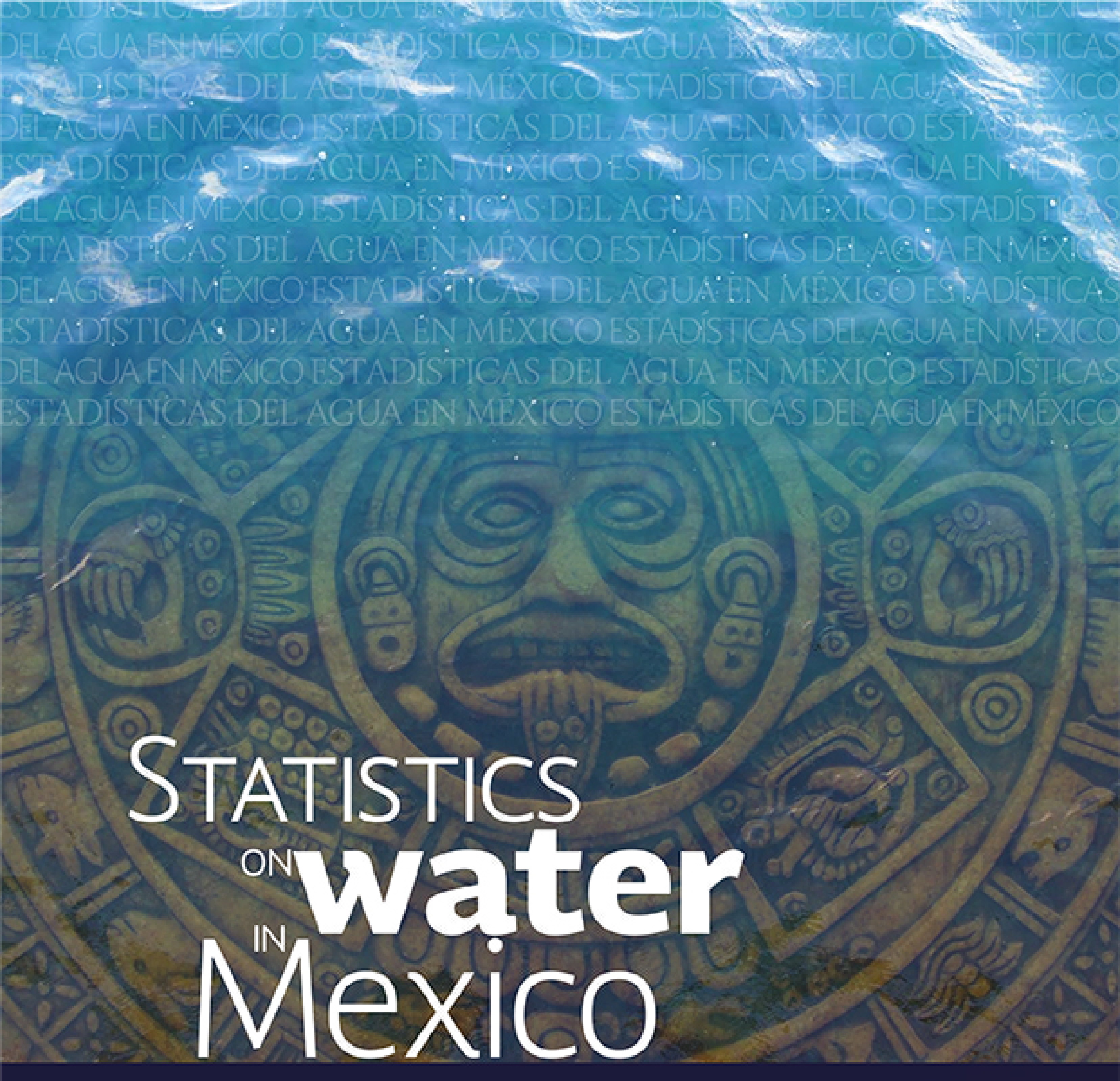

Statistics on water in Mexico

2014 EDITION

MÉXICO
GOBIERNO DE LA REPÚBLICA

SEMARNAT
SECRETARÍA DE MEDIO AMBIENTE Y RECURSOS NATURALES

CONAGUA
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Statistics on Water in Mexico

2014 Edition

National Water Commission

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STATISTICS ON WATER IN MEXICO, 2014 EDITION

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Statistics on Water in Mexico

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National Water Commission

The document ***Statistics on Water in Mexico 2014 edition*** is a product of the National Water Information System (Sina) and is an effort from the National Water Commission of Mexico (Conagua) to present an integral panorama of the water sector in our country.

With the aim of clearly presenting the data included in this publication, the tables and graphs generally speaking show the last ten years of information. For the reader that is interested in looking into the details, the original data for the tables and graphs conserve the whole period of annual statistics available. Throughout the text you may identify them by their first letter, the number of the chapter and a consecutive number: T7.1, G4.9. You may also find diagrams and maps which may be identified in the same way: D2.3, M4.2.

In the electronic version (available for download and to be viewed on the web page http://www.conagua.gob.mx/ConsultaPublicaciones.aspx), it is possible to have access to this original data and find the records on the theme of each chapter, in the Sina with the indication [Reporter: <Name of the theme in Spanish>], as well as the complementary tables, graphs and maps, with the indication [Additional: <key>].

The basis for the federal administration of water issues are the thirteen hydrological-administrative regions (HARs), hence their territorial division is presented in most of the maps in this document. Their characteristics are listed in map M1.3 (page 21).

The calculation of renewable water resources (RWR) is proposed as an important indicator for the sector. On this subject, in 2011 a complete cycle of updating hydrological data came was completed; even though every year the studies on part of Mexico's catchments and aquifers are updated, the 2011 calculation will continued to be used until another complete cycle of studies has been completed.

With the intention of guiding the reader, there are noted identified with numbers ([1]) in the footnotes, as well as notes under the tables or graphs. The sources are identified by references within the text: Inegi (2014i), and a complete bibliography can be found in annex D.

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CHAPTER 1

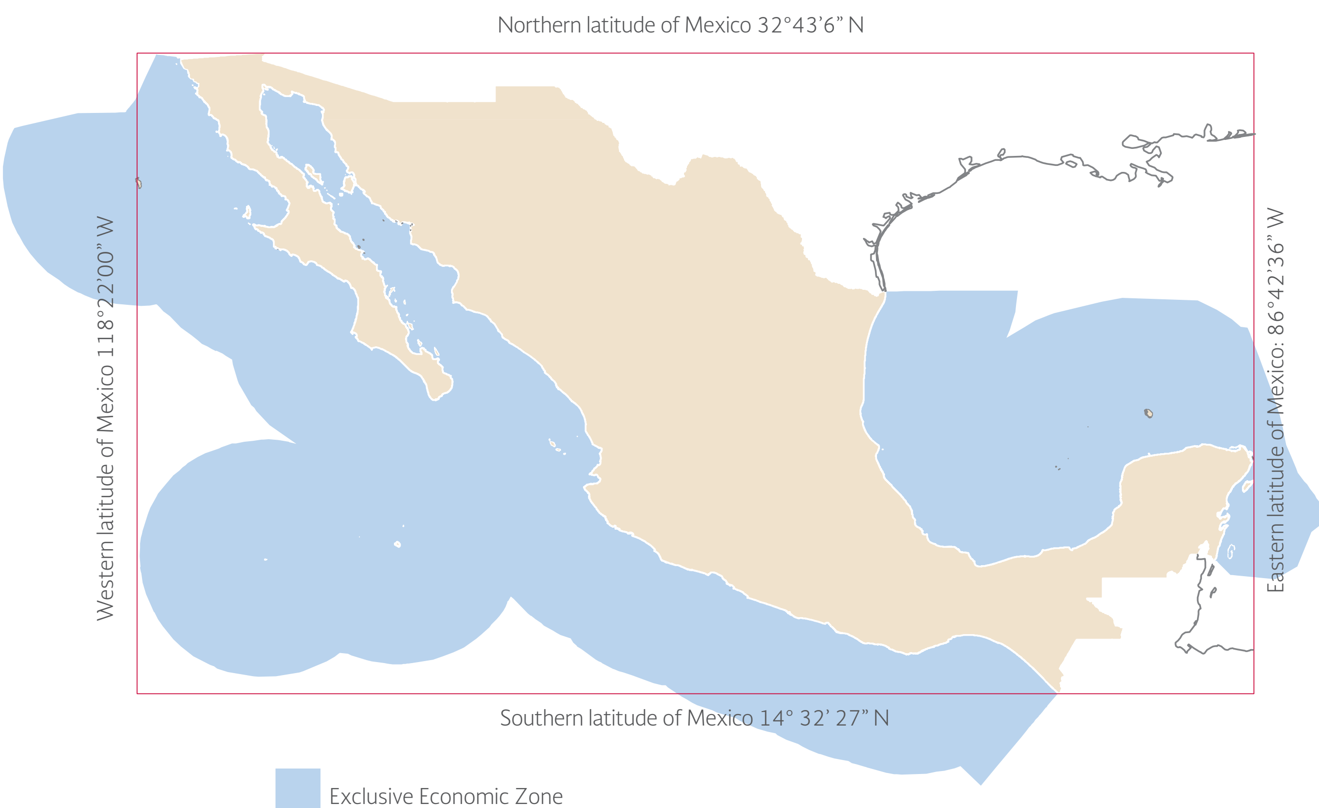
GEOGRAPHICAL AND SOCIO-ECONOMIC CONTEXT

1.1 GEOGRAPHICAL AND DEMOGRAPHIC ASPECTS

[Reporter: Ubicación geográfica de México, Población]

The United Mexican States extend over a surface area of 1.964 million km^2, of which 1.959 million corresponds to the mainland area and the remainder to its island areas. The Exclusive Economic Zone should also be considered, defined as a strip, 370 km wide[1] on average measured from the coastal baseline[2], the extension of which is estimated at approximately three million km^2, as shown in diagram D1.1 and table T1.1.

D1.1 Extreme Coordinates and Exclusive Economic Zone



Source: Produced based on Conabio (2014).

1 Defined internationally as 200 nautical miles, in the United Nations Convention on the Law of the Sea. One nautical mile is the equivalent of 1.852 kilometers

2 Defined as the low tide line along the coast.

T1.1 Location and territorial extension of Mexico

Territorial extension	
Territorial area	1 964 375 km²
Mainland	1 959 248 km²
Island-based	5 127 km²
Coastline	
Total length	11 122 km
Pacific Ocean	7 828 km
Gulf of Mexico and Caribbean Sea	3 294 km

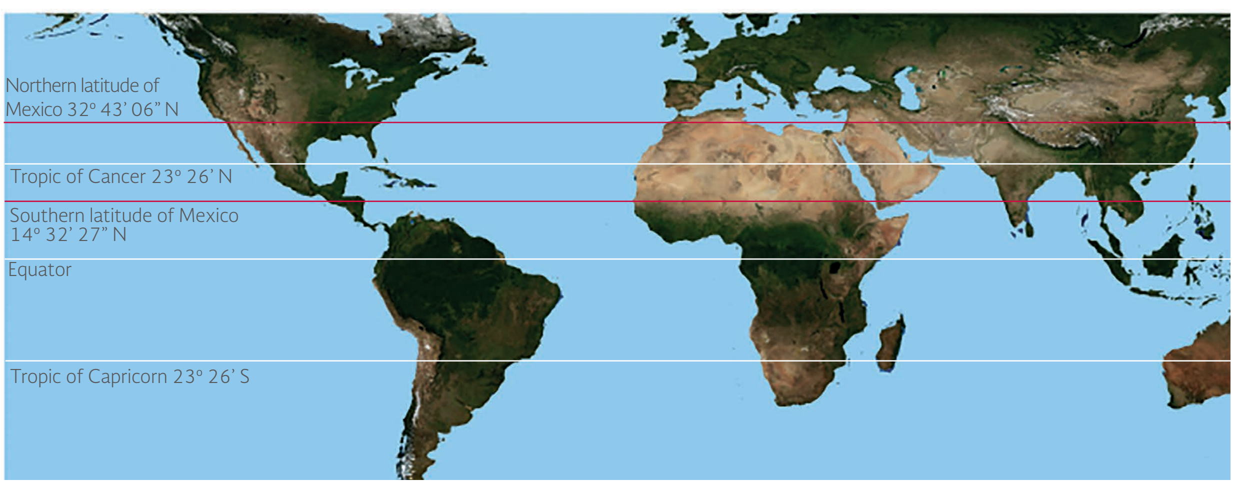
International borders of the mainland territory	
with the United States of America	3 152 km
with Guatemala	956 km
with Belize	193 km
Extreme geographical coordinates	
To the north: 32° 43´ 06” latitude north. Monument 206, on the border with the United States of America	
To the south: 14° 32´27” latitude north. At the mouth of the Suchiate river, at the border with Guatemala	
To the east: 86° 42´36” longitude west. Mujeres Island.	
To the west: 118° 22´00” longitude west. Guadalupe Island	

Source: INEGI (2014g).

There are different factors which determine Mexico's climate. As a result of its geographical location, the southern part of Mexico is in the inter-tropical area of the globe, whereas the northern part is located in the temperate area. Mexico is situated at the same latitude as the Saharan and Arabian deserts, as can be appreciated in map M1.1.

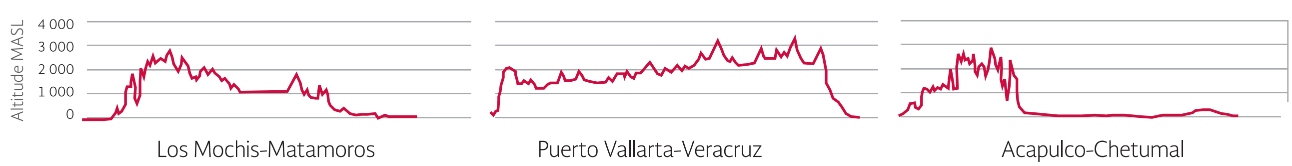
The second factor is the geographical accidents which characterize Mexico's relief (see graph G1.1 on the following page). The geographical location and the relief have a direct impact on the availability of water resources.

M1.1 Geographical location of Mexico in the world



Source: NASA (2014).

G1.1 Elevation profiles



Source: Jarvis et al. (2008).

Two thirds of the territory is considered arid or semi-arid, with annual precipitation of less than 500 mm, whereas the southeast is humid with average precipitations of over 2 000 mm per year. In the majority of the territory, the rainfall is more intense in the summer, when it is mainly torrential.

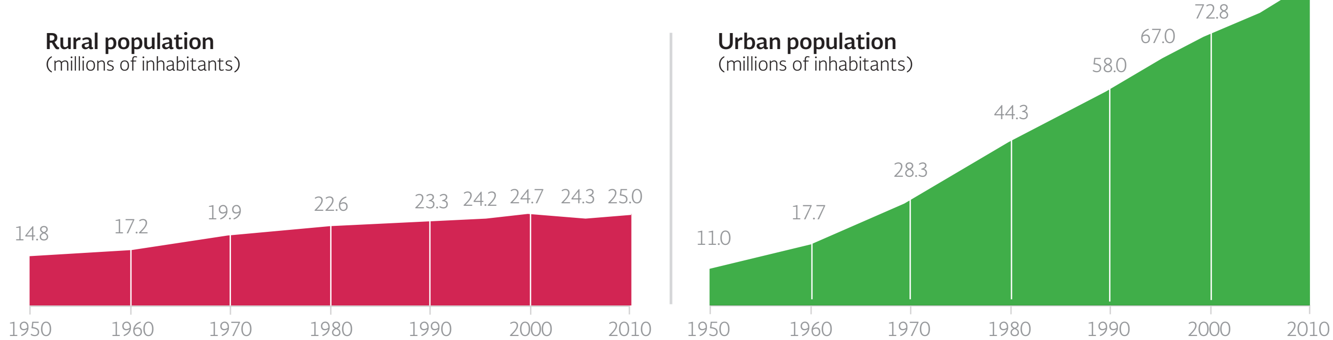
Mexico is made up of 31 states and one Federal District (*Distrito Federal* or *D.F.* in Spanish), which can be further broken down into 2 441 municipalities and 16 delegations respectively, giving a total of 2 457 municipalities and delegations.[3]

Since the mid-20th century, the population has shown a marked trend towards abandoning small rural localities and congregating in urban areas. From 1950 to 2010, the country's population quadrupled, and went from being predominantly rural to mainly urban, as can be observed in graph G1.2[4].

3 According to Inegi (2014i), as of 2013 there were 2 457 municipalities and delegations with geographical representation. Four municipalities created in Chiapas (November 2011) are not included, since they are in a state of controversy.

4 The 2010 *Censo General de Población y Vivienda* (General Census of Population and Housing), at the time it was carried out, identified 112.3 million inhabitants. For the calculation of the 2010-2050 population projections, the National Population Council (Conapo 2014) carried out a demographic conciliation over the 1990-2010 period, which allowed it to establish that the population halfway through 2010 was 114.3 million inhabitants. The Conapo population projections consider 137.48 million inhabitants by 2030.

G1.2 Evolution in the urban and rural population



Note: Data from the Censuses. Rural localities are defined as those with less than 2,500 inhabitants. Urban localities have a population of more than 2,500 inhabitants.

Source: INEGI (2014d).

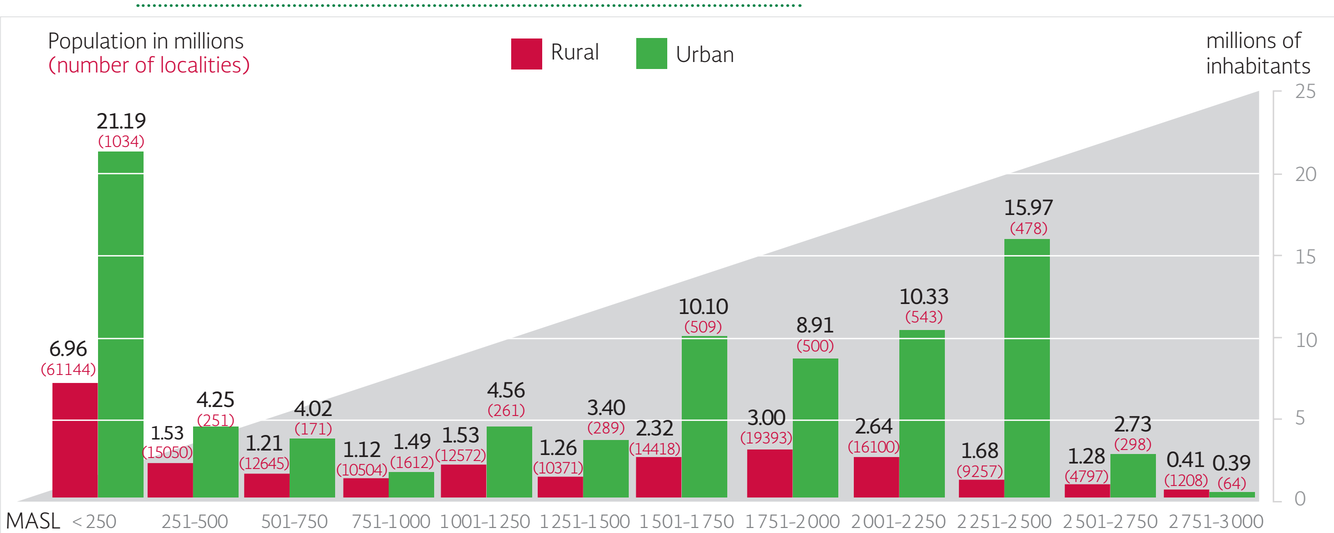
According to the results of the 2010 *Censo General de Población y Vivienda* (General Census on Population and Housing), in Mexico there are 192 244 inhabited localities, spread out according to their size and altitude (table T1.2). As of the same year, 53.2% of the population of Mexico lived in areas over 1 500 meters above sea level, as can be observed in graph G1.3

T1.2 Distribution of the population by range of altitude, 2010 Census

Range	Number of localities	Population (millions of inhabitants)	Percentage of the population
More than 500 000	36	31.2	27.8%
From 50 000 to 499 999	180	28.4	25.3%
From 2 500 to 49 999	3 435	26.7	23.8%
From 100 to 2 499	49 437	23.7	21.1%
Less than 100	139 156	2.4	2.1%
Total	192 244	112.3	100.0%

Source: INEGI (2014e).

G1.3 Distribution of the population by range of altitude, 2010



Note: Data at the time of each Census. In 2010, there were 227 localities (225 rural and 2 urban ones) with a total of 57 821 inhabitants living over 3 000 meters above sea level. Rural localities are defined as those with less than 2 500 inhabitants and that are not municipal seats.

Source: INEGI (2014e).

1.2 POPULATION CENTERS

[Reporter: Población]

Based on data from the 2010 General Census on Population and Housing, 59 Metropolitan Areas (MAs) were defined[5], in which the National Population Council (Conapo) estimated the population in 2013 at 67.4 million inhabitants, thus constituting 56.9% of the total population projected for 2013 by that institution. Up to the same date, additionally there were 36 localities of more than 100 000 inhabitants in localities that are not part of MAs, adding up to 8.3 million people and 7% of the national population.

Of these MAs, 32 have more than 500 000 inhabitants, making a total of 60.1 million people and 50.7% of the national population at that point. Three localities that are not part of an MA (Hermosillo, Victoria de Durango and Culiacan Rosales) had more than 500 000 inhabitants in 2013.

M1.2 Main population centers

Note: Includes both MAs and localities that are not, with a population of more than 500 000 inhabitants

Sources: Conapo (2014), Inegi (2014e), Sedesol et al. (2012).

5 An MA is defined as the sum of two or more municipalities including a city of 50 000 or more inhabitants, and the urban area, functions and activities of which go beyond the limits of the municipality that originally contained it, incorporating as part of the municipality or of its area of direct influence mainly urban neighboring municipalities, with which they maintain a high degree of socio-economic integration. This definition also includes those municipalities which, due to their particular characteristics, are relevant for urban planning and politics of the metropolitan areas in question (Sedesol et al. 2012).

The concentration and the accelerated growth of the population in urban localities have led to stronger pressure on the environment and on institutions, due to the increasing demand for services.

The Conapo estimated that in 2013, in the twelve MAs with a population of more than one million inhabitants, 37.7% of the total population of Mexico was concentrated, or 44.6 million inhabitants.

1.3 ECONOMIC INDICATORS

[Reporter: Indicadores económicos]

According to information from the Bank of Mexico (Banxico, 2014c), the slowing down of the global economy continued in the first half of 2013. As a result, this period presented some complications for Mexico, since there was diminished economic dynamism. For the second half of 2013, there were signs of an international recovery, with better prospects at the end of the year, although not without risks of volatility. Nationally, this represented a slight expansion in the external demand, which combined with an incipient improvement in the domestic demand, resulted in a slight upturn in the economy. An annual growth of 1.1% in the Gross Domestic Product (GDP) was registered (Inegi 2014j). The annual inflation was 3.97% (Inegi 2014k). The five-year trend can be observed in the following table.

T1.3 Main economic indicators in Mexico, from 1990 to 2013

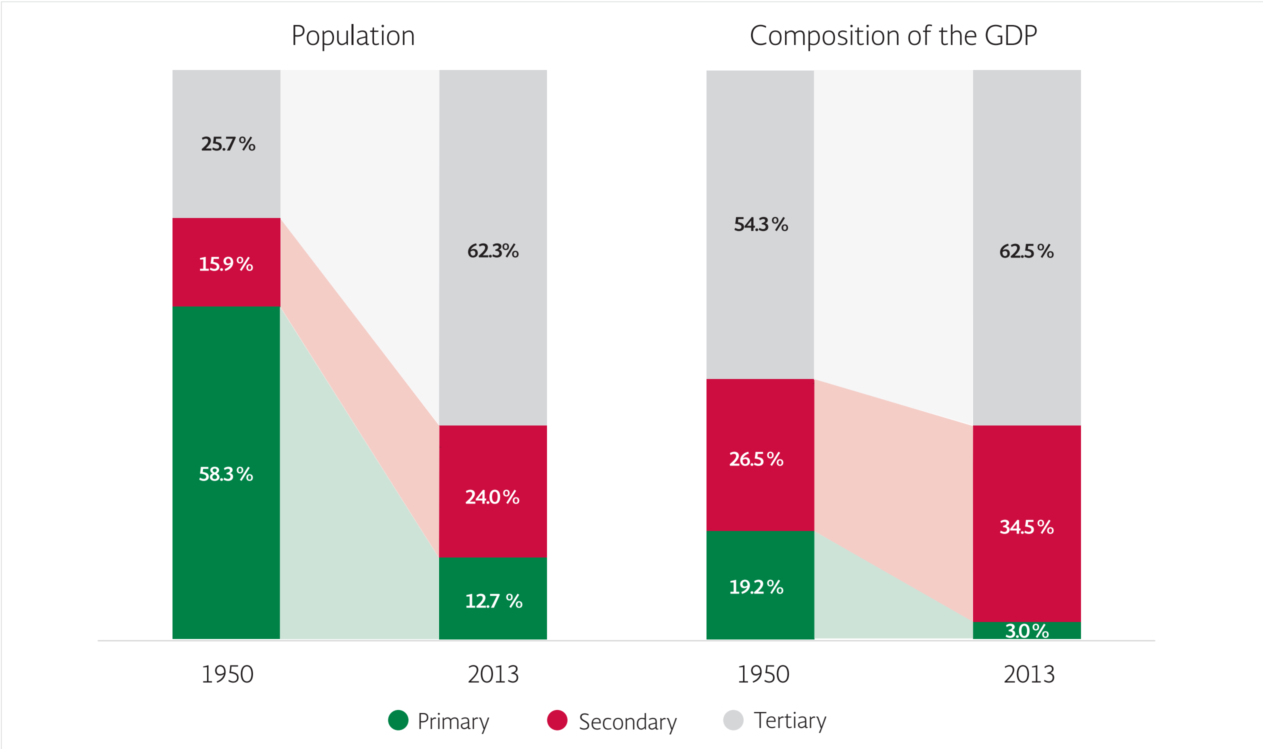
Year	Indicators		
	GDP (billions of pesos, constant 2008 prices)	Per capita GDP (pesos, constant 2008 prices)	% annual inflation based on the National Consumer Price Index (INPC)
1995	8 026.90	84 949.40	51.97
2000	10 288.98	101 976.30	8.96
2005	11 160.49	104 156.67	3.33
2010	12 277.66	107 457.87	4.40
2013	13 425.24	113 393.56	3.97

Sources: Conapo (2014), Inegi (2014b), Inegi (2014l).

Throughout the 20th century, the contribution of agriculture and livestock activities, silviculture and fishing to Mexico's GDP has progressively decreased, as opposed to industry and services which have grown, as can be observed in graph G1.4. This change is also evident in the population occupied by economic sector[6], since the Mexicans occupied in the tertiary sector went from 25.7% in 1950 to 62.3% in 2013.

6 The primary sector includes agriculture and livestock, silviculture and fishing activities. The secondary sector contemplates mining, the manufacturing industry, construction and electricity, gas and water. The tertiary sector includes trade, restaurants and hotels, transport, storage and communications, financial services, insurance, real estate and renting activities, community, social and personal services.

G1.4 Composition of economic activity by sectors 1950 and 2013



Note: For illustrative purposes only, the calculation of the percentage of the population occupied by sector of economic activity does not consider the "Others" category, which represents 0.6% of the population. Along the same lines, the representation of the charges allocated for banking services was simplified, representing indirectly measured financial intermediation services, with a negative sign.

Source: INEGI (2009b), INEGI (2014f), INEGI (2014l).

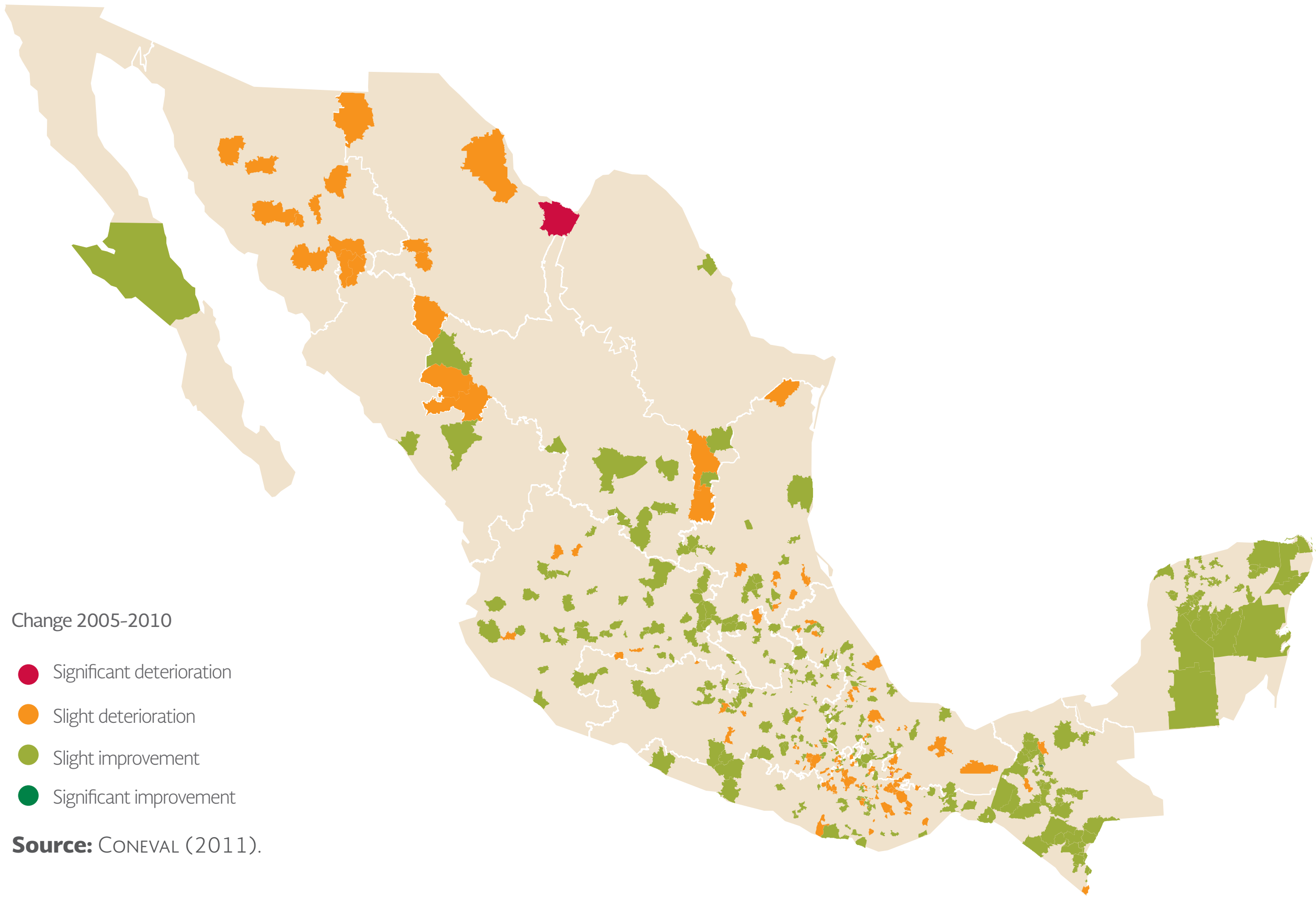
1.4 SOCIAL POVERTY

[Reporter: Rezago social, Marginación social, Desarrollo humano]

According to the social poverty rating, calculated by the National Council for the Evaluation of Social Development Policies (CONEVAL)[7], based on the 2010 General Census of Population and Housing, the poverty rating is determined, which can be very low, low, medium, high or very high. Diagram D1.2 [data at the time of the Census] presents the municipalities whose social poverty rating changed between 2005 and 2010.

