AGUAS art. 12.

[34] Ríos & Quiróz, *supra* note 11, at 2.

[35] SEGURA RIVEIRO, *supra* note 6, at 283.

[36] CÓD. AGUAS arts. 130–76 (establishing the procedure for the petition and allocation of water rights).

[37] I VERGARA BLANCO, *supra* note 18, at 269.

[38] María de la Luz Domper, *supra* note 1, at 3.

[39] I VERGARA BLANCO, *supra* note 18, at 269.

[40] CIVIL CODE art. 650 para. 2.

[41] Ríos & Quiróz, *supra* note 11, at 3 ("[t]hree different types of associations are considered in the Water Code: '*juntas de vigilancia*' which are supervision committees in charge of monitoring the use of natural sources of water

E. Requirements for Licenses to Use Water for Agricultural Purposes

As stated before, since 1981, the right to use water in Chile has been granted through a water concession given by the government.[42] The concession act must, among other things,

- identify the riverbed over which concession rights have been granted;
- determine whether the concessionaire has the right to consume the water or not; and
- specify whether the water may be used irrespective of droughts or other emergencies ("continuous rights"[43]).

In addition, the concession right must be created by a resolution of the General Waters Director, and the constitutive resolution must be registered in the Water Registry.[44]

The "traditional and immemorial use of waters"[45] by farmers and riparian owners existing before 1981 were recognized as validly constituted water rights by the Water Code.[46] These customary rights encountered a legal restriction in the Water Code, according to which such customary rights had to be legally recognized by a judicial decision issued prior to 1981.[47] Thus, since 1981, a de facto dual system of water rights for both farmers and riparian owners—most of them poor—and registered owners has existed. Potential conflicts over water rights as a result of this dual system have been averted by a legal loophole. According to the Water Code, the granting of a new water concession must be made "without generating prejudice to third parties."[48] Government authorities and courts have repeatedly interpreted this provision to require the GWD to take into consideration customary water rights before granting a new concession. Some authors have relied on other legislation to this effect.[49] In sum, the dual system of registered and nonregistered (or customary) water rights continues to exist in Chile.

---

such as rivers, '*asociaciones de canalistas*' which are associations of channel users usually in charge of administering primary infrastructure such as dams and main irrigation channels, and '*comunidades de aguas*', which are water communities responsible for secondary infrastructure such as distribution channels. Except for the '*comunidades de aguas*', these associations have a collective legal status, which allows them, for example, to take out loans collectively.").

[42] CÓD. AGUAS art. 149.

[43] Ríos & Quiróz, *supra* note 11, at 2 ("Continuous rights allow to use water uninterruptedly during 24 hours a day, discontinuous rights imply that two or more people take turns to use water.").

[44] CÓD. AGUAS art. 150 para. 2.

[45] II VERGARA BLANCO, *supra* note 28, at 327.

[46] CÓD. AGUAS art. 310.

[47] *Id*. art. 55.

[48] *Id*. art. 3.

[49] DECRETO LEY [D.L.] [DECREE LAW] No. 2.603 of 1979, art. 7 (stating that "the rights of individuals over waters, when recognized or constituted according to the law, shall grant ownership rights to their holders over them.") (translated by author).

F. Water Quality and Water Conservation Requirements Associated with the Use of Water in Agriculture

The Chilean Constitution guarantees the right of all citizens to live in an environment free from contamination.[50] The following is the most important legislation concerning the quality of water for agricultural purposes:

- Art. 10 of Law 19,300 of 1993 on the General Framework for the Environment [*Ley 19.300 de Bases del Medio Ambiente*], establishing a mandatory environmental review of certain projects, including aqueducts, dams, and other infrastructure works that alter natural watercourses.
- Art. 92 of the Water Code, protecting the quality of irrigation water by prohibiting the deposit of waste in water channels.
- Supreme Decree 90 of 2000, Emissions Standards for the Regulation of Pollutants Associated with the Discharge of Liquid Waste in Marine Waters and Continental Surface Waters [*Decreto Supremo 90 of 2000, Norma de Emisión para la Regulación de Contaminantes Asociados a las Descargas de Residuos Líquidos a Aguas Marinas y Continentales Superficiales*].
- D.L. 3,063 of 1979, Law on Municipal Revenue [*Ley de Rentas Municipales*], prohibiting the discharge of waste into irrigation channels, streams, and rivers.
- Chilean Standard NCh 1333 of 1978, Supreme Decree No. 867, on Water Quality Requirements for Different Uses [*Norma Chilena NCh 1333 de 1978, Decreto Supremo No. 867, sobre Requisitos de Calidad de Agua para Diferentes Usos*], establishing parameters for the biological quality of irrigation water and water use in agriculture.
- Quality Standards for the Protection of Continental Surface Waters [*Normas de Calidad para la Protección de las Aguas Continentales Superficiales*]: pursuant to Law 19,300, the National Commission for the Environment (CONAMA) is charged with issuing these standards.[51] The specific objectives related to the agricultural use of continental surface waters are the following: (i) to maintain or restore the quality of waters suitable for the irrigation of fruits and vegetables; and (ii) to protect the quality of irrigation water used for the conservation of soil and the wild flora found in it.
- Law 20,089 of 2007 Creating the Certification System for Organic Agricultural Products, and Chilean Standard 2,439 of 2010 for Organic Production [*Ley 20.089 que crea el Sistema de Certificación de Productos Orgánicos Agrícolas* and *Norma Chilena NCh 2.439 de Producción Orgánica*], which provides that irrigation water must comply with the applicable legislation; specifically, that irrigation water must not become a factor in the erosion of agricultural soils.

[50] C.P. art. 19 no. 24.

[51] *See* Guía CONAMA para el Establecimiento de las Normas Secundarias de Calidad Ambiental para Aguas Continentales Superficiales y Marinas [Guidelines issued by CONAMA for the Approval of Secondary Quality Norms on Environmental Quality for Continental Ground and Marine Waters], http://www.bcn.cl/carpeta_temas/temas_portada.2005-12-27.4449440028/GuiaNormaPract.pdf (last visited July 29, 2013).

G. Recent Amendments

1. New Legal Framework for Water and Sewage Services

In 1988, the government established a new regulatory regime for water and sanitation services. The two main existing public water companies were reorganized into thirteen new regional public companies. Afterwards, a wave of privatizations followed in which the government divested itself, totally or in part (through thirty-year concessions), of ownership rights over these new companies. This measure was adopted in tandem with a government-mandated gradual increase in the price of water and sewage services.[52]

In 1989, to improve the living standards of persons located below the poverty level, a partial subsidy for individual water consumption and sewage services was created.[53] This subsidy is provided by the government through local municipalities but administered by water companies.[54] Consequently, the equal involvement of the private and public sectors was key to the design of the new system.[55]

To date, all water companies operating in Chile are either entirely private or benefit from the participation of private capital in their operations.

2. New Taxation

The real or perceived drawbacks that arose from the original legal framework for water rights established more than forty years ago in Chile gave way to reformist trends, which pivoted around two approaches. First, some advocated the need to discontinue the market-driven allocation system for water rights and to replace it with another with increased state power over the distribution, use, transference, and termination of water rights. The second position, favored by most experts, was that the fundamental market model for water rights was sound, but that several amendments were necessary to correct certain anomalies.[56]

Regarding these reforms, one of the areas where a broader consensus existed in Chilean society was related to the fact that under the original Water Code, water concessionaries were under no obligation to use their water rights, and no penalties or other financial consequences, such as patents, fees, etc., were levied upon the concessionaries for insufficient use of the resource.[57] In particular, the social cost created by the lack of water use was the most important criticism.

---

[52] María de la Luz Domper, *supra* note 1, at 4.

[53] *Id*. at 6.

[54] *Id*.

[55] *Id*.

[56] I VERGARA BLANCO, *supra* note 18, at 278.

[57] *Id*. at 288.

As a consequence of the consensus on the need for reform, a legislative change took place in 2005 when the Chilean Congress passed Law 20,017.[58] Law 20,017 created a royalty or tax applicable to owners of non-consumptive and continuous water rights who fail to utilize the waters.[59] Specifically, the tax applies when owners fail to build infrastructure works to capture and restitute the waters.[60] Law 20,017 provides that if the taxes are not paid, the courts may order the public auction of the respective water rights.

III. Institutional Framework for the Administration of Water in Agriculture

The following are the most important government agencies in charge of administering water in agriculture:

A. General Directorate of Water (DGA, *Dirección General de Aguas*)

GWD's powers concern the authorization of infrastructure works, the overseeing of water users' organizations, and the imposition of penalties for certain violations.[61] But the GWD—which is located within the Ministry of Public Works—may not intervene in policy decisions concerning the allocation of water rights, resolve water conflicts, or interfere with private contracts concerning water rights. Its enforcement powers are very limited.[62]

B. National Irrigation Commission (CNR, *Comisión Nacional de Riego*)

Together with the Directorate of Irrigation, this agency is in charge of planning, evaluating, and approving investment for both major and minor irrigation infrastructure projects.[63]

C. Directorate of Irrigation (DR, *Dirección de Riego*)

This agency executes the technical and economic studies for the implementation of irrigation infrastructure projects financed by the state after they are approved by the CNR. Private construction companies build these projects.[64]

---

[58] Ley 20.017, Modifica el Código de Aguas [Law 20,017, Amending the Water Code] [D.O.] (June 16, 2005), http://bcn.cl/n0g.

[59] Law 20,017, arts. 129 bis 4–129 bis 21.

[60] SEGURA RIVEIRO, *supra* note 6, at 89.

[61] *Id*. at 283.

[62] Ríos & Quiróz, *supra note* 11, at 3 (noting that other specific tasks of the GWD include the "administration of the National Hydrometric Service, control of activities of the '*juntas de vigilancia*', and approval of all major hydraulic works. In the last years, its main activity has been to regulate the distribution of water rights and to prepare technical reports needed for conflict resolution.").

[63] *Id*. at 320–21.

[64] *Id*. at 321.

D. Agricultural and Livestock Service (SAG, *Servicio Agrícola y Ganadero*)

SAG's goal is to promote the development of sustainable agriculture through the protection and conservation of renewable water resources. For that purpose, SAG implements a contamination prevention and control program for water resources related to agriculture and wildlife.

IV. Intercountry Disputes Concerning the Use of Water

A. Silala River Case

The Silala River flows "across the Bolivian-Chilean border in the Atacama Desert via a canal constructed in the early 1900s by Antofagasta & Bolivia Railway Company,[65] a Chilean mining operation, per a concession granted by the Bolivian Prefecture of Potosí." [66] A dispute arose in 1997 when Bolivia claimed the exclusive right to use the waters of the Silala River, based on the claim that its waters originate in Bolivian territory and are artificially transported to Chile.[67] To further its claims, Bolivia undertook a number of steps, including boosting military presence on the banks of the river, revoking the existing concession, and planning several infrastructure works for the use of the stream.[68] Chile, in turn, maintains that the river waters have never been diverted from the channel and continue to flow naturally into Chilean territory. While Bolivia claims that the Bolivian law concerning concession agreements applies to the dispute, Chile argues that international water law applies to this natural transboundary watercourse.[69]

Currently, no legal or political solution has been reached concerning this dispute.[70]

B. Lauca River Case

The Lauca River originates in the Chilean Andean region of Arica and Parinacota, crosses the Andes Mountains, and flows into the Coipasa Lake in Bolivia.[71] Since the early 1960s, Bolivia has claimed that Chile has diverted the waters[72] of the river. Like the Silala River case, this dispute remains unresolved.

---

[65] Corporación de Defensa de la Soberanía, *La Cuestión del Río Silala* (Apr. 3, 2008), *available at* http://www.soberaniachile.cl/controversia_entre_chile_y_bolivia_del_rio_silala.html.

[66] *The Silala Basin: One of the Most Hydropolitically Vulnerable Basins in the World*, INTERNATIONAL WATER LAW PROJECT BLOG (Oct. 27, 2011), http://www.internationalwaterlaw.org/blog/2011/10/27/the-silala-basin-one-of-the-most-hydropolitically-vulnerable-basins-in-the-world/.

[67] *Id*.

[68] *Id*.

[69] *Id*.

[70] *Si Bolivia Cierra las Aguas del Silala a Chile Habrá un Conflicto Armado*, BOLIVIA HOY (July 15, 2013), *available at* http://www.nadir.org/nadir/initiativ/agp/free/imf/bolivia/txt/2003/0715agua_chile.htm.

[71] *Caso del Río Lauca entre Bolivia y Chile*, BUENASTAREAS.COM (Sept. 2010), http://www.buenastareas.com/ensayos/Caso-Del-Rio-Lauca-Entre-Bolivia/823165.html.

[72] Opinión, *El Desvío del Lauca*, DIARIO LA RAZÓN (Oct. 4, 2010), http://www.la-razon.com/opinion/editorial/desvio-Lauca_0_1261073881.html.

Egypt

George Sadek
Senior Legal Research Analyst

SUMMARY The Nile River is the main water resource for Egypt. It has three major sources: (1) the Blue Nile, (2) the White Nile, and (3) the River Atbara. Law 12-1984 on Irrigation is the principle piece of legislation regulating the usage of water, water management, and distribution. Egypt receives most of water from the Nile, using over 55.5 billion cubic meters of water per year. The situation among countries of the Nile Basin became more complicated when Ethiopia announced that it would build what is known as the "Renaissance Dam." Egypt has accused Ethiopia of endangering its water security.

I. Background

The Nile River is the main water resource for Egypt. The Nile is one of the world's longest rivers and is considered by many historians to be the birthplace of one of the world's first civilizations. It supplies Egypt with 95% of the country's water reserves and is the main source for drinking water and irrigation in the country.[1] Underground water and wells are scarce. Desalinated water supplies are used for drinking purpose in some coastal areas, mainly in touristic resorts.[2]

The water from the Nile has three major sources: (1) the Blue Nile, (2) the White Nile, and (3) the River Atbara. The Blue Nile stems from the highlands of Ethiopia at Lake Tana. The White Nile comes from the high mountains surrounding Lake Victoria and joins the Blue Nile at Khartoum (the capital of Sudan); both rivers form the Nile proper. The River Atbara, the third source of water, joins the Nile proper in northern Sudan. The Nile then flows into Lake Nasr in Egypt, a man-made lake created by the Aswan High Dam.[3]

The Nile River goes through the countries of Egypt, Rwanda, the Democratic Republic of Congo, Burundi, Kenya, Tanzania, Sudan, Southern Sudan, Uganda, and Ethiopia. These countries make up what is known as "the countries of the Nile Basin."[4]

---

[1] Jay Vella, *The Future of Food and Water Security in New Egypt* (Future Directions International, Strategic Analysis Paper, Nov. 22, 2012), http://www.futuredirections.org.au/files/sap/2012/FDI_Strategic_Analysis_Paper_-_22_November_2012.pdf.

[2] *Id*.

[3] Hans Cathcart, *Future Demands on Nile River Water and Egyptian National Security*, ICE CASE STUDIES No. 203 (May 2007), *available at* http://www1.american.edu/ted/ice/nile-2020.htm.

[4] Matt Bradley, *Nile Nations Promise to Consider Egypt's Concern in Water Deal*, THE NATIONAL (May 25, 2010), http://www.thenational.ae/news/world/africa/nile-nations-promise-to-consider-egypts-concern-in-water-deal.

II. Legal Framework

The Ministry of Water Resources and Irrigation (MWRI) is the main governmental body governing the issue of water management and usage in Egypt. Law 12-1984 on Irrigation is the principle piece of legislation regulating the usage of water, water management, and distribution.[5] The law contains eight titles and 104 provisions. Those titles deal with the following: (1) the definition of public water streams, (2) requirements to use a water stream for irrigation and agriculture, (3) the creation and usage of water banks, (4) methods and requirements for distributing water, (5) prohibitions on the use of sewage and underground water, (6) methods to protect streams for the purposes of irrigation and navigation, (7) sanctions against violators, and (8) general provisions related to conflict resolution mechanisms between individuals using water resources and the MWRI.

The law grants the MWRI the right to identify specific streams as public water sources. It sets forth conditions and limitations on usage for farmlands thirty meters (ninety-eight feet) from public water resources.[6] In addition, the law prohibits any modifications to main water resources and public streams without the permission of the MWRI.[7] It authorizes the Ministry to abolish any previously issued licenses for the private usage of water streams.[8] Further, the present law allows irrigation inspectors to set a specific schedule for distributing water to irrigate farmlands.[9] It also grants owners of farmlands the right to appeal the decisions issued by the irrigation inspectors before the General Department of Irrigation.[10] Farmlands are divided into multiple units. Each unit has its own streams and irrigation network.[11]

Concerning water distribution and management, the law creates a private fund to finance the formation of new projects and development of the existing ones. Moreover, it gives the General Director of Irrigation authority to ban the usage of any stream or water resources to ensure the fair distribution of water to farmers.[12] Rice plantations are also prohibited in areas not designated by the MWRI.[13] The Ministry prohibits any attempts to create streams without the appropriate authorizations.[14] Likewise, under the law, the Ministry may issue an order to destroy a certain stream if such stream will damage neighboring farmlands and surrounding bridges.[15] Similarly, the Ministry requires that permission be granted for the usage of streams for purposes

[5] Law No. 12-1984, *Al-Jarida AlRasmiyya*, vol. 9, Mar. 1984 (Supplement), available on the official website of the Ministry of Water Resources and Irrigation, *at* http://www.mwri.gov.eg/irrigationlaw.aspx# (in Arabic).

[6] *Id*. art. 5.

[7] *Id*. art. 9.

[8] *Id*. art. 14.

[9] *Id*. art. 18.

[10] *Id*. art. 23.

[11] *Id*. art. 30.

[12] *Id*. art. 37.

[13] *Id*. art. 38.

[14] *Id*. art. 39.