7 In conformity with the General Law of Social Development, the definition, identification and measurement of poverty in Mexico is a faculty of the CONEVAL.

D1.2 Municipalities with a change in their social poverty rating 2005-2010



Source: CONEVAL (2011).

1.5 HYDROLOGICAL-ADMINISTRATIVE REGIONS (HARS) FOR WATER MANAGEMENT

[Reporter: División hidrológico-administrativa]

For the purpose of the management and preservation of Mexico's water resources, since 1997 the country has been divided into thirteen HARs, which are made up by grouping together catchments, considered the basic units for water resources management, and whose limits respect municipal divisions, so as to facilitate the integration of socio-economic information.

The National Water Commission of Mexico (CONAGUA), an administrative, standard-bearing, technical and consultative agency in charge of water management in the country, carries out its functions through thirteen river basin organizations, the scope of competence of which are the HARs (map M1.3).

The municipalities that make up each one of these HARs are indicated in the River Basin Organizations' Territorial Constituency Agreement, published in the Official Government Gazette (DOF) on April 1, 2010.

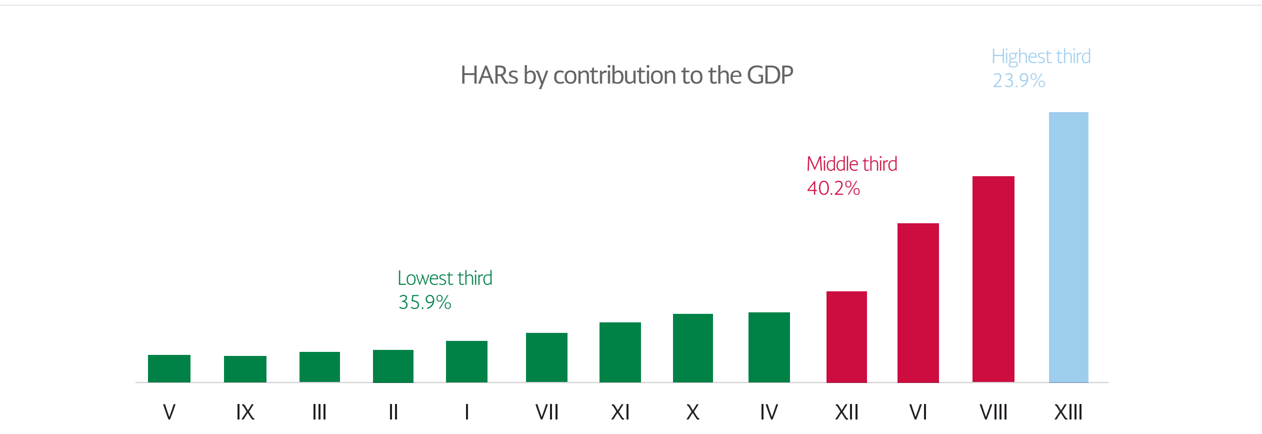
In addition, the CONAGUA has twenty local offices in the states in which no river basin organization has its headquarters.

1.6 REGIONAL CONTRAST BETWEEN DEVELOPMENT AND RENEWABLE WATER RESOURCES

[Reporter: División hidrológico-administrativa, Agua renovable]

The aggregate national values, such as population, renewable water resources (RWR) or GDP, conceal the great regional diversity in Mexico. Ranked in increasing order according to their contribution to the GDP, the HARs can thus be broadly placed into three groups, as shown below.

T1.4 Grouping of regions according to their contribution to Mexico's GDP



Key	HAR	Mainland surface (km²)	Renewable water resources 2011 (hm³/year)	Population as of mid-2013 (millions of inhabitants)	Contribution to the national GDP 2012 (%)	Grouping by contribution to the GDP
I	Baja California Peninsula	145 385	4 999.2	4.29	3.64	Lowest third
II	Northwest	205 218	8 324.9	2.76	2.86	Lowest third
III	Northern Pacific	152 013	25 939.1	4.42	2.72	Lowest third
IV	Balsas	119 248	22 898.7	11.56	6.14	Lowest third
V	Southern Pacific	77 525	32 350.6	4.99	2.39	Lowest third
VI	Rio Bravo	379 552	12 757.2	12.00	14.02	Middle third
VII	Central Basins of the North	202 562	8 064.7	4.47	4.36	Lowest third
VIII	Lerma-Santiago-Pacific	190 367	35 754.0	23.60	18.19	Middle third
IX	Northern Gulf	127 166	28 114.6	5.19	2.43	Lowest third
X	Central Gulf	104 790	95 124.5	10.40	6.07	Lowest third
XI	Southern Border	101 231	163 845.5	7.48	5.30	Lowest third
XII	Yucatan Peninsula	137 753	29 856.3	4.43	8.01	Middle third
XIII	Waters of the Valley of Mexico	16 438	3 468.4	22.82	23.86	Highest third
	Total	1 959 248	471 497.6	118.40	100.00	

Source: Conapo (2014), Inegi (2014a), Conagua (2014l).

There are some contrasts between the regional characteristics. For example: region XIII Waters of the Valley of Mexico, which makes a significant contribution to the GDP, represents by itself one fifth of the population of Mexico, whereas it presents a low quantity of renewable water resources. In contrast, the grouping of the HARs I, II, III, IV, V, VII, IX, X and XI, which make a low contribution to the GDP, have the lion's share of renewable water resources in Mexico.

G1.5 Regional contrasts

Sources: Conapo (2014), Inegi (2008), Inegi (2014a), Conagua (2014l).

1.7 SUMMARY OF DATA BY HAR AND STATE

[Reporter: División hidrológico-administrativa]

The main demographic, socio-economic and renewable water resources-related data on each HAR are indicated in map M1.3 [Additional: TI.B]. At the state level, the data on population and population density is shown in table T1.5, along with the mainland surface area and contribution to the GDP, among other information.

M1.3 Hydrological-administrative regions (HARs)

Sources: CONAPO (2014), INEGI (2008), INEGI (2014a), CONAGUA (2014l).

T1.5 Geographical, demographic and socio-economic data by state

No.	State	Population at mid-2013 (inhabitants)	Mainland surface area (km²)	Population density 2013 (inhabitants/ km²)	GDP 2012 (%)	Municipalities or delegations of DF (number)
1	Aguascalientes	1 252 265	5 618	222.9	1.08	11
2	Baja California	3 381 080	71 446	47.3	2.82	5
3	Baja California Sur	718 196	73 922	9.7	0.74	5
4	Campeche	880 299	57 924	15.2	5.04	11
5	Coahuila de Zaragoza	2 890 108	151 563	19.1	3.39	38
6	Colima	698 295	5 625	124.1	0.57	10
7	Chiapas	5 119 186	73 289	69.8	1.81	118
8	Chihuahua	3 635 966	247 455	14.7	2.75	67
9	Distrito Federal	8 893 742	1 486	5 987.0	16.40	16
10	Durango	1 728 429	123 451	14.0	1.23	39
11	Guanajuato	5 719 709	30 608	186.9	3.91	46
12	Guerrero	3 523 858	63 621	55.4	1.43	81
13	Hidalgo	2 806 334	20 846	134.6	1.67	84
14	Jalisco	7 742 303	78 599	98.5	6.25	125
15	Mexico	16 364 210	22 357	732.0	9.19	125
16	Michoacan de Ocampo	4 529 914	58 643	77.2	2.33	113
17	Morelos	1 874 188	4 893	383.1	1.17	33
18	Nayarit	1 178 403	27 815	42.4	0.64	20
19	Nuevo Leon	4 941 059	64 220	76.9	7.16	51
20	Oaxaca	3 959 042	93 793	42.2	1.64	570
21	Puebla	6 067 607	34 290	177.0	3.25	217
22	Queretaro	1 943 889	11 684	166.4	2.01	18
23	Quintana Roo	1 484 960	42 361	35.1	1.50	10
24	San Luis Potosi	2 702 145	60 983	44.3	1.96	58
25	Sinaloa	2 932 313	57 337	51.1	2.07	18
26	Sonora	2 851 462	179 503	15.9	2.93	72
27	Tabasco	2 334 493	24 738	94.4	3.48	17
28	Tamaulipas	3 461 336	80 175	43.2	2.98	43
29	Tlaxcala	1 242 734	3 991	311.4	0.56	60
30	Veracruz de Ignacio de la Llave	7 923 198	71 820	110.3	5.39	212
31	Yucatan	2 064 151	39 612	52.1	1.47	106
32	Zacatecas	1 550 179	75 539	20.5	1.21	58
	Total	118 395 054	1 959 248	60.4	100.00	2 457

Sources: Conapo (2014), Inegi (2008), Inegi (2014a).

Chapter 2

State of water resources

2.1 Mexico's catchments and aquifers

[Reporter: Regiones hidrológicas, Cuencas-disponibilidad]

In the hydrologic cycle, a significant proportion of the precipitation returns to the atmosphere in the form of evapotranspiration, whereas the rest runs off to the country's rivers and streams, grouped together in watersheds, or filters through to aquifers.

Watersheds are natural territorial units, defined by the existence of a continental divide as a result of the conformation of the relief. For the purpose of the administration of the nation's water resources, especially the publication of availability[1], the Conagua has defined 731 watersheds, the availability in which, as of December 31, 2013, had all been published, in conformity with the standard NOM-011-CONAGUA-2000.

The country's catchments have been organized into 37 hydrological regions, which are in turn grouped into the 13 HARs mentioned in the first chapter.

D2.1 Hydrological regions

01 Baja California Northwest
02 Baja California Central-West
03 Baja California Southwest
04 Baja California Northeast
05 Baja California Central-East
06 Baja California Southeast
07 Colorado River
08 Sonora North
09 Sonora South
10 Sinaloa
11 Presidio-San Pedro
12 Lerma-Santiago
13 Huicicila River
14 Ameca River
15 Jalisco Coast
16 Armeria-Coahuyana
17 Michoacan Coast
18 Balsas
19 Greater Guerrero Coast
20 Lower Guerrero Coast
21 Oaxaca Coast
22 Tehuantepec
23 Chiapas Coast
24 Bravo-Conchos
25 San Fernando-Soto La Marina
26 Panuco
27 North of Veracruz (Tuxpan-Nautla Rivers)
28 Papaloapan
29 Coatzacoalcos
30 Grijalva-Usumacinta
31 Yucatan West
32 Yucatan North
33 Yucatan East
34 Closed Catchments of the North
35 Mapimi
36 Nazas-Aguanaval
37 El Salado

Source: Conagua (2014l).

1 Availability of surface water: the value obtained by subtracting the mean annual volume of runoff from a catchment downstream from the current annual volume committed downstream

As regards groundwater, the country is divided into 653 aquifers. The names of the aquifers were published in the DOF on December 5, 2001, the limits of which are presented in map M2.1. In the 2003-2009 period their geographical limits were published (map M2.1), whereas the publication of their availabilities and their updates were carried out between 2003 and the present.

The Conagua has 3 153 stations in operation to measure climate variables, including temperature, precipitation, evaporation, wind speed and direction. Stream gages measure the flow of water in rivers, as well as the extraction of water through dam intakes. In Mexico there are 717 stream gages, including some automatic ones. On the other hand, hydro-climate stations measure climatic and hydrometric parameters.

Table T2.1 includes 1 064 climate reference stations, employed for the calculation of the normal precipitation (see the Precipitation section in this chapter).

M2.1 Limits of aquifers, 2013

Source: Conagua (2014l).

T2.1 Number of climate stations and stream gages in Mexico operated by the Conagua in Mexico, 2013

Type of station	Number of stations
Climate stations	3 153
Stream gages	717

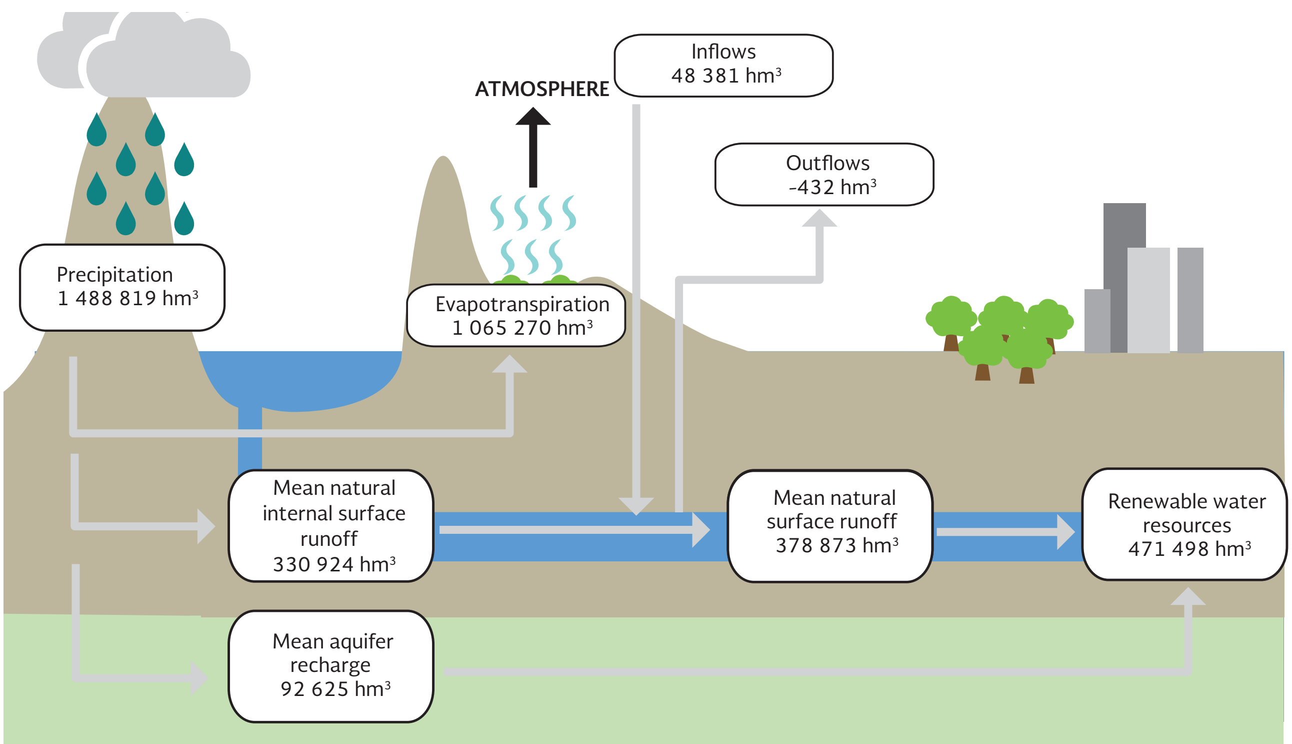
Source: Conagua (2014a), Conagua (2014l).

2.2 RENEWABLE WATER RESOURCES[2]

[Reporter: Ciclo hidrológico, Agua renovable]

Every year, Mexico receives around 1 489 billion cubic meters of water in the form of precipitation. Of this water, it is estimated that 71.6% evapotranspirates and returns to the atmosphere, 22.2% runs off into rivers and streams and the remaining 6.2% naturally filters through to the subsoil and recharges the aquifers[3]. Taking into account the water outflows (exports) to and inflows (imports) from neighboring countries, every year the country has 471.5 billion cubic meters of renewable freshwater resources. These mean values were estimated in 2011, upon the completion of an updated cycle of studies on watersheds and aquifers, and it has thus been considered to employ them as reference values until another cycle has been completed. The components and values that make up the calculation of renewable water resources are shown in the following chart.

G2.1 Mean annual values of the components of the hydrologic cycle in Mexico



Source: CONAGUA (2014l).

2 The maximum quantity of water that can feasibly be used in a region, meaning the quantity of water that is renewed by rainfall and the water that comes from other regions or countries (balance of inflows and outflows). It is calculated as the mean natural annual internal surface runoff, plus the total annual recharge of aquifers, plus the water inflows, minus the water outflows to other regions (Gleick 2002).

3 Some of the aquifers have renewal periods, understood as the rate of their estimated storage divided by their annual recharge, which are exceptionally long. These aquifers are thus known as non-renewable ones.

The inflows represent the volume of water which runs off to Mexico, generated in the eight watersheds Mexico shares on its three borders (United States of America, Guatemala and Belize). The outflows represent the volume of water that Mexico is bound to deliver to the United States of America under the 1944 "Water Treaty" [4].

The renewable water resources should be analyzed from three perspectives:

• **Distribution over time:** In Mexico there are significant variations in renewable water resources throughout the year. The majority of the rainfall occurs in the summer, and the rest of the year is relatively dry.

• **Distribution in space:** Some regions of the country have abundant precipitation and low population density, whereas in others exactly the opposite effect occurs.

• **The area of analysis:** Water problems and their resolution are predominantly local in scale. Indicators calculated at a large scale may hide some strong variations which exist throughout the country.

In some HARs, such as I Baja California Peninsula, VI Rio Bravo, VII Central Basins of the North, VII Lerma-Santiago-Pacific and XIII Waters of the Valley of Mexico, the per capita renewable water resources are alarmingly low. In table T2.2 the variables of the calculation of renewable water resources correspond to the values of the 2011 reference cycle of updated studies on watersheds and aquifers.

T2.2 Per capita renewable water resources

Key	HAR	Renewable water resources 2011 (hm³/year)	Population at mid-year 2013 (millions of inhabitants)	Per capita renewable water resources in 2013 (m³/inhabitant/year)	Total mean natural surface runoff 2011 (hm³/year)	Total mean aquifer recharge 2011 (hm³/year)
I	Baja California Peninsula	4 999.2	4.29	1 165	3 341	1 658
II	Northwest	8 324.9	2.76	3 011	5 073	3 251
III	Northern Pacific	25 939.1	4.42	5 863	22 650	3 290
IV	Balsas	22 898.7	11.56	1 980	17 057	5 842
V	Southern Pacific	32 350.6	4.99	6 488	30 800	1 551
VI	Rio Bravo	12 757.2	12.00	1 063	6 857	5 900
VII	Central Basins of the North	8 064.7	4.47	1 806	5 745	2 320
VIII	Lerma-Santiago-Pacific	35 754.0	23.60	1 515	26 005	9 749
IX	Northern Gulf	28 114.6	5.19	5 421	24 146	3 969
X	Central Gulf	95 124.5	10.40	9 149	90 419	4 705
XI	Southern Border	163 845.5	7.48	21 906	141 128	22 718
XII	Yucatan Peninsula	29 856.3	4.43	6 740	4 541	25 316
XIII	Waters of the Valley of Mexico	3 468.4	22.82	152	1 112	2 357
	National total	471 497.6	118.40	3 982	378 873	92 625

Note: For the HAR XIII, Mexico City's wastewater is considered.
Source: Produced based on Conagua (2014l), Conapo (2014).

4 "Treaty between the government of the United Mexican States and the government of the United States of America on the distribution of international water resources in the Colorado and Tijuana Rivers and the Rio Grande, from Fort Quitman, Texas, to the Gulf of Mexico".

Precipitation

[Reporter: Precipitación]

Mexico's normal precipitation in the period from 1971 to 2000 was 760 millimeters. According to the World Meteorological Organization (WMO), the normal values correspond to average measurements calculated for a uniform and relatively long period, which must include at least 30 years of data collection, considered as a minimum representative climate period. Furthermore, that period should start on January 1 of a year ending in one, and end on December 31 in a year ending in zero.

Table T2.3 presents the normal precipitation by HAR in the period from 1971 to 2000 (consult the data by state in [Additional: T2.A]). In the majority of Mexico, the precipitation occurs mainly between June and September, with the exception of the Baja California Peninsula, where it takes places mainly in the winter

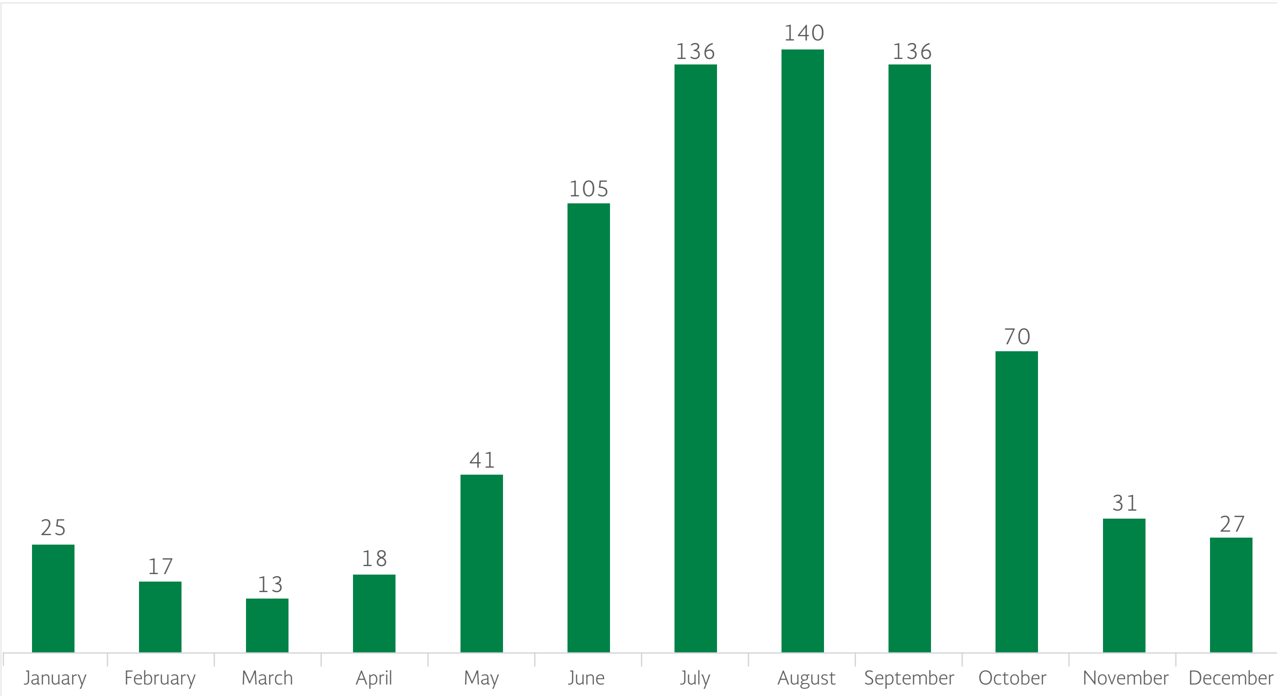
T2.3 Monthly normal precipitation, 1971-2000 (mm)

Key	HAR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
I	Baja California Peninsula	23	22	17	4	1	1	9	23	24	12	12	21	169
II	Northwest	25	23	13	5	5	18	111	107	56	28	20	33	445
III	Northern Pacific	27	12	5	5	8	62	188	193	136	54	29	28	747
IV	Balsas	15	5	6	14	52	186	198	192	189	83	16	7	963
V	Southern Pacific	9	8	8	20	78	244	205	225	249	111	21	9	1 187
VI	Rio Bravo	16	12	10	16	31	50	75	81	81	36	15	17	438
VII	Central Basins of the North	16	6	5	12	27	59	87	86	72	32	13	15	430
VIII	Lerma-Santiago-Pacific	22	6	3	6	23	131	201	185	150	59	18	12	816
IX	Northern Gulf	27	17	21	40	76	142	145	130	176	82	30	29	914
X	Central Gulf	45	34	30	41	85	226	255	253	281	161	88	61	1 558
XI	Southern Border	60	52	38	52	135	278	219	266	332	222	114	77	1 846
XII	Yucatan Peninsula	48	31	29	38	83	172	158	173	212	147	76	52	1 218
XIII	Waters of the Valley of Mexico	10	8	13	28	56	105	115	104	98	50	13	7	606
	Total	25	17	13	18	41	105	136	140	136	70	31	27	760

Source: Conagua (2014a).

It should be mentioned that the monthly distribution of the precipitation accentuates the problems related with the availability of water resources, since 68% of the normal monthly precipitation falls between the months of June and September, as can be observed in the following.

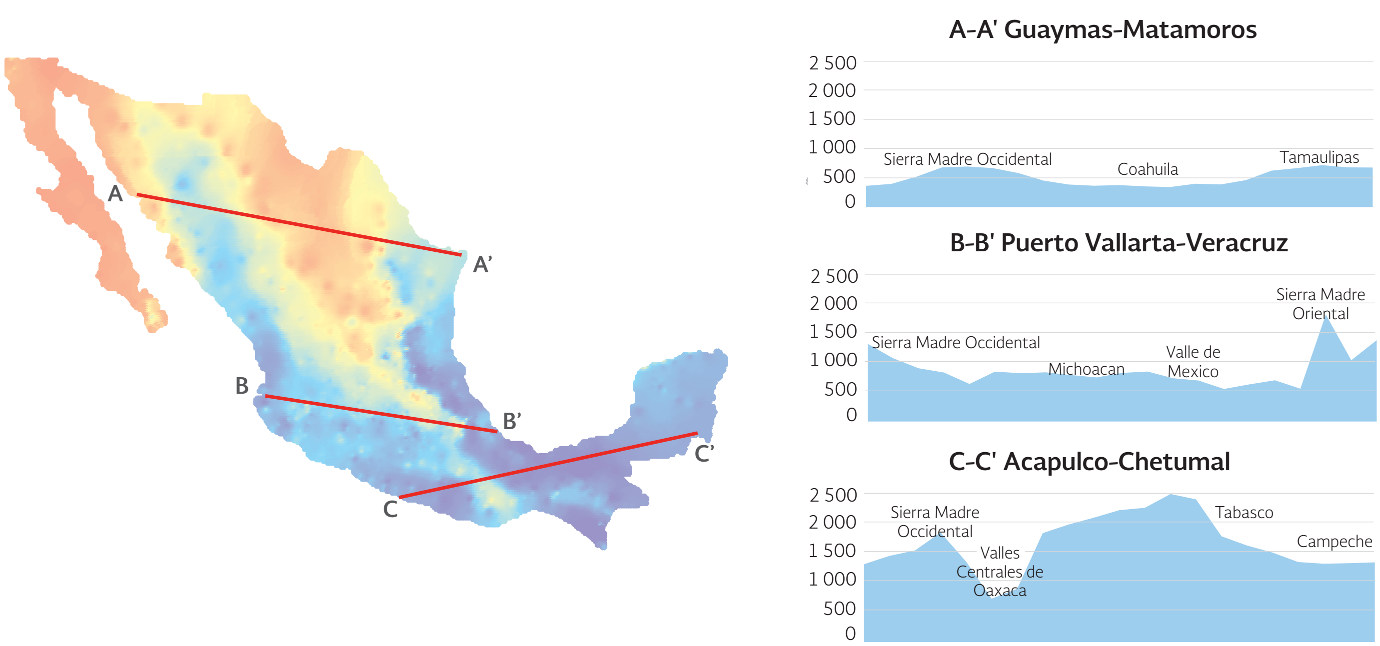
G2.2 Normal monthly precipitation in Mexico (mm)



Source: CONAGUA (2014a).

It may be observed, for example, that in the HAR XI Southern Border, which receives the greatest quantity of rain, the normal annual precipitation for 1971-2000 was eleven times higher than in the HAR I Baja California Peninsula, the driest one. This regional variation in the normal precipitation is highlighted in the following graph and map.

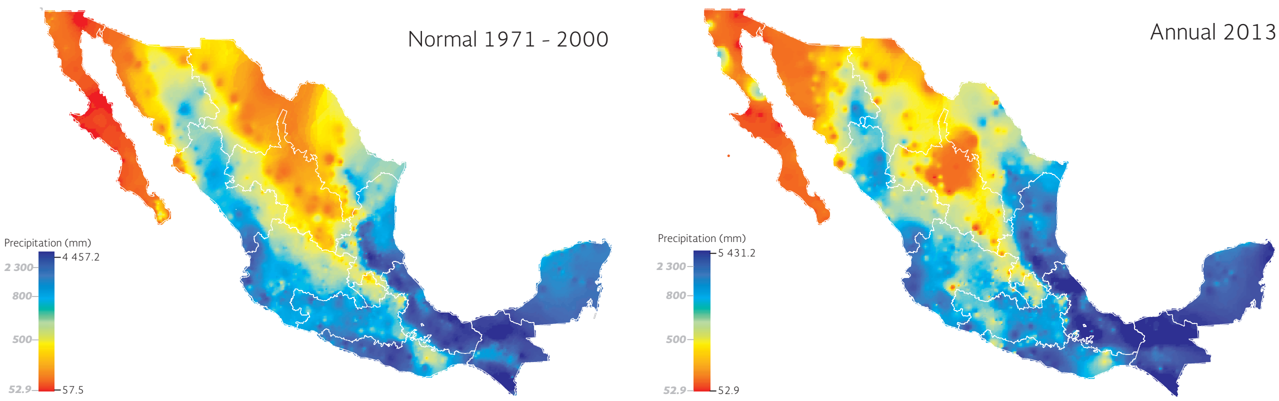
G2.3 Normal precipitation profiles (1971-2000)



Source: CONAGUA (2014a).

To illustrate the regional variation in rainfall, the previous graph shows three cross-sections that allow the precipitation profiles to be visualized in Guaymas-Matamoros (A-A'), Puerto Vallarta-Veracruz (B-B') and Acapulco-Chetumal (C-C'). The graphs show in blue the profile of the variation in the precipitation over the 1971-2000 period, throughout these cross-sections.

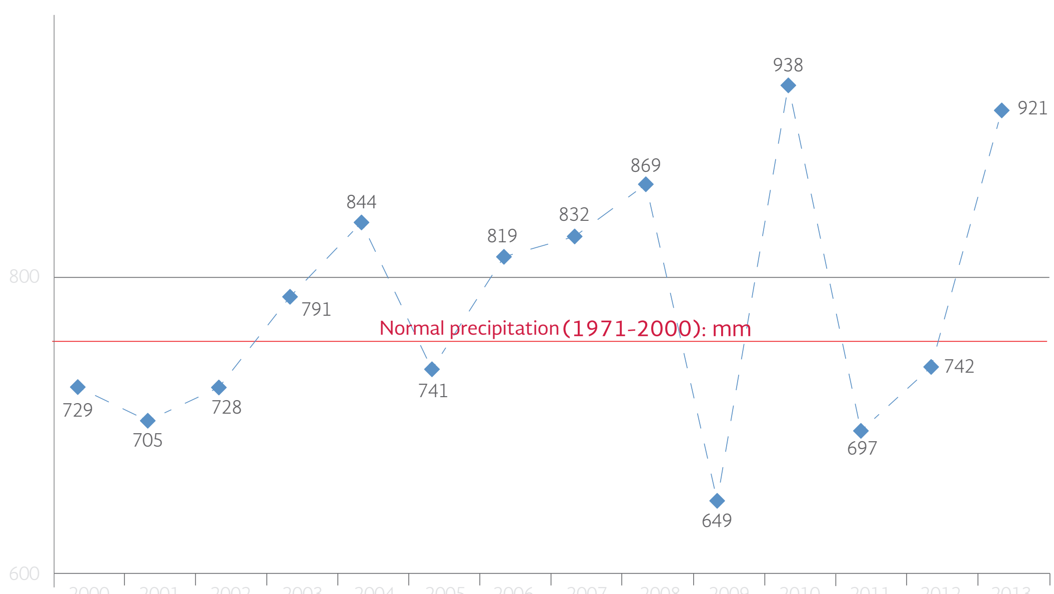
M2.2 Distribution of the precipitation in Mexico



Source: CONAGUA (2014a).