[15] *Id*. art. 41.

other than irrigation.[16] Finally, owners of farmlands must obtain permission from the Ministry to replace and install tools used in the irrigation process and in water distribution among farmers.[17]

The law imposes an array of fines against violators. Such fines range from thirty Egyptian pounds (about US$4) to ten thousand pounds (about US$1,427). It authorizes the irrigation inspectors to report any irrigation violations to law enforcement officials in order to stop such violations. It also allows the inspectors to issue administrative orders to remove any violations against water resources.[18]

III. Intercountry Disputes Concerning the Use of Water

In 1959, Egypt and Sudan agreed to distribute the water of the Nile among the countries of the Nile basin. The agreement allowed Egypt to have the lion's share of water from the Nile by granting Egypt the right to use over 55.5 billion cubic meters of water per year. This arrangement left Sudan with only 18.5 cubic meters. Moreover, the agreement failed to address the needs of the remaining countries of the Nile Basin.[19]

In May 2010, the Nile Basin Cooperative Framework Agreement (CFA) was established to redistribute water shares among the countries of the Nile Basin. The CFA included Ethiopia, Kenya, Uganda, Tanzania, Rwanda, and Burundi.[20] However, Egypt and Sudan did not agree to the CFA and refrained from signing it.[21]

The situation among countries of the Nile Basin became more complicated when Ethiopia announced that it would build what is known as the "Renaissance Dam." Tensions have reached the point where former Egyptian President Mohamed Morsi announced that Egyptians would save every drop of the Nile with their own blood.[22]

Egypt has alleged that Ethiopia's dam, which is currently under construction, will endanger its water security by reducing the amount of water flowing into Lake Nasr. On the other hand, the Ethiopian government believes that the dam will play a vital role in enhancing the process of generating electrical power and considers it a national project. While Sudan has endorsed the

[16] *Id*. art. 48.

[17] *Id*. art. 55.

[18] *Id*. art. 98.

[19] Ashenafi Abedje, *Nile River Countries Consider Cooperative Framework Agreement*, VOICE OF AMERICA (Mar. 17, 2011), http://www.voanews.com/content/nile-series-overview-11march11-118252974/157711.html.

[20] *Id*.

[21] *East Africa Seeks More Nile Water from Egypt*, BBC (May 14, 2010), http://news.bbc.co.uk/2/hi/africa/8682387.stm.

[22] *President Morsi Calls for Egyptian 'Unity' in Face of Threats to Nile Water*, AHRAM ONLINE (June 11, 2013), http://english.ahram.org.eg/News/73683.aspx.

concerns voiced by Egypt, South Sudan and Uganda have voiced their support for what they call "the rights of Ethiopia to the water of Nile."[23]

[23] William George, *Ethiopia's Plan to Dam the Nile Has Egypt Fuming*, TIME MAGAZINE (June 28, 2013), http://world.time.com/2013/06/28/ethiopias-plan-to-dam-the-nile-has-egypt-fuming/.

Iran

Sanaz Alasti
Law Library Scholar in Residence

SUMMARY This report examines Iran's approach to water use through its agriculture laws and water rights administration. Iran's agricultural sector, the country's major user of water, consumes more than 93% of its water resources, and the dry, high desert climate has forced farmers to develop special methods to make use of their limited natural resources.

Nationalization of the waters and land reform in Iran took place in the 1960s, and following the Islamic Revolution and the creation of the Islamic Republic of Iran, the first water law was approved in 1982. Iran now has a comprehensive legal framework regarding the use of water in agriculture, with the government in charge of setting agricultural requirements for water licenses and the ownership of water sources. Increased awareness of the limitations of natural resources has played an important role in adopting appropriate policies and strategies to maximize water allocation and use.

I. Background

A. Geography and Agriculture

Iran covers a total area of about 1.75 million square kilometers. About 52% of the country consists of mountains and deserts, and some 16% of the country has an elevation of more than 2000 meters above sea level. The cultivable area is estimated at about 51 million hectares, which is 29% of the total area. In 2005 18.1 million hectares were cultivated. Of this area, 16.5 million hectares consisted of annual crops and 1.6 million hectares of permanent crops.[1]

Iran is an agricultural country, and the agricultural sector plays an important role in the national economy. Almost 27% of the gross national product (GNP) and 23% of the labor force belong to agriculture. The agricultural sector is the major user of water in Iran, consuming more than 93% of the country's water resources.[2] Agricultural water productivity is one of the most important issues in economic development. The dry, high desert climate in Iran forced farmers to develop special methods of using their limited natural resources.[3]

[1] *FAO Country Profiles: The Islamic Republic of Iran – Agricultural Sector*, FOOD AND AGRICULTURAL ORGANIZATION OF THE UNITED NATIONS (FAO), http://www.fao.org/countryprofiles/index/en/?iso3=IRN&subject=4 (last visited Aug. 8, 2013).

[2] NATIONAL RESEARCH COUNCIL OF THE NATIONAL ACADEMIES, WATER CONSERVATION, REUSE, AND RECYCLING – PROCEEDINGS OF AN IRANIAN-AMERICAN WORKSHOP 169 (National Academies Press 2005).

[3] *Id*.

B. Historical Background

Iran is located in a semiarid region of the Middle East. Distribution of precipitation is uneven. The average amount of precipitation over the country is 252 millimeters/year, which is less than one-third of the world average. Although water surpluses exist in the mountain regions, the areas of high population concentration and high water demand are hundreds of miles away.

Iran is actually one of the driest countries of the world. Even if all the renewable water resources could be utilized, excluding the incoming international rivers, the total amount of water is not more than 117 billion cubic meters. Considering that about 88 billion cubic meters are currently used each year, the country is left with about 30 billion cubic meters of additional water capacity for future use.[4]

Nationalization of the waters and land reform in Iran took place in the 1960s as part of the Shah's "White Revolution."[5] The government adopted an emphasis on agriculture and water resources as the foundation of this program. In 1960 the first land reform law was passed, but it was impracticable.[6] Although the discussion of land reform had started by the late 1950s, it wasn't until 1961 that a new law passed parliament, becoming effective on January 9, 1962. Its main goals were to fix the upper limit of private property at one village and to distribute confiscated lands among sharecroppers.[7] After the nationalization of the waters, many dams were constructed for the sake of water conservation, and the area of land under irrigation increased from 2 million acres (8,000 square kilometers) in 1968 to 5.6 million in 1977.[8] Since the Islamic Revolution, Iranian agriculture has suffered from a low level of investment as well as confusing government policies.[9]

II. Legal Framework

A. Laws Governing Water Use in Agriculture

Although in Iran customary law plays an important role in regulating water laws in agriculture, contemporary Iranian water law is derived from many statutory provisions in addition to the residual customary law.[10]

Iran has a comprehensive legal framework regarding the use of water in agriculture. Article 50 of Iran's Constitution states that "[t]he preservation of the environment, in which the present as

[4] Iran Ministry of Water and Power, Plan and Budget Organization, Document of the Third Plan, at 1 (1999).

[5] The series of national reforms and developments by Mohammad Reza Shah had come to be known as the White Revolution.

[6] N.R. Keddie, *The Iranian Village Before and After Land Reform*, 3 J. CONTEMP. HIST. 69–91 (1968).

[7] *Id.*

[8] O. ARESVIK, THE AGRICULTURAL DEVELOPMENT OF IRAN (Praeger Publishers, New York/Washington, 1976).

[9] Bijan Khajehpour, *Iran's Needs for Agricultural Reform*, AL-MONITOR (July 9, 2013), http://www.al-monitor.com/pulse/originals/2013/07/iranian-president-rouhani-should-promote-agricultural-reform.html#ixzz2ZoCQ75yr.

[10] Abraham M. Hirsch, *Water Legislation in the Middle East*, 8 AM. J. COMP. L. 168–86 (Spring 1959).

well as the future generations have a right to flourishing social existence, is regarded as a public duty in the Islamic Republic. Economic and other activities that inevitably involve pollution of the environment or cause irreparable damage to it are therefore forbidden."[11] Based on Iran's Constitution the protection of the environment is a public obligation.

According to Iranian law all water bodies are public property. The first water law after the revolution in the Islamic Republic of Iran was approved in 1982.[12] Based on this law, allocating and issuing permits to use the water for domestic, agricultural, and industrial purposes is the responsibility of the Ministry of Energy (MOE).[13] The Ministry of Agriculture (MOA) is appointed to distribute water for agriculture among farmers and collect water fees. Water and wastewater companies are responsible for the distribution of water for domestic use in urban and rural areas and for collecting fees.[14]

Based on current law (established in 1982), the price for regulated surface water is between 1–3% of the value of cultivated crops. Based on the 1982 law, water pumped from groundwater resources must be in accordance with the crop water requirement and proposed cropping pattern in each region. In this case, the price for groundwater resources is 0.25–1.0% of the commercial value of the crop yield.

Important legislation that is relevant to water use in Iranian agriculture includes the following:

- Plant Protection Act (1967) and Plant Protection Implementation Regulation
- Law on the Protection of Forest and Rangelands (1967)
- Nationalization of Water Resources Act (1968)
- Law for the Formation of Farm Corporations (1968)
- Law for the Establishment of Companies for the Development and Utilization of Lands Downstream from Dams (1968)
- Environmental Protection and Enhancement Act (1974)
- Law for Endangered Species of Wild Fauna and Flora (1974)
- Law for Protection of the Natural Parks, Protected Areas, and Sensitive Areas (1975)
- Land Acquisition Law (1980)
- Law for Proper Use of Water Resources (1982)
- Law for Environmental Protection Against Water Pollution (1984)
- Law on Economic, Cultural, and Societal Development (1989)

[11] QANUN-E ASASI-E JUMHURI-E ISLAMI-E IRAN [CONSTITUTION OF THE ISLAMIC REPUBLIC OF IRAN] 1358 [1980] art. 44.

[12] Law of Proper Use of Water Resources of 1982.

[13] *Id.* art. 21.

[14] *Id.* art. 19.

- Law for Protection Against Natural Environmental Damage (1991)
- Law for Environmental Protection and Development (1991)

B. Powers of Government Authorities in Charge of Administering Water in Agriculture

According to Iran's Constitution, "[p]ublic wealth and property, such as uncultivated or abandoned land, mineral deposits, seas, lakes, rivers and other public waterways, mountains, valleys, forests, marshlands, natural forests, unenclosed pastureland, legacies without heirs, property of undetermined ownership, and public property recovered from usurpers shall be at the disposal of the Islamic government for it to utilize in accordance with the public interest."[15]

More than 94% of the total annual water consumption in Iran is used for agriculture.[16] Based on Iranian law, water bodies (rivers, lakes, seas, etc.) are public property, and the government is responsible for their management.[17] Article 1 of the Nationalization of Water Resources Act indicates that "[a]ll waters running in rivers, natural streams, valleys, brooks, or in any other natural courses, either surface or underground, as well as flood, sewage and drainage waters, and those of lakes, marshes, natural ponds, springs, mineral waters, and underground water resources are considered as national wealth and belong to the public, and the responsibility for the safeguarding and utilization of this national wealth and the establishment and management of water resources development establishments are charged to the Ministry of Water and Power."[18]

Traditionally, the provision of water has been the responsibility of the government. As far as groundwater is concerned, the private sector invests in drilling wells, which are then operated and managed by farmers. In 1943, Iran set up an independent irrigation institute, whose function is to supervise and carry out all irrigation projects. It has the right to collect fees from the allocation of water and form societies through which private owners can participate in its work.[19] In recent years there has been a large increase in private-sector financing of water projects, especially irrigation and drainage systems. Between 1994 and 1999 the cumulative new private-sector capital expenditures in water projects in the Islamic Republic of Iran came to US$84 million.[20]

Prior to the enactment of the Nationalization of Water Resources Act, the utilization of water resources had been governed by shari'a law (complex body of Islamic rules) and customs. The enactment of the Nationalization of Water Resources Act enabled the government to establish farm corporations if 51% of the farmers accepted to join, although the government could also establish farm corporations under any circumstances without the farmers' consent.

---

[15] CONSTITUTION OF THE ISLAMIC REPUBLIC OF IRAN art. 45.

[16] NATIONAL RESEARCH COUNCIL, *supra* note 2, at 96.

[17] Law of Proper Use of Water Resources of 1982 art. 2.

[18] The Nationalization of Water Resources Act of 1968 art. 1.

[19] Hirsch, *supra* note 10, at 168–86.

[20] FAO Country Profiles, *supra* note 1.

The Law for the Formation of Farm Corporations was passed on January 16, 1968;[21] the Law for the Establishment of Companies for the Development and Utilization of Lands Downstream from Dams was approved on May 27, 1968.[22] These laws provide that agribusiness units were to be not less than 5,000 hectares. With these laws the government set the stage for large-scale mechanized farming in the project area.

By the end of the 1960s, several large multipurpose dams to provide regulated flow water had been built by the government. Because little attention had been given to the development of water distribution systems below these dams, the government came to the conclusion that most of these lands could not be brought into production without investment in both distribution systems and precision land leveling on a massive scale. These factors, taken in the context of the government's pursuit of land reform, led the government in 1968 to pass a law regulating the development of irrigable lands downstream from dams.[23] These lands were nationalized, the villagers and ex-landlords being compensated for loss of their title rights. The law provides that these lands, totaling about 300,000 hectares, will be leased to companies formed with capital from private Iranian, foreign, or government sources, or from a mixture of these sources. Leases cannot exceed thirty years, and the area of such leases must be at least 1,000 hectares.[24]

Increased awareness of the limitations of natural resources has played an important role in adopting appropriate policies and strategies. Some of the current priorities are as follows:

- establishing a comprehensive management system over the whole water cycle according to the principles of sustainable land and water development in river basins;
- developing water resources within the framework of national plans and comprehensive river basin plans;
- integrating water resources development, exploitation, and protection plans with other national and regional plans;
- promoting agricultural water productivity while remaining attentive to the economic, security, and political concerns related to the harvesting and extraction, supplying, storage, and consumption of water;
- ensuring that agricultural water resources are used not only efficiently but in a socially just manner; and
- promoting public awareness about limited natural resources.[25]

[21] Law for the Formation of Farm Corporations of 16 January 1968, LOH-E QANUN (Majlis Research Center CD-ROM, undated).

[22] Law for the Establishment of Companies for the Development and Utilization of Lands Downstream from Dams of 27 May 1968, LOH-E QANUN (Majlis Research Center CD-ROM, undated).

[23] *Id*.

[24] NATIONAL RESEARCH COUNCIL, *supra* note 2, at 253.

[25] *Id*. at 259.

According to Iranian law the following ministries are directly responsible for development and assessment of water resources:

> The Ministry of Energy (MOE) is responsible for energy supplies and water resources. Within the MOE, the Water Affairs Department (WAD) is responsible for the planning, development, management, control and conservation of water resources. The WAD consists of the following sections: Water Resources Management Company, Provincial Water Authorities, Irrigation and Drainage Operation and Maintenance Companies. The Ministry of Agriculture (MOA) is responsible for subsurface drains, tertiary and quaternary canals as well as farm development and irrigation techniques. The Ministry of Agriculture is appointed to distribute water for agriculture among farmers and collect the water fees. Water and wastewater companies are responsible for the distribution of water for domestic use in urban and rural areas and for collecting fees. The Ministry of Jihad-e-Sazandagi [The Ministry of Reconstruction] deals with watershed management and rural development. On the other hand, Iran Department of the Environment (DOE) is responsible for the preparation of the environmental protection policy and the laws.[26]

The Islamic Republic of Iran's Department of the Environment (DOE) is responsible for the formulation of both the environmental protection policy and the laws, directives, and systems that are necessary for evaluating the impact of social and economic development projects related to the environment, particularly irrigation and hydropower projects, and monitoring their implementation.[27]

Recently, Iran's Expediency Council passed the Drive to [Achieve] Self-Sufficiency in Industry, Agriculture, Defense, and Security Decree,[28] which makes the implementation of the plan a strategic goal for the government. One of the critical objectives of the document is the achievement of self-sufficiency in agricultural and food production.[29]

C. Requirements for Licenses to Use Water

Based on Iranian law the use of water resources requires obtaining a water use permit.[30] No one is allowed to use water for any other purposes than what has been mentioned in the permit, nor is the permit transferable to others. [31] A water use permit is applicable solely to the piece of land for which it has been issued, unless the government in the region decides otherwise and/or the use of the water is determined to be harmful or uneconomical.[32] Recent years have witnessed a renewed emphasis on integrated management of water resources, on the basis of which a new comprehensive water act and water management system are being developed.

---

[26] FAO, IRRIGATION IN THE MIDDLE EAST REGION IN FIGURES – AQUASTAT SURVEY – 2008 195 (FAO Water Reports # 34, Rome, 2008), ftp://ftp.fao.org/docrep/fao/012/i0936e/i0936e00.pdf.

[27] Law for Environmental Protection and Development of 18 June 1974, amended 1990, arts. 2, 6.

[28] This decree was passed by Iran's Expediency Council in March 2013.

[29] Khajehpour, *supra* note 9.

[30] Nationalization of Water Resources Act of 1968 art. 10.

[31] *Id.* art. 13.

[32] *Id.* art. 14.

D. Providing Water for Agriculture and Settling Water Disputes

Groundwater is one of the most important water resources of Iran. One of the best methods of supplying water is digging *qanats* (subterranean canals),[33] a practice that researchers consider was developed by Iranians about three thousand years ago. The main source of qanat water is precipitation, which normally amounts to 252 millimeters or 413 billion cubic meters annually.[34] In regard to surface water, any disputes over priority of use, quality, and quantity of water, as well as conflicts that cause delays in supplying, distributing, and consuming water should be settled in an arbitration committee by the water masters and chief water masters. However, if the disputes continue even after arbitration, the Director of the region or Manager of the district, as the case may be, should intervene and investigate the matter, and then give his recommendation.[35]

Utilization of the underground water resources through the drilling of any type of well or qanat anywhere in the country should be carried out with the permission of the Ministry of Energy, except in those cases where the drilling of such wells results in the depletion or drying up of the water in an adjacent well and/or qanat.[36]

E. Ownership of Water Sources

Based on the Nationalization of Water Resources Act (1968), the development of water resources was to be supervised and controlled by the Ministry of Water and Power.[37] Under the traditional irrigation systems, farmers receive their share of water based on their water rights, usually in proportion to the land area.[38] This right to water use is usually measured based on the water delivery time. The water rights are attached to the land, and when the land is sold, the water rights are also transferred to the new owner. Water rights can be rented or traded. Based on the Civil Code of Iran, groundwater is mainly private property and traded between farmers.[39] Wells can be sold with or without the land. Qanats have shared ownerships.[40] Those who have built a qanat or participate in its maintenance are entitled to use its water.[41] For example, the oldest water rights legislation in the country is about how to use and divide qanat water among farmers.

---

[33] A *qanat* initially consists of a well dug in a mountainside to reach the groundwater stored there. An underground tunnel is then dug from this point, directing the water to the village.

[34] NATIONAL RESEARCH COUNCIL, *supra* note 2, at 107.

[35] Nationalization of Water Resources Act of 1968 art. 46.

[36] Law of Proper Use of Water Resources of 1982 art. 3.

[37] Nationalization of Water Resources Act of 1968 art. 1.

[38] QANUN-E MADANI [CIVIL CODE] Tehran 1314 [1935] art. 134.

[39] *Id*. art. 160.

[40] *Id.*

[41] FAO, *supra* note 1.

F. Conclusion

Iran is an arid country and undertakes significant conservation efforts focused primarily on information and education programs.[42] Conservation is achieved through a combination of efforts that includes legislation, pricing, incentives, coalition building, research, and education.

[42] *Id*.

Israel

Ruth Levush
Senior Foreign Law Specialist

SUMMARY Water sources in the State of Israel are publicly owned and controlled by the state. Private land ownership does not include ownership of water resources that are located on or cross the land. Water production and use require licensing and compliance with requirements regarding the efficiency and proper maintenance of water equipment to avoid waste and ensure the prevention of clogging and depletion of water sources. The amount of water permitted to be used for agricultural purposes is noted on a license issued by the Governmental Authority on Water, in accordance with a formula determined by the Minister of Agriculture and prescribed in regulations.

I. Background

The State of Israel is located in a relatively arid area that includes a desert. The state collaborated with the private sector to effectively use and maximize the limited available water resources by promoting and developing a desalination program as well as by utilizing advanced technologies in agriculture.[1] The development and oversight of the execution of policies for the conservation and use of water are within the responsibilities of the Ministry of Energy and Water Resources.[2]

A Review of Agricultural Policies by the Organisation for Economic Co-operation and Development (OECD) concluded as follows:

> Israel's agriculture is unique amongst developed countries in that land and water resources are nearly all state-owned and that agricultural production is dominated by co-operative communities. Since the late 1980s, agriculture in Israel has benefited from: a stable macroeconomic climate; policy reforms; high levels of investment in R&D; a developed education system; high-performing extension services; and accumulated farm management expertise.
>
> Israel is a world leader in agricultural technology, particularly in farming in arid conditions. Israeli agriculture thus relies on an "induced", rather than "natural", comparative advantage, one built on knowledge and technological progress.[3]

[1] *See Israel's Water Economy*, MINISTRY OF ENERGY AND WATER RESOURCES (MEWR), http://energy.gov.il/English/Subjects/water/Pages/AboutWater.aspx (last visited Aug. 8, 2013).

[2] *See Areas of Responsibilities*, MEWR, http://energy.gov.il/English/Subjects/Pages/default.aspx (last visited Aug. 8, 2013).

[3] *OECD Review of Agricultural Policies: Israel 2010* (summary), OECD, http://www.oecd.org/israel/oecdreviewofagriculturalpoliciesisrael.htm (last visited Aug. 8, 2013).

It should be noted, however, that according to a position paper submitted to the OECD in June 2010, the importance of agriculture in the Israeli economy has declined in recent years to 3% of total employment and 2% of the country's domestic product.[4]

II. Legal Framework

The law governing the use of water for agricultural purposes is the Water Law, 5719-1959[5] (the Law) and subsidiary legislation. According to the Law, water sources in the State of Israel are publicly owned and controlled by the state for the purpose of accommodating the needs of Israeli residents and developing the country.[6] The law specifically provides that "[a] person's right in any land does not confer on him a right in a water resource situated therein or crossing it or abutting thereon."[7] Approval for the receipt of water from a water source may be granted based on a qualified purpose, including agriculture.[8]

The Water Law requires every person to use water in an economical and efficient way, to maintain water equipment in good condition to avoid waste, and to ensure the prevention of clogging and the depletion of water sources.[9] A violation of these requirements may result in an injunction requiring repair, or the discontinuation of water production, supply, or use pending rectification.[10]

Water production from a water source, or water desalinization for personal use or for supply to others, requires a license issued by the Governmental Authority on Water (GAW).[11] The license specifies the amount of water the licensee may produce and supply, and includes any other conditions determined by the GAW, including the amount of water that is permitted to be used by the licensee for agricultural purposes.[12] This amount is determined in accordance with a formula that has been adopted by the Minister of Agriculture in regulations.[13]

In accordance with the Water Law the GAW may issue a declaration designating a specific region as an area that is subject to limitations on water use. Such a declaration may be issued when the GAW has determined that water sources in the designated area are not sufficient for

[4] OECD, *Agricultural Policy Reform in Israel* (Position Paper, June 2010), http://www.oecd.org/tad/agricultural-policies/45189389.pdf.

[5] Water Law, 5719-1959, 13 LAWS OF THE STATE OF ISRAEL 173 (5719-1958/59), *as amended*.

[6] *Id.* § 1.

[7] *Id.* § 4.

[8] *Id.* § 6.

[9] *Id.* § 9.

[10] *Id.* § 11.

[11] *Id.* § 23.

[12] *Id.* § 24.

[13] *Id.* § 25A.

maintaining current water consumption.[14] The designation of an area as one that is subject to limitations on water consumption must be published in the official gazette. Following publication of the designation, the GAW may determine the maximum level of water consumption that is permitted in the designated area for agricultural purposes.[15]

III. Intercountry Disputes Concerning the Use of Water

The control and distribution of water in the Middle East is one of the contested topics between Israel and the Palestinians and is subject to the parties' renewed negotiations on a final status peace agreement. Much of the water sources in the area originate from a shared aquifer, which is located underneath Israel and the West Bank. The parties disagree on issues relating to control and distribution of water, including the appropriate levels of consumption and the need for proper treatment of sewage and development of new water sources.

Information on the differing views concerning this topic can be found in the following sources:

(1) Amikam Nachmani, *A Commodity in Scarcity: The Politics of Water in the Middle East*, JERUSALEM CENTER FOR PUBLIC AFFAIRS (Mar. 1, 1994), http://jcpa.org/article/a-commodity-in-scarcity-the-politics-of-water-in-the-middle-east/.

(2) *The Water Issue Between Israel and the Palestinians: Main Facts*, WATER AUTHORITY, STATE OF ISRAEL (Feb. 2012), http://www.water.gov.il/Hebrew/ProfessionalInfoAndData/2012/19-Water-Issues-between-Israel-and-Palestinians-Main-Facts.pdf.

(3) *The Issue of Water Between Israel and the Palestinians*, WATER AUTHORITY, STATE OF ISRAEL (Mar. 2009), http://www.water.gov.il/Hebrew/ProfessionalInfoAndData/2012/21-Water-Issues-Between-Israel-and-the-Palestinians.pdf.

(4) Sharif S. Elmusa, Center for Policy Analysis on Palestine, *The Water Issue and the Palestinian-Israeli Conflict* (Information Paper No. 2, 1993), http://www.thejerusalemfund.org/images/TheWaterIssueandPalestinianIsraeliConflict.pdf.

(5) Jad Isaac, Applied Research Institute, *Core Issues of the Palestinian-Israeli Water Dispute*, PALESTINE LIBERATION ORGANIZATION, http://www.nad-plo.org/userfiles/file/Reports/core.pdf (last visited Aug. 8, 2013).

[14] *Id.* § 36.

[15] *Id.* § 37(c). For the most recent regulations establishing the criteria for the distribution of water for agriculture at the time this report was completed, see Water Regulations (Criteria for Allocation of Water in Agriculture) (Temporary Provision), 5773-2013, KOVETZ HATAKANOT (Subsidiary Legislation, Official Gazette) 5773, No. 7221, pp. 728–41 (Feb. 7, 2013), http://www.justice.gov.il/NR/rdonlyres/65F0CE77-3AC6-4FDF-B288-40E23FB894B9/39782/7221.pdf.

Kyrgyzstan, Tajikistan, and Uzbekistan

Peter Roudik
Director of Legal Research[*]

SUMMARY: The Constitutions of Kyrgyzstan, Tajikistan, and Uzbekistan state that water belongs to all people and is the property of the state. The use of water for agricultural purposes is regulated by Water Codes, selected acts, and regulations issued by executive agencies in charge of agriculture and water management. Management of water resources and irrigation infrastructure is conducted by territorial government authorities with some functions delegated to nongovernmental, nonprofit Water Users Associations, which may resolve minor disputes regarding water usage, regulate water supply, and collect the mandatory water supply fee. Government authorities monitor the level of water pollution and establish standards for the maximum permissible concentrations of hazardous substances in water. A requirement to maintain the minimal ecological river flow exists in Kyrgyzstan. Despite the conclusion of interstate agreements, unresolved conflicts between upstream and downstream countries continue because of the unregulated taking of water from transborder water sources due to increased irrigation and hydroelectric power production.

I. Background

Owing to its arid climate and limited possibilities for rain-fed agriculture, irrigated agriculture has always played and is likely to continue to play a major role in Central Asia, including the three Central Asian countries that are the subject of this report—Kyrgyzstan, Tajikistan, and Uzbekistan.[1] Despite huge investments in the water supply during the Soviet period, the often inappropriate expansion of irrigation and intensified agricultural production, mainly of cotton, contributed to the degradation of soil and water resources.[2] Free access to water resources in the Soviet Union also contributed to their inefficient use.[3] During the last twenty years of independence, existing irrigation practices have worsened the region's soil and water quality even more.[4]

Organizational structures regulating water management in the collective farming system that existed in these republics for most of the twentieth century were abolished in the newly independent countries of the region without proper substitution. The same happened with on-farm irrigation and drainage infrastructure, which was built during the Soviet period and

[*] This report was prepared with the assistance of the Foreign Law Consultant Svitlana Vodyanyk.

[1] Christine Bichsel, *Liquid Challenges: Contested Water in Central Asia*, 12 SUSTAINABLE DEVELOPMENT L. & POL'Y 24 (Fall 2011), http://digitalcommons.wcl.american.edu/cgi/viewcontent.cgi?article=1495&context=sdlp.

[2] Christine Bichsel et al., *Law, Water, and Ecology*, *in* FERGHANA VALLEY: THE HEART OF CENTRAL ASIA 255 (Frederick Starr ed., 2011).

[3] PHILIP MACKLIN, MANAGING WATER IN CENTRAL ASIA 60 (2000).

[4] Bichsel, *supra* note 2, at 265.

historically managed by collective farms. The responsibility to maintain these systems was not redelegated following independence.[5]

Because of growing irrigation water management problems, international organizations working in Central Asia have recommended the formation of water users associations (WUAs), which are nongovernmental, noncommercial organizations aimed at managing water resources and operating irrigation-drainage infrastructure. Thus far WUAs are not powerful or effective, however, mostly because they are being established in a top-down bureaucratic manner without involving the local population and farmworkers.[6]

Major international donors made the introduction of such changes that would lead to effective regulation and improved efficiency of water use for irrigation a priority in Central Asian countries' market reform efforts.[7] However, the legal situation with regard to water issues is similar to the overall legal environment in these countries. Recently adopted legal acts do not reflect the dynamism of the transition period, and their application to everyday life is limited because of inefficiencies in the judicial systems of these countries.[8]

II. Legislative Framework

A. Basic Legislation

The Constitutions of the republics of Kyrgyzstan, Tajikistan, and Uzbekistan state that water resources are the exclusive and inalienable property of the state. Every person has the right to use water within the national borders in accordance with the provisions of each country's legislation, and the government guarantees its effective utilization in the interests of the people. The rational use of water as a natural resource and its protection by the state is specified.[9]

The main legislative documents in this area are the Water Code in Kyrgyzstan and Tajikistan, and the Law on Water and Water Usage in Uzbekistan.[10] These documents establish principles

[5] *Id*. at 258–59.

[6] Iskandar Abdullaev et al., *Water User Groups in Central Asia: Emerging Form of Collective Action in Irrigation Water Management*, 24 WATER RESOURCES MGMT. 1030 (Mar. 2010), *available at* http://www.academia.edu/441417/Water_User_Groups_In_Central_Asia_Emerging_Form_of_Collective_Action_In_Irrigation_Water_Management.

[7] MACKLIN, *supra* note 3, at 60.

[8] Abdullaev et al., *supra* note 6.

[9] CONSTITUTION OF THE KYRGYZ REPUBLIC art. 4, *available at* http://www.wipo.int/wipolex/en/details.jsp?id=10576; CONSTITUTION O F THE REPUBLIC OF TAJIKISTAN art. 13, *available at* http://unpan1.un.org/intradoc/groups/public/documents/untc/unpan003670.htm; CONSTITUTION OF THE REPUBLIC OF UZBEKISTAN art. 55, http://www.gov.uz/en/constitution/.

[10] Law on Water and Water Use of the Republic of Uzbekistan (Mar. 6, 1993), *available at* http://www.lex.uz/Pages/GetAct.aspx?lact_id=93202 (in Russian); Water Code of the Republic of Tajikistan (Nov. 29, 2000), *available at* http://www.parlament.tj/ru/index.php?option=com_content&view=article&id=

for managing water resources, define the jurisdiction of state bodies concerning water resources and water management, regulate the usage of and payment for surface and underground waters, and set forth measures protecting water resources from pollution, depletion, and irrigation. The Water Codes also include norms related to the establishment and operation of water users associations. In Kyrgyzstan, the Water Code includes provisions that establish the minimal ecological river flow, which require government water authorities to define minimal water flow level for certain rivers and water bodies in order to conserve fish reserves and water ecosystems.[11]

Water-related provisions are included in other acts as well, such as the Land Code, and laws related to environmental protection, agriculture, and taxation.[12] In Uzbekistan, where the interstate Amudarya, Syrdarya, and Zerafshan rivers and the Aral Sea cross national boundaries, some issues related to water law must be resolved according to interstate agreements.[13]

B. Government Authorities in Charge of Water Control

In all three countries, functions and responsibilities in the field of water relations are divided between various national ministries and departments and local governing bodies. National parliaments establish state policies for the use and protection of water resources,[14] approve annual budget allocations for irrigation and drainage, and define charges for the use of water as a natural resource.[15] The role of the government is to develop state water programs and coordinate activities of specific ministries. These are the Ministry of Agriculture and Melioration of the Kyrgyz Republic,[16] the Ministry of Land Reclamation and Water Resources of Tajikistan,[17] and the Ministry of Agriculture and Water Resources in Uzbekistan.[18] These ministries have similar functions in all three republics and are responsible for the implementation of current water

559%3A2013-01-06-13-55-16&catid=71%3A2000&Itemid=62 (in Russian); Water Code of the Kyrgyz Republic (Jan. 12, 2005), *available at* http://online.adviser.kg/Document/?link_id=1000868559 (in Russian).

[11] Water Code of the Kyrgyz Republic art. 64.

[12] *See, e.g.*, Law on Property in the Republic of Uzbekistan (Oct. 31, 1990), *available at* http://www.pravo.uz/economy/get_data.php3?topic=356&sub=0#0 (in Russian).

[13] Law on Water and Water Use of the Republic of Uzbekistan art. 4.

[14] *See, e.g.*, Law on Water and Water Use of the Republic of Uzbekistan art. 5.

[15] Water Code of the Kyrgyz Republic art. 7.

[16] MINISTRY OF AGRICULTURE AND MELIORATION OF THE KYRGYZ REPUBLIC, http://www.agroprod.kg/ (last visited Oct. 2, 2013). For the structure of government institutions dealing with water issues, see MINISTRY OF AGRICULTURE AND MELIORATION OF THE KYRGYZ REPUBLIC, NATIONAL DIALOG ON WATER POLICY IN KYRGYZSTAN IN INTEGRATED MANAGEMENT OF WATER RESOURCES: REVIEW OF PROGRESS AND RESULTS FOR THE YEARS 2008–2013, at 17, *available at* http://www.unece.org/fileadmin/DAM/env/water/meetings/NPD_meetings/2013/Kyrgyzstan/pb_rus.pdf (in Russian).

[17] MINISTRY OF LAND RECLAMATION AND WATER RESOURCES OF TAJIKISTAN, http://www.mwr.tj/en/ (last visited Oct. 2, 2013).

[18] MINISTRY OF AGRICULTURE AND WATER RESOURCES IN UZBEKISTAN, http://www.agro.uz (last visited Oct. 2, 2013).

regulations and policies. They also regulate construction and operation of the national irrigation infrastructure.[19]

According to some national experts and international donors, the institutional framework for water resource management that exists in these countries requires reforms because the involvement of local governments in water management undermines the uniformity of efforts undertaken by national ministries in charge of water resources and their regional offices and slows down the implementation of national policies.[20]

C. Water Users Associations

Water users associations (WUAs) have been created in Central Asian states with the purpose of managing water resources at the farm level. These are membership-based, nongovernmental, and noncommercial organizations aimed at maintaining irrigation systems in the public interest; ensuring fair, effective, and timely distribution of water between farms; collecting payments for the water supply; and settling minor disputes related to the distribution and use of water.[21] The first WUAs were established by the Kyrgyz government in the mid-1990s. This was a pilot project initiated by the Asian Development Bank, World Bank, UN Food and Agricultural Organization, and the government of Japan.[22] According to the 1997 Statute on Water Users Associations in Rural Areas, existing on-farm water infrastructures were transferred to WUAs without payment. Associations were granted the right to trade water, define fees, and impose sanctions in case of a breach of regulations.[23] The Water Code stipulates that the bulk water suppliers must enter into agreements with WUAs and cannot provide water directly to individual users in rural areas outside of a supply contract concluded with a respective WUA.[24]

Similar provisions were included in the Decree of the Uzbekistan Cabinet of Ministers of July 21, 2003. The Decree changed water management from an administrative and territorial system to a basin approach and consolidated water management through the establishment of WUAs.[25]

---

[19] A. DJAILOOBAEV, MINISTRY OF WATER RESOURCES AND AGRICULTURE, NATIONAL REPORT ON REGIONAL WATER PARTNERSHIP (KYRGYZ REPUBLIC) 5, *available at* http://www.gwp.org/Global/GWP-CACENA_Files/en/pdf/kyrgyzstan.pdf (last visited Oct. 2, 2013).

[20] *See*, *e.g.*, Tajikistan Proposal for Financing to the Global Agriculture and Food Security Program (GAFSP) (unofficial translation), http://www.gafspfund.org/sites/gafspfund.org/files/Documents/Tajikistan%205%20of%209%20Proposal.pdf (last visited Oct. 2, 2013).

[21] Water Code of the Republic of Tajikistan art. 43.