The accumulated precipitation in the Mexican Republic from January 1 to December 31, 2013 reached a sheet of 921 mm, which was 21.2% higher than the normal value for the 1971 to 2000 period (760 mm). The 2000-2013 annual series of accumulated precipitation can be appreciated in the following graph.

G2.4 Annual precipitation, 2000-2013 (mm)



Source: CONAGUA (2014a).

2.3 Hydro-meteorological phenomena

Tropical cyclones

[Reporter: Huracanes y ciclones]

Tropical cyclones are natural phenomena that generate most of the movement of sea humidity to the semi-arid zones of the country. In several regions of the country, cyclonic rains represent the majority of the annual precipitation. Cyclones are classified according to the intensity of the maximum sustained winds. When the latter are stronger than 118 km/h, they are referred to as hurricanes (see table R2.1); when they are between 62 km/h and 118 km/h, they are called tropical storms (TS); and finally when the winds are less than 62 km/h, they are defined as tropical depressions (TD).

R2.1 Hurricanes and the Saffir-Simpson scale

A hurricane is a tropical cyclone in which the maximum sustained winds are greater than 118 km/h. In this case the cloudy area covers an extension of between 500 and 900 km of diameter, producing intense rains. The eye of the hurricane normally reaches a diameter that varies between 24 and 40 km, however, it can be anything up to 100 km. Hurricanes are classified through the Saffir-Simpson scale:

Category	Maximum winds (km/h)	Storm tide that it normally generates (m)	Characteristics of the possible material damage and floods
H1	From 118 to 154	1.2 to 1.5	Small trees toppled; some flooding on the lowest-lying coastal highways.
H2	From 154 to 178	1.8 to 2.5	Rooftops, doors and windows damaged; trees uprooted.
H3	From 178 to 210	2.5 to 4.0	Cracks appear in small buildings; flooding in low-lying and flat grounds.
H4	From 210 to 250	4.0 to 5.5	Household roofs come loose; significant erosion on beaches and river and stream channels. Imminent damage to drinking water and sanitation services.
H5	More than 250	More than 5.5	Very severe and extensive damage to windows and doors. Roofs lifted off many residences and industrial buildings.

Source: Conagua (2014l).

Between 1970 and 2013, 211 tropical cyclones hit the coasts of Mexico [Additional: G2.A]. Table T2.4 presents their occurrence on the Atlantic and Pacific oceans, from which it can be observed that, despite a greater number of cyclones having hit the Pacific coast, intense hurricanes have been more frequent on the Atlantic coast.

T2.4 Tropical cyclones that hit Mexico between 1970 and 2013

Ocean	Tropical depressions	Tropical storms	Moderate hurricanes (H1 and H2)	Intense hurricanes (H3-H5)	Total
Atlantic	27	29	14	12	82
Pacific	31	47	44	10	132
Total	**58**	**76**	**58**	**22**	**214**

Source: CONAGUA (2014a).

In map M2.3 [Additional: T2.B], the hurricanes that occurred in Mexico between 1970 and 2013 are shown. The intense hurricanes during this period (categories H3-H5) are identified with a label. In turn, those from 2013 are also labelled, irrespective of their intensity. In the 2013 hurricane season, the ones with the greatest intensity to hit the coast of Mexico were Manuel (H1) in Colima, Barbara (H1) in Chiapas and Ingrid (H1) in Tamaulipas.

M2.3 Hurricanes 1970-2013

Source: CONAGUA (2014a).

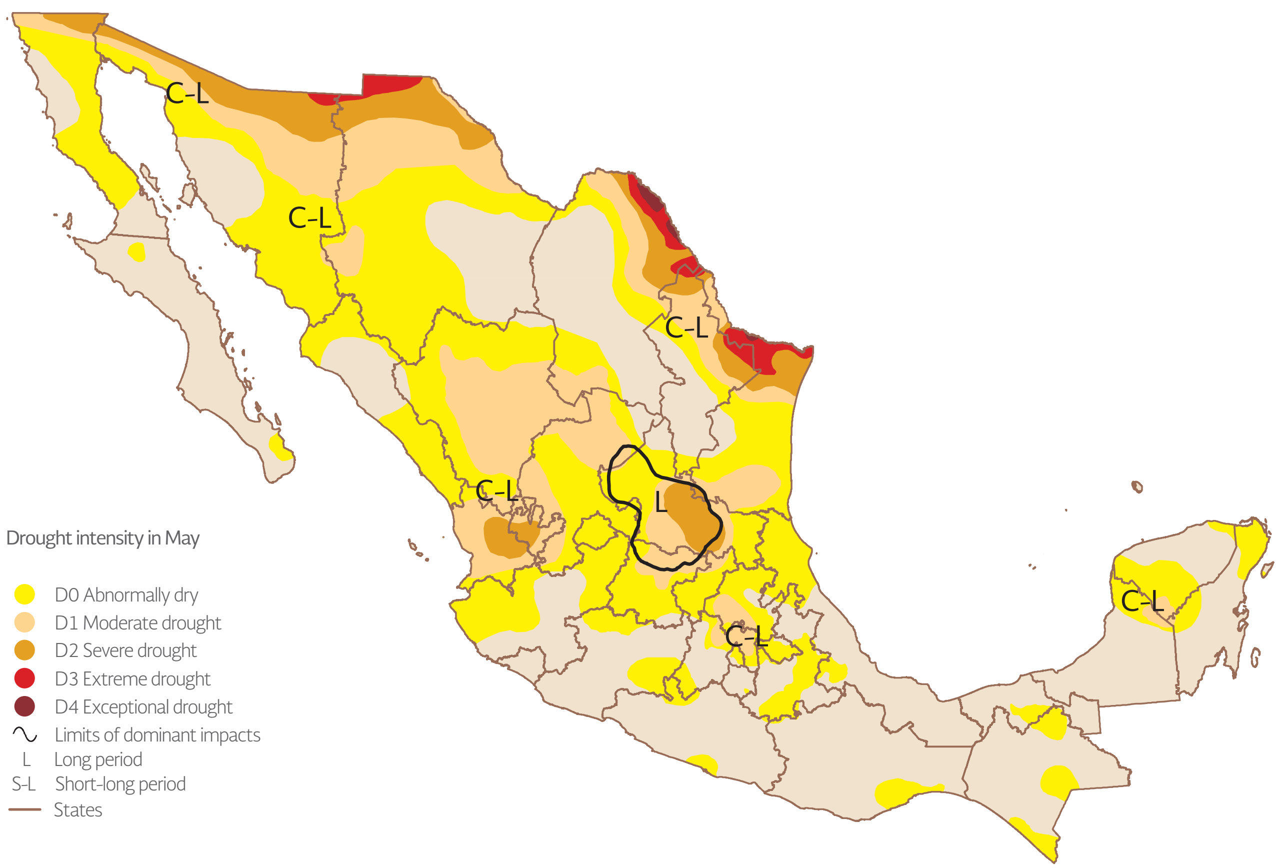
Every year, twelve estimations of drought conditions are carried out in North America, as part of the North American Drought Monitor (NADM) project. In this document, the May estimation is employed as the end of the dry season and the November one for the end of the rainy season.

For the first drought estimation, corresponding to the end of the dry season, in May 2013 (map M2.4), drought conditions were experienced with intensities from D0 (abnormally dry) to D2 (severe drought) in a large area of the country that covers the following states: Baja California, Sonora, Chihuahua, Sinaloa, Nayarit, Durango, Zacatecas, San Luis Potosi, Jalisco, Queretaro, Aguascalientes, Guanajuato, Hidalgo, Tlaxcala, the north of Veracruz and Tamaulipas.

In the north of Coahuila and the north of Nuevo Leon, a drought was experienced with intensities from D0 (abnormally dry) to D2 (severe drought) and practically along the border with the United States, the drought reached a D4 intensity (exceptional drought).

In the rest of the country, localized and relatively isolated regions were affected by drought with intensities from D0 (abnormally dry) to D1 (severe drought).

M2.4 Drought conditions in May 2013



Source: CONAGUA (2014a).

For the second estimation, at the end of the rainy season (map M2.5) in November 2013, there was a drought with intensities from D0 (abnormally dry) to D1 (moderate drought) in Sonora and along the US border, in the states of Baja California, Chihuahua, Coahuila, Nuevo Leon and Tamaulipas.

In tiny areas of the states of Sinaloa, Durango, Nayarit, Michoacan, San Luis Potosi, Guerrero, Oaxaca, Tabasco and Campeche, drought was present with D0 intensity (abnormally dry). In the rest of the country this phenomenon was no longer present.

M2.5 Drought conditions in November 2013

Source: Conagua (2014a).

Effects

Both drought and intense precipitation, added to factors such as topography, soil use and the status of vegetation cover, may cause impacts on society and economic activities.

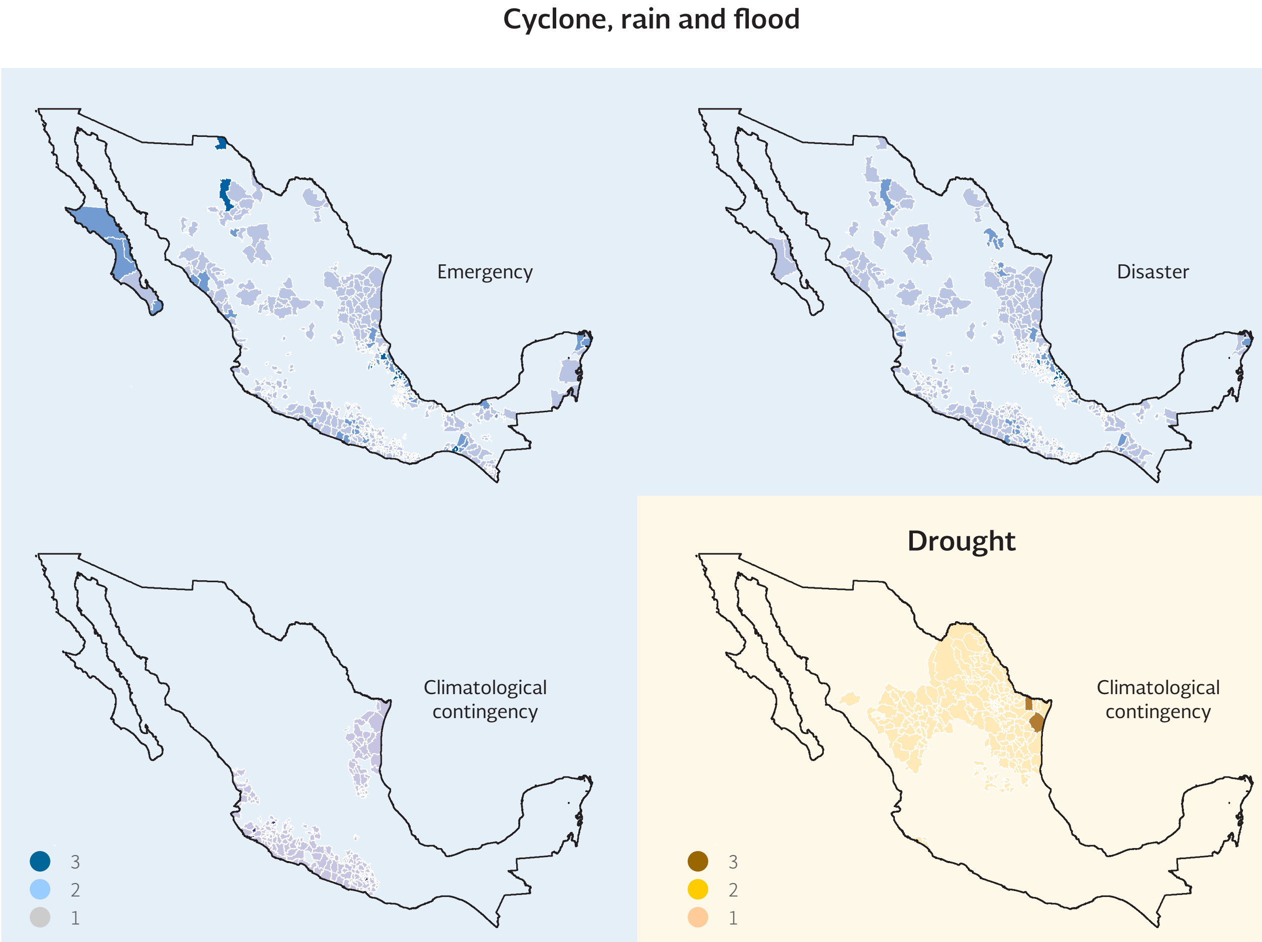
In Mexico there are procedures in place for the issuing of declarations[5] as a result of these phenomena, in categories which describe their effects. Climate contingencies are affectations on productive activities, emergencies imply risks to life and public health, whereas disasters focus the state's and society's resources on the reconstruction of the affected areas.

The National Disaster Prevention Center (Cenapred) generates a database of emergency, disaster and climate contingency declarations, highlighting the distribution of the municipalities with declarations as a result of cyclones, rainfall, floods and droughts[6] in 2013, so as to be able to distinguish their categories (diagram D2.2).

5 The declarations make it possible to employ resources from public programs to attend these affectations.

6 It is worth mentioning that the drought reported in the NADM is established with a different methodology to the one used for the declarations.

D2.2 Number of declarations as a result of hydro-meteorological phenomena, 2013



Source: Produced based on Cenapred (2014).

2.4 Surface water

Rivers

[Reporter: Ríos principales]

Mexico's rivers and streams constitute a hydrographic network of 633 000 kilometers, in which 50 main rivers stand out, through which 87% of the country's surface runoff flows, and whose catchments cover 65% of the country's mainland surface area (map M2.6).

M2.6 Mexico's main rivers

Source: Produced based on Cenapred (2014).

For their surface area, the catchments of the Rio Grande and Balsas River stand out, as do the Rio Grande and Grijalva-Usumacinta River for their length. The Lerma and Nazas-Aguanaval are inland-flowing rivers. In tables T2.5, T2.6 and T2.7, the most relevant data on Mexico's main rivers is shown, according to the water body into which they flow. It should be mentioned that the mean natural surface runoff represents the mean annual value of its historical registry and the maximum stream order was determined according to the Strahler method. In the case of transboundary catchments, the area and length of the river correspond to the Mexican side of the watershed, strictly speaking the catchment itself.

Table T2.5 describes the rivers which flow into the Pacific and Gulf of California. For the transboundary catchments (Colorado, Suchiate, Coatan and Tijuana) the mean natural surface runoff includes the inflows from other countries, except for the Tijuana river, the runoff from which only corresponds to the Mexican share.

T2.5 Characteristics of the main rivers that flow into the Pacific Ocean and Gulf of California, ordered by their mean natural surface runoff

No.	River	Code	HAR	Mean natural surface runoff (millions of m^3/year)	Catchment area (km^2)	Length of the river (km)	Maximum stream order
1	Balsas	IV	Balsas	16 279	117 406	770	7
2	Santiago	VIII	Lerma-Santiago-Pacific	7 423	76 416	562	7
3	Verde	V	Southern Pacific	6 046	18 812	342	6
4	Ometepec	V	Southern Pacific	5 100	6 922	115	4
5	El Fuerte	III	Northern Pacific	5 024	33 590	540	6
6	Papagayo	V	Southern Pacific	4 288	7 410	140	6
7	San Pedro	III	Northern Pacific	3 347	26 480	255	6
8	Yaqui	II	Northwest	3 179	72 540	410	6
9	Culiacan	III	Northern Pacific	3 122	15 731	875	5
10	Ameca	VIII	Lerma-Santiago-Pacific	2 205	12 214	205	5
11	Sinaloa	III	Northern Pacific	2 100	12 260	400	5
12	Armeria	VIII	Lerma-Santiago-Pacific	1 805	9 795	240	5
13	Coahuayana	VIII	Lerma-Santiago-Pacific	1 732	7 114	203	5
14	Colorado	I	Baja California Peninsula	1 928	3 840	160	6
15	Baluarte	III	Northern Pacific	1 830	5 094	142	5
16	San Lorenzo	III	Northern Pacific	1 665	8 919	315	5
17	Suchiate	XI	Southern Border	1 584	203	75	2
18	Acaponeta	III	Northern Pacific	1 433	5 092	233	5
19	Piaxtla	III	Northern Pacific	1 406	11 473	220	5
20	Presidio	III	Northern Pacific	1 084	6 479	U	4
21	Tomatlan	VIII	Lerma-Santiago-Pacific	1 166	2 118	U	4
22	Mayo	II	Northwest	1 222	15 113	386	5
23	Tehuantepec	V	Southern Pacific	901	10 090	240	5
24	Coatan	XI	Southern Border	934	605	75	3
25	Marabasco	VIII	Lerma-Santiago-Pacific	503	2 526	U	5
26	San Nicolas	VIII	Lerma-Santiago-Pacific	487	2 330	U	5
27	Elota	III	Northern Pacific	463	2 324	U	4
28	Sonora	II	Northwest	412	27 740	421	5
29	Concepcion	II	Northwest	113	25 808	335	2
30	Tijuana	I	Baja California Peninsula	95	3 231	186	4
31	Matape	II	Northwest	89	6 606	205	4
32	Sonoyta	II	Northwest	20	7 653	311	5
				78 983	563 934		

Note: The length of the Suchiate River belongs to the border between Mexico and Guatemala. The runoff from the Colorado River considers the inflow as per the "1944 Water Treaty".
U: Unavailable.

Source: CONAGUA (2014l).

Table T2.6 describes the rivers that flow into the Gulf of Mexico and the Caribbean Sea. For the transboundary catchments (Grijalva-Usumacinta, Grande, Candelaria and Hondo), the mean natural surface runoff includes the inflows from other countries, except for the Rio Grande and Hondo River, the runoff from which only corresponds to the Mexican share.

T2.6 Characteristics of the main rivers that flow into the Gulf of Mexico and Caribbean Sea, ordered by their mean natural runoff

No.	River	Code	HAR	Mean natural surface runoff (millions of m³/year)	Catchment area (km²)	Length of the river (km)	Maximum stream order
33	Grijalva-Usumacinta	XI	Southern Border	101 517	83 553	1 521	7
34	Papaloapan	X	Central Gulf	42 887	46 517	354	6
35	Coatzacoalcos	X	Central Gulf	28 679	17 369	325	5
36	Panuco	IX	Northern Gulf	19 673	84 956	510	7
37	Tonala	X	Central Gulf	3 955	5 679	82	5
38	Tecolutla	X	Central Gulf	6 098	7 903	375	5
39	Bravo	VI	Rio Bravo	5 588	225 242	U	7
40	Nautla	X	Central Gulf	2 218	2 785	124	4
41	La Antigua	X	Central Gulf	2 145	2 827	139	5
42	Soto La Marina	IX	Northern Gulf	1 999	21 183	416	6
43	Tuxpan	X	Central Gulf	2 072	5 899	150	4
44	Jamapa	X	Central Gulf	2 055	4 061	368	4
45	Candelaria	XII	Yucatan Peninsula	1 861	13 790	150	4
46	Cazones	X	Central Gulf	1 712	2 688	145	4
47	San Fernando	X	Northern Gulf	1 573	17 744	400	5
48	Hondo	XII	Yucatan Peninsula	576	7 614	115	4
				224 607	549 810		

Source: Conagua (2014l).

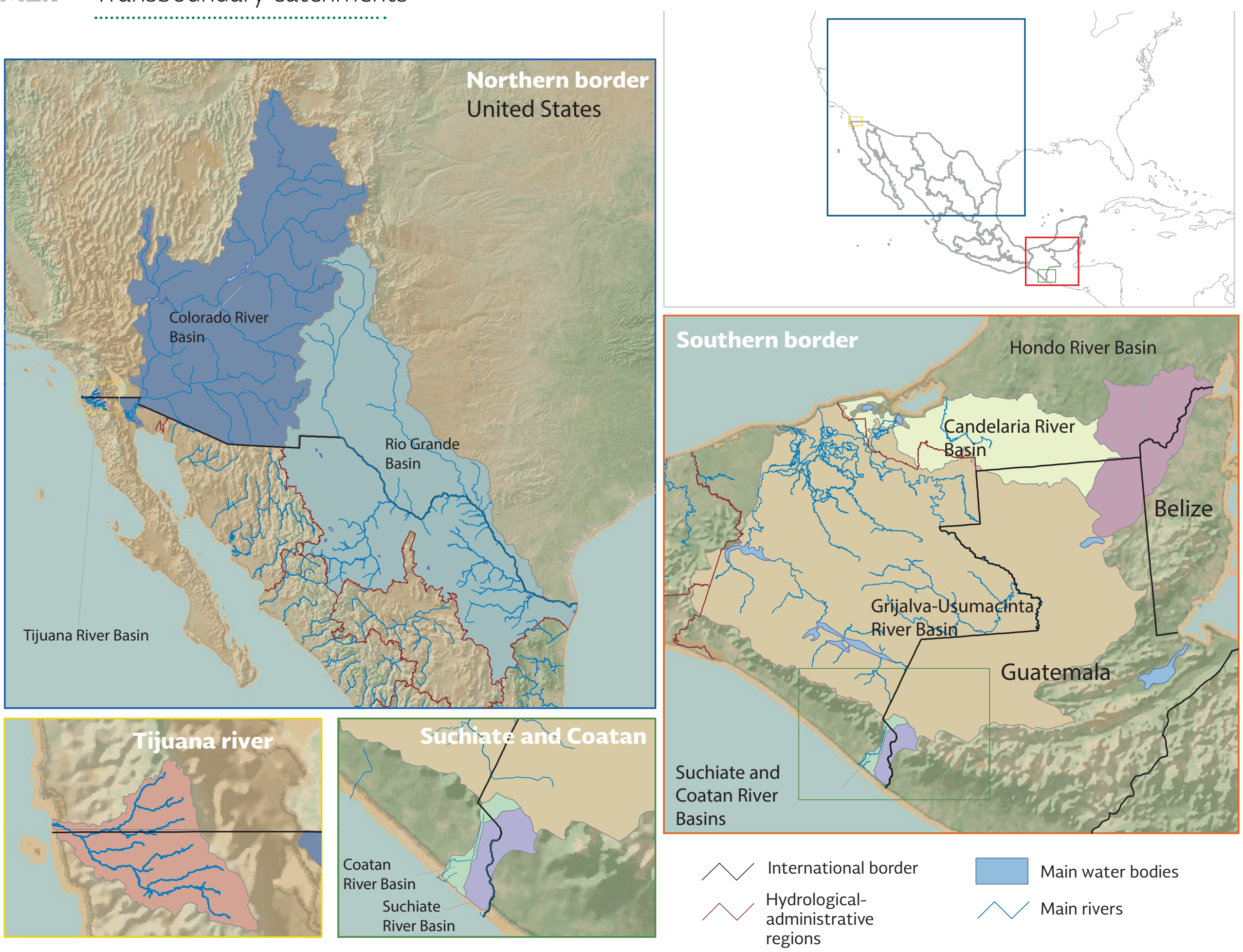
T2.7 Characteristics of the main inland-flowing rivers, ordered by the mean natural surface runoff

No.	River	Clave	HAR	Mean natural surface runoff (millions of m³/year)	Catchment area (km²)	Length of the river (km)	Maximum stream order
49	Lerma	VIII	Lerma-Santiago-Pacific	4 742	47 116	708	6
50	Nazas-Aguanaval	VII	Central Basins of the North	2 085	89 239	1 081	7
				6 827	136 355		

Source: Conagua (2014l).

Mexico shares eight catchments with its neighboring countries: three with the United States of America (Grande, Colorado and Tijuana), four with Guatemala (Grijalva-Usumacinta, Suchiate, Coatan and Candelaria) and one with both Belize and Guatemala (River Hondo), the data on which is presented in map M2.7 and table T2.8. The data on mean natural surface runoff and the catchment area were obtained from available hydrological studies.

M2.7 Transboundary catchments



Source: Produced based on CEC (2014), USGS (2014a), VITO (2014), USGS (2014c).

T2.8 Characteristics of the rivers with transboundary catchments, 2013

No.	River	Key	HAR	Country	Mean natural surface runoff (millions of m³/year)	Catchment area (km²)	Length of the river (km)
1	Suchiate	XI	Southern Border	Mexico	291	203	75
				Guatemala	1 294	1 084	60
2	Colorado	I	Baja California Peninsula	Mexico	78	3 840	160
				USA	1 850*	626 943	2 140
				Binational	NA	NA	NA
3	Coatan	XI	Southern Border	Mexico	642	605	75
				Guatemala	292	280	12
4	Tijuana	I	Baja California Peninsula	Mexico	78	3 231	186
				USA	17	1 221	9
5	Grijalva-Usumacinta	XI	Southern Border	Mexico	57 697	83 553	1 521
				Guatemala	43 820	44 837	390
6	Grande	VI	Rio Bravo	Mexico	5 588	225 242	NA
				USA	74*	241 697	1 074
				Bilateral	NA	NA	2 034
7	Candelaria	XI	Southern Border	Mexico	1 600	13 790	150
				Guatemala	261	1 558	8
8	Hondo	XII	Yucatan Peninsula	Mexico	533	7 614	115
				Guatemala	NA	2 873	45
				Belize	NA	2 978	16

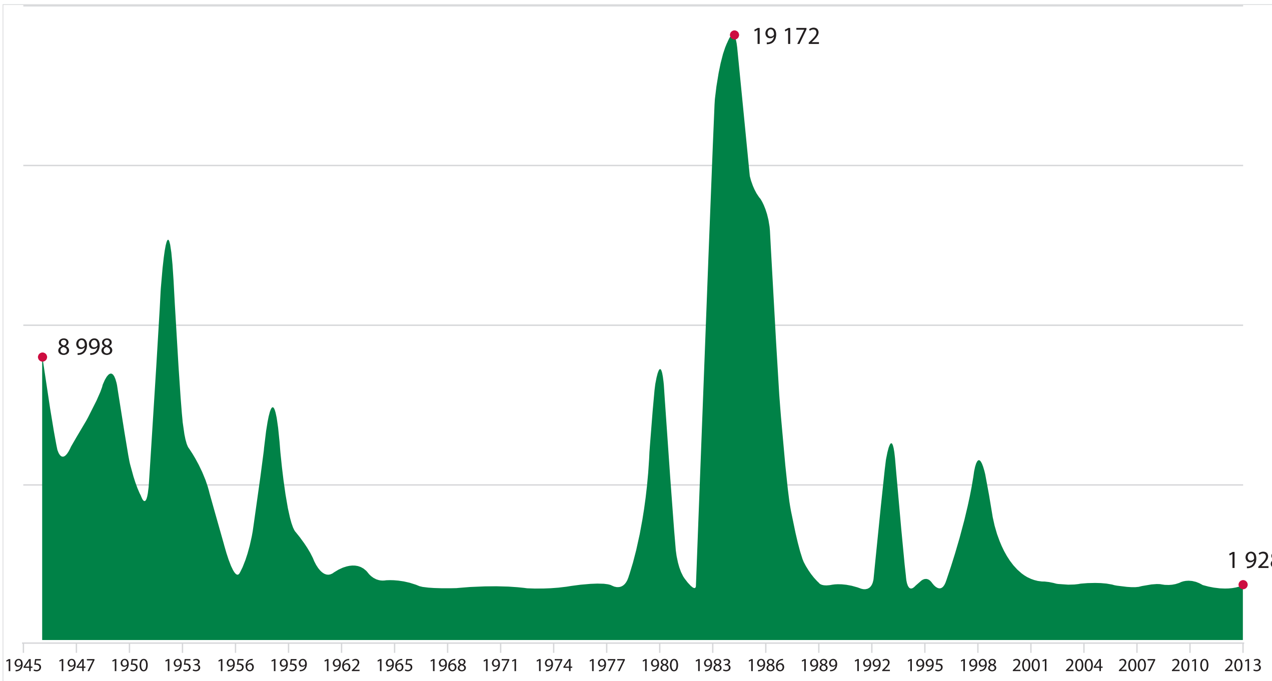
Note: The 75 km belong to the border between Mexico and Guatemala. The 115 km belong to the border between Mexico and Belize.
* Volumes delivered to Mexico.
NA: Not applicable.

Source: Conagua (2014l).

The waters of the Rio Grande and the Colorado and Tijuana rivers are shared between Mexico and the United States of America, according to the indications of the "Water Treaty" signed in Washington, D.C. on February 3, 1944. In the case of the Colorado River, the treaty specifies that the United States of America should deliver 1 850.2 million cubic meters (1.5 million acre feet per year) every year to Mexico.

The annual series of this delivery from 1945 to 2013 is shown in graph G2.5.

G2.5 Volume delivered from the Colorado River (hm³)



Source: CONAGUA (2014l).

For the Tijuana River, the treaty only establishes that both countries, through the International Boundary and Water Commission (IBWC), will make recommendations for the equitable sharing of its waters; will draw up projects for storage infrastructure and flood control; and estimate the costs and build the infrastructure that is agreed upon, sharing the construction and operation costs equitably. As regards the Rio Grande (called the Rio Bravo in Mexico), table T2.9 describes the distribution of its waters as defined in the treaty.

T2.9 Distribution of the waters of the Rio Grande according to the 1944 Treaty

The United Mexican States' share	The United States of America's share
All of the runoff from the San Juan and Alamo Rivers.	All of the runoff from the Pecos and Devils Rivers, Goodenough Spring and Alamito, Terlingua, San Felipe and Pinto Stream.
Two thirds of the water that flows into the main channel of the Rio Grande from the following six Mexican channels: the Conchos, San Diego, San Rodrigo, Escondido and Salado rivers and the Las Vacas stream.	One third of the water that flows into the main channel of the Rio Grande from the following six Mexican channels: the Conchos, San Diego, San Rodrigo, Escondido and Salado rivers, and the Las Vacas stream.
One half of all unassigned flows in the Treaty that reach the main channel, between Quitman and Falcon.	One half of all unassigned flows in the Treaty that reach the main channel, between Quitman and Falcon.
One half of the runoff of the Rio Grande watershed, downstream from Falcon.	One half of the runoff of the Rio Grande watershed, downstream from Falcon.

Source: IBWC (2014).

Three considerations should be mentioned regarding the six Mexican channels previously referred to:

1. The volume that Mexico should provide to the United States of America, as part of the third of the volume in the six aforementioned Mexican channels, shall not be less on the whole, as an average amount and in cycles of five consecutive years, than 431.72 million cubic meters (350 000 acre feet) per year, the equivalent of supplying a minimum volume of 2 158.6 million cubic meters (1 750 000 acre feet) in each cycle.

2. In the event of extraordinary drought or serious accident in the hydraulic systems on the measured Mexican tributaries, making it difficult for Mexico to make available the run-off of 431.72 million cubic meters annually, any deficiencies existing at the end of the aforesaid five-year cycle shall be made up in the following five-year cycle with water from the said measured tributaries.

3. If the capacity assigned to the United States in the international reservoirs shared by both countries (La Amistad and Falcon) is filled with waters belonging to the United States, the five-year cycle shall be considered as terminated and all debits fully paid, whereupon a new five-year cycle shall commence.

In terms of the capacities in reservoirs, the allocations by country are shown in table T2.10.

T2.10 Capacities assigned in the international reservoirs (millions of cubic meters, hm^3)

Country	La Amistad	Falcon
Mexico	1 770	1 352
United States of America	2 271	1 913

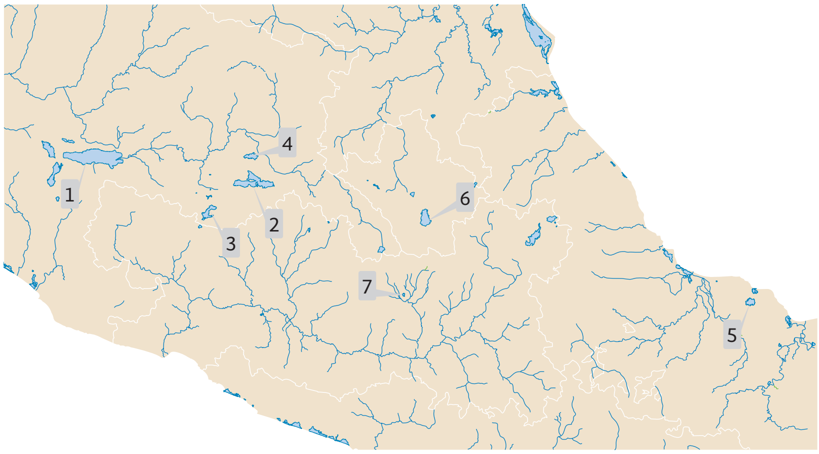
Source: Conagua (2014l).

Main lakes in Mexico

Reporter: Lagos principales]

Mexico's main lakes are shown in map M2.8, according to the extension of their own catchment [Additional: T2.C]. The data presented corresponds to the available hydrological studies and the catchment area corresponds to the water bodies' own catchment. Lake Chapala is the biggest inland lake in Mexico, with a depth that varies between four and six meters. The behavior of its volumes stored per year is shown in the following graph.

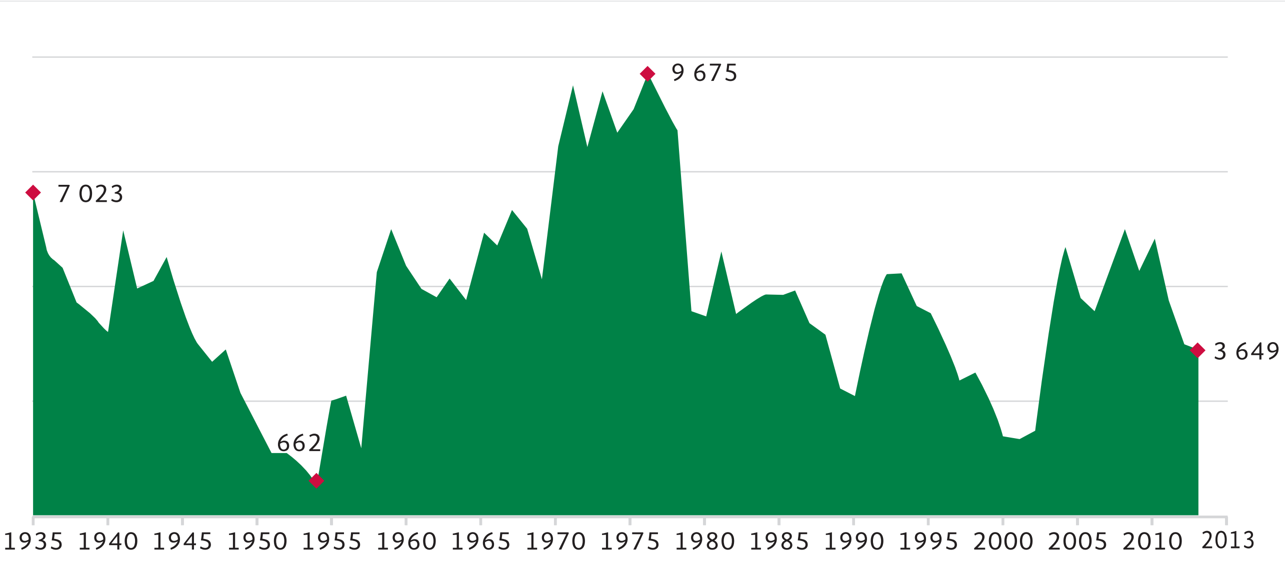
M2.8 Mexico's main lakes



No.	Name	Catchment km²	Capacity hm³
1	Chapala	1 116	8 126
2	Cuitzeo	306	920
3	Patzcuaro	97	550
4	Yuriria	80	188
5	Catemaco	75	454
6	Dr. Nabor Carrillo	10	12
7	Tequesquitengo	8	160

Source: CONAGUA (2014l).

G2.6 Volume stored in Lake Chapala (hm³)



Note: The values indicated are those as of December 31 each year.

Source: CONAGUA (2014l).

2.5 Groundwater

[Reporter: Acuíferos]

Groundwater plays an increasingly important role in the country's socio-economic growth, due to its physical characteristics which allow it to be used for a number of different purposes, since it works as a storage dam and distribution network, making it possible to extract water at any point of the year from practically any point of the area above the aquifer. It also works as a purifying filter, preserving water quality.

The importance of groundwater is manifest due to the magnitude of the volume employed by the main users. Around 37% of the total volume allocated for offstream uses (30.4 billion m^3 per year in 2013) is from groundwater sources. As already mentioned, for the purpose of groundwater management, the country has been divided into 653 aquifers, the official names of which were published in the DOF on December 5, 2001.

From that point onwards a process of outlining and studying the aquifers initiated, in order to officially make their mean natural availability public, following the official Mexican standard NOM-011-CONAGUA-2000. As of December 31, 2013, the availability of groundwater in all 653 aquifers had been published in the DOF[7]. It is worth highlighting the publication on December 20 that year of the updated calculation of availability of all the nation's aquifers. Availability is a prerequisite for the preservation of the resource through the administration of the nation's water resources, through the instruments of concession or allocation of rights for the use of the nation's water resources, as well as legislative measures for the use of aquifers such as prohibition zones, regulations, regulated zones and reserve zones (diagram D2.3 and section 5.2 "Legal framework for the use of water in Mexico").

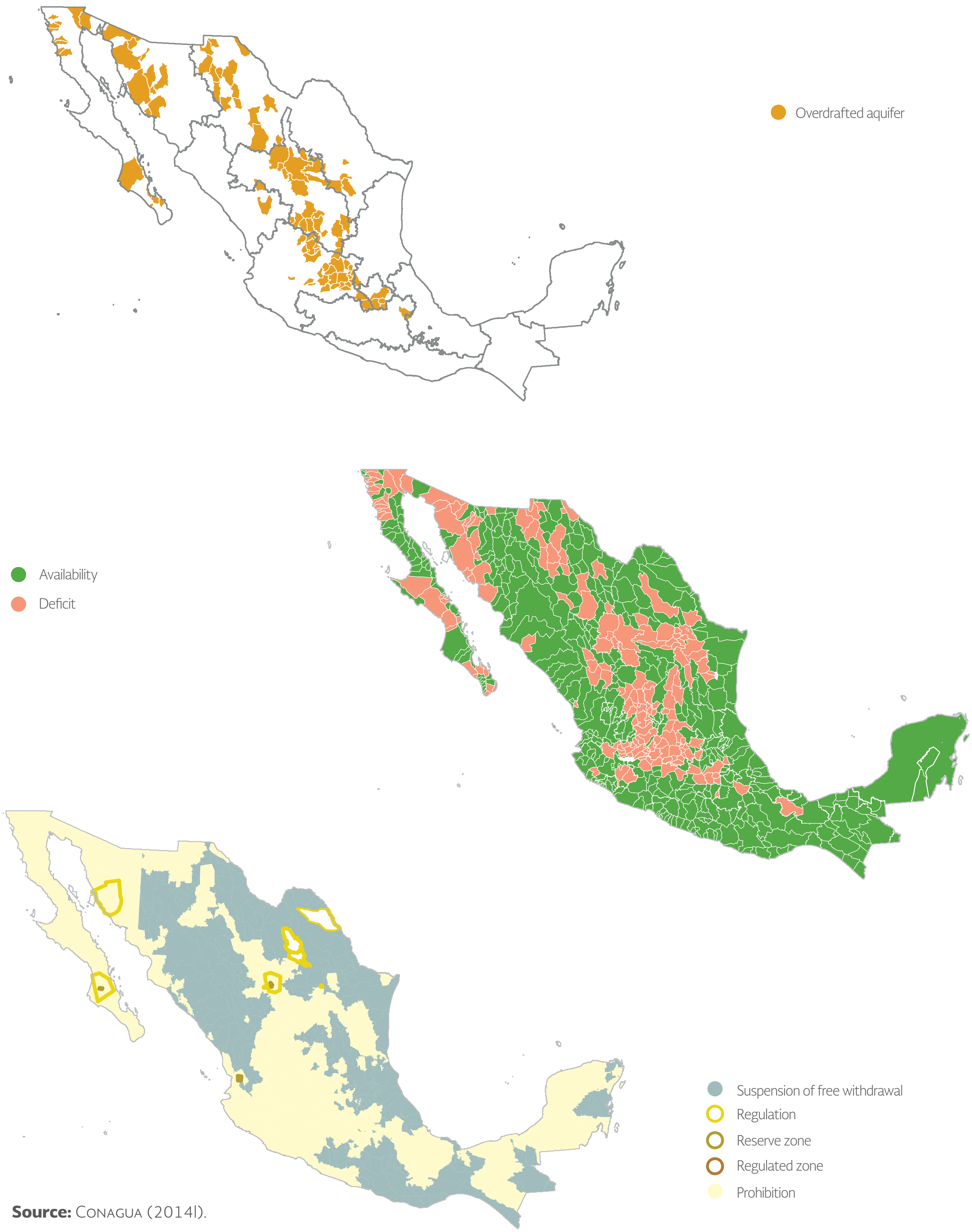
Overdrafting of aquifers

Based on the process of identification, outlining, studying and calculation of availability, which started in 2001, the number of overdrafted aquifers has varied every year from 100 to 106. As of December 31, 2013, it was reported that there were 106 overdrafted aquifers (diagram D2.3). From these overdrafted aquifers, 55.2% of groundwater is withdrawn for all uses. According to the results of recent studies, it is defined whether aquifers are considered overdrafted or cease to be so, based on the withdrawal/recharge ratio. The statistics on aquifers are presented in table T2.11.

Statistics on aquifers are presented in table T2.11. It should be mentioned that the mean recharge in this table corresponds to 2013, thus explaining the difference with the 2011 reference mean recharge as shown in table T2.2.

7 Availability of groundwater: The mean annual volume of groundwater that can be withdrawn from a hydrogeological unit for different uses, in addition to the withdrawals already allocated and the natural discharge committed, without jeopardizing the balance of ecosystems.

D2.3 Aquifers, 2013



Source: Conagua (2014l).

T2.11 Mexico's aquifers, 2013

Key	HAR	Total	Overdrafted	With saltwater intrusion	Under the phenomena of soil salinization and brackish groundwater	Mean recharge 2013 (hm³)
I	Baja California Peninsula	88	15	10	4	1 658
II	Northwest	62	10	5		3 207
III	Northern Pacific	24	2			3 076
IV	Balsas	45	1			5 351
V	Southern Pacific	36				1 936
VI	Rio Bravo	102	18		8	5 900
VII	Central Basins of the North	65	23		18	2 320
VIII	Lerma-Santiago-Pacific	128	32			9 670
IX	Northern Gulf	40	1			4 069
X	Central Gulf	22				4 705
XI	Southern Border	23				22 718
XII	Yucatan Peninsula	4			1	25 316
XIII	Waters of the Valley of Mexico	14	4			2 346
	Total	653	106	15	31	92 271

Source: CONAGUA (2014l).

Aquifers with saltwater intrusion and/or suffering from the phenomena of soil salinization and brackish groundwater

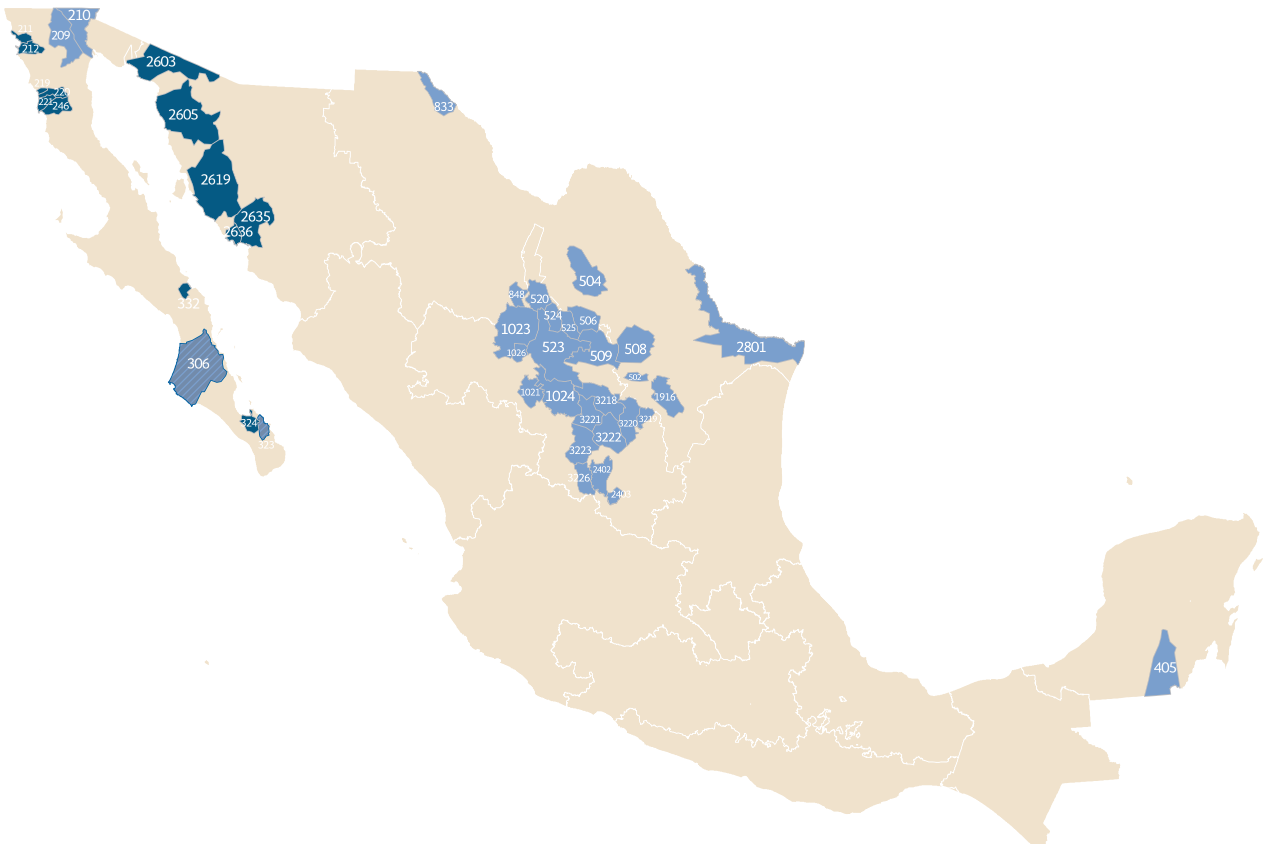
Soil salinization and the presence of brackish groundwater occur as a result of high indices of evaporation in areas of low levels of groundwater, the dissolution of evaporite minerals and the presence of high-salinity connate water. Brackish water occurs specifically in those aquifers located in geological provinces characterized by sedimentary formations that are ancient, superficial, of marine origin and evaporite, in which the interaction of groundwater with the geological material produces the higher salt content.

As of the end of 2013, 31 aquifers with the presence of saline soils and brackish water had been identified, mainly located in the Baja California Peninsula and in the Mexican Plateau, which combine conditions of limited precipitation, high indices of solar radiation and thus evaporation, as well as the presence of connate water and easily-dissolved evaporite minerals.

In the same year, saltwater intrusion had occurred in 15 coastal aquifers nationwide, as shown in map M2.9.

M2.9 Aquifers with saltwater intrusion and/or soil salinization and brackish groundwater, 2013

Key	Aquifer
209	Laguna Salada
210	Valle de Mexicali
211	Ensenada
212	Maneadero
219	Camalu
220	Colonia Vicente Guerrero
221	San Quintin
246	San Simon
306	Sato Domingo
323	Los Planes
324	La Paz
332	Mulege
405	Xpujil
502	Cañon del Derramadero
504	Cuatrocienegas-Ocampo
506	El Hundido
508	Paredon
509	La Paila Laguna del Rey-Sierra
520	Mojada
523	Principal-Region Lagunera
524	Acatita
525	Las Delicias
833	Valle de Juarez
848	Laguna de Palomas
1021	Pedriceña-Velardeña
1023	Ceballos
1024	Oriente Aguanaval
1026	Vicente Suarez
1916	Navidad-Potosi-Raices
2402	El Barril
2403	Salinas de Hidalgo
2603	Sonoyta-Puerto Peñasco
2605	Caborca
2619	Costa de Hermosillo
2635	Valle de Guaymas
2636	San Jose de Guaymas
2801	Bajo Rio Bravo
3218	Cedros
3219	El Salvador
3220	Guadalupe Garzaron
3221	Camacho
3222	El Carditos
3223	Corrientes
3226	Chupaderos



- Saltwater intrusion
- Phenomena of soil salinization and brackish groundwater
- Saltwater intrusion and phenomena of soil salinization and brackish groundwater

Source: CONAGUA (2014l).

2.6 Water quality

Monitoring of water quality

[Reporter: Calidad del agua, Sitios fuertemente contaminados, Calidad del agua en playas]

In 2013, the National Monitoring Network had 5 025 sites, distributed throughout the country.

T2.12 Sites in the National Monitoring Network, 2013

Network	Area	Sites (number)
Surface water	Surface water bodies	2 613
Groundwater	Groundwater bodies	1 064
Special studies	Surface water bodies Groundwater bodies	35 0
Coastal	Coastal zones	1 106
Surface water discharges		184
Groundwater discharges		23
Total		5 025

Source: Conagua (2014l).

In addition to the aforementioned physical-chemical and microbiological parameters, biological monitoring has been carried out since 2005 in some regions of the country, which allows water quality to be evaluated, using simple low-cost methods, such as the benthic organism diversity index. The results of these activities as of 2013 are shown in table T2.13.

T2.13 Samples for biological monitoring, 2013

Key	HAR	Number of samples
IV	Balsas	25
IX	North Gulf	6
X	Central Gulf	4
VI	Rio Bravo	28
	Total	63

Source: Conagua (2014l).

The evaluation of water quality is carried out by using three indicators: five-day Biochemical Oxygen Demand (BOD_5), Chemical Oxygen Demand (COD) and Total Suspended Solids (TSS). BOD_5 and COD are used to determine the quantity of organic matter present in water bodies, mainly from municipal and non-municipal wastewater discharges.

Additionally, the increase in COD indicates the presence of substances coming from non-municipal discharges.

TSS originate in wastewater and soil erosion. The increase in the levels of TSS results in the water body losing its capacity to support the diversity of aquatic life. These parameters allow gradients to be identified that vary from a relatively normal condition or with no influence of human activity, to water that shows significant signs of or impacts from municipal and non-municipal wastewater discharges, as well as areas with severe deforestation.

BOD_5 determines the quantity of biodegradable organic matter, whereas COD measures the total quantity of organic matter. The increase in the concentration of these parameters has an impact on the decrease of the dissolved oxygen content in water bodies with the consequent affectation of aquatic ecosystems.

It should be mentioned that the water quality monitoring sites are situated in areas with a high anthropogenic influence. The water quality classification scale is shown in [Additional: T2.D].

The evaluation for 2013 of the water quality indicators was carried out according to the terms established in table T2.14, with the results recorded in the subsequent tables and graphs (maps M2.10, M2.11 and M2.12; tables T2.15, T2.16 and T2.17).

T2.14 Number of monitoring sites with data for each water quality indicator, 2013

Water quality indicator	Number of monitoring sites
Biochemical Oxygen Demand (BOD_5)	2 647
Chemical Oxygen Demand (COD)	2 651
Total Suspended Solids (TSS)	3 616

Source: Conagua (2014l).

According to the results of the water quality evaluations of the three indicators (BOD_5, COD and TSS) applied to the monitoring sites in 2013, it was determined that 260 sites were classified as heavily polluted in one, two or all three of these indicators. These sites are shown in map M2.13 [Additional: T2.E].

M2.10 Water quality: Biochemical Oxygen Demand (BOD_5), 2013

Source: CONAGUA (2014l).

T2.15 Percentage distribution of monitoring sites in surface water bodies by HAR, according to the BOD_5 indicator, 2013

Key	HAR	Excellent	Good quality	Acceptable	Polluted	Heavily polluted
I	Baja California Peninsula	1.2	23.8	34.5	38.1	2.4
II	Northwest	11.8	53.9	31.6	1.3	1.4
III	Northern Pacific	12.5	60.5	26.5	0.5	0.0
IV	Balsas	17.9	17.3	43.9	17.0	3.9
V	Southern Pacific	26.2	39.3	29.5	5.0	0.0
VI	Rio Bravo	46.9	20.3	31.1	1.7	0.0
VII	Central Basins of the North	8.7	65.2	26.1	0.0	0.0
VIII	Lerma-Santiago-Pacific	7.5	26.4	53.4	10.0	2.7
IX	Northern Gulf	64.9	20.2	11.6	2.5	0.8
X	Central Gulf	25.7	36.9	32.5	4.4	0.5
XI	Southern Border	51.1	34.8	12.5	1.6	0.0
XII	Yucatan Peninsula	54.7	35.8	9.5	0.0	0.0
XIII	Waters of the Valley of Mexico	1.5	7.5	55.2	23.9	11.9
	Total	26.2	30.4	34.3	7.5	1.6

Source: CONAGUA (2014l).

M2.11 Water quality: Chemical Oxygen Demand (COD), 2013

Source: CONAGUA (2014l).

T2.16 Percentage distribution of monitoring sites in surface water bodies by HAR, according to the COD indicator, 2013

Key	HAR	Excellent	Good quality	Acceptable	Polluted	Heavily polluted
I	Baja California Peninsula	0.0	7.1	25.0	54.8	13.1
II	Northwest	0.0	7.9	47.4	42.1	2.6
III	Northern Pacific	0.0	2.3	59.1	36.7	1.9
IV	Balsas	1.2	10.3	34.6	40.4	13.5
V	Southern Pacific	0.8	17.2	31.1	41.8	9.1
VI	Rio Bravo	32.1	13.6	37.6	15.7	1.0
VII	Central Basins of the North	0.0	0.0	54.3	43.5	2.2
VIII	Lerma-Santiago-Pacific	0.3	3.1	25.3	63.5	7.8
IX	Northern Gulf	49.4	8.2	18.9	21.0	2.5
X	Central Gulf	13.7	6.8	49.4	27.7	2.4
XI	Southern Border	37.5	21.1	25.4	14.8	1.2
XII	Yucatan Peninsula	28.3	26.4	18.9	26.4	0.0
XIII	Waters of the Valley of Mexico	2.9	3.0	17.9	46.3	29.9
	Total	13.8	8.9	33.2	38.1	6.0

Source: CONAGUA (2014l).

M2.12 Water quality: Total Suspended Solids (TSS), 2013

Source: CONAGUA (2014l).

T2.17 Percentage distribution of monitoring sites in surface water bodies by HAR, according to the TSS indicator, 2013

Key	HAR	Excellent	Good quality	Acceptable	Polluted	Heavily polluted
I	Baja California Peninsula	69.5	21.4	5.7	2.4	1.0
II	Northwest	42.2	36.7	10.2	7.0	3.9
III	Northern Pacific	34.3	39.9	14.9	8.6	2.3
IV	Balsas	34.8	32.0	9.5	16.3	7.4
V	Southern Pacific	32.1	15.5	17.7	24.1	10.6
VI	Rio Bravo	45.4	32.8	12.3	9.2	0.3
VII	Central Basins of the North	37.0	34.8	15.2	4.3	8.7
VIII	Lerma-Santiago-Pacific	34.5	28.4	20.9	12.7	3.5
IX	Northern Gulf	40.8	34.9	16.4	7.2	0.7
X	Central Gulf	60.1	29.4	5.9	4.2	0.4
XI	Southern Border	44.2	28.0	11.6	11.0	5.2
XII	Yucatan Peninsula	76.4	19.6	2.5	1.5	0.0
XIII	Waters of the Valley of Mexico	26.9	43.3	17.9	11.9	0.0
	Total	43.3	29.1	13.4	10.7	3.5

Source: CONAGUA (2014l).

M2.13 Catchments with monitoring sites classified as heavily polluted for BOD_5, COD and/or TSS, 2013

01 Descanso Los Medanos
02 Guadalupe
03 Rio Colorado
04 Rio Mayo 3
05 Rio Juchipilan
06 Salado
07 Rio Turbio
08 Presa El Niagara
09 Rio Lerma 5
10 Lago de Cuitzeo
11 Rio Papagayo 4
12 Rio Quetzala
13 Rio Blanco
14 Rio Necaxa
15 Rio Alto Atoyac
16 Xochimilco
17 Texcoco
18 Ciudad de Mexico
19 Rio Cuautitlan
20 Rio Salado
21 Rio San Juan
22 Rio Toliman

Source: Conagua (2014l).

Groundwater quality

One of the parameters that allows groundwater salinization to be evaluated is the total solids. According to their concentration, groundwater is classified as fresh (<1 000 mg/l), slightly brackish (1 000-2 000 mg/l), brackish (2 000-10 000 mg/l) and saline (>10 000 mg/l). The limit between freshwater and slightly brackish water corresponds to the maximum concentration indicated by the modification of the official Mexican standard NOM-127-SSA1-1994, which "establishes the maximum permissible limits that water should comply with for human consumption and treatment as regards water quality for human consumption".

Water quality on beaches

Through the Clean Beach Program, the cleaning up of beaches and their associated catchments and aquifers is promoted. The finality of the program is to prevent and redress the pollution of Mexico's beaches, respecting the native ecology, making them competitive as well as raising the quality and standard of living of the local population, and increasing tourism.

For the development of the program, clean beach committees have been set up, which are chaired by the President of the municipality and with the active presence of representatives of Semarnat, Profepa, Semar, Sectur, Cofepris and the Conagua, as well as representatives of associations and the private sector.

In order to evaluate water quality on beaches, the bacteriological indicator of *enterococcus faecalis* is used, which is considered the most efficient means of evaluating seawater quality for first-contact recreational use.

Based on the above, the Ministry of Health, in accordance with studies carried out by the World Health Organization (WHO), determined that a level of enterococcus of 200 MLN[8]/100 ml is considered the maximum limit for recreational use.

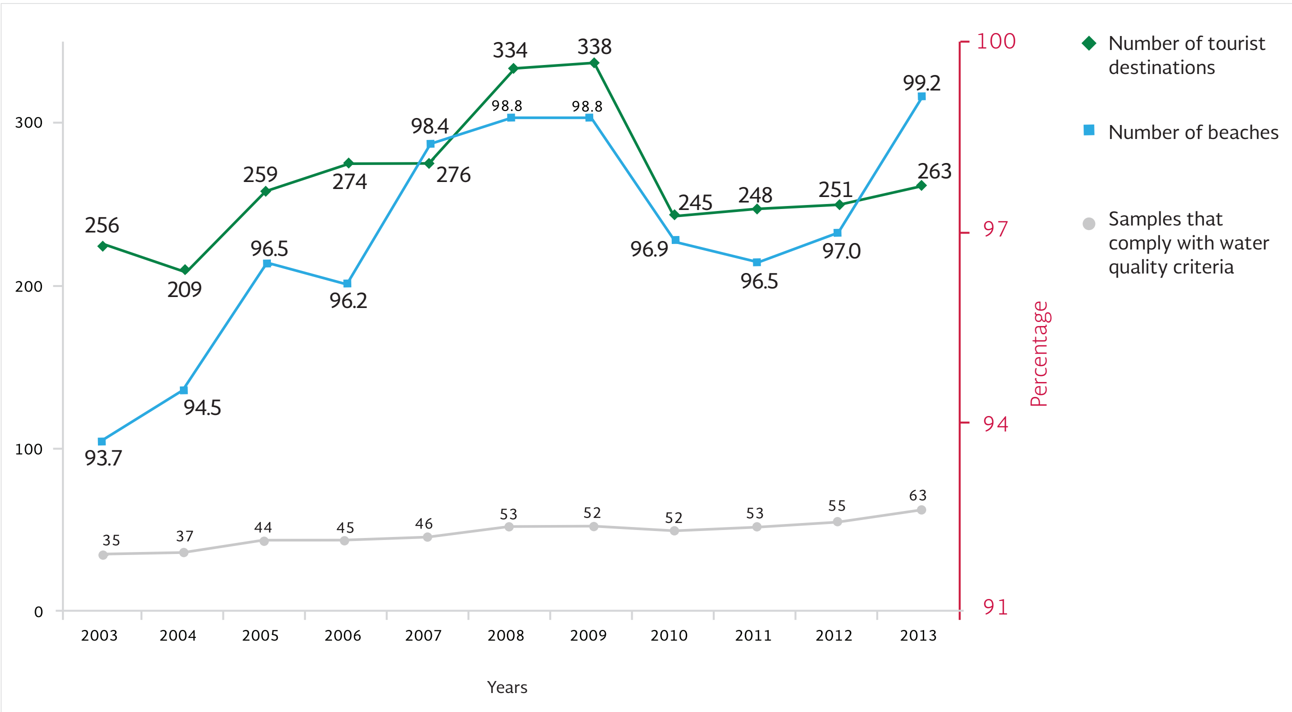
Water quality classification criteria on beaches

- 0-200 MLN/100 ml, the beach is considered SUITABLE for recreational use.
- More than 200 MLN/100 ml, the beach is considered UNSUITABLE for recreational use.