[22] Jenniver Sehring, Water User Associations (WUAs) in Kyrgyzstan: A Case Study on Institutional Reform in Local Irrigation Management 7 (Discussion Paper, Zentrum für internationale Entwicklungs- und Umweltforschung der Justus-Liebig-Universität Gießen, Aug. 2005), http://geb.uni-giessen.de/geb/volltexte/2005/2392/pdf/ZEUDiscPap24.pdf.

[23] *Id*.

[24] Water Code of the Kyrgyz Republic art. 21.

[25] Iskandar Abdullaev et al., *Agricultural Water Use and Trade in Uzbekistan: Situation and Potential Impacts of Market Liberalization*, 25 WATER RESOURCES DEVELOPMENT 47, 54 (Mar. 2009), *available at* http://www.zef.de/module/register/media/5d18_Abdullaev_revise.pdf.

The goal of the Decree was to involve farmers in the irrigation rehabilitation and agricultural reform effort so that the supplied water could be used more efficiently.[26]

In Tajikistan, the Law On Water Users Associations was passed in November 2006.[27] Although the Tajik legislators used the Kyrgyz WUA Law as an example, they omitted many articles that clearly specified the structure and standard procedures for WUAs. As a result, varied donors working in this field, such as the World Bank, USAID, Asian Development Bank, EU, Swiss Agency for Development and Cooperation , and others used different structures for WUAs in their areas of responsibility, eventually creating a lack of standardization.[28]

D. Specifics of Water Usage in Agriculture

In the republics of Kyrgyzstan, Tajikistan, and Uzbekistan, water users are divided into two categories: general and special. General water use does not involve application of technical equipment or structures that may affect the conditions of water, and most of the agricultural users fall into the special water use category.[29] This status applies to all users regardless of their legal form, type of ownership, citizenship, or residency. The special use is on a fee-paid basis, and the fee is collected from all special water users.

According to the Water Code of Tajikistan,[30] WUAs and other public organizations can use water bodies for irrigation on the basis of a license issued by an authorized regulatory state body and according to an agreement with the local water supply organization. The water usage fee is included in the license fee and in water supply payments.[31] A similar process was established in Uzbekistan.[32]

In Kyrgyzstan, water charges were introduced in 1996; however, this system is not working properly, and therefore there are inadequate incentives to save water. Tariffs set by the Kyrgyz Parliament do not depend on economic factors but often reflect the political situation.[33] For example, in 2010 the already low tariffs were decreased by the Interim Government of Kyrgyzstan in view of the numerous complaints from local administrations, farms, and WUAs.[34] Because access to water resources in Kyrgyzstan remains a source of social tensions, in October

[26] *Id*. at 48.

[27] Law of the Republic of Uzbekistan No. 213 on Water Users Associations (Nov. 21, 2006), http://www.mmk.tj/ru/legislation/legislation-base/ (in Russian).

[28] *WUA Workshop – Country Summary: Tajikistan*, WORLD BANK, http://go.worldbank.org/26GZLRGY60 (last visited Oct. 2, 2013).

[29] *See* Water Code of the Republic of Tajikistan art. 66; Law on Water and Water Use of the Republic of Uzbekistan art. 18-1.

[30] Water Code of the Republic of Tajikistan art. 26.

[31] *Id*. art. 74.

[32] Law on Water and Water Use of the Republic of Uzbekistan art. 28.

[33] DJAILOOBAEV, *supra* note 19.

[34] *Tariffs for Supply of Irrigation Water Will Be Reduced*, KABAR (June 24, 2010), http://www.kabar.kg/economics/full/2798 (in Russian).

2012, the Kyrgyz Parliament amended the country's Water Code, abolishing special permits for agricultural water use and the authorization procedures for water supply.[35] Water permits are required for special water use in Tajikistan[36] and Uzbekistan.[37]

Uzbek legislation has introduced limits on water use. Limits must be set for all types of water consumers, including agricultural users, by the Agriculture and Water Resources government authorities and by WUAs for individual farmers.[38] Charges for water supply and other water services are considered to be economic measures that support rational water use and its conservation.[39] The same purpose underlies the tax on the use of water resources calculated under articles 257–264 of the Tax Code of Uzbekistan.[40] Farmers, individual entrepreneurs who use water for business purposes, and all legal entities are subject to this tax.[41] The tax applies to water used from surface and groundwater sources,[42] and is calculated on the basis of the actual amount of water used.[43]

E. Water Quality Standards

Each republic regulates water quality by a number of laws, bylaws, and sanitary rules and standards.[44] Most of the standards and regulatory documents were adopted by government authorities during the Soviet times,[45] although some of them were put into effect following independence.[46] The goal of these documents is to protect water bodies from pollution, littering, and depletion as well as to assure favorable conditions for water use and ecological well-being.[47]

---

[35] Law of the Kyrgyz Republic No. 170 on Amendments to Some Legislative Acts of the Kyrgyz Republic art. 14 (Oct. 10, 2012), http://base.spinform.ru/show_doc.fwx?rgn=55058 (in Russian).

[36] Water Code of the Republic of Tajikistan art. 27.

[37] Law on Water and Water Use of the Republic of Uzbekistan art. 24.

[38] *Id*. art. 30.

[39] *Id*. art. 106.

[40] Tax Code of the Republic of Uzbekistan, *available at* http://www.lex.uz/Pages/GetAct.aspx?lact_id=1286689.

[41] *Id*. art. 258.

[42] *Id*.

[43] *Id*. art. 259.

[44] I. PETRAKOV, THE REGIONAL ENVIRONMENTAL CENTER FOR CENTRAL ASIA, LEGAL AND INSTITUTIONAL BASIS OF WATER QUALITY MANAGEMENT IN CENTRAL ASIAN COUNTRIES, REGIONAL REPORT 10 (2010), http://www.carecnet.org/programmes-and-activities/water-initiatives-support/project-water-quality-in-central-asia/publications-and-reports/other-publications/?lang=en (in Russian).

[45] A. JUMAGULOV, THE REGIONAL ENVIRONMENTAL CENTER FOR CENTRAL ASIA, WATER QUALITY STANDARDS AND NORMS IN THE REPUBLIC OF TAJIKISTAN 29 (2009), http://www.carecnet.org/programmes-and-activities/water-initiatives-support/project-water-quality-in-central-asia/publications-and-reports/standards-and-norms-of-water-quality-in-central-asia/?lang=en.

[46] *Id*. at 32.

[47] *Id*. at 24–25.

Each country's environmental protection legislation includes standards and rates for the maximum permissible concentrations of hazardous substances in water and standards for the maximum permissible discharges of hazardous substances into water bodies.[48] Norms governing the maximum permissible disposal of harmful substances are established separately for each source of pollution.[49] National water quality monitoring is conducted by government agencies in charge of environmental protection. Monitoring includes controlling, assessing, and forecasting the level and quality of national water resources.[50]

III. Intercountry Water Disputes

Today, water conflicts remain one of the main regional problems in Central Asia. After the collapse of the Soviet Union and following the breakup of the economic ties upon which the water infrastructure in Central Asia was based, the Central Asian republics entered into a long-term conflict between upstream countries (Tajikistan, Kyrgyzstan) and downstream countries (including Uzbekistan) regarding control of common water resources and the purposes for which they are used.[51]

For upstream Tajikistan, expansion of irrigated areas in downstream countries resulted in increased withdrawals from the Amudarya River. In contrast, the downstream population in Uzbekistan is hoping to increase water allocations for their reservoirs. Upstream water development in Kyrgyzstan and Tajikistan for agriculture or hydroelectricity is obstructing the downstream states' interests in expanding their cotton production. Upstream development could also potentially hinder regional solutions for mitigating the Aral Sea crisis that mostly affects the downstream population in Uzbekistan and other neighboring countries.[52]

The Central Asian states were able to negotiate several interstate agreements to assuage potential water conflicts. The Almaty Agreement of 1992 established the Interstate Commission for Water Coordination (ICWC) as the highest decision-making body for all matters pertaining to the regulation, efficient use, and protection of interstate watercourses and bodies of water in Central Asia. The ICWC consists of leading water officials from each of the five countries of Central Asia, who meet several times annually to set allocations and quotas as well as resolve disputes.[53] From this commission a number of additional agreements emerged, some of them pertaining to all Central Asia and others to specific rivers.[54] However these water-sharing

[48] *Id*. at 26.

[49] ZULFIYA YARULLINA ET AL., THE REGIONAL ENVIRONMENTAL CENTER FOR CENTRAL ASIA, NATIONAL REPORT [ON] WATER QUALITY STANDARDS AND NORMS IN THE REPUBLIC OF UZBEKISTAN 21 (2011), http://www.carecnet.org/wp-content/uploads/2011/08/uzbek_angl.pdf.

[50] *Id*.

[51] Erika Weinthal, Water Conflict and Cooperation in Central Asia 6 (Background Paper for the UN Human Development Report 2006), http://hdr.undp.org/en/reports/global/hdr2006/papers/weinthal%20erika.pdf.

[52] *Id*. at 6–7.

[53] *Water in Central Asia: Past, Present, and Future*, WATER POLITICS (Oct. 17, 2012), http://www.waterpolitics.com/2012/10/17/water-in-central-asia-past-present-and-future/.

[54] *Id*.

agreements were not sustainable over the long term owing to the disparity in fossil fuel resources between the upstream and downstream states.[55]

According to experts, international norms and concepts establishing equal rights for the upstream and downstream countries should be used in resolving disputes over transborder water resources. International observers recommend that upstream and downstream states negotiate a mutually acceptable use of water resources instead of infringing on the economic interests and rights of each other.[56]

[55] Weinthal, *supra* note 51, at 10–11.

[56] Kulpash Konyrova, *Water, Energy Can Cause Serious Conflict in Central Asia*, NEW EUROPE (Apr. 13, 2013), http://www.neurope.eu/article/water-energy-can-cause-serious-conflict-central-asia.

Lebanon, Yemen, Saudi Arabia, and Iraq

Issam M. Saliba
Foreign Law Specialist

SUMMARY: The use of water in agriculture in the countries of the Middle East has been historically governed by general principles developed under classical Islamic law. Under the Ottoman Empire these principles were codified in Majallat al-Ahkam al-Adlia (Majallat). While a number of laws relating to water were enacted in Lebanon, Iraq, Saudi Arabia, and Yemen after World War I, the use of water in agriculture is still governed by these basic principles, either through the direct application of the provisions of the Majallat as in Lebanon, or through legislation that confirms past practices under Islamic law.

I. Background

Prior to World War I, the use of water in Lebanon, Iraq, Saudi Arabia, and Yemen was governed by Islamic law. Majallat al-Ahkam al-Adlia (Majallat), which can be described as the codification of Islamic civil law under the Ottoman Empire, devoted several articles to the issue of water rights, including the use of water in agriculture.[1]

Since the end of World War I a number of laws and regulations dealing with water have been enacted in each of the above-mentioned countries.

II. Legal Framework

A. Islamic Law Related to Water Rights

In many respects the basic principles set out in the Majallat are still in effect in the four jurisdictions. Book X of the Majallat, which deals with joint ownership, contains several provisions devoted to water rights and use. Article 1234 declares a general principle that water is free and jointly owned by the public. Some exceptions to this general principle are described thereafter. Article 1235 declares that water flowing underground is not the "absolute" property of any particular person, implying that certain rights may be acquired over such water supplies. Article 1236 provides that wells that have not been made by the labor of any particular person are free property of the public, implying that a well drilled by an individual shall be his property. In terms of rivers, article 1239 makes a distinction between those with continuous flow and those with flow that is exhausted after passing through a limited number of properties. Rivers in the first category cannot be privately owned while those in the second categories can be privately owned.

[1] Al-Majallah al-Ahkam al-Adaliyyah (The Majelle) – The Civil Code of the Ottoman Empire (Hanafi), *available at* http://www.global-islamic-finance.com/2009/07/al-majallah-al-ahkam-al-adaliyyah.html (in English).

The right to take possession of water for drinking or irrigation is discussed in Section IV of Chapter IV of Book X. Article 1266 provides that all persons and animals have the right to take water for drinking. Articles 1267 and 1268 specify that this right extends to water over which other persons have absolute ownership and, under certain circumstances, allow people to enter the property of others for the purpose of taking such water.

The right to take water for irrigation is more restrictive. Article 1265 provides that everyone may irrigate his lands from rivers that are not owned by others and may dig canals for this purpose and construct mills; however, if the water used overflows and causes damage to other people, or if it is cut off completely and navigation becomes impossible, then such use shall not be permitted.

B. Current Laws

1. Lebanon

The above provisions of the Majallat are still in force in Lebanon. The Civil Code (Obligations and Contracts Law) of 1932 did not alter these provisions.[2] Pursuant to article 1106 of this Code the only provisions of the Majallat that are abrogated are those that contradict or are incompatible with the present Code.

2. Yemen

Article 2(17) and (18) of Yemeni Law No. 33 of 2002 concerning water defines water rights as those acquired through customary practices or under Islamic law; article 6 provides that the owners of such rights shall continue to exercise them over water resources in a manner that does not wrongfully affect these resources or the right of others.[3] Articles 27 to 29 essentially incorporate the same basic provisions of the Majallat. For example, article 27 specifically provides that all water rights acquired before or after the issuance of the law shall be preserved and protected and cannot be infringed upon except in extreme circumstances and for fair compensation. Article 28 specifically addresses the right over water harvested from rain and flood water by stating that traditional irrigation rights related to such waters shall be maintained in accordance with local customary practices. Article 29 provides that traditional rights of usufruct over waters flowing from springs and other natural sources such as wells not deeper than 6o meters shall continue to be maintained and protected and shall be transferred with the land; if the land is divided the water right shall be prorated accordingly.

[2] Civil Code (Obligations and Contracts Law) of 1932 (Lebanon), *available at* http://www.aproarab.org/Down/Lebanon/24.doc (in Arabic).

[3] Law No. 33 of 2002 (Yemen), *available at* http://www1.umn.edu/humanrts/arabic/Yemeni_Laws/Yemeni_Laws72.pdf (in Arabic).

3. Saudi Arabia

In Saudi Arabia, article 1 of the Regulation Concerning the Protection of Water Sources issued by Royal Decree No. M/34 of the year 1400 hijri states that all sources of water are public property provided that rights established according to Islamic law are not infringed upon.[4]

4. Iraq

Articles 1052 to 1058 of the Iraqi Civil Code of 1951 codify the rights under Islamic law of land owners to use water for irrigation.[5]

III. Powers of Government Authorities in Charge of the Management of Water Resources

Each of the four jurisdictions manages the use of water, including in agriculture, through different and varied government authorities. For example, Lebanese Law No. 221 of 2000 has organized the water management through the Ministry of Energy and Water and four separate public establishments.[6]

It may be argued that provisions giving the government or any of its subsidiary authorities in these jurisdictions the power to allocate water rights, such as article 3 of the Iraqi Irrigation Law of 1962[7] and article 4 of the Saudi Royal Decree No. M/34, can be interpreted as only applying to new water resources and that they must be applied in a manner consistent with the rights mentioned above.

The four jurisdictions are consistent in requiring that owners obtain permits for water well drilling. This is provided for in articles 24 to 46 of Yemeni Law No. 33 of 2002 and articles 6 to 8 of Saudi Royal Decree M/34 of 1400 hijri. In Lebanon, requirements and a sample permit application are available on the website of the Ministry of Energy and Water.[8] In Iraq, information on the website of the Ministry of Water Resources indicates that the Ministry is in charge of supervising the drilling process.[9]

---

[4] Royal Decree No. M/34, Regulation Concerning the Protection of Water Sources (Saudi Arabia), http://www.boe.gov.sa/ViewSystemDetails.aspx?lang=ar&SystemID=112 (in Arabic).

[5] Civil Code of 1951 (Iraq), *available at* http://www.iraq-ild.org/LoadLawBook.aspx?SP=IDX&SC=120120013721926&Year=1951&PageNum=1 (in Arabic).

[6] Law No. 221 of 2000 (Lebanon) *available at* http://www.energyandwater.gov.lb/adminpages/page/DownloadPageFile.asp?PageFile_ID=24 (in Arabic).

[7] Irrigation Law of 1962 (Iraq), *available at* http://www.iraq-ild.org/LoadLawBook.aspx?SP=REF&SC=101120053458875&Year=1962&PageNum=1 (in Arabic).

[8] *Requirements for Drilling Wells Deeper than 150 Meters for Various Uses*, MINISTRY OF ENERGY AND WATER, http://www.energyandwater.gov.lb/pages.asp?Page_ID=68 (last visited Aug. 13, 2013).

[9] *Department of Geology*, MINISTRY OF WATER RESOURCES, http://www.mowr.gov.iq/?q=node/180 (last visited Aug. 13, 2013).

Libya

George Sadek
Senior Legal Research Analyst

SUMMARY: Libya was considered one of the driest countries on earth. The Libyan government developed a plan to overcome this dilemma by creating an irrigation system that depends on the underground water found in sandstone aquifers, known as "fossilized water." Law No. 3-1982 on regulating water sources, issued January 5, 1982, is the main legislation governing the issue of water usage for agricultural and drinking purposes. Concerning the inter-country dispute, the Governor of the Deboye District in Mali had accused the Libyan authorities of attempting to divert the Niger River to increase farmland areas at the expense of the Niger Delta.

I. Background

Before the 1950s Libya was considered one of the driest countries on earth. It has a vast desert area and dry climate conditions that led to severe water scarcity. The main source of the water supply in Libya previously came from desalination plants on the coast. Such plants did not generate enough water to irrigate farmland, however.[1]

In 1953 the Libyan government developed a plan to overcome this dilemma by creating an irrigation system that depends on the underground water found in sandstone aquifers, known as "fossilized water." The major reserve of fossilized water was discovered under the aquifers during oil exploration. During the 1970s the Libyan government began to develop the usage of fossilized water to grow crops in southern Libya and proposed the construction of pipelines to transport water to coastal areas for irrigation. In 1983, in collaboration with international construction firms, the Libyan government implemented its proposal by forming a national project known as the "Great Man-made River" (GMR). The project aimed at supplementing the northern desert areas of Libya with a network of water pipelines to enhance farming and irrigation projects.[2]

According to research studies, over the past years the GMR project has significantly increased Libya's water supply. Libya was able to create a 4,000 kilometer network of water pipelines, which supply 1.6 million cubic meters of water per day. The Libyan government stated in 2010 that the project, which was then nearing completion, had cost $19.58 billion and was intended to be used to develop 395,000 acres of farmland.[3] The Libyan Ministry of Agriculture announced

[1] *The Great Man-made River Project*, MEED INSIGHT (Dec. 11, 2011), http://www.meed.com/Journals/1/Files/2011/12/11/Sample%20Chapter.pdf.