According to the findings in the National Information System on Water Quality on Mexican Beaches, the bacteriological monitoring on beaches, carried out by the Ministry of Health through its state representations and published on the website of Cofepris, water quality on Mexico's beaches tended to improve between 2003 and 2013, as shown in graph G2.7. For 2013, the graph shows the latest data available.

8 MLN (most likely number).

G2.7 Results of the water quality monitoring program on beaches, 2003 to 2013



Source: Produced based on SEMARNAT et al. (2014).

In M2.14, the bacteriological quality on tourist beaches is shown for 2013.

M2.14 Bacteriological water quality in tourist destinations, 2013

Source: Produced based on SEMARNAT et al. (2014).

Chapter 3

Uses of Water

3.1 Classification of uses of water

[Reporter: Usos del agua]

Water is used in different ways in all areas of human activity, be it to meet basic needs or to produce and exchange goods and services.

The Public Registry of Water Duties (Repda) registers the volumes allocated or assigned[1] to the users of the nation's water. The Repda classifies the uses of water into twelve groups. In this chapter, the term grouped use will be used, with the categorization shown in table T3.1, which also distinguishes between offstream and instream uses[2].

Throughout this chapter, the data on volumes allocated for 2013 are those up to December 31, 2013. It should be mentioned that the regionalization of volumes was carried out based on the location of the use as registered in the Repda, rather than the area of registration of the respective deeds.

T3.1 Grouping of uses in the Repda classification

Grouped use	Offstream / Instream	Headings of the Repda classification
Agriculture	Offstream	Agriculture, aquaculture, livestock, multiple uses, other uses
Public supply	Offstream	Domestic, public urban
Self-supplying industry	Offstream	Agro-industry, services, industrial, trade
Energy generation excluding hydropower	Offstream	Industrial
Hydropower	Instream	Hydropower

Source: Produced based on Conagua (2014g).

Graph G3.1 shows the evolution in the volume allocated for offstream uses, in the period from 2004 to 2013. As may be appreciated, 62.8% of the water used for offstream uses comes from surface water sources (rivers, streams and lakes), whereas the remaining 37.2% corresponds to groundwater sources (aquifers).

There are both increases and decreases in the volumes allocated throughout time. Compared to the start of recent statistics (2001), in the year 2013 the volume of surface water allocated was 16.5% higher, whereas the groundwater allocated was 22.5% higher.

1 In the case of volumes destined for public urban or domestic use.

2 Offstream use: The volume of water of a given quality that is "consumed" during the implementation of a specific activity, which is determined as the difference between the volume of a given quality that is withdrawn, minus the volume of a given quality that is discharged, and which is shown in the respective deed (National Water Law)

G3.1 Volume allocated for offstream uses by type of source, 2004-2013 (billions of m³)

Source: Produced based on CONAGUA (2014g).

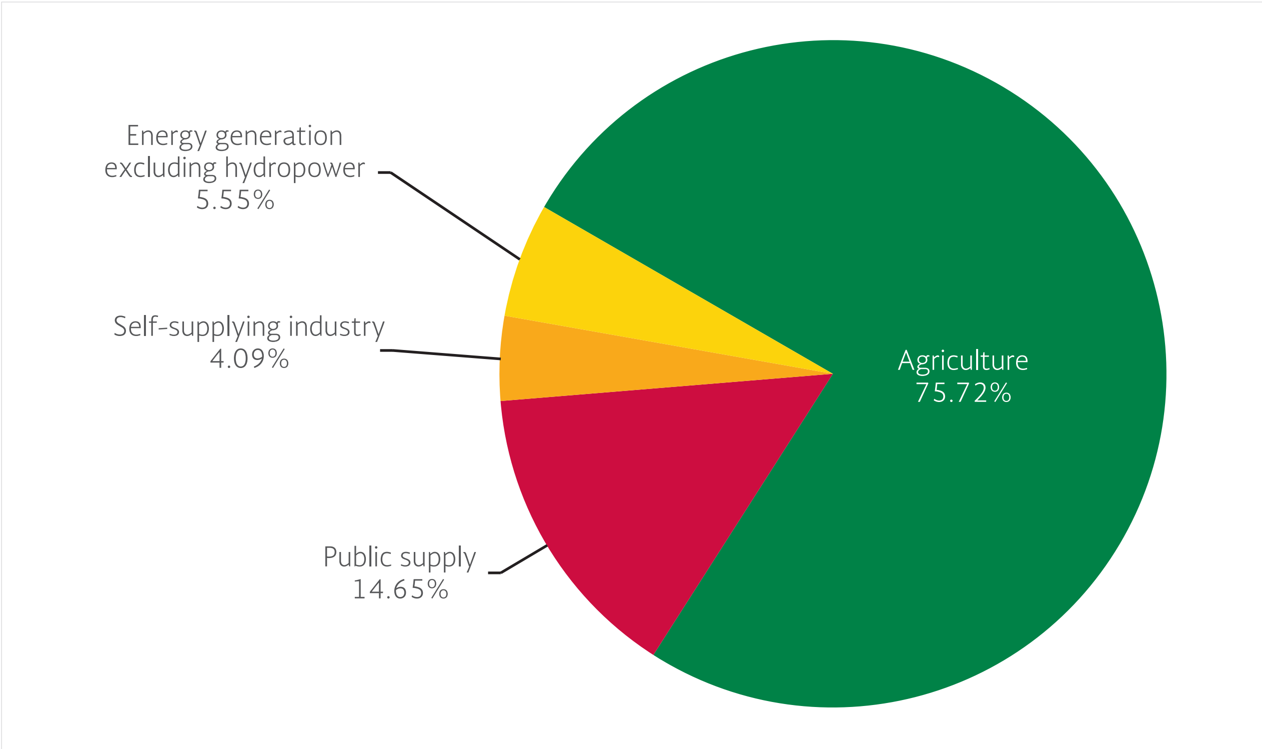
The greatest volume allocated for offstream uses is for the grouped agricultural use, mainly for irrigation, as can be observed in table T3.2 and graph G3.2. It is also important to mention that Mexico is one of the countries with the most substantial irrigation infrastructures in the world (see chapter four).

T3.2 Grouped offstream uses according to the type of source, 2013

Grouped use	Origin		Total volume (billions of m³)	Percentage of withdrawal
	Surface water (billions of m³)	Groundwater (billions of m³)		
Agriculture	41.04	20.78	61.82	75.72
Public supply	4.74	7.22	11.96	14.65
Self-supplying industry	1.41	1.93	3.34	4.09
Energy generation excluding hydropower	4.09	0.44	4.53	5.55
Total	51.28	30.37	81.65	100.00

Source: CONAGUA (2014g).

G3.2 Distribution of the volumes allocated for grouped offstream uses, 2013



Note: Agriculture includes 1.30 km³ of water corresponding to irrigation districts that are awaiting registration.
Source: CONAGUA (2014g).

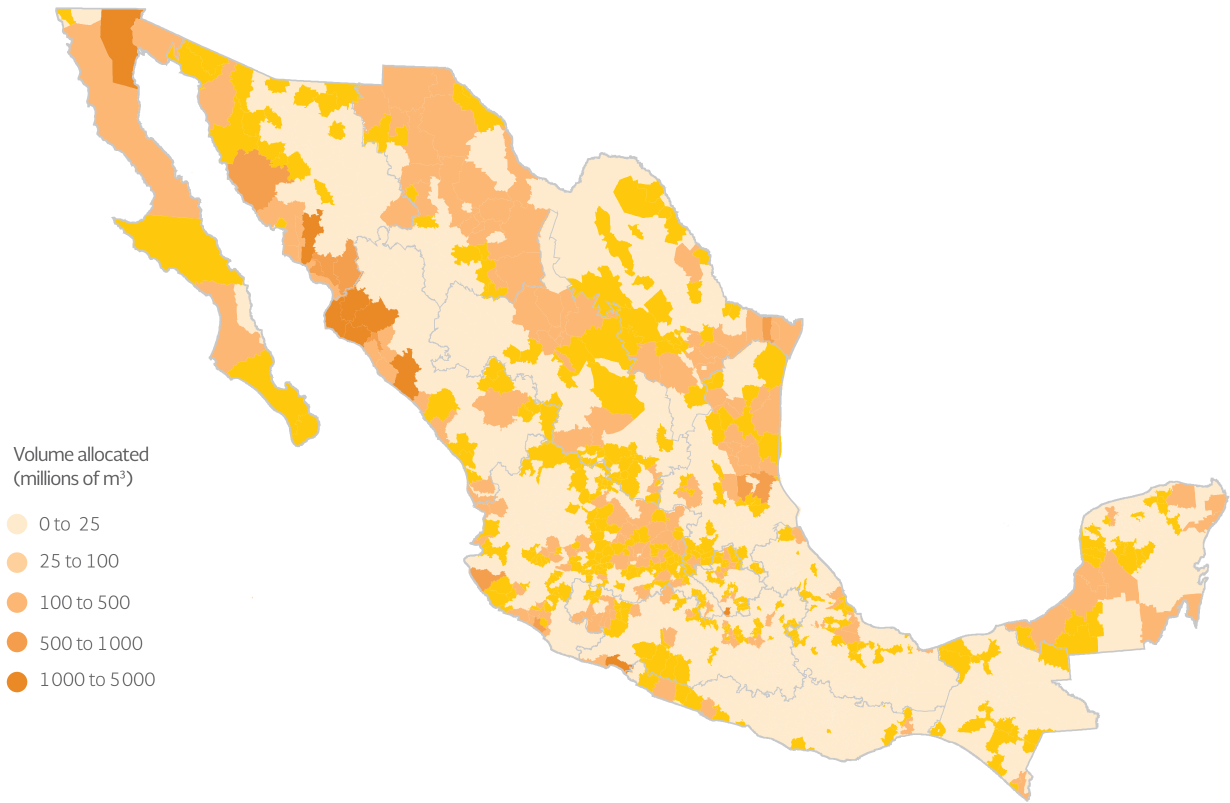
As regards hydropower plants, which represent an instream use of water resources, 112.8 billion cubic meters (km³) of water were used nationwide in 2013. It should be pointed out that, for this use, the same water is used and counted several times, in all the country's plants.

3.2 Distribution of uses throughout Mexico

[Reporter: Usos del agua]

Map M3.1 shows the volume allocated for offstream uses in 2013 by municipality, and map M3.2 identifies the predominant sources. When there is a difference of less than 5% between surface water and groundwater sources, there is no predominant source, and they are referred to as similar sources.

M3.1 Intensity of offstream uses by municipality, 2013



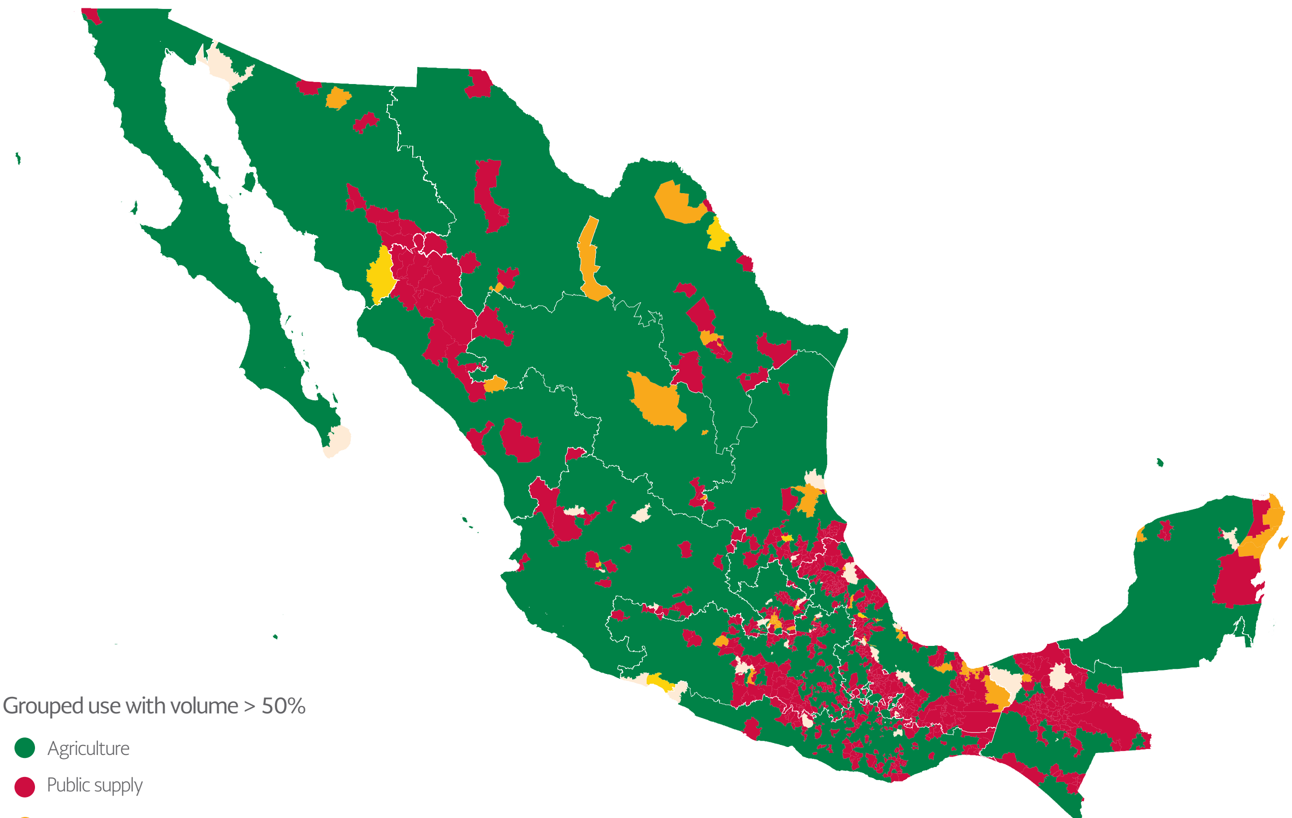
Source: Produced based on CONAGUA (2014g).

M3.2 Predominant source for offstream uses by municipality, 2013

Source: Produced based on CONAGUA (2014g).

In the majority of municipalities in Mexico, the grouped use for agriculture is the dominant one, followed by the grouped use for public supply, as can be observed in map M3.3.

M3.3 Predominant grouped offstream use, by municipality, 2013



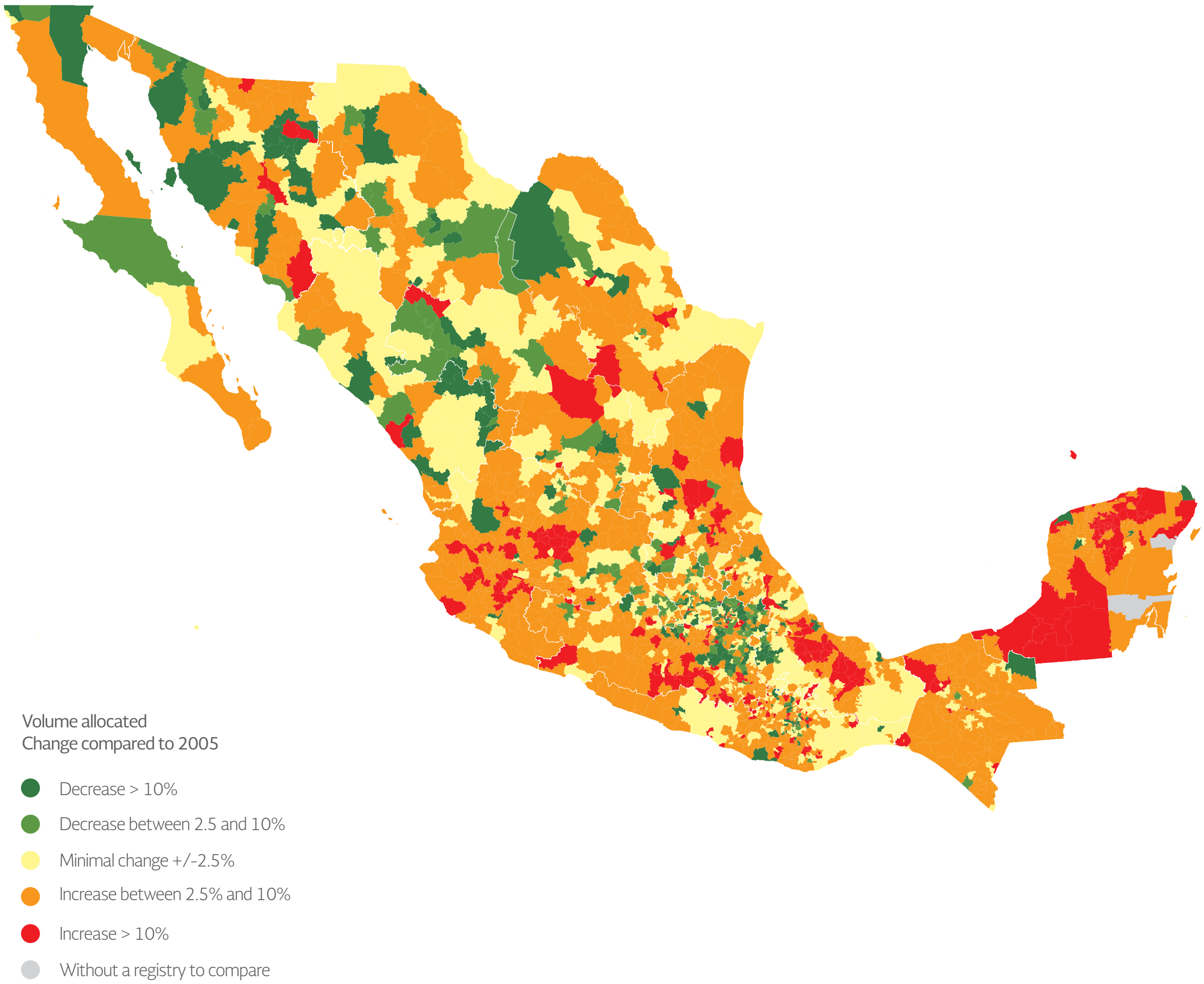
Grouped use with volume > 50%

- Agriculture
- Public supply
- Self-supplying industry
- Energy generation excluding hydropower
- No volume allocated or assigned

Source: Produced based on CONAGUA (2014g).

The distribution of uses can also be visualized over time according to the evolution of volumes. Map M3.4 compares the volume allocated or assigned by municipality in 2013 compared to the volume in 2005, in order to indicate if it increased or decreased.

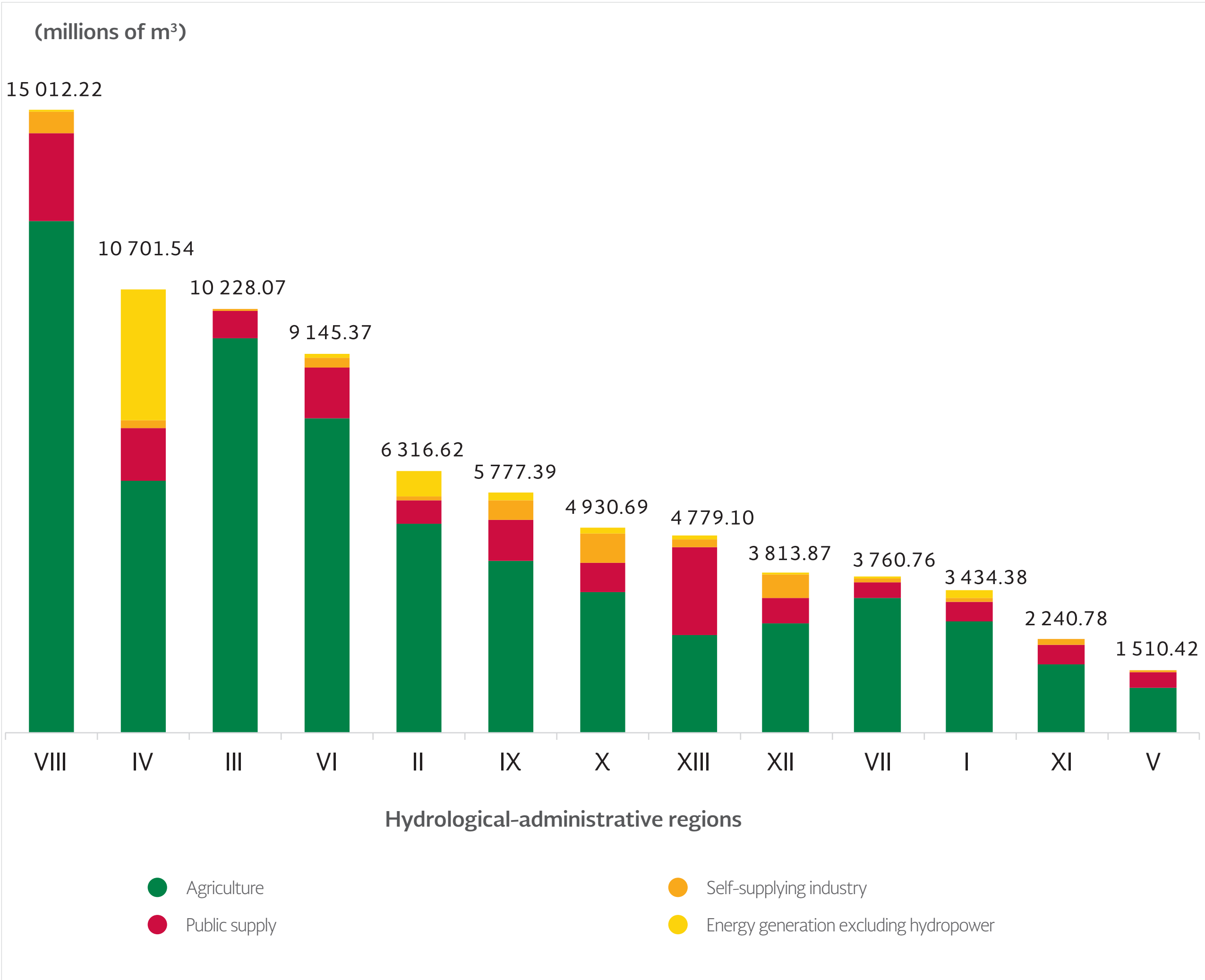
M3.4 Evolution in offstream uses by municipality, comparison 2005-2013



Source: Produced based on Conagua (2014g).

Graph G3.3 and [Additional: T3.A] show how volumes of water have been allocated for grouped offstream uses throughout the country. The HARs with the greatest allocation of water are as follows: VIII Lerma-Santiago-Pacific, IV Balsas, III Northern Pacific and VI Rio Bravo. It is worth noting that agricultural use is above 80% of the total allocations in these HARs, with the exception of IV Balsas, where the Petacalco thermoelectric plant, located near the estuary of the Balsas river, uses a significant volume of water.

G3.3 Volumes allocated for grouped offstream uses, 2013



Source: Produced based on Conagua (2014g).

Table T3.3 and [Additional: G3.A] show the information on the volumes of water allocated by state, among which Sinaloa and Sonora stand out, due to their large areas under irrigation.

T3.3 Volumes allocated by grouped offstream uses, by state, 2013 (hm³)

Key	State	Volumen allocated	Agriculture	Public supply	Self-supplying-industry	Electricity excluding hydropower
01	Aguascalientes	618.4	481.8	122.0	14.6	0.0
02	Baja California	2 541.1	2 079.6	184.4	81.9	195.3
03	Baja California Sur	409.9	333.8	61.7	13.8	0.6
04	Campeche	1 194.9	1 021.6	145.8	27.5	0.0
05	Coahuila de Zaragoza	2 033.0	1 642.8	240.1	75.2	74.9
06	Colima	1 751.2	1 634.9	88.7	27.6	0.0
07	Chiapas	1 799.2	1 477.3	284.7	37.3	0.0
08	Chihuahua	4 792.1	4 220.9	489.7	53.9	27.5
09	Distrito Federal	1 122.8	1.2	1 089.6	32.0	0.0
10	Durango	1 510.2	1 327.8	153.2	17.6	11.5
11	Guanajuato	3 986.5	3 351.4	545.9	68.6	20.5
12	Guerrero	4 417.3	882.9	384.8	27.5	3 122.1
13	Hidalgo	2 399.4	2 107.4	176.5	32.9	82.6
14	Jalisco	4 614.9	3 661.4	751.6	201.8	0.1
15	Mexico	2 701.4	1 150.0	1 344.2	176.6	30.6
16	Michoacan de Ocampo	5 257.6	4 702.4	370.8	136.3	48.2
17	Morelos	1 321.7	983.1	290.0	48.7	0.0
18	Nayarit	1 255.9	1 081.7	113.2	61.0	0.0
19	Nuevo Leon	2 067.3	1 472.1	511.9	83.3	0.0
20	Oaxaca	1 262.8	969.8	258.5	34.4	0.0
21	Puebla	2 114.7	1 608.1	427.9	72.2	6.5
22	Queretaro	945.8	577.1	303.9	59.1	5.7
23	Quintana Roo	901.5	207.1	189.1	505.3	0.0
24	San Luis Potosi	2 039.5	1 228.9	653.1	31.4	126.1
25	Sinaloa	9 057.3	8 505.5	509.3	42.5	0.0
26	Sonora	6 612.0	5 137.4	764.3	119.6	590.6
27	Tabasco	404.8	155.1	182.0	67.7	0.0
28	Tamaulipas	4 131.4	3 642.8	319.0	115.5	54.0
29	Tlaxcala	265.0	158.6	89.3	17.0	0.0
30	Veracruz de Ignacio de la Llave	4 870.3	3 234.9	545.8	966.5	123.2
31	Yucatan	1 717.4	1 414.5	253.2	40.6	9.1
32	Zacatecas	1 533.8	1 368.6	117.2	48.0	0.0
	Total	**81 651.2**	**61 822.7**	**11 961.5**	**3 337.9**	**4 529.1**

Source: Conagua (2014g).

3.3 Grouped agricultural use

[Reporter: Usos del agua]

The largest user of water in Mexico is agriculture. According to the VII Agricultural, Livestock and Forest Census 2007 (the latest one available nationwide), the surface area in agricultural production units was 30.2 million hectares, of which 18% was for irrigation and the remainder was rainfed.

The area harvested every year (considering the agricultural year and perennial crops, under both irrigated and rainfed regimes) has varied between 21.8 and 22.1 million hectares during the period 2008-2012[3]. Every year the area harvested in this same period and configuration (considering the agricultural year and perennial crops, under both irrigated and rainfed regimes) varied between 18.1 and 20.5 million hectares per year[4]. At constant 2008 prices, the contribution of the agriculture, livestock, forest use, fishing and hunting sector to the GDP was 3% in 2013[5].

According to the National Inquiry of Occupation and Employment (Enoe), the population occupied in this primary sector activity (agriculture, livestock, forest use, fishing and hunting) up to the fourth trimester of 2013 was 7.0 million people, which represents 13.9% of the economically active population[6].

The yield in tons per hectare of irrigation agriculture is 2.2 to 3.3 times higher than in areas under a rainfed regime (see chapter 4).

Mexico is in sixth place worldwide in terms of the area with irrigation infrastructure, with 6.4 million hectares, of which 54% corresponds to 85 irrigation districts and the remainder to more than 39 000 irrigation units (see glossary).

Of the water allocated for the grouped use for agriculture, 33.6% is of groundwater origin, as can be observed in graph G3.4. Taking into account that there are annual variations, this value is 22.7% higher than in 2001, the reference year of the series.

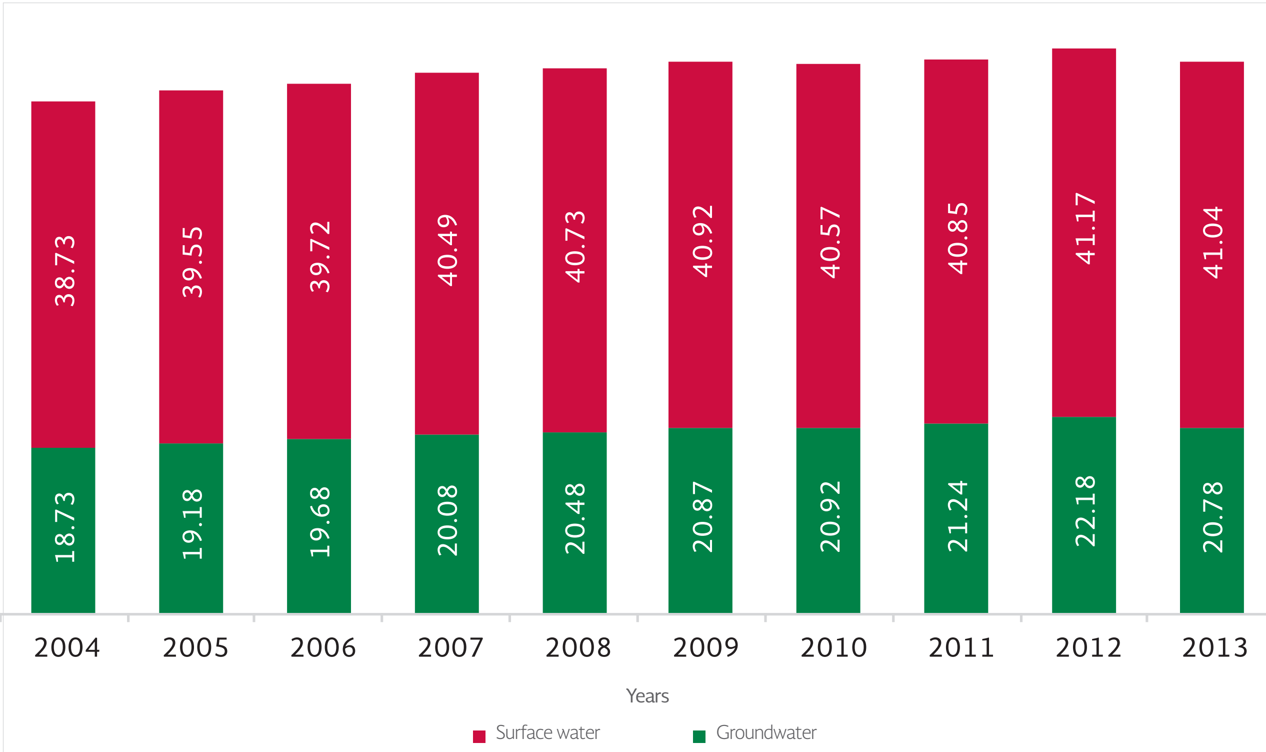
3 SIAP (2014).

4 *Idem*.

5 Inegi (2014l).

6 Inegi (2014f).

G3.4 Evolution in the volume allocated for grouped use for agriculture by type of source, 2004-2013 (billions of m³)



Source: Produced based on CONAGUA (2014g).

3.4 GROUPED USE FOR PUBLIC SUPPLY

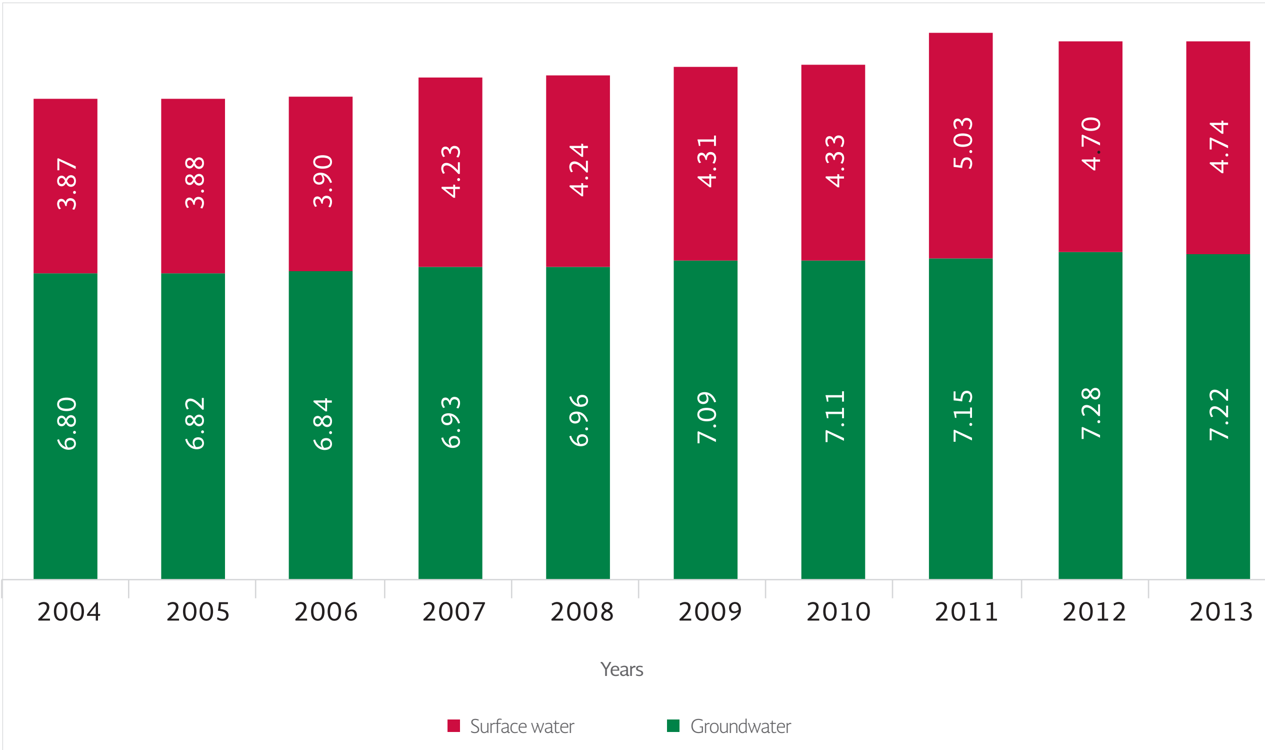
[Reporter: Usos del agua]

The grouped use for public supply consists of the water delivered through drinking water networks, which supply domestic users (homes), as well as different industries and services.

Having access to water in sufficient quantity and quality for human consumption is one of the basic needs of the population, since it has a direct influence on their health and general wellbeing. This characteristic is recognized by the guiding tools for national planning: the 2013-2018 National Development Plan and the 2014-2018 National Water Program.

In the grouped use for public supply, the predominant source is groundwater, with 60.4% of the volume, as can be appreciated in graph G3.5. It is worth noting that between 2001 and 2013, the surface water allocated for this use increased by 43.4%.

G3.4 Evolution in the volume allocated for grouped use for public supply by type of source, 2004-2013 (billions of m³)



Source: Produced based on CONAGUA (2014g).

In Mexico, drinking water services, sanitation, sewerage, wastewater treatment and disposal are under the responsibility of the municipalities, generally speaking through water utilities.

3.5 GROUPED USE FOR SELF-SUPPLYING INDUSTRY

[Reporter: Usos del agua]

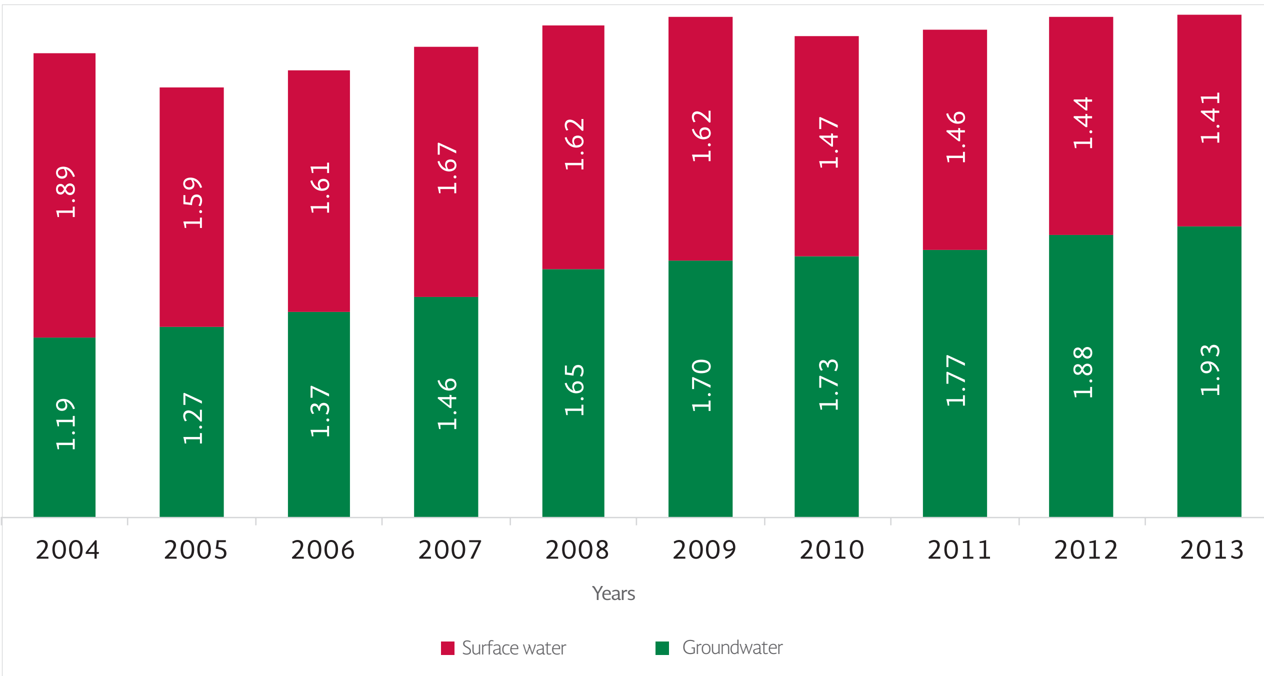
This heading includes the industry that takes its water directly from the country's rivers, streams, lakes or aquifers.

According to the North American Industrial Classification System (NAICS), secondary activities, known as "industry", are made up of the mining, electricity, water and piped gas supply sectors to end users, as well as construction and the manufacturing industry[7]. It should be added that the classification of uses in the REPDA does not exactly follow this classification, although it is considered that there is a reasonable degree of correlation.

7 INEGI (2013c).

Even though it only represents 4.0% of the total use of water, the grouped use for self-supplying industry presents a strong growth trend, as shown in graph G3.6. It should be mentioned that between 2001 and 2013, from a situation of predominant use of surface water, groundwater gained importance until it was predominant, with a growth of 59.2% in the volume allocated from that source.

G3.6 Evolution in the volume allocated for the grouped use for self-supplying industry by type of source, 2004-2013 (billions of m³)



Source: Produced based on Conagua (2014g).

3.6 Use in energy generation excluding hydropower

[Reporter: Usos del agua, Generación de energía]

The water included under this heading refers to that used in dual steam, coal-electric, combined cycle, turbo-gas and internal combustion plants.

According to the findings of the Ministry of Energy (Sener), in 2013 the plants of the Federal Commission for Electricity (CFE) considered in this use, including External Energy Producers (EEPs) for public service, generated 230.4 TWh, which represented 89% of the total of electricity produced in Mexico[8]. The corresponding plants have an installed capacity of 41 513 MW, or 78.3% of Mexico's total capacity[9]. It should be noted that 68.9% of the water allocated for this use correspond to the coal-electric plant in Petacalco, situated on the Guerrero coast, close to the estuary of the Balsas river.

8 Excluding generation by concessionaires, co-generation and self-supply (sener, 2014).

9 *Idem.*

Table T3.4 shows the annual evolution in this use in the period from 2004 to 2013. Both in this table and in table T3.6, co-generators and self-suppliers of electricity are not included, but CFE is considered, as well as EEPs, -also known as Independent Power Producers (IPPs) and which do not generate through hydropower plants-, as well as in the years relevant for the now defunct Luz y Fuerza del Centro.

T3.4 Gross generation and effective energy generation capacity, excluding hydropower, in Mexico, 2004-2013

Parameter/Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Gross generation of energy (excluding hydropower) (TWh)	181.9	189.5	193.3	203.9	195.2	207.0	204.8	222.1	229.2	230.4
Total gross generation of energy (TWh)	207.0	217.2	223.6	230.9	234.1	233.5	241.5	257.9	260.5	257.9
Percentage compared to the total gross generation	87.9%	87.3%	86.4%	88.3%	83.4%	88.7%	84.8%	86.1%	88.0%	89.4%
Effective generation capacity (excluding hydropower) (MW)	36 021	35 998	38 202	39 685	39 762	40 303	41 442	41 012	41 570	41 513
Total effective installed generation capacity (MW)	46 552	46 534	48 769	51 029	51 105	51 686	52 945	52 512	53 114	53 022
Percentage compared to the total effective capacity	77.4%	77.4%	78.3%	77.8%	77.8%	78.0%	78.3%	78.1%	78.3%	78.3%

Source: Sener (2014).

Use in hydropower plants

[Reporter: Usos del agua, Generación de energía. Volúmenes declarados]

Nationwide, the HARs XI Southern Border and IV Balsas are those which have the greatest allocation of water for this use, since they are home to the rivers with the heaviest flows and consequently the country's largest hydropower plants, as shown in table T3.5. The volume allocated for this use nationwide is 168 billion cubic meters[10], of which variable quantities are used every year.

In 2013, hydropower plants used 112.8 billion cubic meters of water, which allowed 27.4 TWh of electricity to be generated, corresponding to 10.6% of Mexico's total generation[11]. The installed capacity in hydropower plants is 11 509 MW, which corresponds to 21.7% of Mexico's installed capacity[12] (see tables T3.5 and T3.6).

T3.5 Volumes declared for the payment of duties for hydropower production, 2004-2013

Key	Volume of water declared (cubic hectometers, hm^3)										
	HAR	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
I	Baja California Peninsula	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
II	Northwest	1 013.7	3 250.8	2 928.6	3 350.7	3 404.7	3 127.7	4 140.6	3 416.5	3 032.7	2 627.2
III	Northern Pacific	7 284.1	11 598.4	10 747.0	11 183.9	13 216.7	11 405.1	11 912.1	11 100.3	5 176.6	6 127.9
IV	Balsas	35 207.1	32 141.0	21 820.3	31 099.4	30 572.8	28 059.6	34 487.9	35 539.9	32 177.7	28 126.2
V	Southern Pacific	2 049.1	1 890.3	1 949.1	2 139.6	2 244.7	2 063.4	3 528.0	16 313.8	2 028.2	1 716.9
VI	Rio Bravo	461.6	2 073.6	2 262.7	2 889.6	1 967.7	2 960.4	2 987.7	3 350.1	3 771.8	2 556.8
VII	Central Basins of the North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VIII	Lerma-Santiago-Pacific	10 417.5	7 361.0	4 657.8	10 516.6	13 516.9	9 030.9	11 764.6	7 741.4	5 733.5	5 598.0
IX	Northern Gulf	1 597.9	1 487.8	809.7	1 105.3	2 912.1	1 441.0	1 525.9	1 243.0	1 312.4	1 273.5
X	Central Gulf	16 042.6	13 978.5	17 835.0	14 279.1	14 040.5	13 673.7	15 029.1	4 254.6	17 286.7	16 463.1
XI	Southern Border	36 453.6	41 573.3	77 245.7	46 256.8	68 793.3	64 304.7	49 406.9	81 813.4	85 197.3	48 325.9
XII	Yucatan Peninsula	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
XIII	Waters of the Valley of Mexico	53.8	31.0	39.1	10.6	0.0	18.8	0.5	0.0	0.0	0.3
	Total	110 581.1	115 385.8	140 294.9	122 831.6	150 669.4	136 085.3	134 783.3	164 773.0	155 716.9	112 815.9

Source: Conagua (2014g).

10 Conagua (2014g).

11 *Idem.*

12 *Idem.*

T3.6 Gross generation and effective hydropower generation capacity in Mexico, 2004-2013

Parameter/year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Gross hydropower generation (TWh)	25.1	27.6	30.3	27.0	38.9	26.4	36.7	35.8	31.3	27.4
Gross total generation of energy (TWh)	207.0	217.2	223.6	230.9	234.1	233.5	241.5	257.9	260.5	257.9
Percentage compared to the gross total generation	12.1%	12.7%	13.6%	11.7%	16.6%	11.3%	15.2%	13.9%	12.0%	10.6%
Effective hydropower generation capacity (MW)	10 530	10 536	10 566	11 343	11 343	11 383	11 503	11 499	11 544	11 509
Total effective generation capacity installed	46 552	46 534	48 769	51 029	51 105	51 686	52 945	52 512	53 114	53 022
Percentage compared to the total effective	22.6%	22.6%	21.7%	22.2%	22.2%	22.0%	21.7%	21.9%	21.7%	21.7%

Source: Sener (2014).

3.8 Degree of water stress

[Reportear: Grado de presión, Usos del agua, Agua renovable]

The percentage of water used for offstream uses as compared to the renewable water resources is an indicator of the degree of water stress in any given country, catchment or region. The degree of water stress can be very high, high, medium, low and with no stress. It is considered that if the percentage is greater than 40%, there is a high or very high degree of water stress (see the scale and formula on map M3.5).

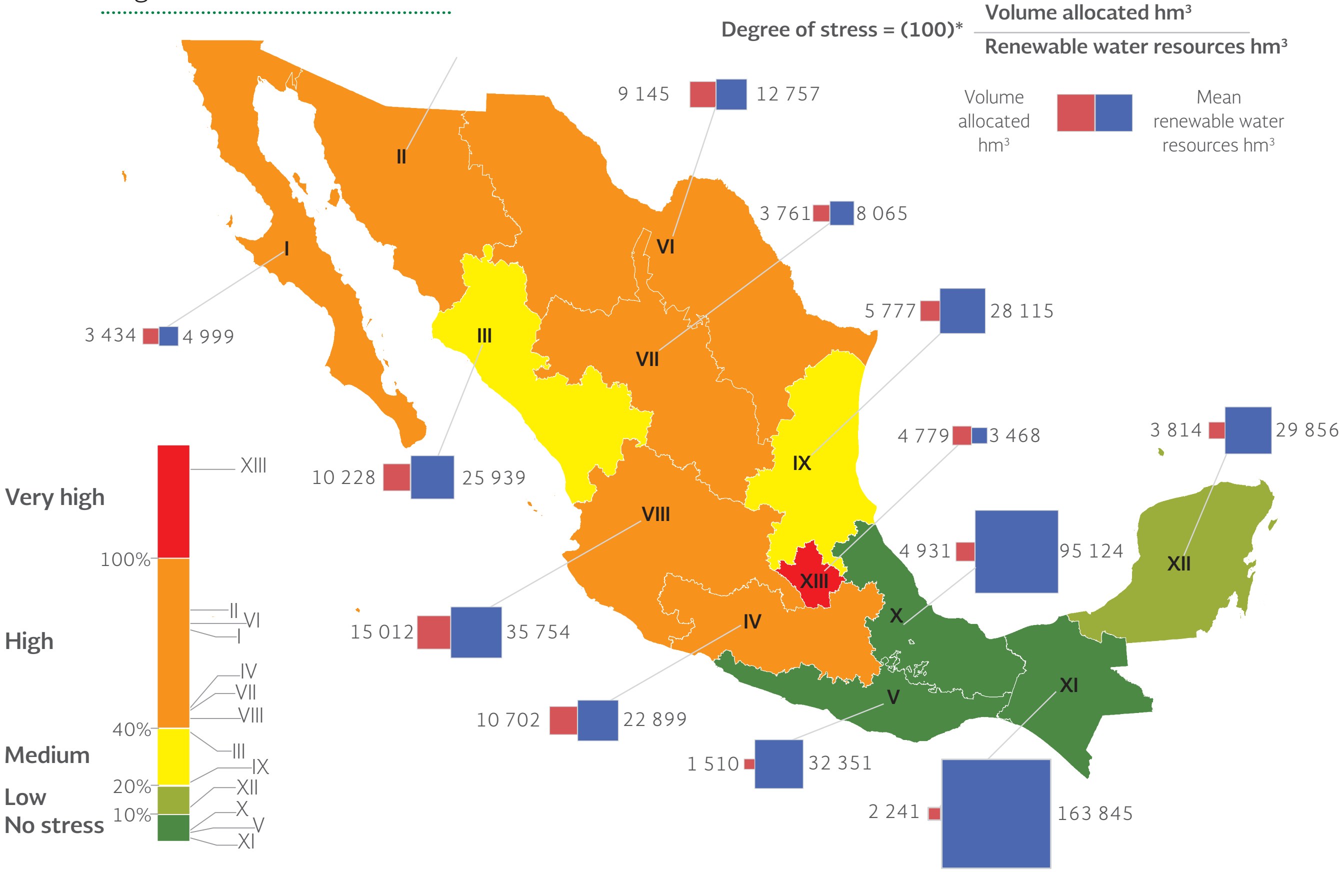
Nationwide, Mexico is experiencing a degree of water stress of 17.3%, which is considered moderate; however, the central, northern and northwestern areas of the country are experiencing a high degree of water stress. In table T3.7 and map M3.5, this indicator is shown for each of the country's HARs. It should be mentioned that the reference calculation of renewable water resources is employed, from 2011.

T3.7 Degree of water stress by HAR, 2011 (reference) and 2013

Key	HAR	Total volume of water allocated (hm³)	Renewable water resources 2011(hm³/year)	Degree of water stress (%)	Classification of water stress
I	Baja California Peninsula	3 434	4 999	68.7	High
II	Northwest	6 317	8 325	75.9	High
III	Northern Pacific	10 228	25 939	39.4	Medium
IV	Balsas	10 702	22 899	46.7	High
V	Southern Pacific	1 510	32 351	4.7	No stress
VI	Rio Bravo	9 145	12 757	71.7	High
VII	Central Basins of the North	3 761	8 065	46.6	High
VIII	Lerma-Santiago-Pacific	15 012	35 754	42.0	High
IX	Northern Gulf	5 777	28 115	20.5	Medium
X	Central Gulf	4 931	95 124	5.2	No stress
XI	Southern Border	2 241	163 845	1.4	No stress
XII	Yucatan Peninsula	3 814	29 856	12.8	Low
XIII	Waters of the Valley of Mexico	4 779	3 468	137.8	Very high
	Total	81 651	471 498	17.3	Low

Source: Produced based on CONAGUA (2014g), CONAGUA (2014l).

M3.5 Degree of water stress, 2013



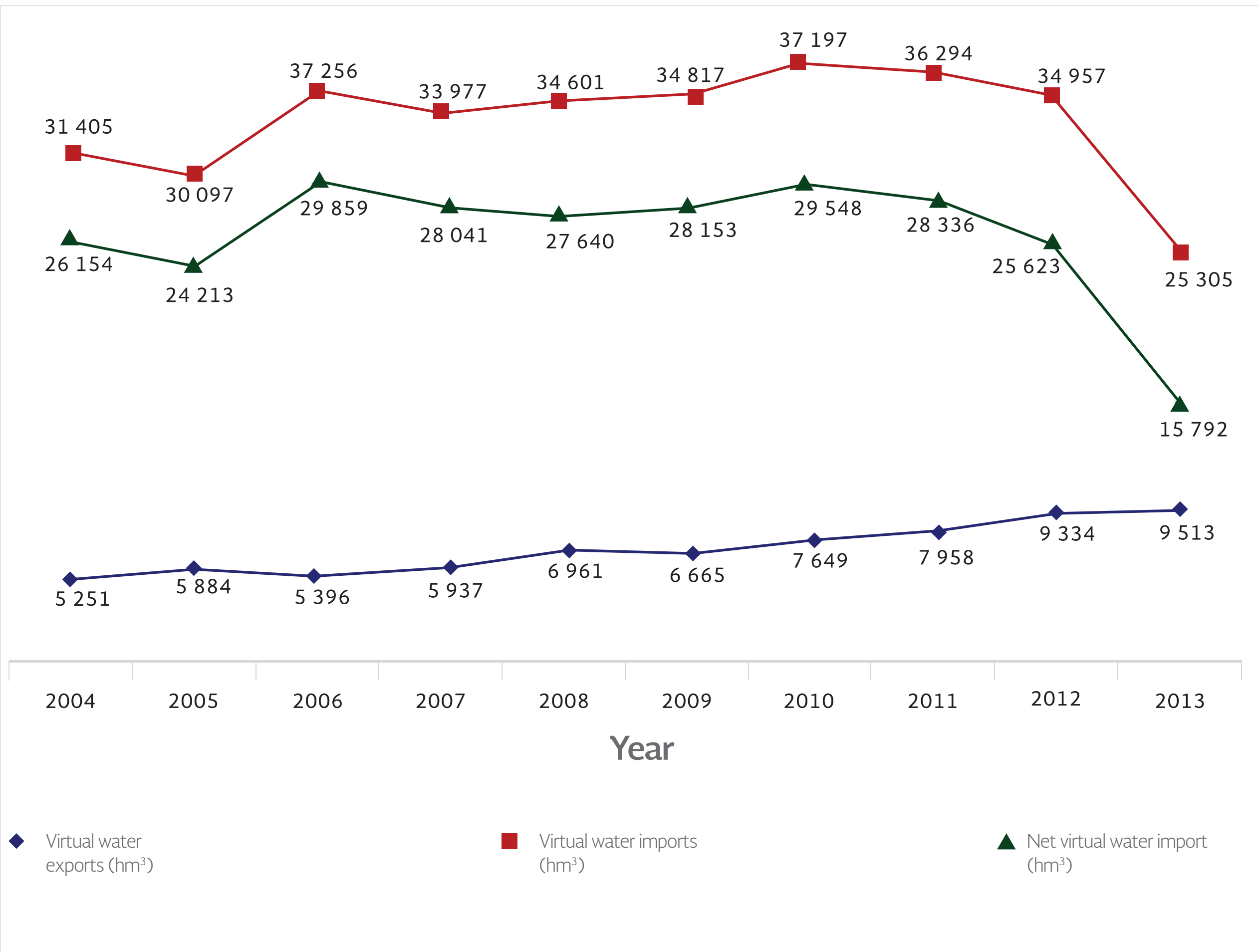
Source: Produced based on CONAGUA (2014g), CONAGUA (2014l).

3.9 Virtual water in Mexico

[Reporter: Agua virtual / Huella hídrica]

Virtual water is defined as the total quantity of water used by or embedded in a product, good or service. For example, one kilogram of wheat in Mexico requires an average of 1 000 liters of water, whereas a kilogram of beef requires 13 500 liters; these values vary between countries. As a result of Mexico's commercial exchanges with other countries, in 2013 Mexico exported 9 513 million cubic meters (VWE), and imported 25 305 (VWI), meaning that it had a net virtual water import of 15 792 million cubic meters of water (NVWI). In graph G3.7 and [Additional: T3.B], the evolution in the period from 2004-2013 is shown.

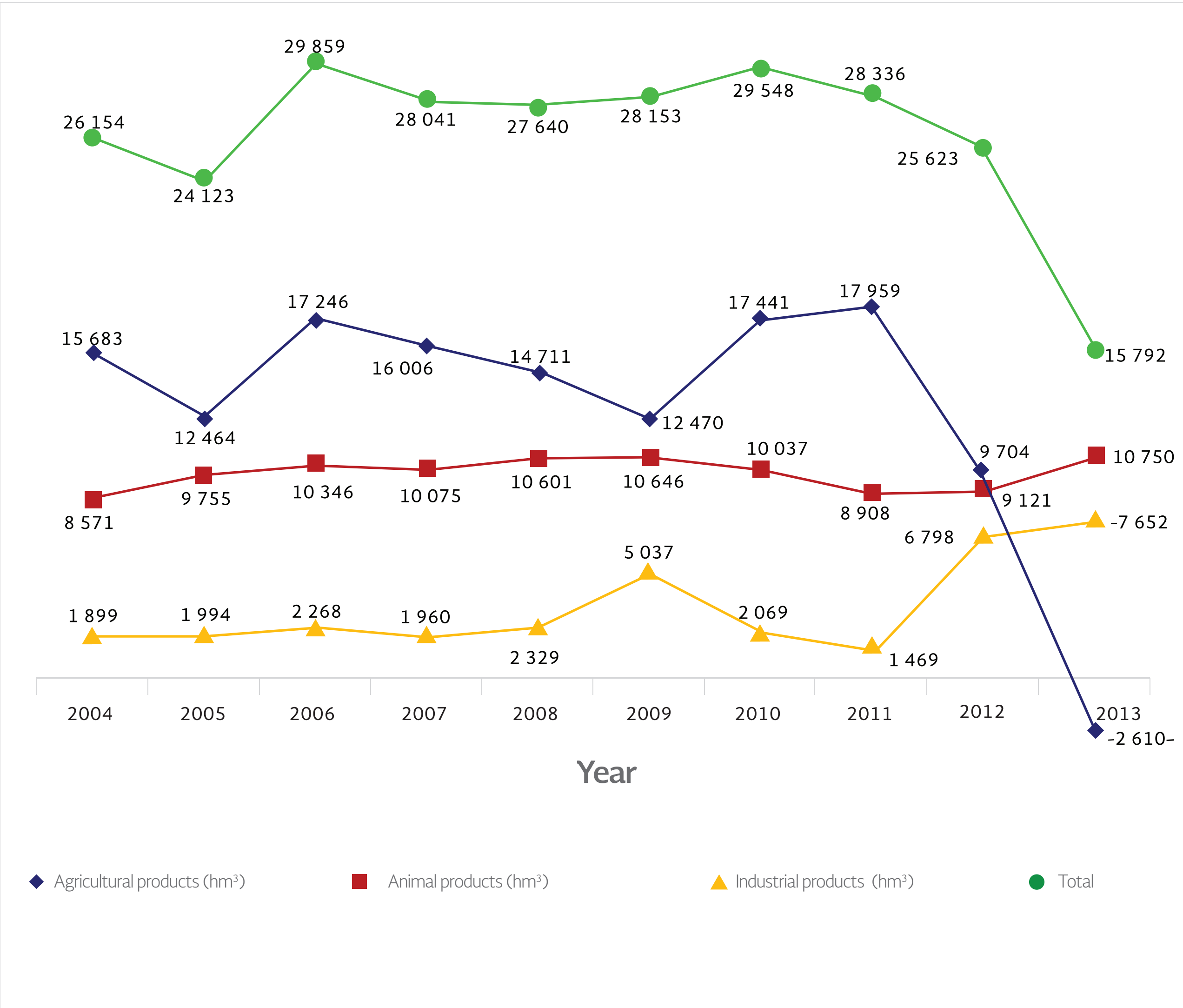
G3.7 Virtual water imports and exports in Mexico 2004-2013 (millions of m³)



Source: Produced based on Economia (2014).

Of the resulting net virtual water import (NVWI), the evolution registered in recent years shows that from being a country that imports virtual water in agricultural products, Mexico is now an exporter (the import with a negative symbol in graph G3.8). In the period from 2012 to 2013, the net virtual water import on the one hand was reduced 38% in total, whereas the import related to animal and industrial products increased by 18% and 13% respectively.

G3.8 Net virtual water import 2004-2013 (millions of m³)



Source: Produced based on Economia (2014).

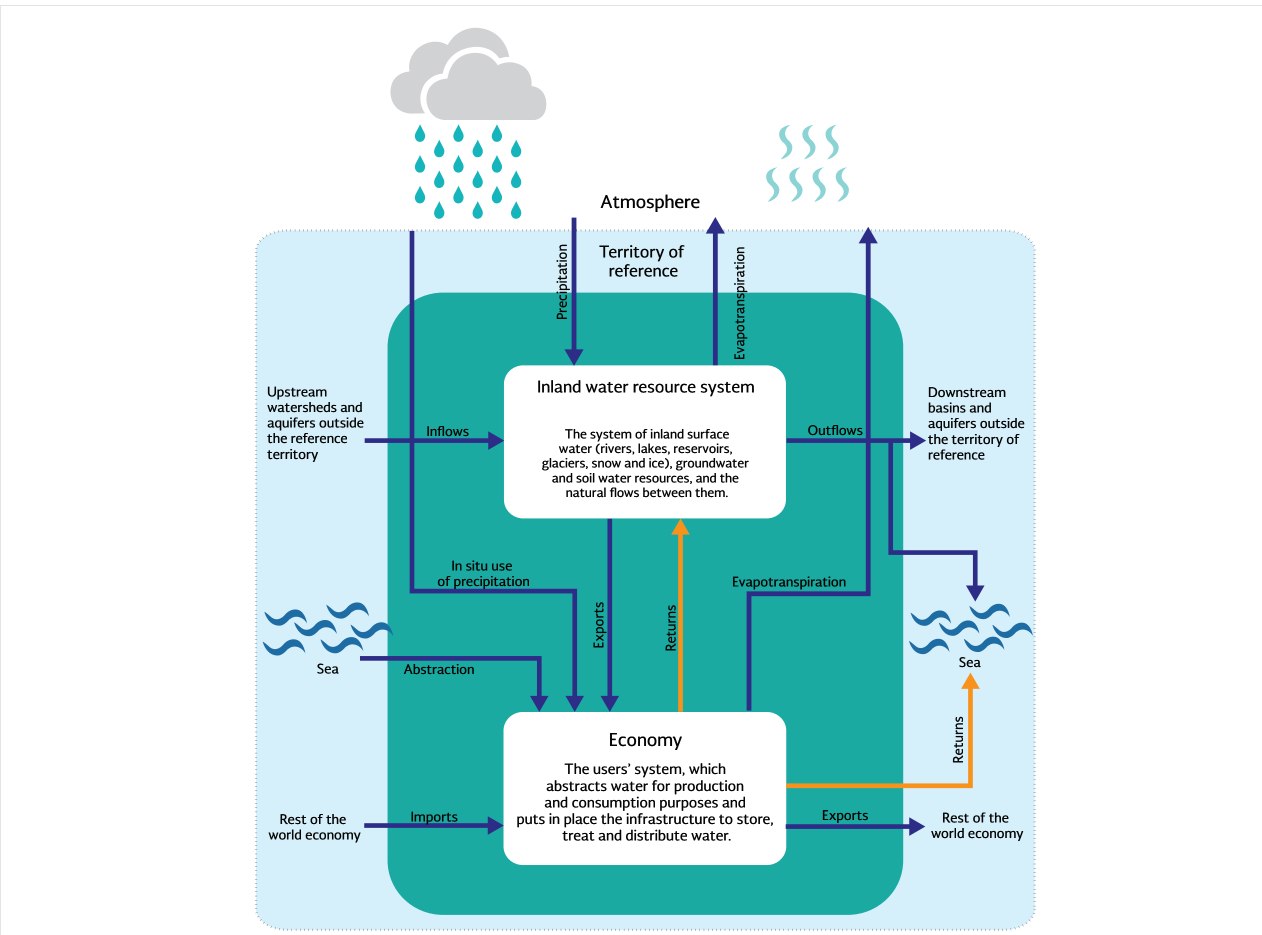
R3.1 Water accounts in Mexico

[Reporter: Reúso de aguas residuales]

Through international collaboration, the System of Environmental-Economic Accounting (SEEA) has been developed, as a series of tables, accounting rules, classifications, definitions and standard concepts, the objective of which is to produce comparable statistics at the international level about the environment and its relationship with the economy. It follows an accounting structure similar to the System of National Accounts in order to facilitate the integration of environmental and economic statistics.