[2] Hussin Aqeil et al., *Water Security and Interconnected Challenges in Libya* (TinMore Institute, Nov. 2012), http://tinmore.com/pdf/WS121027_WaterSecurityLibya.pdf.

[3] Sarah A. Topol, *Libya's Qaddafi Taps Fossil Water to Irrigate Desert Farms*, THE CHRISTIAN SCIENCE MONITOR (Aug. 23, 2010), http://www.csmonitor.com/World/Africa/2010/0823/Libya-s-Qaddafi-taps-fossil-water-to-irrigate-desert-farms.

the same year that there were plans for the GMR to supply 6 million cubic meters of water per day by 2030.[4]

II. Legal Framework

Law No. 3-1982 on regulating water sources, issued January 5, 1982, is the main legislation governing the issue of water usage for agricultural and drinking purposes.[5] Article 5 of the law grants Libyan citizens the right to use water resources so long as they do not damage those resources. Article 5(b) requires a permit from public water authorities to use the water for drinking or farming. Under article 6, dumping any liquid waste into water resources is prohibited. Article 7 prohibits drilling water wells without a permit from the Public Authority of Agricultural Development.

The Law also covers the issue of water management. Article 7(c) grants the right to the Public Authority of Agricultural Development to confiscate any unused wells. In addition, article 7(c) grants the Water Authority the right to issue orders to close producing wells. The Law also sets forth requirements for obtaining licenses to use water resources. Article 8 limits the usage of water resources to drinking, agricultural uses, and industrial uses. Article 10 allows the Public Authority of Agricultural Development to grant multiple individuals the right to use the same water resource. However, article 11 prohibits an individual using a water resource from dumping any waste in it or causing any damages to it.

Finally, article 15 of the law punishes violators with a term of imprisonment of not less than three months or a fine not to exceed 500 Libyan dinars (about US$385). The court has discretion to impose either or both penalties.

III. Intercountry Disputes Concerning the Use of Water

An academic study issued by Yale University in 2011 reported that the Governor of the Deboye District in Mali had accused the Libyan authorities of attempting to divert the Niger River to increase farmland areas at the expense of the Niger Delta. The governor claimed that Libyan corporations began construction of a project on the soil of Mali to divert large amount of water from the Niger River. He also argued that such a project would dry the river that feeds the inland delta and destroy the seasonal floods supporting agriculture and fisheries in those areas.[6]

[4] MEED INSIGHT, *supra* note 1.

[5] Law No. 3-1982, *Al-Jaridah Al-Rasmiyya*, vol. 10, 6 April 1982.

[6] Fred Pearce, *Africa's Flourishing Niger Delta Threatened by Libya Water Plan*, ENVIRONMENT 360 (Feb. 3, 2011), http://e360.yale.edu/feature/africas_flourishing_niger_delta_threatened_by_libya_water_plan/2366/.

Mexico

Gustavo Guerra
Senior Foreign Law Specialist

SUMMARY: The use of water for agriculture in Mexico is primarily governed by the National Waters Law, which provides that Mexican waters are national property, and their use is allocated by concessions granted by the federal government through its National Water Commission. Water concessions must indicate the amount of water authorized for extraction, the specific use for such water, the location of the point of extraction, and the term of the concession. A concession may be granted for a term of five to thirty years. This Law also provides that conservation and protection of the quantity and quality of water is a matter of national security; therefore, unsustainable use and pollution of water must be avoided.

I. Background

Agriculture plays a significant role in the Mexican economy. It represents 8.4% of the gross domestic product and provides employment to 23% of the working population.[1] Furthermore, 77% of Mexican water is used for agricultural purposes.[2]

The National Water Commission (CONAGUA) is Mexico's water authority, whose vast administrative system manages water rights and policy through its central headquarters in Mexico City and its regional offices and irrigation districts, as well as through several entities that provide support on such issues as clean beaches.[3]

II. Legal Framework

The use of water for agriculture is primarily governed by the National Waters Law.[4] This Law provides that, as a general rule, Mexican waters are national property and, consequently, their use is administered and allocated by concessions granted by the federal government through its

[1] OECD, MAKING WATER REFORM HAPPEN IN MEXICO 174 (2013), http://dx.doi.org/10.1787 /9789264187894-en.

[2] COMISIÓN NACIONAL DEL AGUA [CONAGUA] , PROGRAMA NACIONAL HIDRICO 2007–2012 [NATIONAL WATER PROGRAM 2007–2012] 27 (Feb. 2008), http://www.conagua.gob.mx/CONAGUA07/Contenido/Documentos/PNH_05-08.pdf.

[3] OECD, *supra* note 1, at 45, 47, 113, 114, 115, 174. *See also Historia*, CONAGUA, http://www.conagua.gob.mx/Contenido.aspx?n1=1 (last updated Oct. 25, 2012).

[4] Ley de Aguas Nacionales [National Waters Law], *as amended*, arts. 4, 9, 48, Diario Oficial de la Federación [DO], Dec. 1, 1992, available on the website of Mexico's House of Representatives, *at* http://www.diputados.gob.mx/LeyesBiblio/pdf/16.pdf.

National Water Commission.[5] Some waters may be subject to private property provided that applicable rules are met.[6]

A. Concessions

Water concessions must indicate the amount of water authorized for extraction, the specific use for such water, the location of the point of extraction, and the term of the concession.[7] A concession may be granted for a term of five to thirty years, and may be extended if a request for its extension is made at least six months before the expiration of the concession.[8]

B. Water for Domestic Use

Surface water may be freely used for domestic purposes (such as watering gardens and ornamental trees, and providing domestic animals with drinking water) as long as its stream bed and quality is not altered by the user and its quantity is not significantly diminished.[9] Such a diminution may be presumed if the extraction of water is made through the use of pumping equipment or similar mechanical or electric devices.[10]

C. Water Conservation

The National Waters Law provides that conservation and protection of the quantity and quality of water is a matter of national security; therefore, unsustainable use of water must be avoided.[11] Mexico's National Water Commission promotes strategies aimed at fostering the sustainable use of water in agriculture, which include

- using irrigation technologies that allow for the efficient use of water in agriculture (i.e., technologies that allow less water to be used while achieving equal or better agricultural productivity);
- fostering the sowing of crops that don't require high water volumes, especially in arid areas;
- distributing water through irrigation tubes in order to minimize water loss through evaporation and surface filtration; and

[5] *Id.* arts. 16, 20.

[6] CONSTITUCIÓN POLÍTICA DE LOS ESTADOS UNIDOS MEXICANOS [POLITICAL CONSTITUTION OF THE MEXICAN UNITED STATES], *as amended*, art. 27, DO, Feb. 5, 1917, available on the website of Mexico's House of Representatives, *at* http://www.diputados.gob.mx/LeyesBiblio/pdf/1.pdf.

[7] Ley de Aguas Nacionales art. 23.

[8] *Id.* art. 24.

[9] *Id.* arts. 3(LVI), 17.

[10] Reglamento de la Ley de Aguas Nacionales [Regulation of the National Waters Law], *as amended*, art. 28, DO, Jan. 12, 1994, http://www.diputados.gob.mx/LeyesBiblio/regley/Reg_LAN.pdf.

[11] Ley de Aguas Nacionales art. 14 BIS 5(IX).

- using treated wastewater for the irrigation of crops (except for vegetables that may be consumed raw).[12]

D. Water Quality

Mexico's Environmental Standard NOM-001-SEMARNAT-1996 sets limits on the amount and type of pollutants that are allowed in water used for agricultural purposes.[13] The holders of water concessions for agriculture must comply with environmental standards and requirements applicable to the discharge of water and the prevention and control of pollution resulting from handling substances that may contaminate water quality.[14]

III. Intercountry Disputes Concerning the Use of Water

Mexico shares three transboundary rivers with the United States (the Tijuana River, the Colorado River, and the Rio Grande).[15] Bilateral treaties (particularly the 1944 Treaty on Utilization of Waters of the Colorado and Tijuana Rivers and the Rio Grande) provide rules that govern the sharing mechanisms applicable to these water resources.[16] The International Boundary and Water Commission (IBWC) is a binational entity that comprises a Mexican section and a United States section, each administered separately by a Commissioner appointed by the Presidents of Mexico and the United States, respectively.[17] The duties of the IBWC include the distribution of the waters of the Colorado River and the Rio Grande between both countries.[18]

Recently, the United States has claimed that Mexico is not sharing the amount of water from the Rio Grande as provided by the 1944 Treaty.[19] The Texas Department of Agriculture has released a report explaining this issue as follows:

> The [1944 Water] Treaty takes a five-year approach to water management. Mexico is required to provide a minimum of 350,000 acre feet of water on average to the United

[12] Press Release No. 148/13, CONAGUA, CONAGUA promueve la modernización del campo para eficientar el uso del agua [Mexico's National Water Commission Promotes the Efficient Use of Water in Agriculture] (Mar. 29, 2013), http://www.conagua.gob.mx/CONAGUA07/Comunicados /Comunicado%20de%20Prensa%20No%20148-13.pdf.

[13] Norma Oficial Mexicana NOM-001-SEMARNAT-1996, Que establece los límites máximos permisibles de contaminantes en las descargas de aguas residuales en aguas y bienes nacionales [Official Mexican Standard NOM-001-ECOL-1996, Establishing the Maximum Limits of Pollutants in Wastewaters Discharged in National Waters], DO, Oct. 30, 1996, http://www.conagua.gob.mx/CONAGUA07/Publicaciones/Publicaciones/SGAA-15-13.pdf.

[14] Reglamento de la Ley de Aguas Nacionales art. 137.

[15] OECD, MAKING WATER REFORM HAPPEN IN MEXICO 60 (2013), http://dx.doi.org/10.1787 /9789264187894-en.

[16] *Id*.

[17] The International Boundary and Water Commission – Its Mission, Organization and Procedures for Solution of Boundary and Water Problems, INTERNATIONAL BOUNDARY & WATER COMMISSION – UNITED STATES SECTION, http://www.ibwc.state.gov/About_Us/About_Us.html (last visited Sept. 16, 2013).

[18] *Id*.

[19] *Morning Edition: Water Dispute Heightens Tensions Between U.S., Mexico* (NPR radio broadcast Sept. 4, 2013, with transcript), http://www.npr.org/2013/09/04/218834216/water-dispute-heightens-tensions-between-u-s-mexico.

> States each year of the term. Should Mexico fail to deliver the annual allocation, it is required to catch-up and correct the accumulated deficit by the end of the five-year term at the latest. The Treaty provides Mexico with an exemption to the delivery schedule if the country is in extraordinary drought. However, the agreement directs Mexico and the United States to attempt to ensure compliance. Currently, Mexico is neither in extraordinary drought nor attempting to ensure compliance. The current water management cycle began in October 2010. Two and a half years into the current cycle, Mexico should have delivered 916,000 acre-feet to Texas. Instead, as of June 8, 2013, Mexico has delivered only 433,408 acre-feet, creating a pro-rata deficit of 483,000 acre-feet. Should Mexico refuse to comply with the Treaty, the water debt at the end of the five-year cycle could total approximately 1.2 million acre-feet or more.[20]

According to an official with the US section of the IBWC, Mexico is not setting aside the water allocation that must be delivered every year to the United States.[21] Instead, Mexico apparently relies on rainy years to deliver annual water allocations, and a drought that started in 2011 has prevented Mexico from delivering water to the United States.[22] According to news reports, the Mexican government is currently addressing this issue by developing regulations that would require setting aside water to meet Mexico's obligations to the United States. These regulations could become effective by October 2013.[23]

[20] TEXAS DEPARTMENT OF AGRICULTURE, ADDRESSING MEXICO'S WATER DEFICIT TO THE UNITED STATES, http://www.texasagriculture.gov/Portals/0/forms/COMM/Water%20Debt.pdf (last visited Sept. 19, 2013).

[21] Morning Edition, *supra* note 19.

[22] *Id.*

[23] *Id.*

Nicaragua

Norma C. Gutiérrez
Senior Foreign Law Specialist

SUMMARY In Nicaragua the use of water, including its use in agriculture, is mainly governed by the National General Water Law and its Regulation. The Law charges the National Water Authority with administering, planning, and controlling the use of water resources, as well as granting water concessions for periods of five to thirty years. The Law also provides for the permanent protection and conservation of water sources.

I. Background

Nicaraguan policy on water rights emphasizes that water is in the public domain and is a strategic resource. Human consumption is a priority issue for water legislation as are the preservation of water and the development of a water rights system.[1] Within this system, agricultural water rights are of importance. Agriculture is the principal sector of Nicaragua's economy. It represents over 80% of exports and employs one third of the labor force. According to the World Trade Organization, over one-fifth of Nicaragua's GDP comes from the agricultural sector (agriculture, livestock, fisheries, forestry), with 9.9% from agriculture alone.[2]

II. Legal Framework

The Constitution regards natural resources as the national patrimony and charges the state with the responsibility for their conservation, development, and rational exploitation.[3] The Constitution also states that it is the obligation of the state to promote, facilitate, and regulate the provision of basic public services, among them water services.[4] The Civil Code establishes that lakes, rivers, ponds, canals, freshwater streams, and fountains are public, and it is lawful for anyone to use them within the restrictions imposed by the law and administrative regulations.[5] The National General Water Law (Ley General de Aguas Nacionales), promulgated in 2007, governs the use of water, including its use in agriculture.[6] The Law provides for the creation of the National Water Authority (ANA) and charges it with the responsibility of administering,

[1] Paula Novo & Alberto Garrido, *The New Nicaraguan Water Law in Context*, INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE, IFPRI Discussion Paper 01005 (July 2010), http://www.ifpri.org/sites/default/files/publications/ifpridp01005.pdf.

[2] World Trade Organization, *Trade Policy Review: Nicaragua*, *Report by the Secretariat*, at 57, WT/TPR/S/167 (June 19, 2006), http://www.wto.org/english/tratop_e/tpr_e/s167-00_e.doc.

[3] CONSTITUCIÓN POLÍTICA DE LA REPÚBLICA DE NICARAGUA art. 102, (LA GACETA, DIARIO OFICIAL [L.G.], Sept. 16, 2010).

[4] *Id*. art. 105.

[5] CÓDIGO CIVIL art. 611 (Impresiones La Universal, Managua, 2001).

[6] Ley General de Aguas Nacional, No. 620, L.G., Sept. 4, 2007.

planning, and controlling the use of water resources in the country.[7] The ANA's functions include granting, modifying, extending, suspending, and terminating concessions and licenses for using water.[8]

A. Concessions

Under the Regulation of the National Water Law, water concessions must include at least the following elements: the name of the licensee, type of water source, exact geographical location of the concession, exact delimitation of the concession area, manner in which the water will be used, volume of water to be used, expiration date of the concession, and points of extraction and discharge. They are also to include any other information that the ANA deems necessary.[9]

A concession may be granted for a term of not less than five nor more than thirty years. [10] Concessions may be extended for the same term, volume of water, and kind of use as long as their holders incur no cause for termination under the Law and apply for the extension of the concession at least six months before its expiration.[11]

With respect to authorizations of water for agricultural and livestock (but not industrial) uses, farm owners of seventy acres or less require only municipal authorization. Owners of farms that are larger than seventy acres require authorization or a concession issued by the ANA or the Basin Organization (Organismo de Cuenca). Farmers or ranchers also require authorization from the ANA, regardless of the size of their property, when their products are marketed for industrial purposes.[12]

B. Water for Domestic Use

Anyone is entitled without authorization to use national waters for the purpose of human or livestock consumption provided that they obtain the water through the use of human- or animal-operated manual or mechanical means, have access to the water sources, do not cause damage to third parties, and do not alter the water quality or perform activities that in any way harm or alter the streambed and its banks, or contaminate it.[13]

C. Water Conservation

The National Water Law provides that it is in the public interest to ensure the quality of national water sources through promoting and implementing the measures and actions necessary for their

[7] *Id*. arts. 24, 26 & 27

[8] *Id*. art. 26(j).

[9] Decreto No. 44-2010, Reglamento de la Ley No. 620, Ley General de Aguas Nacionales (hereinafter, Reglamento de la Ley General de Aguas Nacionales) art. 45, L.G., Aug. 9, 2010.

[10] Ley General de Aguas Nacionales art. 48.

[11] *Id*. art. 53.

[12] Reglamento de la Ley General de Aguas Nacionales art. 71.

[13] Ley General de Aguas Nacionales art. 67.

proper and permanent protection and conservation. The Law prohibits the cutting of trees or plants of any kind that are within an area of two hundred meters from the banks of rivers and shores of lakes and ponds in order to protect water sources.[14]

The Law directs the Ministry of Environment and Natural Resources (MARENA), in consultation with the National Water Authority (ANA), to adopt and implement such strategic plans as the following to ensure the protection of national waters:

- Promoting the implementation of plans to protect water sources in river basins and aquifers;
- Promoting or carrying out the necessary measures to prevent waste and toxic substances from contaminating the nation's water and public properties;
- Implementing programs to reduce the emissions of pollutants;
- Bringing about consultations between water users and other civil society groups to determine quality goals, deadlines for achieving them, and the resources to be obtained for this purpose;
- Coordinating studies and other work necessary to determine discharge parameters, the assimilation and dilution capacity of national water bodies, and permissible pollutant loads; and
- Participating with other institutions responsible for conducting studies to evaluate water quality, monitoring human consumption needs, monitoring wastewater for conformity with quality standards, implementing efficient rapid response mechanisms in emergency and environmental contingencies, and conducting studies to identify and repair environmentally damaged water bodies.[15]

D. Water Quality

Nicaragua has many obligatory technical standards (NTONs), but if one exists that establishes limits for the pollutants allowed in water for agricultural use and the environmental standards that water-concession holders must comply with, we were unable to locate it in our available sources.

[14] *Id*. art. 96.

[15] *Id*. art. 101.

Turkey

Wendy Zeldin
Senior Legal Research Analyst[*]

SUMMARY: Although the control of irrigation in Turkey has seen major reforms in recent years, with the transfer of management from the central government to local, farmer-led irrigation associations, its system of laws on water is currently in flux, as the government seeks to conform to European Union (EU) policies and directives on water management. Under Turkey's Constitution, water is generally characterized as a public good under state trusteeship; according to the Civil Code, waters may be classified as either public or private. Furthermore, for purposes of law, waters are distinguished on the basis of whether they are used directly as a substance or exist in a natural form and appearance.

A new, overarching Water Law has been drafted, but at present a number of separate laws and regulations govern the use of water in agriculture in Turkey, and there is no clear provision defining water rights. Among the currently applicable laws are the Groundwater Law, the Irrigation Associations Law, and the Law on the Establishment of the General Directorate of State Hydraulic Works. Among the key bylaws affecting water use in agriculture are those on water contamination, surface water quality management, protection of waters from agricultural nitrate pollution, and controlling contamination and environmental pollution from dangerous substances, many of which are in conformity with EU Directives. Bylaws have been drafted, moreover, to cover reuse of treated waste water, water loss and leakage, monitoring of surface and ground water, and protection of water against nitrate pollution from agriculture.

The General Directorate of State Hydraulic Works under the Ministry of Forestry and Water Affairs has for a long time been the main central body in charge of water management in Turkey. It is the agency that issues licenses to water users. In 2012, a new Water Management Coordination Committee was established to coordinate the activities of various bodies involved in handling water resources.

Turkey shares a number of rivers with neighboring states. Most notably, it is a riparian state with Syria and Iraq for the Euphrates-Tigris rivers system. Although concern has been expressed over transboundary water disputes between Turkey and its neighbors as having the potential for serious water conflicts, in recent years some mechanisms have been launched to resolve common water-related issues.

I. Background

Turkey, located in a semi-arid part of the world, is not rich in freshwater resources, nor does it have the greatest wealth of water resources in the region; compared to water-rich areas (*i.e.*, those with 10,000 cubic meters of water per capita annually) such as North America and Western

[*] At present there are no Law Library of Congress research staff members versed in Turkish. This report has been prepared by the author's reliance on practiced legal research methods and on the basis of relevant legal resources, chiefly in English, currently available in the Law Library and online.

Europe, it has only about one fifth (1,500 cubic meters) of the water available per capita.[1] Moreover, the water is not necessarily available in the places most suited to meeting Turkey's present and future needs, because some regions, like the Black Sea area, "have ample but unusable freshwater, while some of the more heavily populated and industrialized regions such as the Marmara and the Aegean regions lack sufficient fresh water."[2]

The irrigated land in Turkey is 5.29 million hectares, or 13% of the country's agricultural area, with the majority of larger irrigation projects concentrated in the coastal regions of the Aegean and Mediterranean Seas.[3] According to a 2010 study, 75% of utilizable water was allocated to irrigation, with the irrigated area having "already reached 60 percent of the total 'economically irrigable' area of 8.5 million hectares" and water consumption per hectare constituting over 7,000 cubic meters.[4] Through a participatory irrigation management program instituted in Turkey from 1994 onwards, the transfer of about 95% of the state-managed irrigation infrastructure to water user organizations, i.e., management by local stakeholders, was achieved by 2005.[5]

European Union membership has served as an impetus for reforming Turkey's environmental policy, including water policy, gaining ground after Turkey's official recognition as a candidate for full EU membership in December 1999 and intensifying ever since official accession negotiations began in October 2005.[6] A key document in connection with water management in the EU is the Water Framework Directive.[7] It sets forth detailed requirements for domestic water management and also obliges member states to internationally coordinate their actions along river basins.[8] Two other related Directives include the Directive on Environmental Quality Standards[9] and the Nitrates Directive.[10]

---

[1] Ministry of Foreign Affairs, *Turkey's Policy on Water Issues*, http://www.mfa.gov.tr/turkey_s-policy-on-water-issues.en.mfa (last visited Sept. 23, 2013).

[2] *Id*.

[3] Wafa Ghazouani, François Molle & Edwin Rap, Water Users Associations in the NEN Region: IFAD Interventions and Overall Dynamics (Draft Submitted to International Fund for Agricultural Development, IFAD) (Oct. 2012), at 25, http://www.un.org/waterforlifedecade/water_cooperation_2013/pdf/water_users_associations_in_nen_region.pdf.

[4] Erol H. Cakmak, *Agricultural Water Pricing: Turkey*, OECD (2010), http://www.oecd.org/tad/sustainable-agriculture/agri-environmentalindicatorsandpolicies/45016347.pdf.

[5] Ghazouani, Molle & Rap, *supra* note 3.

[6] *EU-Turkey Relations*, EUROPEAN COMMISSION – ENLARGEMENT, http://ec.europa.eu/enlargement/candidate-countries/turkey/eu_turkey_relations_en.htm (last visited Sept. 30, 2013).

[7] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 Establishing a Framework for Community Action in the Field of Water Policy, 2000 O.J. (L 327) 1, *available at* http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2000L0060:20090625:EN:HTML.

[8] TURKEY'S WATER POLICY: NATIONAL FRAMEWORKS AND INTERNATIONAL COOPERATION xxvi (Aysegul Kibaroglu, Annika Kramer & Waltina Scheumann eds., Heidelberg; New York: Springer, 2011).

[9] Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on Environmental Quality Standards in the Field of Water Policy, Amending and Subsequently Repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and Amending Directive 2000/60/EC of the European Parliament and of the Council, 2008 O.J. (L 348) 84, *available at* http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0084:0097:EN:PDF.

II. Policies

In the view of some scholars, excessive water consumption is a major problem in Turkey, and new, successful water management policies are needed to meet the country's increasing population, in addition to initiatives to heighten public awareness and knowledge of efficient water use.[11] Former Turkish Foreign Minister Yaşar Yakış commented in March 2013 that while Turkey has recently attached greater importance to water issues, effective water management policies are not in place in Turkey, nor does it have many qualified experts on water, unlike other countries in the Middle East. "Therefore," in his view, "Turkey needs to establish departments on water issues at Turkish universities to train domestic water experts as soon as possible."[12]

The government's Ninth Development Plan 2007–2013[13] recognized "the significant role of irrigation for improving the performance of the agricultural sector," but at the same time established as a priority the more efficient use of water resources in agriculture and the completion of irrigation projects already underway.[14] While agriculture has been decreasing in importance in Turkey compared to the industrial and service sectors of the economy, it nevertheless still plays a fundamental role, employing about a quarter of the workforce and generating most of the income and employment in rural areas.[15] From 1980 to 2009, the contribution of agriculture to GDP decreased from 23% to 8.3%, although its share of total exports, according to a 2011 study, remained stable at about 11% of total exports.[16] About 55% of the land suitable for agriculture is used for arable crops (with about 24% of the land irrigated and 11% left fallow), 8% for permanent crops, and 38% for permanent meadows and pastures.[17] The majority of farming enterprises are still small holdings or family farms, with almost two-thirds smaller than five hectares and "with a high degree of fragmentation," even though more

---

[10] Council Directive 91/676/EEC of 12 December 1991 Concerning the Protection of Waters Against Pollution Caused by Nitrates from Agricultural Sources, 1991 O.J. (L 375) 1, *available at* http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31991L0676:EN:NOT.

[11] *Turkey: More Effective Water Management Policies Need to Be Adopted*, EURO-MEDITERRANEAN INFORMATION SYSTEM ON KNOW-HOW IN THE WATER SECTOR (Mar. 27, 2013), http://www.emwis.org/thematicdirs/news/2013/03/turkey-more-effective-water-management-policies-need-be-adopted.

[12] *Id*.

[13] State Planning Organization of the Prime Ministry of the Republic of Turkey, Ninth Development Plan 2007–2013 (approved by the Turkish Grand National Assembly on June 28, 2006, by Law No. 877), http://ekutup.dpt.gov.tr/plan/ix/9developmentplan.pdf.

[14] Cakmak, *supra* note 4.

[15] *See* OECD, EVALUATION OF AGRICULTURAL POLICY REFORMS IN TURKEY, 9 (2011), http://www.oecd-ilibrary.org/docserver/download/5111091e.pdf?expires=1380296189&id=id&accname=ocid195520&checksum=B3AD8816037CD5BB8419AA8CBDB9F925.

[16] *Id*.

[17] *Id*.

commercialized farming has emerged in recent years.[18] Relatively more of the larger and more specialized types of farms are found in Turkey's Aegean and Mediterranean regions.[19]

III. Legal Framework

A. Constitution and Civil Code

The Constitution of the Republic of Turkey of 1982 sets forth as a basic principle that water is a public good under the trusteeship of the State.[20] According to article 168, "natural wealth and resources shall be under the authority and at the disposal of the State. The right to explore and exploit these belongs to the State."[21] Article 43, paragraph (2) states, moreover, "in the utilization of sea coasts, lake shores or river banks, and of the coastal strip along the sea and lakes, public interest shall be taken into consideration with priority."[22]

Water is divided into two categories for purposes of law, namely, "waters taken directly as a substance" and waters that exist "in a natural form and appearance (rivers, underground waters, springs, lakes, etc.)."[23] Based on the Turkish Civil Code, waters may be classified as either public waters, available for public service and utilization under the government's direction and possession, or private waters, available for personal ownership as private property.[24] This distinction is derived from article 715, which provides that assets not in anyone's possession and commodities at the service of the public will be under the command and possession of the government. The article further provides that unless prescribed otherwise, waters at the service of the public and places unsuited for agriculture, such as rocks, hills, and mountains, and the resources therefrom, are not owned by anyone in any way and cannot be subject to private ownership.[25]

B. Water Law

According to the Ministry of Forestry and Water Affairs, the current Law Concerning Water (*Sular Hakkinda Kanun*), No. 831, which entered into force on May 10, 1926, does not sufficiently address a number of subjects, such as water-related construction (e.g., dams),

---

[18] *Id*. at 9–10.

[19] *Id*. at 10.

[20] TURKEY'S WATER POLICY, *supra* note 8, at xxiv.

[21] CONSTITUTION OF THE REPUBLIC OF TURKEY (as last amended by Act No. 6214 of Mar. 17, 2011), http://global.tbmm.gov.tr/docs/constitution_en.pdf; TÜRKIYE CUMHURIYETI ANAYASASI [CONSTITUTION OF THE REPUBLIC OF TURKEY], Law No. 2709 (Nov. 7, 1982 , as last amended Mar. 17, 2011), RESMÎ GAZETE [R.G.] No. 27889 (Mar. 29, 2011), http://www.tbmm.gov.tr/anayasa/anayasa_2011.pdf.

[22] *Id*.

[23] Aynur Aydin Coskun, *Water Law: The Current State of Regulation in Turkey*, 28:1 WATER INT'L 70 (Mar. 2003), *available at* http://dx.doi.org/10.1080/02508060308691666 (subscription required).

[24] *Id*.

[25] *Id*.; Türk Medenî Kanunu [Turkish Civil Code], Law No. 4721 of Nov. 22, 2001 (as last amended May 3, 2013, by Law No. 6462), art. 715, R.G. No. 24607, *available at* http://www.mevzuat.gov.tr/MevzuatMetin/1.5.4721.pdf.

industrial water needs, groundwater usage, irrigation, and pollution of the receiving environment.[26] There are also gaps in the existing water legislation as a whole, and current laws do not clearly assign authority and responsibility for water-related matters. In addition, according to the Ministry, Turkey's laws need to accord with the EU Framework Directive on Water, and greater consideration needs to be given not just to assuring the quantity of water but also its quality.[27]

A new Water Law, drafted after a review of the laws of ten countries and consultations with foreign experts, was presented for evaluation by Turkish agencies and institutions, universities, and NGOs and municipalities; as of February 2013, the comments received were being evaluated.[28] Some features of the draft law are that it provides for basin-based water management and allocation, treatment of water as property to be disposed by the state, the full cost principle (user/polluter pays), coordination of water management, preparation of a National Water Plan and of flood management plans, establishment of a supreme council for water management, and inclusion of sparkling mineral water in the Water Law.[29]

C. Groundwater Law

The government is responsible for development of water resources, with the exception of privately owned springs and waters. The Groundwater Law, No. 167 of 1960, covers the use of underground water resources (more than ten meters below the ground surface).[30] Bylaw No. 1465 on Groundwaters sets priorities for the use of underground water, *i.e.*, for drinking, cleaning, in connection with animals, and for agricultural irrigation.[31] According to article 756 of the Civil Code, "underground waters are generally beneficial to the public, and therefore, ownership of any land shall not cover the water under that land," and, "pursuant to the Constitution, underground waters and mineral waters are under the command and possession of State."[32] Springs are not defined in the Civil Code, but article 756 and subsequent articles provide that springs are subject to private ownership.[33]

[26] Cumali Kınacı, *Water Management in Turkey* (Feb. 21, 2013), PowerPoint slide 15, http://suen.gov.tr/UserFiles/CKUpload/Upload/Annex%20A.2%20CUMAL%C4%B0%20KINACI%20-%20TURKEY%20-%20DG%20OF%20SYGM.ppt.

[27] *Id*.

[28] *Id*. at 14.

[29] *Id*. at 16; *see also* the text of the draft law, Su Kanunu Tasarisi [Draft Water Law], Kalkınma Ortak Paydamız [Development Common Denominator, a Turkish government website], http://www.kop.gov.tr/SU_KANUNU_TASLA%C4%9EI_5.10.2012.pdf (last visited Oct. 22, 2013).

[30] Erol C. Cakmak, *supra* note 4, at 17.

[31] WATER LAW: THE CURRENT STATE OF REGULATION IN TURKEY 74 (Mar. 2003).

[32] *Id*. at 73.

[33] *Id*. at 74.

D. Laws on Irrigation Users

From 1993 onwards, most water user organizations (or irrigation associations, IAs), were formed under the Municipal Act, Law No. 1580, implying control by the Ministry of the Interior. In 2005, with the enactment of the Local Administration Act, Law No. 5355, specific reference was made to IAs in a statute for the first time, under article 19.[34] In March 2011, the supervisory role of the General Directorate of State Hydraulic Works (Devlet Su İşleri Genel Müdürlüğü or DSI) over IAs was strengthened by the enactment of a new Irrigation Associations Law, Law No. 6172, which authorized the DSI "as the dominant public water authority that acts as an 'advisory and controlling institution' to IAs."[35] The new law redefined the status of IAs from 'local administration associations' to 'public legal entities,' subjecting them to an administrative and technical audit and opening the possibility of DSI's taking back the management of IAs and either exercising management itself or outsourcing it to the private sector by selling irrigation canals to private enterprises.[36] As of 2012, IAs managed 90% of the total areas transferred from centralized to local farmers' control, some 3.21 million hectares.[37]

> However, IAs were not the only possible form of user organization, because also cooperatives (5%; Cooperative Law), municipalities (3%) and village legal entities (2%; Village Law) were made responsible for managing local irrigation systems. Local leaders such as village headmen (*muhtars*) or mayors of municipalities often became the heads of these user organizations . . . [38]

Several different laws regulate irrigation areas in addition to Law No. 6172 and Law No. 5355. These include Law No. 442 on village authorities and Law No. 1163 regulating irrigation cooperatives.[39]

E. Agricultural Land

Turkey has had a large number of multiparcel agricultural land holdings, which may for the most part be attributed to the 1926 Civil Code, "which specifies that, upon death of a landowner, 25% of the land should pass to the owner's spouse, with the rest being equally distributed among any

---

[34] Ghazouani, Molle & Rap, *supra* note 3, at 27, *citing* G. Özerol, A. Özen-Tacer & M. Islar, *Public Participation as an Essentially Contested Concept: Insights from Water Management in Turkey*, *in* WATER GOVERNANCE, POLICY AND KNOWLEDGE TRANSFER: INTERNATIONAL STUDIES ON CONTEXTUAL WATER MANAGEMENT (C. de Boer, J. Vinke-de Kruijf, G. Özerol & H. Bressers eds., Abingdon; Oxon: Routledge, 2013). *See* Mahallî İdare Birlikleri Kanunu, No. 5355 (May 26, 2005, as last amended Dec. 6, 2012, by Law No. 6360), http://www.mevzuat.gov.tr/Metin.Aspx?MevzuatKod=1.5.5355&sourceXmlSearch=&MevzuatIliski=0.

[35] Ghazouani, Molle & Rap, *supra* note 3, at 27. Sulama Birlikleri Kanunu [Irrigation Associations Law], No. 6172 (Mar. 8, 2011), 27882 R.G. (Mar. 22, 2011), http://www.mevzuat.gov.tr/Metin.Aspx?MevzuatKod=1.5.6172&sourceXmlSearch=&MevzuatIliski=0.

[36] Ghazouani, Molle & Rap, *supra* note 3, at 80.

[37] *Id*. at 26.

[38] *Id*.

[39] Usaid El-Hanbali & Ebru Karamete, *Turkey Irrigation Sector Reform: What Worked and What Did Not Work* (Mar. 9, 2011) PowerPoint Slide 17, http://siteresources.worldbank.org/PAKISTANEXTN/Resources/TURKEY_IRR_SECTOR_REFORM.pdf.

surviving children."[40] The Law on Soil Conservation and Land Use (Toprak Koruma ve Arazi Kullanımı Kanunu), Law No. 5403 of July 3, 2005 (in force on July 19, 2005), was amended in 2007 to prevent continued fragmentation in that manner, establishing the minimum permissible size of a land parcel to be twenty hectares.[41] The Law was further amended in 2008 by the Law Amending the Law on Soil Preservation and Land Utilization and the Law on Pastures (Toprak Koruma ve Arazi Kullanımı Kanunu ile Mera Kanununda değişiklik yapılması hakkında Kanun).[42] The Bylaw on the Conservation and Consolidation of Agricultural Lands, adopted in July 2009, sets forth the principles of implementation of the Law, and subsequently there has been "noticeable acceleration in the progress of land consolidation."[43]

F. Water Resource Management

The Law on the Establishment of the General Directorate of State Hydraulic Works (Devlet Su İşleri (DSİ) Genel Müdürlüğü), No. 6200 (Dec. 18, 1953; published Dec. 25, 1953) defines the duties and powers of the DSI and the organizations under it.[44]

On July 4, 2011, a new law was promulgated to establish a General Directorate of Water Management.[45] The Directorate was established under the Ministry of Forestry and Water Affairs.[46]

G. Financing

The Provincial Bank Corporation Law[47] appears to continue to assume the responsibility of the former Bank of the Provinces Law "to assist all municipalities, irrespective of size, in the financing and construction of their infrastructure works including water supply (drinking water)

---

[40] OECD, EVALUATION OF AGRICULTURAL POLICY REFORMS IN TURKEY 24 (2011), http://browse.oecdbookshop.org/oecd/pdfs/product/5111091e.pdf.