The SEEA is thus a system to organize statistical data and integrate coherent indicators and descriptive statistics in order to monitor the interactions between the economy and the environment, so as to thus be able to provide critical information to inform decision making.

At the moment the SEEA consists of a central framework and specific subsystems for the resources and sectors of energy, water, fishing, land and ecosystems and agriculture. These subsystems are completely consistent with the SEEA but provide greater details on specific topics. Below is the general scheme of flows between the economy and water, employing the standard SEEA terminology.



Source: INEGI (2014m), UNSTATS (2012), UNSTATS (2014).

In Mexico the INEGI leads the inter-institutional effort to put together Mexico's Economic and Ecological Accounts, part of which are the integrated Environmental and Economic Accounts on Water.

Chapter 4

Water infrastructure

4.1 Mexico's water infrastructure

The water infrastructure available within the country to provide the water required by the various national users includes the following:

5 163 reservoirs and water retention berms.[1]

6.4 million hectares with irrigation.

2.9 million hectares with technified rainfed infrastructure.

742 drinking water treatment plants in operation.

2 287 municipal wastewater treatment plants in operation.

2 617 industrial wastewater treatment plants in operation.

3 000 km of aqueducts.

R4.1 Main projects

- **Monterrey VI:** 372 km aqueduct to supply 5 m^3/s to Monterrey.
- **Tabasco Hydrological Project (PROHTAB):** Flood protection for the population of Tabasco.
- **El Realito:** 50 hm^3 reservoir and 133 km aqueduct to supply San Luis Potosi and Celaya.
- **Sanitation of the Valley of Mexico:** Atotonilco wastewater treatment plant (35 m^3/s) and El Caracol (2 m^3/s in stage 1); Eastern Drainage Tunnel (TEO) for 150 m^3/s, Western Drainage Tunnel II for 112 m^3/s and Canal General Tunnel for 20 m^3/s.
- **Rehabilitation and integral modernization of the Cutzamala System.**
- **El Zapotillo:** Reservoir and 140 km aqueduct to supply Guadalajara, Leon and Los Altos de Jalisco.
- **Agua Futura:** Supply projects for Victoria de Durango and Comarca Lagunera.
- **Ensenada:** Desalinization plant with a flow of 0.250 m^3/s.
- **El Purgatorio:** Reservoir and infrastructure to make use of 5.6 m^3/s in conjunction with El Zapotillo to supply the Guadalajara metropolitan area.
- **Chapultepec:** 34 km aqueduct and 1.25 m^3/s to supply Acapulco.
- **Chicbul-Ciudad del Carmen:** Parallel 120 km aqueduct to supply Ciudad del Carmen.
- **Sanitation of Guadalajara:** Agua Prieta treatment plant for 8.5 m^3/s and other infrastructure.

Source: Produced based on Conagua (2014p).

1 An approximate number, due to the insufficient registry of berms.

4.2 Reservoirs and berms

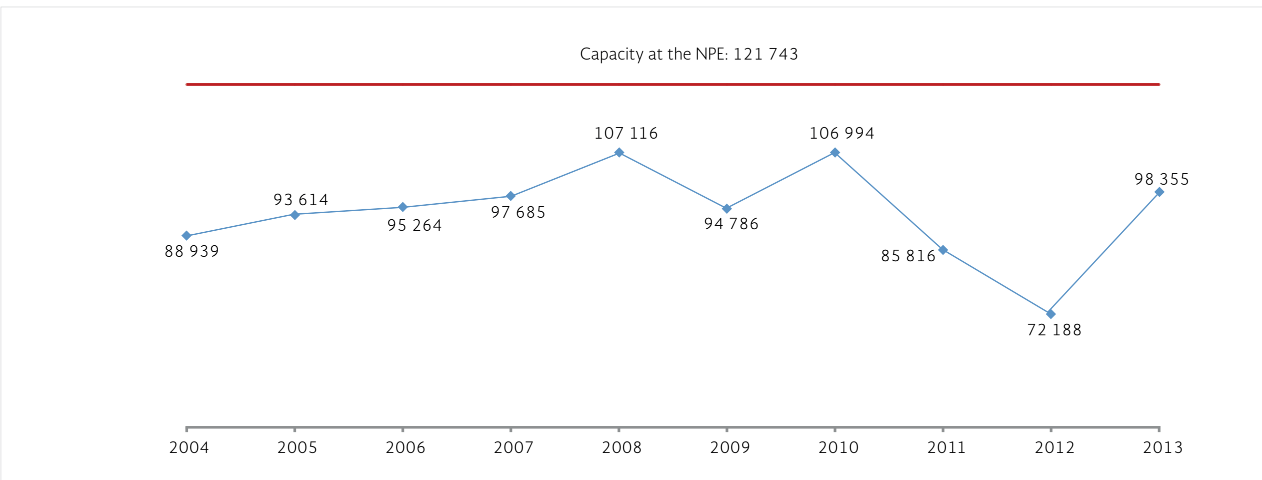
[Reporter: Principales presas]

There are more than 5 163 reservoirs and water retention berms in Mexico, of which 667 are classified as large dams, according to the definition of the International Commission on Large Dams[2].

There is an incomplete registry of water retention berms. Efforts are currently underway to register these small storage works, mainly present on dirt tracks.

The storage capacity in the country's reservoirs is approximately 150 billion m^3. This edition presents statistics on the 172 reservoirs that represent 80% of the national storage capacity. The annual volume stored in the period from 2004 to 2013 is shown at the national scale in graph G4.1 and regionally in [Additional: G4.A]. This volume depends upon the precipitation and runoff in the different regions of the country, as well as the dams' operation policies, defined by their storage purposes for various uses and flood control. Graph G4.1 shows the volume stored as of December 31 each year, with the reference of the normal pool elevation (NPE).

G4.1 Volume in the 172 reservoirs (hm^3)



Source: Conagua (2014l).

Their location is shown in map M4.1 and their main characteristics in table T4.1. The localization of the large reservoirs follows, among other factors, the hydrological regime of the current, the topography and the geological characteristics of the site, as well as the uses for which they were destined, among them hydropower generation, public water supply, irrigation and flood control. Table T4.1 employs the abbreviations of G: Electricity generation. I: Irrigation. P: Public water supply. C: Flood control; the code recorded corresponds to the one in the inventory of the Conagua's Deputy Director General's Office for Technical Affairs.

2 The reservoir should be at least 15 meters high; or between 10 and 15 meters high with a storage volume of more than 3 m^3/s (Icold, 2007).

T4.1 Volume in the 172 reservoirs (hm^3)

No.	SGT Code	Official name	Given name	Capacity at the NPE (hm^3)	HAR	Uses
1	693	Dr. Belisario Dominguez	La Angostura	15 549.20	Southern Border	G
2	706	Netzahualcoyotl	Malpaso or Raudales	12 373.10	Southern Border	G, I, C
3	1453	Infiernillo	Infiernillo	9 340.00	Balsas	G, C
4	2754	Presidente Miguel Aleman	Temascal	8 119.10	Central Gulf	G, I, C
5	2516	Aguamilpa Solidaridad	Aguamilpa	5 540.00	Lerma-Santiago-Pacific	G, I
6	345	Internacional La Amistad	La Amistad	4 174.00	Rio Bravo	G, I, P, C
7	3617	General Vicente Guerrero Consumador de la Independencia Nacional	Las Adjuntas	3 910.00	Northern Gulf	P, I
8	3440	Internacional Falcon	Falcon	3 258.00	Rio Bravo	P, C, G
9	3148	Adolfo Lopez Mateos	El Humaya or Varejonal	3 086.61	Northern Pacific	G, I
10	3243	Alvaro Obregon	El Oviachic	2 989.20	Northwest	G, I, P
11	3218	Miguel Hidalgo y Costilla	El Mahone	2 921.42	Northern Pacific	G, I
12	3216	Luis Donaldo Colosio	Huites	2 908.10	Northern Pacific	G, I
13	750	La Boquilla	Lago Toronto	2 893.57	Rio Bravo	G, I
14	1084	Lazaro Cardenas	El Palmito	2 872.97	Central Basins of the North	I, C
15	3320	Plutarco Elias Calles	El Novillo	2 833.10	Northwest	G, I
16	2742	Miguel de la Madrid	Cerro de Oro	2 599.51	Central Gulf	I
17	3210	Jose Lopez Portillo	El Comedero	2 580.19	Northern Pacific	G, I
18	2538	Leonardo Rodriguez Alcaine	El Cajon	2 551.70	Lerma-Santiago-Pacific	G
19	2519	Ing. Alfredo Elias Ayub	La Yesca	2 292.92	Lerma-Santiago-Pacific	G
20	3203	Gustavo Diaz Ordaz	Bacurato	1 859.83	Northern Pacific	G, I
21	1463	Ing. Carlos Ramirez Ulloa	El Caracol	1 458.21	Balsas	G
22	1679	Ing. Fernando Hiriat Balderrama	Zimapan	1 390.11	Northern Gulf	G
23	701	Manuel Moreno Torres	Chicoasen	1 384.86	Southern Border	G
24	494	Venustiano Carranza	Don Martin	1 312.86	Rio Bravo	P, C, I
25	2689	Cuchillo-Solidaridad	El Cuchillo	1 123.14	Rio Bravo	P, I
26	688	Angel Albino Corzo	Peñitas	1 091.10	Southern Border	G
27	3241	Adolfo Ruiz Cortines	Mocuzari	950.30	Northwest	G, I, P
28	2708	Presidente Benito Juarez	El Marques	946.50	Southern Pacific	I
29	1436	Solis	Solis	800.03	Lerma-Santiago-Pacific	I, C
30	3490	Ing. Marte R. Gomez	El Azucar	781.70	Rio Bravo	I
31	3302	Lazaro Cardenas	La Angostura	703.38	Northwest	P, I
32	3229	Sanalona	Sanalona	673.47	Northern Pacific	G, I, P
33	2206	Constitucion de Apatzingan	Chilatan	601.19	Balsas	I, C
34	3211	Josefa Ortiz de Dominguez	El Sabino	595.30	Northern Pacific	I

No.	SGT Code	Official name	Given name	Capacity at the NPE (hm^3)	HAR	Uses
35	3557	Estudiante Ramiro Caballero Dorantes	Las Animas	571.07	Northern Gulf	I
36	2257	Jose Maria Morelos	La Villita	540.80	Balsas	G, I
37	1710	Cajon de Peña	Tomatlan or El Tule	466.69	Lerma-Santiago-Pacific	P, I
38	3693	Chicayan	Paso de Piedras	456.92	Northern Gulf	I
39	2382	Tepuxtepec	Tepuxtepec	425.20	Lerma-Santiago-Pacific	G, I
40	3154	Ing. Aurelio Benassini Vizcaino	El Salto or Elota	415.00	Northern Pacific	I, C
41	1825	Manuel M. Dieguez	Santa Rosa	403.00	Lerma-Santiago-Pacific	G
42	1477	El Gallo	El Gallo	400.04	Balsas	I
43	2126	Valle de Bravo	Valle de Bravo	394.39	Balsas	P
44	813	Francisco I. Madero	Las Virgenes	355.29	Rio Bravo	I, C
45	49	Plutarco Elias Calles	Calles	350.00	Lerma-Santiago-Pacific	I
46	1045	Francisco Zarco	Las Tortolas	309.24	Central Basins of the North	I, C
47	2826	Manuel Avila Camacho	Valsequillo or Balcon del Diablo	303.70	Balsas	I
48	3202	Ing. Guillermo Blake Aguilar	El Sabinal	300.60	Northern Pacific	I, C
49	2631	Jose Lopez Portillo	Cerro Prieto	300.00	Rio Bravo	P, I
50	825	Ing. Luis L. Leon	El Granero	292.47	Rio Bravo	I, C
51	1507	Vicente Guerrero	Palos Altos	250.00	Balsas	I
52	1782	General Ramon Corona Madrigal	Trigomil	250.00	Lerma-Santiago-Pacific	I
53	1035	Federalismo Mexicano	San Gabriel	245.43	Rio Bravo	P, C, I
54	3478	Presidente Lic. Emilio Portes Gil	San Lorenzo	230.78	Northern Gulf	I
55	4365	Solidaridad	Trojes	220.81	Lerma-Santiago-Pacific	I
56	3239	Abelardo L. Rodriguez	Hermosillo	219.50	Northern Gulf	P, C, I
57	2167	El Bosque	El Bosque	202.40	Balsas	P, C
58	2286	Melchor Ocampo	El Rosario	200.00	Lerma-Santiago-Pacific	I
59	2136	Villa Victoria	Villa Victoria	185.72	Balsas	P
60	1583	Endho	Endho	182.00	Waters of the Valley of Mexico	I, C
61	1315	Ignacio Allende	La Begoña	150.05	Lerma-Santiago-Pacific	I, C
62	1926	Tacotan	Tacotan	149.24	Lerma-Santiago-Pacific	I, C
63	1702	Basilio Vadillo	Las Piedras	145.72	Lerma-Santiago-Pacific	I
64	3747	El Chique	El Chique	139.95	Lerma-Santiago-Pacific	I
65	1203	Santiago Bayacora	Bayacora	130.05	Northern Gulf	I
66	3308	Ing. Rodolfo Felix Valdes	El Molinito	130.04	Northwest	I, C
67	1499	Revolucion Mexicana	El Guineo	127.00	Southern Pacific	I, C

No.	SGT Code	Official name	Given name	Capacity at the NPE (hm³)	HAR	Uses
68	917	El Tintero	El Tintero	125.08	Rio Bravo	I, C
69	2011	Huapango	Huapango	121.50	Northern Gulf	I
70	3790	Gobernador Leobardo Reynoso	Trujillo	118.07	Central Basins of the North	I
71	1365	La Purisima	La Purisima	110.03	Lerma-Santiago-Pacific	I, C
72	1459	Andres Figueroa	Las Garzas	102.50	Balsas	I
73	1057	Presidente Guadalupe Victoria	El Tunal	90.22	Northern Pacific	I
74	3197	Lic. Eustaquio Buelna	Guamuchil	90.06	Northern Pacific	P, C, I
75	731	Abraham Gonzalez	Guadalupe	85.44	Northwest	I, C
76	1887	El Salto	El Salto	85.00	Lerma-Santiago-Pacific	P
77	2202	Cointzio	Cointzio	84.80	Lerma-Santiago-Pacific	P, I
78	5133	Derivadora Las Blancas	Las Blancas	84.00	Rio Bravo	I, C
79	836	Las Lajas	Las Lajas	83.27	Rio Bravo	I, C
80	1800	Ing. Elias Gonzalez Chavez	Puente Calderon	80.00	Lerma-Santiago-Pacific	P
81	1040	Francisco Villa	El Bosque	78.70	Northern Pacific	I
82	237	Abelardo L. Rodriguez	Rodriguez or Tijuana	76.90	Baja California Peninsula	P, C
83	3807	Miguel Aleman	Excame	71.61	Lerma-Santiago-Pacific	G, I, C
84	2886	Constitucion de 1917	Presa Hidalgo	69.86	Northern Gulf	I
85	711	Juan Sabines	El Portillo II or Cuxquepeques	68.15	Southern Border	I
86	2113	San Andres Tepetitlan	Tepetitlan	67.62	Lerma-Santiago-Pacific	I
87	2359	San Juanico	La Laguna	60.48	Balsas	I, C
88	2005	Guadalupe	Guadalupe	56.70	Waters of the Valley of Mexico	I
89	4677	Ing. Juan Guerrero Alcocer	Vinoramas	55.00	Northern Pacific	P, C, I
90	3562	Republica Española	Real Viejo or El Sombrero	54.78	Northern Gulf	I
91	3639	San Jose Atlanga	Atlanga	54.50	Balsas	I
92	2931	San Ildefonso	El Tepozan	52.75	Northern Gulf	I
93	1639	Requena	Requena	52.50	Waters of the Valley of Mexico	I
94	4531	Ing. Guillermo Lugo Sanabria	La Polvora	51.70	Lerma-Santiago-Pacific	I
95	867	Pico del Aguila	Pico del Aguila	51.21	Rio Bravo	I
96	2408	Zicuiran	La Peña	50.00	Balsas	I
97	1602	Javier Rojo Gomez	La Peña	50.00	Waters of the Valley of Mexico	I
98	461	San Miguel	San Miguel	47.30	Rio Bravo	I
99	2782	Yosocuta	San Marcos Arteaga	46.80	Balsas	P, I
100	981	Caboraca	Canoas	45.00	Northern Pacific	I

No.	SGT Code	Official name	Given name	Capacity at the NPE (hm³)	HAR	Uses
101	1918	Ing. Santiago Camarena	La Vega	44.00	Lerma-Santiago-Pacific	I
102	1666	La Laguna	Tejocotal	43.53	Central Gulf	G
103	1664	Taxhimay	Taxhimay	42.80	Waters of the Valley of Mexico	I
104	3267	Cuauhtemoc	Santa Teresa	42.50	Northwest	I
105	241	El Carrizo	El Carrizo	40.87	Baja California Peninsula	P
106	2668	Rodrigo Gomez	La Boca	39.49	Rio Bravo	P
107	514	Laguna de Amela	Tecoman	38.34	Lerma-Santiago-Pacific	I
108	4559	Guaracha	San Antonio	38.20	Lerma-Santiago-Pacific	I
109	2024	Jose Antonio Alzate	San Bernabe	35.31	Lerma-Santiago-Pacific	I
110	3782	Ing. Julian Adame Alatorre	Tayahua	34.48	Lerma-Santiago-Pacific	I
111	1120	Peña del Aguila	Peña del Aguila	31.73	Northern Pacific	I
112	3524	Pedro Jose Mendez	Pedro Jose Mendez	31.26	Northern Gulf	P, I
113	1995	Danxho	Danxho	31.05	Northern Gulf	I
114	1505	Valerio Trujano	Tepecoacuilco	31.01	Balsas	P, I
115	1757	El Cuarenta	El Cuarenta	30.60	Lerma-Santiago-Pacific	I
116	1945	El Tule	El Tule	30.00	Lerma-Santiago-Pacific	I
117	2829	Necaxa	Necaxa	29.06	Central Gulf	G
118	2458	La Laguna	El Rodeo	28.00	Balsas	I
119	3827	Ramon Lopez Velarde	Boca del Tesorero	27.00	Lerma-Santiago-Pacific	I
120	3739	El Cazadero	El Cazadero	26.85	Central Basins of the North	I
121	2848	Tenango	Tenango	26.82	Central Gulf	G
122	2840	Los Reyes	Omiltepec	26.05	Central Gulf	G
123	777	Chihuahua	Chihuahua	24.84	Rio Bravo	P
124	363	El Centenario	El Centenario	24.68	Rio Bravo	I
125	1357	Peñuelitas	Peñuelitas	23.83	Lerma-Santiago-Pacific	I
126	2282	Malpais	La Cienega	23.74	Lerma-Santiago-Pacific	I
127	3661	La Cangrejera	La Cangrejera	23.50	Central Gulf	I
128	2298	Los Olivos	Los Olivos	21.75	Balsas	I
129	1799	Hurtado	Hurtado	21.73	Lerma-Santiago-Pacific	I
130	1337	Mariano Abasolo	San Antonio de Aceves	21.42	Lerma-Santiago-Pacific	I
131	381	La Fragua	La Fragua	21.17	Rio Bravo	I
132	1673	Vicente Aguirre	Las Golondrinas	20.62	Northern Gulf	I
133	2013	Ignacio Ramirez	La Gavia	20.50	Lerma-Santiago-Pacific	I
134	2671	Salinillas	Salinillas	19.00	Rio Bravo	I

No.	SGT Code	Official name	Given name	Capacity at the NPE (hm³)	HAR	Uses
135	2161	Aristeo Mercado	Wilson	18.34	Lerma-Santiago-Pacific	I
136	3297	Ignacio R. Alatorre	Punta de Agua	17.78	Northwest	I
137	2045	Ñado	Ñado	16.80	Northern Gulf	I
138	152	El Niagara	El Niagara	16.19	Lerma-Santiago-Pacific	I
139	2	Abelardo L. Rodriguez	Abelardo L. Rodriguez	15.99	Lerma-Santiago-Pacific	I
140	2144	Agostitlan	Mata de Pinos	15.95	Balsas	I
141	2194	Tercer Mundo	Chincua	15.58	Lerma-Santiago-Pacific	I
142	1078	Jose Jeronimo Hernandez	Santa Elena	15.10	Northern Pacific	I
143	142	Media Luna	Media Luna	15.00	Lerma-Santiago-Pacific	I
144	1950	Vicente Villaseñor	Valle de Juarez	14.44	Lerma-Santiago-Pacific	I
145	1879	La Red	La Red	14.25	Lerma-Santiago-Pacific	I
146	2400	Urepetiro	Urepetiro	13.00	Lerma-Santiago-Pacific	I
147	2037	Madin	Madin	12.95	Waters of the Valley of Mexico	P
148	2830	Nexapa	Nexapa	12.50	Central Gulf	G
149	1989	La Concepcion	La Concepcion	12.11	Waters of the Valley of Mexico	I
150	3850	Santa Rosa	Santa Rosa	11.37	Central Basins of the North	I
151	118	Derivadora Jocoque	Derivadora Jocoque	10.98	Lerma-Santiago-Pacific	I
152	1935	Tenasco	Boquilla de Zaragoza	10.50	Lerma-Santiago-Pacific	I
153	2253	Jaripo	Jaripo	10.20	Lerma-Santiago-Pacific	I
154	1354	El Palote	El Palote	10.01	Lerma-Santiago-Pacific	P
155	2003	Francisco Jose Trinidad Fabela	Isla de las Aves or El Salto	9.93	Lerma-Santiago-Pacific	I
156	2321	Pucuato	Pucuato	9.58	Balsas	I
157	1462	La Calera	La Calera	9.39	Balsas	I
158	2903	La Llave	Divino Redentor	9.31	Northern Gulf	I
159	2881	El Centenario	El Centenario	8.99	Northern Gulf	I
160	2847	La Soledad	Apulco or Mazatepec	8.99	Central Gulf	G
161	2039	El Molino	Arroyo Zarco	7.70	Northern Gulf	I
162	1762	Cuquio	Los Gigantes	7.50	Lerma-Santiago-Pacific	I
163	881	El Rejon	El Rejon	6.53	Rio Bravo	P
164	2207	Copandaro	Copandaro de Corrales	6.50	Lerma-Santiago-Pacific	I
165	1773	El Estribon	El Estribon	6.40	Lerma-Santiago-Pacific	P, I

No.	SGT Code	Official name	Given name	Capacity at the NPE (hm³)	HAR	Uses
166	1307	La Golondrina	La Golondrina	6.00	Lerma-Santiago-Pacific	I
167	67	La Codorniz	La Codorniz	5.37	Lerma-Santiago-Pacific	I
168	2347	Sabaneta	Sabaneta	5.19	Balsas	I
169	1585	La Esperanza	La Esperanza	3.92	Northern Gulf	I
170	242	Emilio Lopez Zamora	Ensenada	2.73	Baja California Peninsula	P
171	2954	La Venta	La Venta	2.48	Northern Gulf	I
172	158	Derivadora Pabellon	Derivadora Potrerillos	2.04	Lerma-Santiago-Pacific	I
				121 742.58		

Source: Conagua (2014l).

M4.1 Reservoirs, 2013

01 Lazaro Cardenas
02 Plutarco Elias Calles
03 Alvaro Obregon
04 Miguel Hidalgo y Costilla
05 Luis Donaldo Colosio
06 La Boquilla
07 Aldolfo Lopez Mateos
08 Lazaro Cardenas
09 Jose Lopez Portillo
10 Leonardo Rodriguez Alcaine
11 Ing. Alfredo Elias Ayub
12 Infiernillo
13 Ing. Carlos Ramirez Ulloa
14 Netzahualcoyotl
15 Manuel Moreno Torres
16 Dr. Belisario Dominguez
17 Miguel de la Madrid
18 Ing. Fernando Hiriat Balderrama
19 Plutarco Elias Calles
20 Jose Lopez Portillo
21 Cuchillo-Solidaridad
22 Internacional Falcon
23 Venustiano Carranza
24 Internacional La Amistad

Source: Produced based on Conagua (2014l).

4.3 Hydro-agricultural infrastructure

[Reporter: Principales presas]

In Mexico, the area with infrastructure that allows irrigation is approximately 6.4 million hectares, of which 3.4 million correspond to 85 irrigation districts (IDs) and the remaining three million to more than 39 000 irrigation units (IUs).

IDs and IUs considered the prevailing technology at the time of their design for the application of water to plots by means of gravity. In many cases, only the networks of channels and main drains were built, with the construction on the plots remaining the responsibility of the users. This situation, along with the deterioration of the infrastructure, which has worsened over decades through the insufficient economic resources for its conservation and improvement, has brought about a decrease in the overall efficiency of water management.

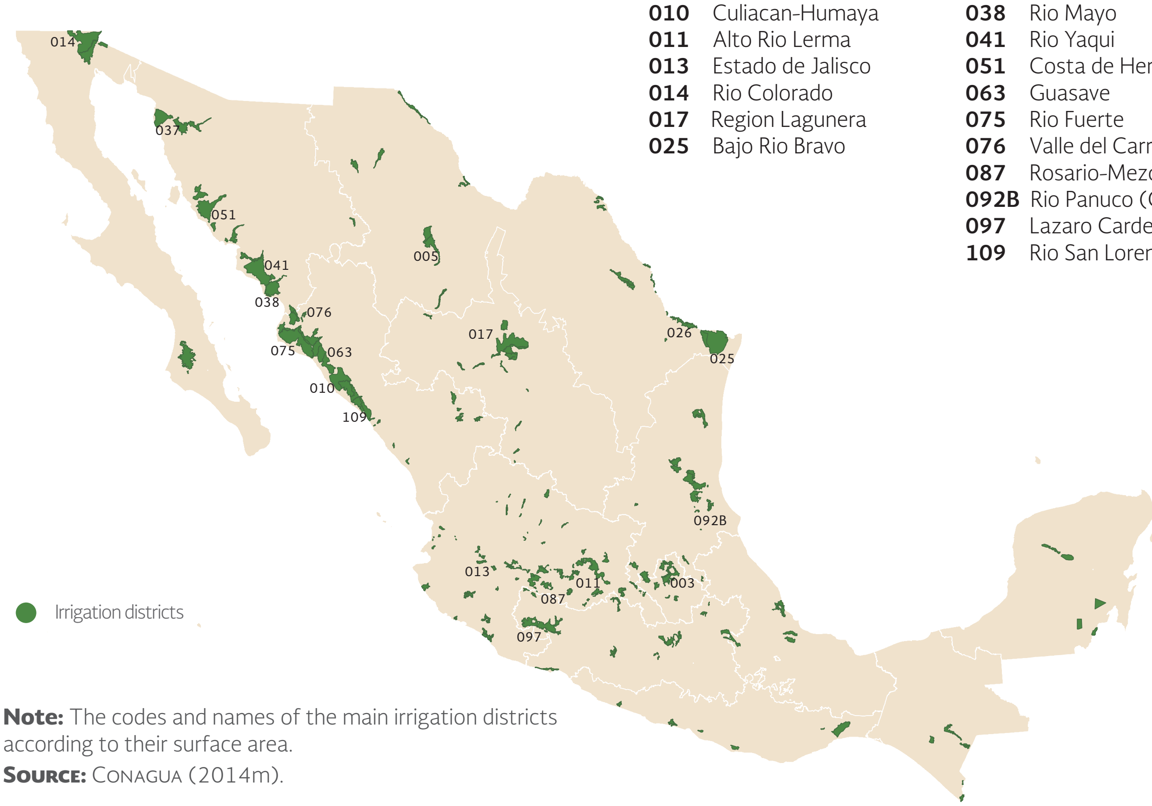
It should be mentioned that the yield in areas under irrigation regimes is greater than in areas using rainfed agriculture. In 2013, for the main crops by area harvested -corn grain, sorghum grain and beans-, the yield in areas under irrigation, measured in tons/ha, was 2.2 to 3.3 times higher than in rainfed areas (produced based on SIAP 2014).

Irrigation districts (IDs)

[Reporter: Distritos de riego]

IDs are irrigation projects developed by the Federal Government since 1926, the year in which the National Irrigation Commission was created, and include various works, such as storage basins, direct diversions, pumping plants, wells, channels and pathways, among others. The existing IDs are shown in map M4.2 and table T4.2. In [Additional: T4.A], data is presented on the IDs, whereas graph G4.2 illustrates the evolution of water used in the IDs for the agricultural years 2003-04 to 2012-2013. The agricultural year in Mexico includes the period from October to September of the following year.