[41] *Id.*; *see Turkey: Law No. 5403 on Soil Preservation and Land Utilization*, FAOLEX, http://faolex.fao.org/cgi-bin/faolex.exe?database=faolex&search_type=query&table=result&query=ID:LEX-FAOC054515&format_name=ERALL &lang=eng (providing legislative history and link to text, in Turkish) (last visited Dec. 26, 2013).

[42] *See Turkey: Law Amending the Law on Soil Preservation and Land Utilization and the Law on Pastures*, FAOLEX, http://faolex.fao.org/cgi-bin/faolex.exe?database=faolex&search_type=query&table=result&query=ID:LEX-FAOC117280&format_name=ERALL&lang=eng (providing legislative history and link to text, in Turkish) (last visited Dec. 26, 2013).

[43] OECD, *supra* note 40.

[44] SEMIDE/EMWIS, *LOCAL WATER SUPPLY, SANITATION AND SEWAGE, COUNTRY REPORT: TURKEY* 11 (Nov. 2005), http://www.emwis.org /countries/fol749974/semide/PDF/Sogesid-turkey; Devlet Su İşleri Genel Müdürlüğünün Teşkilat ve Görevleri Hakkinda Kanun [Law on Organization and Duties of State Hydraulic Works] (Dec. 18, 1953), http://www.mevzuat .gov.tr/Metin.Aspx?MevzuatKod=1.3.6200&sourceXmlSearch=&MevzuatIliski=0.

[45] Kınacı, *supra* note 26, slide 18.

[46] SEMIDE/EMWIS, *Interview with Prof. Dr. Cumali Kınacı, Director General of Water Management of the Ministry of Forestry and Water Affairs* (June 21, 2012), http://www.emwis.org/countries/fol749974/country378851/links/interview-with-prof.-dr.-cumali-kinaci-director-general-of-water-management-of.

[47] İller Bankasi Anonim Şirketi Hakkinda Kanun [Provincial Bank Corporation Law], No. 6107 (Jan. 26, 2011, as last amended by Law No. 6306 of May 16, 2012), http://www.ilbank.gov.tr/index.php?Sayfa=iceriksayfa&icId=284. Law No. 6107 repealed the Bank of the Provinces Law, No. 4759 of June 13, 1945 (in force on June 23, 1945).

and sewerage, under the Ministry of Public Works and Settlement" (Bayindirlik ve Iskan Bakanligi).[48]

H. Prospective Laws

In addition to the proposed Water Law, some other water-related laws that were ready to be approved or for which drafting was underway in February of this year include the Draft By-Law on Reuse of Treated Waste Water, Draft By-Law for Water Loss and Leakage, the Draft By-Law on 'Monitoring Surface and Ground Water,' and the Draft By-Law of Water Protection Against Nitrates Pollution from Agriculture.[49]

IV. Rights of Riparian Owners

Among other criticisms of Turkey's water resources management framework is that current laws and regulations "do not provide a proper definition of water rights."[50]

In regard to water pricing, "the dominant pricing practice is per hectare charge differentiated according to the crop."[51] There is no difference in policy based on the sources of irrigation water; "the price (fee) for the irrigation water is still based on operation and maintenance costs in all irrigation schemes and it is charged on per hectare basis."[52]

Water fee pricing is based on lists of water prepared by IA technical personnel "and approved by Association Council and collected as whole in advance, or in installments. The collected money is used for operational costs of the association and for repair and maintenance"; for costly repair and maintenance, assistance is requested from DSI."[53] DSI allows the water users groups "to collect an amount between 20 and 40% of the annual water charge."[54]

V. Powers of Government Authorities in Charge of Administration of Water in Agriculture

A. Ministry of Forestry and Water Affairs: DSI

After World War II, a centralized water bureaucracy, the DSI, mentioned above,[55] was established to enhance development of water resources. In the 1960s, under the direction of the

[48] SEMIDE/EMWIS, *supra* note 44.

[49] Kınacı, *supra* note 26, slides 10 & 12.

[50] Cakmak, *supra* note 4, at 17.

[51] *Id*. at 7.

[52] Erol H. Cakmak, *Irrigation Management and Water Pricing in Turkey*, 1(2) INT'L J. SOCIAL ECOLOGY & SUSTAINABLE DEVELOPMENT 14 (Apr.–June 2010).

[53] Ghazouani, Molle & Rap, *supra* note 3, at 150, *citing* S. Kodal, Y.E. Yildirim, & H. Demir, Farmers Participation in the Management of Public Irrigation Schemes in Turkey (unpublished FAO country paper, 2005).

[54] *Id*.

[55] *General Directorate of State Hydraulic Works*, http://www2.dsi.gov.tr/english/ (last visited Sept. 24, 2013).

State Planning Organisation (SPO), public investments in the water sector were based on national five-year development plans, and "major water infrastructure such as irrigation systems, storage facilities and multi- and single-purpose dams (for e.g., hydroelectricity generation) was state-financed and state managed."[56] The mandate to foster the development of water and land resources was given to DSI and to the General Directorate of Rural Services (TOPRAKSU),[57] established in 1985[58] but dismantled in 2005.[59] However, the TOPRAKSU staff "was not transferred to DSI, but to the 81 provincial governments in which the field staff were based."[60]

The DSI, which is under the Ministry of Forestry and Water Affairs, is responsible for centralized management of water resources and for water sector planning nationwide.[61] More specifically, the DSI is responsible for planning, constructing, and financing water and wastewater treatment plants; constructing dams and hydroelectric power plants; building irrigation and drainage systems; carrying out studies for surveys, investigation, conservation, and utilization of ground water; allocating and registering ground water; and flood control.[62] "DSI provides drinking water and water for irrigation and works in cooperation with the General Directorate of the Bank of Provinces (Iller Bank), municipalities (at the local level), and the Ministry of Agriculture and Rural Affairs (MARA)."[63]

On July 4, 2011, a new law was promulgated to establish a General Directorate of Water Management under the Ministry of Forestry and Water Affairs.[64] Among other tasks, it is to do planning and coordination of water management on a national and international basis, set water policy, deal with transboundary waters, handle water legislation, develop water discharge standards and criteria, set water quality standards for the receiving environment, plan flood and drought management, address climate change and water resources issues, assess efficiency of

---

[56] TURKEY'S WATER POLICY, *supra* note 8, at xxiv.

[57] *Id*.

[58] Selmin Burak, *Turkey: Transfer of Irrigation Management to Water Users Associations (PIM) Case # 57*, http://www.gwp.org/Global/ToolBox/Case%20Studies/Mediterranean%20and%20Middle%20East/Turkey.%20Transfer%20of%20irrigation%20management%20to%20water%20users%20associations%20(%2357).pdf (last visited Sept. 30, 2013).

[59] State Planning Organization of the Prime Ministry of the Republic of Turkey, Ninth Development Plan 2007–2013 (approved by the Turkish Grand National Assembly on June 28, 2006, by Law No. 877), ¶ 182, http://ekutup.dpt .gov.tr/plan/ix/9developmentplan.pdf. The State Planning Organization, founded in 1960, was reorganized as the Ministry of Development in June 2011, under Decree Law No. 641. REPUBLIC OF TURKEY MINISTRY OF DEVELOPMENT, http://www.mod.gov.tr/en/SitePages/mod_aboutus.aspx (last visited Sept. 30, 2013). For the Tenth Development Plan 2014–2018, *see* Onuncu Kalkinma Plani (2014–2018) (July 2, 2013), http://www.kalkinma.gov .tr/DocObjects /view/15089/Onuncu_Kalkınma_Planı.pdf.

[60] El-Hanbali & Karamete, *supra* note 39, slide 13.

[61] SEMIDE/EMWIS, *supra* note 44, at 11.

[62] Nermin Çiçek & Özge Hande Sahtiyanci, *Developments in Turkey in the Context of Participatory Approach Based on River Basin Management*, at 3 [n.d.], http://www.inbo-news.org/IMG/pdf/Developments_in_Turkey__in_the_Context_of_ParticipatoryApproach-Fulltext.pdf.

[63] *Turkey*, EUROPEAN-MEDITERRANEAN INFORMATION SYSTEM ON KNOW-HOW IN THE WATER SECTOR (Aug. 9, 2011), http://www.emwis.org/thematicdirs/countries-water-profiles/TR.pdf.

[64] Kınacı, *supra* note 26, slide 18.

water use, and handle international relations regarding water.[65] One aspect of efficient water use that the new agency will monitor is the use of treated domestic wastewater in irrigation.[66]

B. Other Concerned Ministries

Other major central government agencies involved in overseeing water resources and irrigation are the Ministry of Environment and Urbanization, responsible for the control and inspection of and sanctions against unlawful discharges and the preparation of environmental impact assessment and environment plans; the Ministry of Agriculture and Rural Affairs (MARA), responsible for the bylaw on nitrates; and the Ministry of Health, responsible for water to be used for human consumption.[67]

C. Water Management Coordination Committee

By Prime Ministry Notice No. 2012/7, a new Water Management Coordination Committee (WMCC) was established,[68] and since 2011 there has been a General Directorate of Agrarian Reform under MARA.[69]

The WMCC is responsible for determining measures to protect water resources "in a holistic way," attaining coordination and cooperation of different sectors, enhancing water-related investments, achieving goals stated in national and international documents, and implementing institutional responsibilities stated in river basin management plans.[70] The Committee's members are from the Ministry of Forestry and Water Affairs, the Ministry of Environment and Urbanization, the Ministry of Internal Affairs, the Ministry of Foreign Affairs, the Ministry of Health, the Ministry of Food, Agriculture and Livestock, the Ministry of Science, Industry and Technology, the Ministry of Energy and Natural Resources, the Ministry of Culture and Tourism, the Ministry of Development, the Ministry of the European Union, and the Turkish Water Institute.[71]

VI. Requirements for Licenses to Use Water for Irrigation

For each reservoir in Turkey, the DSI issues licenses at the request of prospective users to use the groundwater. The licenses cover only the right to use and cannot be transferred or sold.[72]

---

[65] *Id*., slides 19–20.

[66] *Id*., slide 26; *see also* Çiçek & Sahtiyanci, *supra* note 62.

[67] Çiçek & Sahtiyanci, *supra* note 62, at 3–4.

[68] Kınacı, *supra* note 26, slide 34.

[69] Ilhami Bayramin, *Soil Data of Turkey, Currents [sic] Status, Problems, Needs* (2012), http://eusoils.jrc.ec.europa.eu/esdb_archive/ESDB_Data_Distribution/UPDATES/Extension/izmir2012_turkey_bayramin.pdf.

[70] Çiçek & Sahtiyanci, *supra* note 62, at 4.

[71] *Id*.

[72] Cakmak, *supra* note 4, at 17.

VII. Water Quality and Water Conservation Requirements

The Law on the Environment, No. 2873, provides that the Ministry of Environment is responsible for the utilization and protection of natural resources and for the prevention of water, soil, and air contamination.[73] One objective of the Bylaw on Water Contamination (also called the Bylaw for Water Pollution Control) of 1988, No. 19919, which was adopted on the basis of Law No. 2873, "is to maintain the potential of the country's underground and surface springs and to utilize them in the most appropriate manner with the prevention of the contamination."[74]

Bylaw 19919, as amended in 2004 and 2008, further "aims at both conserving the quality of water resources and water-dependent ecosystems, and protecting and improving water quality to meet human demands." The Bylaw establishes emission discharge standards or limits that define the maximum allowable amounts of pollutant discharge (including priority substances as defined in the EU Dangerous Substances and Nitrate Directives) that may be received in natural and artificial water bodies. It defines the water quality standards for receiving bodies of water by classifying inland surface waters into four classes: high-quality waters, waters with minimal pollution, polluted water, and highly polluted water. The Bylaw also "regulates the permit system for direct (into receiving natural water) and indirect dischargers (into municipal sewage systems) and authorizes the Provincial Environment and Forestry Directorate to issue the permits (the Local Environment Commissions act as their advisors)."[75]

The Bylaw on Surface Water Quality Management entered into force on November 30, 2012. It was adopted to conform to the EU Water Framework Directive and the Directive on Environmental Quality Standards.[76] The Bylaw on the Protection of Groundwater Against Pollution and Deterioration entered into force on April 7, 2012, in conformity with the EU Groundwater Directive.[77]

The Bylaw on the Protection of Waters from Agricultural Nitrate Pollution of 2004 (No. 25377) governs nitrate and nitrate-based components originating from agricultural practices (*i.e.*, from the application of fertilizer and from animal waste) that pollute groundwater, surface water, and soil.[78] The Bylaw also defines drinking water standards and criteria for determining regions at risk. MARA is given the responsibility of promoting good agricultural practices, *e.g.*, for fertilizer use in agriculture, and for developing programs towards that end.[79]

---

[73] Coskun, *supra* note 23, at 73.

[74] *Id*. at 76.

[75] TURKEY'S WATER POLICY: NATIONAL FRAMEWORKS AND INTERNATIONAL COOPERATION, *supra* note 8, at 127.

[76] Kınacı, *supra* note 26, slide 11; Yüzeysel Su Kalitesi Yönetimi Yönetmeliği [Bylaw on Surface Water Quality Management], 28483 R.G. (Nov. 30, 2012), http://suyonetimi.ormansu.gov.tr/Libraries/su/Y%C3%BCzeysel_Su_Kalitesi_Y%C3%B6netimi_Y%C3%B6netmeli%C4%9Fi_RG.sflb.ashx.

[77] Kınacı, *supra* note 26, slide 11; Yeralti Sularinin Kirlenmeye ve Bozulmaya Karġi Korunmasi Hakkinda Yönetmelik [Bylaw on the Protection of Groundwater Against Pollution and Deterioration], 28257 R.G. (Apr. 7, 2012), http://www.ormansu.gov.tr/osb/Files/duyuru/anasayfaDuyurular/2012_yonetmelikler /07-04-2012-28257.pdf.

[78] TURKEY'S WATER POLICY: NATIONAL FRAMEWORKS AND INTERNATIONAL COOPERATION, *supra* note 8, at 127–28.

[79] *Id*.

> The Bylaw on Controlling Contamination and Environmental Pollution Stemming from Dangerous Substances of 2005 (No. 26040) sets forth technical and administrative standards for identifying dangerous substances that pollute surface water, estuaries, and regional waters.[80] It also provides standards for preparing pollution reduction programs, for monitoring and preventing pollution, and for conducting inventories of dangerous substances discharged into water resources.[81] It also covers determination of wastewater discharge standards and water quality standards related to fourteen dangerous substances in receiving environments, among other standards.[82]

The General Directorate of Water Management has examined preparation of a draft Bylaw on Protection of Basins and Preparation of Management Plans. The aim of the draft Bylaw is "to set procedures and principles of planning for and protection of the quantity and quality of groundwater and surface water on the basis of a holistic approach"; the draft Bylaw also includes principles on the preparation of river basin management plans.[83]

VIII. Intercountry Disputes Concerning the Use of Water

According to a 2011 study, "the somewhat alarming description of Turkish transboundary water disputes as having potential for serious water conflicts appears exaggerated and does not realistically mirror the current situation, even in the most marked water quantity disputes over the Euphrates-Tigris rivers system."[84] In addition to the Euphrates-Tigris rivers system shared by the riparian states Turkey, Syria, and Iraq, other transboundary rivers shared by Turkey include the Meric River, with the riparian states Bulgaria, Greece, and Turkey; the Kura-Aras river basin, with Armenia, Azerbaijan, Georgia, Iran, and Turkey; the Coruh River, with Georgia and Turkey; and the Orontes River with Turkey and Syria.[85]

In 2009, Turkey, Syria, and Iraq "agreed to establish joint stations to measure water volume, monitor and exchange information about climate and drought, and create joint water education programs" in connection with the Tigris and Euphrates. The agreement was reached at the sixth meeting of a series of water meetings held over the previous two years to avoid conflict among the riparian states.[86] Nevertheless, one recent news article noted that tensions between the countries that share the Tigris-Euphrates basin (which also includes western Iran) remain high, with Syria and Iraq having accused Turkey of hoarding water.[87]

---

[80] *Id*. at 128.

[81] *Id*.

[82] *Id*.

[83] Çiçek & Sahtiyanci, *supra* note 62, at 4–5.

[84] TURKEY'S WATER POLICY: NATIONAL FRAMEWORKS AND INTERNATIONAL COOPERATION, *supra* note 8, at xxix.

[85] *Id*. at 127.

[86] Suzan Fraser, *Turkey, Iraq and Syria Tussle over Water Rights in Light of Drought*, THE HUFFINGTON POST (Sept. 3, 2009), http://www.huffingtonpost.com/2009/09/03/turkey-iraq-and-syria-tus_n_276406.html.

[87] Joshua Hammer, *Is a Lack of Water to Blame for the Conflict in Syria?*, SMITHSONIAN MAGAZINE (June 2013), http://www.smithsonianmag.com/science-nature/Is-a-Lack-of-Water-to-Blame-for-the-Conflict-in-Syria-208345431.html. The article notes that "the world's earliest documented water war happened 4,500 years ago, when the armies of Lagash and Umma, city-states near the junction of the Tigris and Euphrates rivers, battled with spears

and chariots after Umma's king drained an irrigation canal leading from the Tigris," a war that ended when the two states adopted "the world's first international water treaty, a cuneiform tablet now hanging in the Louvre." *Id*.

Venezuela

Dante Figueroa
Senior Legal Information Analyst

SUMMARY The Venezuelan constitutional and legal regime has changed enormously since 1999 when the new Political Constitution was passed. Under the prior juridical framework, waters were classified by law according to a number of criteria (location, composition, use, etc.), and were also generally subject to private use and appropriation. After 1999, the existing classifications of waters into different categories (surface, ground, etc.) were eliminated. The new constitutional regime also eliminated private ownership of waters. The 1999 Constitution did not contemplate expropriation or compensation provisions for the changed legal regime concerning waters. Water destined for agricultural purposes is subject to the same rules that govern all waters. Consequently, under the current constitutional and legal regime, the use of water in agriculture requires a government-issued concession or permit, and is subject to the control and monitoring powers of a myriad of national, state, and local governmental entities.

I. Background

During Spanish colonial times, the waters of Venezuela belonged to the Crown, but their common use was permitted for Spaniards and Indians.[1] The first Civil Code of Venezuela of 1862 established the public character of lakes and rivers, but allowed for the private use of waters.[2] The Civil Code of 1867 went a step further by permitting private ownership of waters by the owners of the soil where the water is located, including surface and ground waters.[3] The Civil Code of 1916 ratified the then existing private property regime over waters, as did the Law of Mountains and Waters of 1921, which also extended it to fountainheads, wells, and ponds.[4] With several nonsubstantive amendments over the years, this private-oriented legal system subsisted until the Constitution of 1999, which abrogated the private regime for waters and substituted a statist system.

II. Current Legal Framework

A. Constitutional Regime for Waters in Venezuela

When the Venezuelan Constitution of 1999 replaced the traditional property regime over waters that had governed that country since colonial times, it provided that

> all waters are public property of the Nation, [and are] irreplaceable for life and development. The law shall establish the necessary provisions to guarantee their

[1] ALLAN BREWER-CARÍAS, LEY DE AGUAS 23 (2007).

[2] *Id*.

[3] *Id*. at 24.

[4] *Id*. at 25.

> protection, use, and recovery, respecting the phases of the hydrological cycle, and the criteria for the organization of the territory.[5]

The Water Law of 2007,[6] which implements the aforementioned constitutional provision, establishes that waters are public goods and may not be appropriated by any individual or entity.[7] Also, according to the Water Law, access to water is a fundamental human right,[8] and it is a fundamental duty of the state, aided by the community, to guarantee the conservation of water sources, both surface and ground water.[9] In addition, also in accordance with the Water Law, the integral management of water by governmental entities must encompass activities of a technical, scientific, economic, financial, institutional, managerial, legal, and operative nature aimed at the conservation and use of water for the benefit of the community.[10]

The general declaration of waters as public property made by the Constitution and the Water Law substantially changed the previous juridical regime, which had classified waters as public waters and as waters subject to private appropriation.[11] Under the new regime, waters are no longer subject to private appropriation in Venezuela. Another important change is the holistic approach to regulating water use at the basin level; in effect, the legislation recognizes and promotes the regulation of the aquifer pursuant to the principle of the "unity of the hydrological cycle."[12] The elimination of the classification of waters into categories (surface, ground, salt, navigable, etc.), is yet another feature of the new legal framework governing waters in Venezuela, and it is a direct consequence of the "unity of the hydrological cycle" principle.[13]

B. Laws Governing the Use of Water in Agriculture

Multiple legislative instruments directly or indirectly cover the use of water in agriculture in Venezuela. Among them, the Organic Law for Land Planning and Territory Management of 2006[14] indicates that land-planning activities involve, among other matters, a determination of spaces subject to risks associated with natural and hydrological phenomena, and with the

---

[5] CONSTITUCIÓN DE LA REPÚBLICA BOLIVARIANA DE VENEZUELA [CONST.] [CONSTITUTION OF THE BOLIVARIAN REPUBLIC OF VENEZUELA] art. 304, http://pdba.georgetown.edu/constitutions/venezuela/ven1999.html (translated by the author).

[6] Ley de Aguas [Water Law], GACETA OFICIAL [G.O.] No. 38.595, Jan. 2, 2007, http://www.tsj.gov.ve/gaceta/enero/020107/020107-38595-01.html.

[7] *Id.* art. 5(10).

[8] *Id.* art. 5(1).

[9] *Id.* art. 5(8).

[10] *Id.* arts. 3, 5(11).

[11] BREWER-CARÍAS, *supra* note 1, at 14–15.

[12] *Id.* at 16.

[13] *Id.* at 17.

[14] Ley Orgánica para la Planificación y Gestión de la Ordenación del Territorio [Organic Law for Land Planning and Territory Management], G.O. No. 38.513, Sept. 1, 2006, http://www.tsj.gov.ve/gaceta/septiembre/010906/010906-38513-01.html.

contamination of air, water and soil.[15] Furthermore, the National Land Ordering Plan sets forth the guidelines for the localization of grand works of infrastructure, related to, among other activities, the use of waters.[16] Sectoral plans, and in particular rural and agricultural development plans, must take into consideration the integral management of waters.[17] National water reserves are considered as "special use and natural protected areas,"[18] and are defined as territories where natural or artificial bodies of water justify their regulation under a special administrative regime because of their nature, situation, or importance.[19] Consequently, the Venezuelan legislative framework governing land-planning activities that affect agricultural lands must, necessarily, take into consideration the integral management of waters in the concerned territories.

The Organic Law of the Environment,[20] in turn, reinforces the aforementioned approach, establishing that the integral management of waters by the authorities must be oriented toward securing their conservation, and guaranteeing the conditions of their quality, availability, and quantity in relation to the sustainability of the hydrological cycle.[21] Specifically, the following aspects must be considered for the adoption of water conservation measures, which include those applied for agricultural purposes:

> (a) the classification of waters according to the characteristics required to determine their different uses; (b) the activities likely to degrade natural water sources, their courses, and their embankments; (c) the reuse of previously treated residual water; (d) water treatment; (e) integral protection of hydrographic basins; (f) continuous and long-term monitoring of water bodies; (g) continuous and long-term monitoring of land uses and their impacts on the main hydrographic basins that provide water to human populations and irrigation systems for agricultural areas.[22]

The Organic Law of the Environment also states that the National Environmental Authority must establish and maintain an Environmental Information Registry. This Registry must contain biophysical, economic, and social data, as well as legal information related to the environment. Data in the Registry must be freely accessible for consultation free of charge and must be disseminated periodically when the data contained therein is of public interest.[23] The Registry must also contain an inventory of water resources.[24] Finally, the Organic Law of the Environment defines the activities likely to degrade the environment as those that directly or

[15] *Id.* art. 7(9).

[16] *Id.* art. 17(6).

[17] *Id.* art. 32.

[18] *Id.* art. 43(2)(a).

[19] *Id.* art. 38(1).

[20] Ley Orgánica del Ambiente [Organic Law of the Environment], G.O. No. 38.590, Dec. 22, 2006, http://www.tsj.gov.ve/gaceta/diciembre/221206/221206-38590-01.html.

[21] *Id.* art. 55.

[22] *Id.* art. 57 (translated by the author).

[23] *Id.* art. 66.

[24] *Id.* art. 67(2).

indirectly pollute or deteriorate the atmosphere, water, marine soil, soil and subsoil, or those that unfavorably affect biological, vegetable, or animal communities.[25] Consequently, the Organic Law of the Environment forces the adoption of a series of measures concerning waters that directly affect their use for agricultural purposes.

The Law of Forests and Forestry Management defines "protected areas" as those lands, whether public or private, established by the law or by an executive order, that are necessary to protect and preserve the forestry patrimony, hydrographic basins, and other natural spaces and resources, and which, owing to their geographical, natural, environmental, and socioeconomic characteristics, are particularly vulnerable to human activity.[26] The declaration of a private land—including agricultural lands and the waters existing in them—as a protected area by law or executive order is not subject to the payment of an indemnification by the government.[27]

Among the relevant regulations concerning the use of water in agriculture are the following:

The Norms for the Classification and Quality Control of Water Bodies and Discharge of Liquids of 1995[28] charges the Ministry of the Environment and Natural Resources with the design of material plans for the control and management of specific water quality standards per hydrographical basin throughout the national territory.[29] Agricultural activities are included in the list of regulated activities,[30] which concern the composition of the discharge, authorized volumes, locations of the water courses, and nature of the materials poured into waters, among other aspects.[31]

The Norms on the Regulation and Control of the Use of Hydro Resources and Hydrographic Basins of 1996,[32] in turn, reiterate that the Ministry of the Environment and Natural Resources is in charge of the administration and management of water resources and hydrographic basins throughout the country. In addition, the Norms require that landowners petition the Ministry for

[25] *Id.* art. 80(1).

[26] Decree 6.070 of May 14, 2008, Ley de Bosques y Gestión Forestal [Law of Forests and Forestry Management] art. 39, G.O. No. 38.946, June 5, 2008, http://www.tsj.gov.ve/gaceta/junio/050608/050608-38946-2.html.

[27] *Id*.

[28] Decreto 883, Normas para la Clasificación y el Control de la Calidad de los Cuerpos de Agua y Vertidos o Efluentes Líquidos [Norms for the Classification and Quality Control of Water Bodies and Discharge of Liquids], G.O. No. 5.021, Extraordinaria, Dec. 18, 1995, http://www.bvsde.ops-oms.org/bvsacg/e/cd-cagua /ref/text/43.pdf.

[29] *Id*. art. 6.

[30] *Id*. art. 7.

[31] *Id*. arts. 8–18.

[32] Decreto 1.400, Normas sobre la Regulación y el Control del Aprovechamiento de los Recursos Hídricos y de las Cuencas Hidrográficas [Norms on the Regulation and Control of the Use of Hydro Resources and Hydrographic Basins], G.O. No. 36.013, Aug. 2, 1996, http://www.vitalis.net/Normas%20sobre%20la%20regulación%20y%20el%20control%20del%20aprovechamiento%20de%20los%20recursos%20hídricos.pdf.

a concession or permit to use waters for any purposes (including agriculture).[33] Concessions or permits may never be issued against the public interest.[34]

[33] *Id*. art. 24.

[34] *Id*. art. 40, para. 2.

Finally, the Norms on Environmental Evaluation of Activities Likely to Degrade the Environment of 1996[35] require the submission of an Environmental Impact Study for the implementation of several industrial and commercial activities, including sugar processing and production at cellulose, pulp, and paper plants.[36]

C. Legal Status of Waters

The general declaration of waters as public property made by the Constitution of 1999 had enormous legal consequences in the Venezuelan juridical order. Significantly, all previous legislation establishing vested rights over waters was repealed on January 1, 2000, upon the entry into effect of the new Constitution of 1999. Therefore, private property over waters, whatever their nature or characteristics, became outlawed under the new constitutional regime. However, the natural beneficiaries of waters that originate or pass onto a property are still allowed to use the waters for communal purposes without obtaining a concession or permit.[37] Otherwise, the use of water, both surface and ground water, for private purposes now requires a government concession or permit.[38]

D. Assignment of Water Rights

The government grants water concessions and assignments for different purposes, including hydroelectric generation and industrial, commercial, and agricultural activities.[39] Concessions and assignments to private parties—which may not exceed twenty years in duration[40]—are contracts between the government and the concessionaire.[41] Governmental entities are entitled to request the National Water Authority (Autoridad Nacional de las Aguas, ANA) to grant concessions over the volumes of water necessary to comply with their institutional purposes.[42] The ANA may also grant licenses for the use of surface and ground waters in order to supply human populations, and for not-for-profit agricultural and recreational purposes.[43]

---

[35] Decreto 1.257, Normas sobre Evaluación Ambiental de Actividades Susceptibles de Degradar el Ambiente [Norms on Environmental Evaluation of Activities Susceptible of Degrading the Environment], G.O. No. 35.946, Apr. 26, 1996, http://www.vitalis.net/Normas%20sobre%20evaluación%20ambiental%20de%20actividades%20susceptibles%20de%20degradrar%20el%20ambiente.pdf.

[36] *Id.* art. 6(4).

[37] Water Law art. 73 (mentioning water "for bathing and other domestic uses, as well as to feed livestock and for navigation").

[38] BREWER-CARÍAS, *supra* note 1, at 43.

[39] Water Law art. 75.

[40] *Id.* art. 77 (providing that the concession term must be at least equivalent to the time necessary to recover investments in the respective works).

[41] *Id.* art. 76.

[42] *Id.* art. 78.

[43] *Id.* art. 80.

Concessionaires and permit holders are entitled to obtain the necessary easements to occupy the lands necessary for executing the works related to the use of their water.[44] Easements over lands under public domain are granted without the need of a payment, without prejudice to the rights of third parties.[45] Easements affecting indigenous lands are subject to a special law.[46]

E. Rights of Riparian Owners

Under the legal regime established in the Civil Code of 1916—now repealed by the Water Law of 2007—waters belonging to the public domain could be privately used for agricultural purposes. In fact, a landowner had the right to extract from rivers the water necessary for his agricultural and industrial activities.[47] This regime was traditionally associated with riparian ownership,[48] in conjunction with other legal authorities. For example, the Civil Code regulated the right of landowners to transport their waters through the property of other landowners,[49] and the Mining Law allowed mining owners to use waters of public domain reasonably and included the right to obtain easements for that purpose.[50] Prior to the Water Law of 2007 and under the now repealed Forestry Law of Soils and Waters, landowners enjoyed the right to use the waters of rivers born in their lands, so long as this did not affect the rights of third parties or endanger public health.[51]

The current legal framework that is based on the Water Law of 2007 can be summarized as granting only to mining owners the right to use waters *pursuant* to their mining concessions. All others, including riparian users, require a government concession to divert waters from a natural riverbed.[52]

F. Requirements for Licenses to Use Water for Agricultural Purposes

The use of water in agriculture is subject to administrative control mechanisms established in the law, and depends on the characteristics of the aquifer.[53] In effect, surface and ground water may be categorized according to (a) uses not subject to special formalities, such as for domestic,

---

[44] *Id.* art. 66.

[45] *Id.* art. 67.

[46] Ley Orgánica de Pueblos y Comunidades Indígenas [Organic Law on Indigenous Peoples and Communities], G.O. No. 38.344, Dec. 27, 2005, http://www.defensoria.gob.ve/dp/index.php/leyes-pueblos-indigenas/1329).

[47] CÓDIGO CIVIL [CÓD. CIVIL] [CIVIL CODE] of 1916, art. 653, G.O. No. 2.990, Jul. 26, 1982, http://www.cicpc.gob.ve/files/u1/Codigo_Civil_de_Venezuela.pdf.

[48] BREWER-CARÍAS, *supra* note 1, at 28.

[49] CÓD. CIVIL art. 666.

[50] Ley de Minas [Mining Law] of 1999, art. 14, G.O. No. 5.382, Sept. 28, 1999, Extraordinaria, *available at* http://www.conapri.org/articledetails.asp?articleid=341644.

[51] Ley Forestal de Suelos y Aguas [Forestry Law of Soils and Waters] art. 90, G.O. No. 1.004, Extraordinaria, Jan. 26, 1966, *available at* http://www.agropatria.com.ve/wp-content/uploads/2011/01/ley_forestaldesuelos.pdf.

[52] BREWER-CARÍAS, *supra* note 1, at 29.

[53] Water Law art. 61.

livestock, and navigation purposes; and (b) uses subject to concessions, assignments, and licenses for supplying human populations and for agricultural, industrial, hydroenergy, and commercial purposes.[54]

G. Water Quality and Water Conservation Requirements Associated with the Use of Water in Agriculture

The National Fund for the Integral Management of Waters is a non-concentrated and autonomous governmental entity[55] in charge of the administrative and financial management of waters throughout the country.[56] The Water Law establishes the criteria that must be used to secure the protection, use, and recovery of waters, including water extractions in volumes that adjust to availability and demand at the respective source, the efficient use of water, the reuse of residual waters, the conservation of hydrographic basins, and the holistic management of surface and ground water sources.[57] As a result, the quality and conservation requirements related to the use of water for agricultural purposes is subject to administrative regulations issued according to the aforementioned criteria, by multiple government agencies, as described below.

III. Institutional Framework for the Administration of Water in Agriculture

Multiple government agencies administer waters in Venezuela for different purposes, including agricultural activities. The following are the most important of these agencies:

A. National Water Authority

The ANA[58] enjoys broad powers concerning the definition of policies and strategies aimed at obtaining the integral management of waters around the country.[59] For example, it maintains the National Registry of Users of Water Sources, which is an automated system with national coverage of data related to the different uses of ground continental waters, as well as underground, marine, and insular waters.[60] The ANA also prepares and implements water infrastructure projects, elaborates the technical norms for the conservation and sustainable use of waters, administers the National Integral Management Fund, and grants concessions and licenses for water use.[61]

[54] *Id*.

[55] *Id*. art. 96.

[56] *Id*. art. 97.

[57] *Id*. art. 11.

[58] *Id*. art. 21(1).

[59] *Id*. art. 24(1).

[60] *Id*. art. 84.

[61] *Id*. arts. 24(2), (3), (5), (10) & (12).

B. National Council Authority

The National Council Authority (Consejo Nacional de las Aguas, CNA)[62] provides advice to and assists the ANA in achieving compliance with the ANA's legal duties.[63]

C. Regional Hydrographic Councils

There are sixteen Regional Hydrographic Councils (Consejos de Región Hidrográfica, CRHs)[64] in the country, which serve as advisory and decision-making bodies to obtain better water management.[65] Particularly, they coordinate joint activities related to water conservation and sustainable use between national, state, and municipal entities, on the one side, and local communities on the other.[66]

D. Hydrographic Basin Councils

The Hydrographic Basin Councils (Consejos de Cuenca Hidrográfica, CCHs)[67] formulate, implement, and supervise the Integral Water Management Plan in their respective hydrographic basins.[68]

E. Other Governmental Agencies

Other governmental agencies with responsibilities in the management of waters include:

- Institutional Users (Usuarios o las Usuarias Institucionales)[69]
- Communal Councils, Technical Boards, and Irrigation Committees (Consejos comunales, las Mesas Técnicas y Comités de Riego)[70]
- National Institute of Indigenous Peoples (Instituto Nacional de Pueblos Indígenas)[71]
- Ministry of Defense *(*Ministerio de Defensa)[72]

---

[62] *Id.* art. 21(2).

[63] *Id.* art. 26.

[64] *Id.* art. 21(3).

[65] *Id.* art. 27.

[66] *Id.*

[67] *Id.* art. 21(4).

[68] *Id.* art. 34.

[69] *Id.* art. 21(5).

[70] *Id.* art. 21(6).

[71] *Id.* art. 21(7).

[72] *Id.* art. 21(8).

- State Councils for Planning and the Coordination of Public Policies (*Consejos Estadales de Planificación y Coordinación de Políticas Públicas*)[73]
- Local Councils for Public Planning (*Consejos Locales de Planificación Pública*)[74]

IV. Intercountry Disputes Concerning the Use of Water

No information on current water-use disputes between Venezuela and its neighboring countries was found.

V. Conclusion

Under the new statist constitutional and legal regime established in Venezuela in 1999, the property and use of all waters is reserved to the state. Both the property and use of waters for whatever purposes, including agriculture, may be granted to private citizens only pursuant to government-granted concessions or permits. The only exception is water used for limited domestic, livestock, and navigation purposes. In addition, numerous government entities at the national, state, and municipal level are in charge of controlling and monitoring all activities related to water, including its distribution among users, discharge to watercourses, and conservation.

[73] *Id.* art. 21(9).

[74] *Id.* art. 21(10).