M4.2 Irrigation districts, 2013



003	Tula	**026**	Bajo Rio San Juan
005	Delicias	**037**	Altar-Pitiquito-Caborca
010	Culiacan-Humaya	**038**	Rio Mayo
011	Alto Rio Lerma	**041**	Rio Yaqui
013	Estado de Jalisco	**051**	Costa de Hermosillo
014	Rio Colorado	**063**	Guasave
017	Region Lagunera	**075**	Rio Fuerte
025	Bajo Rio Bravo	**076**	Valle del Carrizo y Fuerte-Mayo
		087	Rosario-Mezquite
		092B	Rio Panuco (Chicayan)
		097	Lazaro Cardenas
		109	Rio San Lorenzo

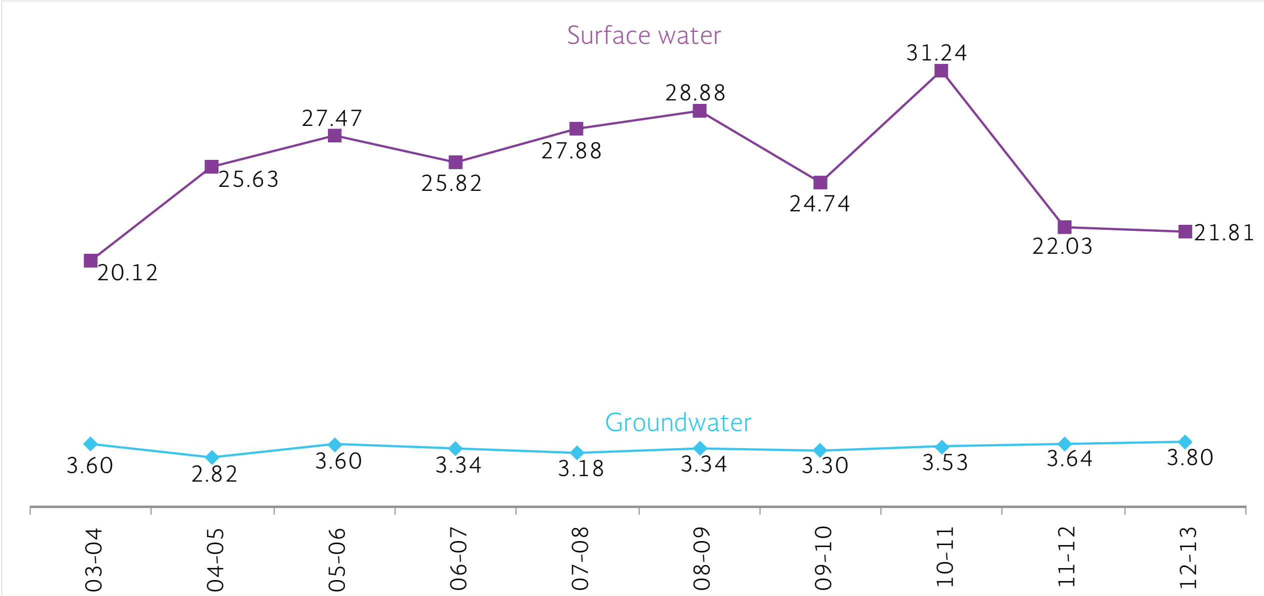
Note: The codes and names of the main irrigation districts according to their surface area.
Source: Conagua (2014m).

T4.2 Irrigation districts, 2013

Code	HAR	Number of irrigation districts	Total surface area (ha)	Users	Physical area irrigated, 2012/13 agricultural year (ha)	Volume distributed (hm³)
I	Baja California Peninsula	2	245 695	18 395	221 264	2 522 946
II	Northwest	7	466 222	33 576	401 110	3 979 704
III	Northern Pacific	9	788 877	87 760	710 388	6 234 638
IV	Balsas	9	204 106	73 183	152 078	2 199 939
V	Southern Pacific	5	69 739	12 741	34 116	648 446
VI	Rio Bravo	12	462 315	37 676	343 670	2 212 884
VII	Central Basins of the North	1	71 964	38 010	31 721	600 000
VIII	Lerma-Santiago-Pacific	14	497 513	118 414	339 806	3 400 420
IX	Northern Gulf	13	257 822	38 222	138 716	1 381 964
X	Central Gulf	2	41 253	8 963	28 998	581 063
XI	Southern Border	4	35 815	7 460	27 804	353 603
XII	Yucatan Peninsula	2	16 191	5 374	13 817	87 882
XIII	Waters of the Valley of Mexico	5	97 913	67 236	86 024	1 407 147
	Total	85	3 255 423	547 010	2 529 509	25 610 636

Source: Conagua (2013), Conagua (2014m).

G4.2 Volume employed in irrigation districts, by source (billions of m³)

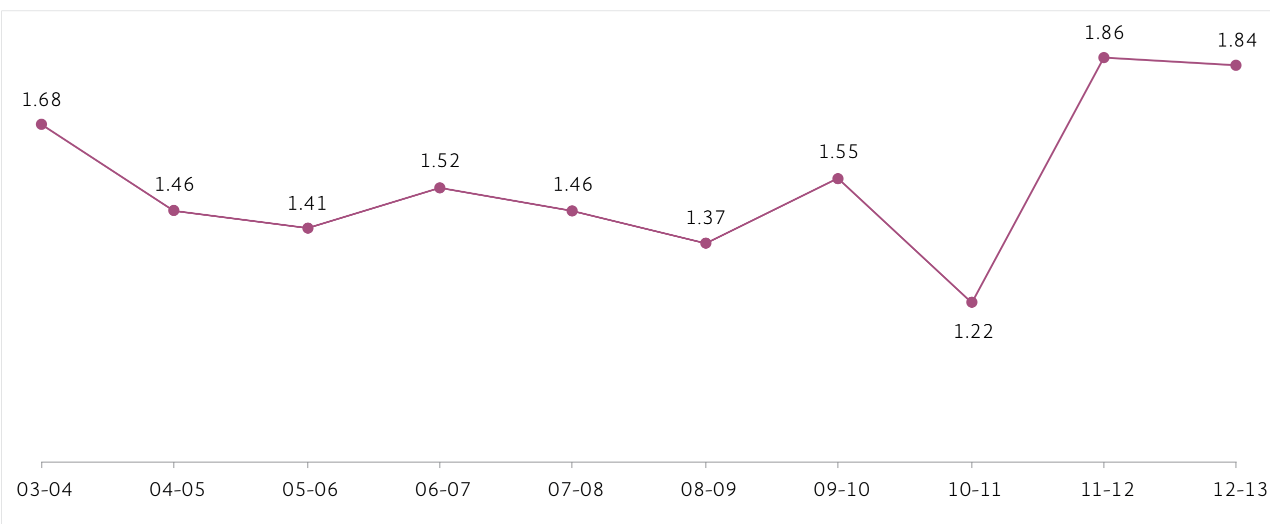


Source: CONAGUA (2014m).

Water is employed in IDs by means of gravity or pumping. In turn, the surface water source may be a dam, diversion or pump directly from the current; whereas the groundwater source is inevitably used by pumping wells. The volume distributed by each type of use is shown in [Additional: T4.B]. The productivity of water in IDs is a key indicator to evaluate the efficiency with which water is used for food production, and depends upon the piping from the supply sources to plots and its use there.

The evolution in this aspect is shown in graph G4.3, which shows the gross volume used corresponding to the vegetative cycle, which is why it does not coincide with the annual volumes used.

G4.3 Productivity of water in irrigation districts according to agricultural years (kg/m³)



Source: CONAGUA (2014m).

In the current environment in which a decrease in availability is predicted as a result of climate change, it is imperative to increase piping efficiencies. It should be mentioned that water productivity may fluctuate greatly according to the meteorological conditions, as well as the phenological characteristics of each crop.

For the 2012-2013 agricultural year, the main crops according to the area harvested were corn grain and wheat grain, which together represented 43.5% of the surface area. It should be mentioned that these two crops combined were 19.3% of the production in tons and 30.4% of the value of production. The main crops are shown in [Additional: T4.C]. The transfer of IDs to the users commenced with the creation of the Conagua in 1989 and the passing of the new National Water Law in 1992, with the support of a program of partial rehabilitation of the infrastructure that was allocated via irrigation modules to irrigation user associations.

Up to December 2013, more than 99% of the total surface of the IDs had been transferred to the users. Up to that date, only two IDs had not been totally transferred to the users, as shown in [Additional: T4.D].

Irrigation Units (IUs)

IUs, also known as Urderales in Spanish, are operated by members of cooperatives and small landholders, who in some cases are organized within the Units.

Annual statistics were generated from the 2004-2005 cycle. The data from the 2011-2012 agricultural year is shown in table T4.3.

T4.3 Area harvested, production and yield of irrigation units, 2011-2012 agricultural year

Code	HAR	Surface harvested (ha)	Production (ton)	Yield (ton/ha)
I	Baja California Peninsula	37 857	1 400 957	37.01
II	Northwest	130 196	2 773 990	21.31
III	Northern Pacific	178 641	3 222 881	18.04
IV	Balsas	356 934	8 388 421	23.50
V	Southern Pacific	94 554	1 270 249	13.43
VI	Rio Bravo	586 700	10 116 336	17.24
VII	Central Basins of the North	305 139	9 810 342	32.15
VIII	Lerma-Santiago-Pacific	870 791	21 371 261	24.54
IX	Northern Gulf	289 840	7 253 031	25.02
X	Central Gulf	109 477	4 224 262	38.59
XI	Southern Border	32 677	1 479 263	45.27
XII	Yucatan Peninsula	60 655	1 137 750	18.76
XIII	Waters of the Valley of Mexico	82 831	2 728 637	32.94
	Total	**3 136 292**	**75 177 380**	**23.97**

Source: Conagua (2013).

Technified Rainfed Districts (TRDs)

[Reporter: Distritos de temporal y agrícola]

In Mexico's tropical and subtropical plains, which have an excess of humidity and constant floods, the Federal Government has established TRDs, in which infrastructure has been built to remove the excess volume of water. Table T4.4 lists the main characteristics of the TRDs. Similarly to the irrigation districts, the TRDs have gradually been transferred to organized users.

T4.4 Characteristics of the technified rainfed districts, 2013

No.	Code	Name	Code	HAR	State	Surface area (thousands of ha)	Users (number)
1	1	La Sierra	XI	Southern Border	Tabasco	32.1	1 178
2	2	Zanapa Tonala	XI	Southern Border	Tabasco	106.9	6 320
3	3	Tesechoacan	X	Central Gulf	Veracruz de Ignacio de la Llave	18.0	1 139
4	5	Pujal Coy II	IX	Northern Gulf	San Luis Potosi and Tamaulipas	236.0	9 987
5	6	Acapetahua	XI	Southern Border	Chiapas	103.9	5 131
6	7	Centro de Veracruz	X	Central Gulf	Veracruz de Ignacio de la Llave	75.0	7 131
7	8	Oriente de Yucatan	XII	Yucatan Peninsula	Yucatan	667.0	25 021
8	9	El Bejuco	III	Northern Pacific	Nayarit	24.0	1 979
9	10	San Fernando	IX	Northern Gulf	Tamaulipas	505.0	14 495
10	11	Margaritas-Comitan	XI	Southern Border	Chiapas	41.9	5 399
11	12	La Chontalpa	XI	Southern Border	Tabasco	91.9	10 300
12	13	Balancan-Tenosique	XI	Southern Border	Tabasco	115.6	3 429
13	15	Edzna-Yohaltun	XII	Yucatan Peninsula	Campeche	85.1	1 120
14	16	Sanes Huasteca	XI	Southern Border	Tabasco	26.4	716
15	17	Tapachula	XI	Southern Border	Chiapas	94.3	5 852
16	18	Huixtla	XI	Southern Border	Chiapas	107.6	6 393
17	20	Margaritas-Pijijiapan	XI	Southern Border	Chiapas	67.9	4 400
18	23	Isla Rodriguez Clara	X	Central Gulf	Veracruz de Ignacio de la Llave	13.6	627
19	24	Zona sur de Yucatan	XII	Yucatan Peninsula	Yucatan	26.1	880
20	25	Rio Verde	XII	Yucatan Peninsula	Campeche	134.9	1 984
21	26	Valle de Ucum	XII	Yucatan Peninsula	Quintana Roo	104.7	1 713
22	27	Frailesca	XI	Southern Border	Chiapas	56.8	8 533
23	35	Los Naranjos	X	Central Gulf	Veracruz de Ignacio de la Llave	92.6	6 045
	Total					2 827.3	129 772

Source: Conagua (2014m).

4.4 Drinking water and sanitation infrastructure

Drinking water coverage

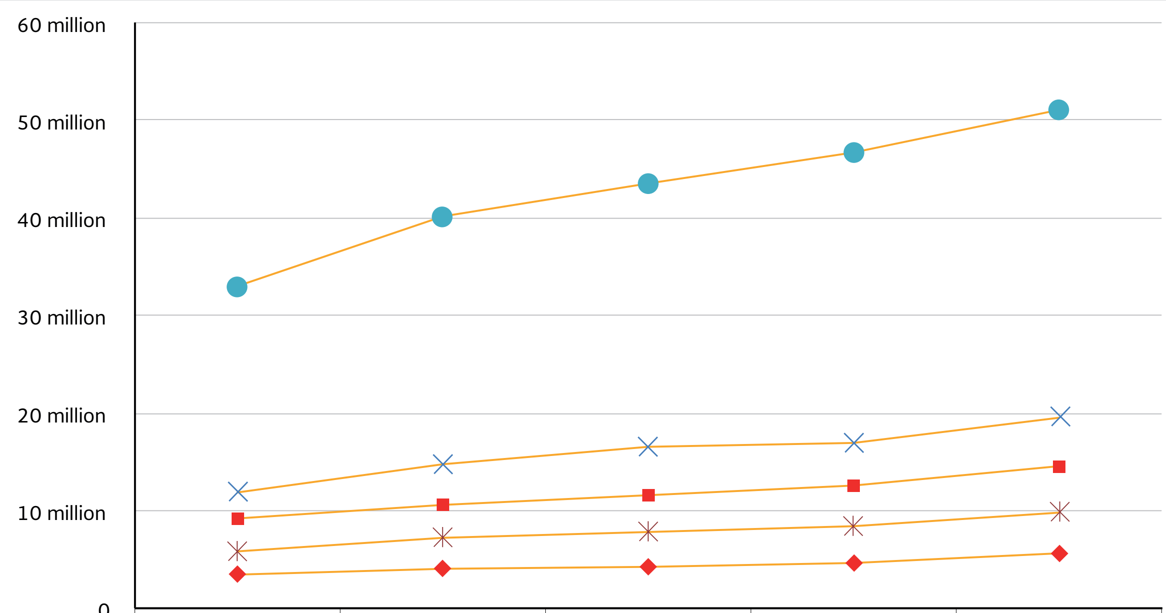
[Reporter: Cobertura universal]

The Conagua considers that drinking water coverage includes those who have tap water in their household, outside their household, but within their grounds, from a public tap or from another household.

Bearing in mind the aforementioned definition and the results of the 2010 Census on Population and Housing, up to June 25 that year, 90.9% of the population had drinking water coverage. The Conagua estimates that by the end of 2013, the drinking water coverage was 92.3%, which breaks down as 95.4% in urban zones and 81.6% in rural areas. [Additional: T4.E] indicates the evolution in the drinking water coverage in Mexico, calculated based on the different Censuses.

The evolution in the population with coverage is differentiated according to the size of the population in the locality. The coverage for populations in large localities, of more than 100 000 inhabitants, increases more rapidly than in smaller localities, as can be observed in graph G4.4, which shows the population at the time of the censuses.

G4.4 Population with drinking water coverage, by population ranges

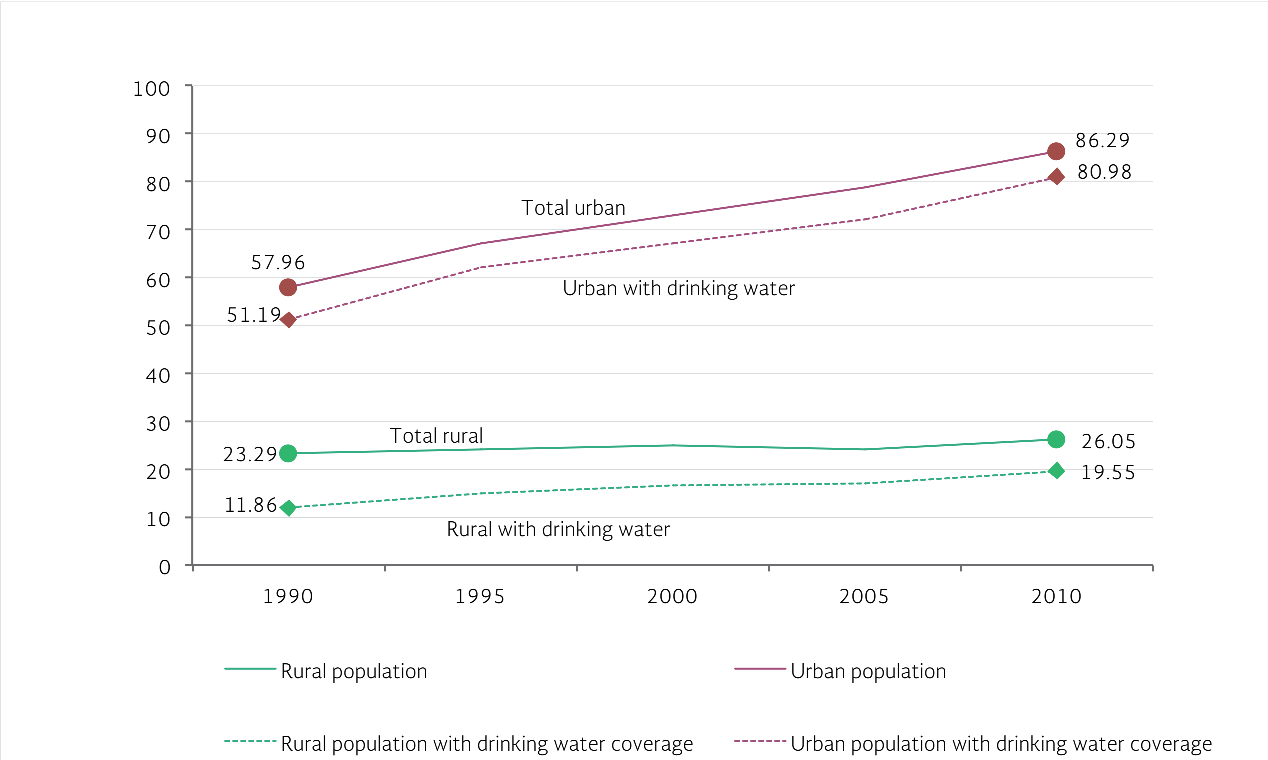


	1990	1995	2000	2005	2010
1- 2 499	11 864 664	14 724 552	16 466 341	16 914 253	19 554 527
2 500-14 999	9 117 904	10 675 524	11 671 967	12 545 001	14 550 482
15 000-49 999	5 760 112	7 182 064	7 892 887	8 421 362	9 818 678
50 000-99 999	3 402 524	4 053 299	4 278 454	4 649 524	5 536 132
100 000 and more	32 910 338	40 103 489	43 459 153	46 693 611	51 070 728

Source: Produced based on Conagua (2011), Conagua (2007), Inegi (2014d).

However, it should be taken into account that the increase in the population is greater in urban localities, whereas in rural localities the population is growing at a slower pace. Graph G4.5 illustrates the evolution in the population with drinking water coverage and the total population, considering in both cases both its rural and urban components.

G4.5 Evolution in the rural and urban population with drinking water coverage (millions of inhabitants)



Source: Produced based on Conagua (2011), Conagua (2007), Inegi (2014d).

Sanitation coverage

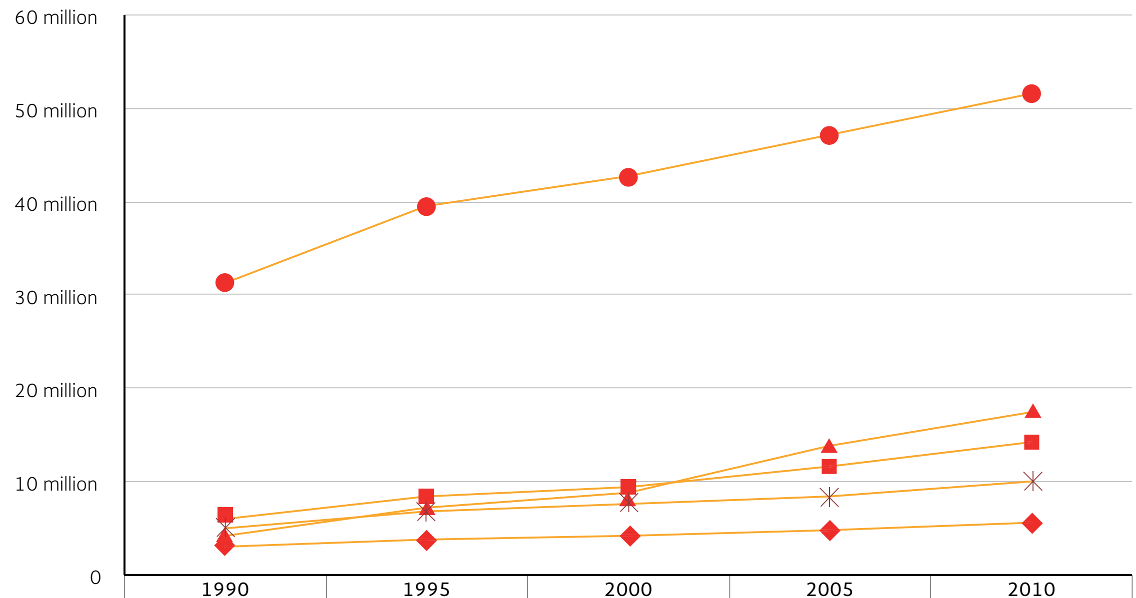
[Reporter: Cobertura universal]

On the other hand, the Conagua considers that sanitation coverage includes those citizens connected to the sanitation network or a septic tank, wastepipe, ravine, crevice, lake or sea.

It should be mentioned that for the purpose of this document, sanitation and sewerage are considered as synonyms. Taking into account that definition and the results of the 2010 Census on Population and Housing, up to June 25 of that year, 89.6% of the population had sanitation coverage. The Conagua estimates that by the close of 2013, sanitation coverage was 90.9%, composed of 96.7% coverage in urban areas and 71.2% in rural zones. [Additional: T4.F] shows the composition of the sanitation coverage nationwide, calculated based on the different Censuses.

As in the case of drinking water, the evolution in the population with sanitation coverage is also differentiated as regards the size of the population in each locality. In this case, the population in rural localities with sanitation coverage increased significantly from 2000 onwards, as can be appreciated in graphs G4.6 and G4.7.

G4.6 Population with sanitation coverage, by population ranges

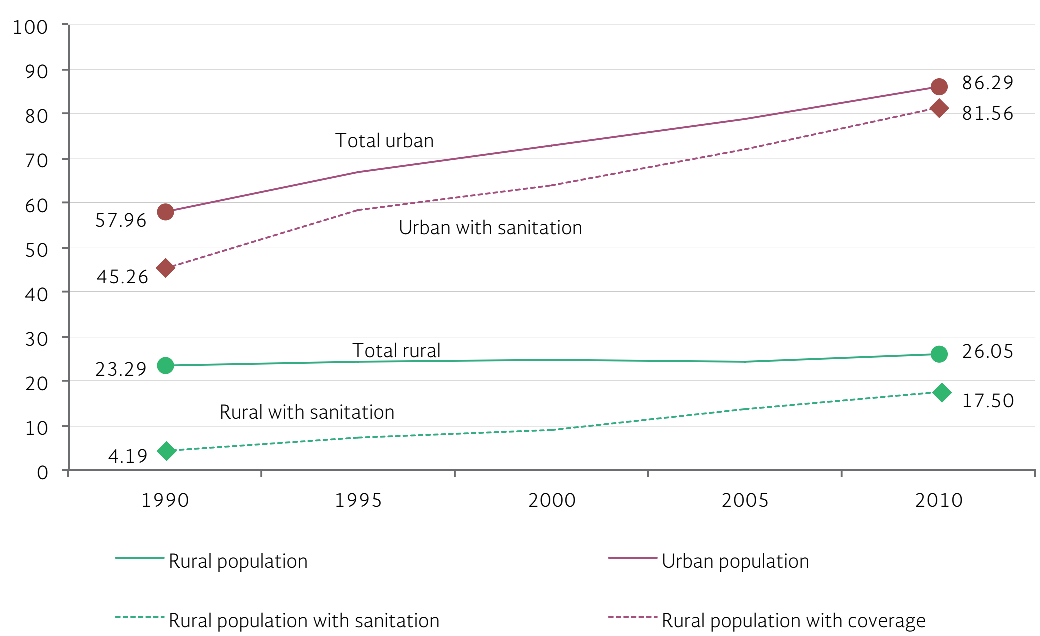


	1990	1995	2000	2005	2010
1- 2 499	4 192 850	7 128 147	8 895 698	13 758 528	17 499 695
2 500-14 999	5 997 188	8 375 040	9 372 637	11 528 523	14 179 960
15 000-49 999	4 976 324	6 810 300	7 516 231	8 508 107	10 057 011
50 000-99 999	3 028 547	3 846 956	4 097 097	4 713 634	5 661 924
100 000 and more	31 259 792	39 528 700	42 772 718	47 132 386	51 660 243

Source: Produced based on CONAGUA (2011), CONAGUA (2007), INEGI (2014d).

Graph G4.7 illustrates the evolution in the population with sanitation coverage and the total population, considering in both cases both its rural and urban components.

G4.7 Evolution in the total rural and urban population with sanitation coverage (millions of inhabitants)



Source: Produced based on CONAGUA (2011), CONAGUA (2007), INEGI (2014d).

The evolution in coverage both for drinking water and sanitation, considering the urban and rural contexts, is illustrated in table T4.5.

T4.5 Coverage of the national population with drinking water and sanitation, by urban and rural scopes, series of Census years from 1990 to 2010

Population	1990 Census (%)	1995 Census (%)	2000 Census (%)	2005 Census (%)	2010 Census (%)
	12/03/90	05/11/95	14/03/00	17/10/05	25/06/10
			Drinking water		
Urban	89.36	92.94	94.60	95.03	95.59
Rural	51.22	61.39	67.95	70.61	75.69
Total	**78.39**	**84.58**	**87.90**	**89.20**	**90.94**
			Sanitation		
Urban	79.01	87.79	89.62	94.47	96.28
Rural	18.09	29.71	36.71	57.48	67.74
Total	**61.48**	**72.40**	**76.18**	**85.62**	**89.61**

Source: Produced based on Inegi (2014d).

In table T4.6 the drinking water and sanitation coverage by hydrological-administrative region (HAR) is shown. It can be observed that the regions with the greatest backlogs in drinking water are V Southern Pacific, IX Northern Gulf, X Central Gulf and XI Southern Border; whereas for sanitation the greatest backlogs are concentrated in the regions V Southern Pacific, IX Northern Gulf, X Central Gulf and XII Yucatan Peninsula.

T4.6 Coverage of the population with drinking water services, series of Census years from 1990 to 2010 (percentage)

Code	HAR	Drinking water				
		12/03/90	05/11/95	14/02/00	17/10/05	25/06/10
I	Baja California Peninsula	81.30	87.37	92.03	92.87	95.46
II	Northwest	89.73	93.25	95.25	94.78	96.28
III	Northern Pacific	78.68	85.58	88.82	89.04	91.29
IV	Balsas	72.84	81.08	83.23	84.45	85.76
V	Southern Pacific	59.16	69.02	73.24	73.48	75.60
VI	Rio Bravo	91.78	94.42	96.09	96.12	97.00
VII	Central Basins of the North	83.20	87.93	90.87	93.30	95.04
VIII	Lerma-Santiago-Pacific	84.16	90.29	92.21	93.36	94.86
IX	Northern Gulf	57.65	67.76	75.49	80.86	84.94
X	Central Gulf	58.80	64.60	71.94	77.20	81.24
XI	Southern Border	56.68	65.43	73.26	74.41	78.51
XII	Yucatan Peninsula	73.98	84.85	91.89	94.10	94.22
XIII	Waters of the Valley of Mexico	92.52	96.26	96.86	96.53	96.79
	National	**78.39**	**84.58**	**87.83**	**89.20**	**90.94**

T4.7 Coverage of the population with sanitation services, series of Census years from 1990 to 2010 (percentage)

Code	HAR	Sanitation				
		12/03/90	05/11/95	14/02/00	17/10/05	25/06/10
I	Baja California Peninsula	65.24	75.80	80.61	89.04	93.08
II	Northwest	62.57	71.48	76.47	84.06	88.08
III	Northern Pacific	51.65	63.94	69.89	82.65	87.45
IV	Balsas	48.84	63.00	67.52	81.35	86.87
V	Southern Pacific	33.31	46.48	47.36	63.28	72.55
VI	Rio Bravo	73.93	83.96	88.24	93.76	95.42
VII	Central Basins of the North	55.44	65.28	73.31	85.60	90.72
VIII	Lerma-Santiago-Pacific	67.98	79.78	82.51	90.08	93.05
IX	Northern Gulf	33.94	42.16	49.98	65.26	72.98
X	Central Gulf	45.89	55.93	60.11	74.82	81.60
XI	Southern Border	45.49	62.27	67.67	80.75	85.61
XII	Yucatan Peninsula	45.06	57.54	63.17	76.34	84.48
XIII	Waters of the Valley of Mexico	85.86	93.14	94.40	97.21	97.82
	National	**61.48**	**72.40**	**76.18**	**85.62**	**89.61**

Source: Produced based on Inegi (2014d).

The states with the greatest backlogs in drinking water coverage are: Guerrero, Oaxaca and Chiapas; whereas in terms of sanitation it is Oaxaca, Guerrero and Yucatan, as shown in [Additional: T4.G].

Aqueducts

[Reporter: Acueductos principales]

There are more than 3 000 kilometers of aqueducts in Mexico that transport water to various cities and rural communities around the country, with a total capacity of more than 112 cubic meters per second. The main ones, as regards their length and flow, are listed in table T4.7.

T4.8 Main aqueducts in Mexico, 2013

No.	Aqueduct	HAR	Length (km)	Design flow (l/s)	Year of completion	Supplies	Operated by
1	Rio Colorado Tijuana	I Baja California Peninsula	130	4 000	1982	Cities of Tijuana and Tecate and the village of La Rumorosa in Baja California.	Water Service Commission of the State of Baja California (Cosae).
2	Vizcaino-Northern Pacific	I Baja California Peninsula	206	62	1990	Localities of Bahia Asuncion, Bahia Tortugas and the fishing villages of Punta Abreojos in Baja California.	Water utility of the municipality of Mulege, Baja California.
3	Cutzamala System	IV Balsas and XIII Waters of the Valley of Mexico	162	19 000	1993	The Metropolitan Zone of Mexico City with water from the Valle de Bravo, Villa Victoria and El Bosque reservoirs, among others.	Conagua.

No.	Aqueduct	HAR	Length (km)	Design flow (l/s)	Year of completion	Supplies	Operated by
4	Linares-Monterrey	VI Rio Bravo	133	5 000	1984	The Metropolitan Zone of the city of Monterrey, Nuevo Leon, with water from the Cerro Prieto reservoir.	Water and Sanitation Services of Monterrey, I.P.D.
5	El Cuchillo-Monterrey	VI Rio Bravo	91	5 000	1994	The Metropolitan Zone of the city of Monterrey with water from the El Cuchillo reservoir.	Water and Sanitation Services of Monterrey, I.P.D.
6	Lerma	VIII Lerma-Santiago-Pacific and XIII Waters of the Valley of Mexico	60	14 000	1975	Mexico City with water from the aquifers located in the upper area of Lerma River.	Mexico City Water System.
7	Armeria-Manzanillo	VIII Lerma-Santiago-Pacific	50	250	1987	Manzanillo, Colima.	Manzanillo Drinking Water, Drainage and Sanitation Commission, Colima.
8	Chapala-Guadalajara	VIII Lerma-Santiago-Pacific	42	7 500	1991	The Metropolitan Zone of the city of Guadalajara with water from Lake Chapala.	Inter-Municipal System for Drinking Water and Sanitation Services (SIAPA).
9	Presa Vicente Guerrero-Ciudad Victoria	IX Northern Gulf	54	1 000	1992	Ciudad Victoria, Tamaulipas, with water from the Vicente Guerrero .	Municipal Drinking Water and Sanitation Commission (Comapa Victoria).
10	Uxpanapa-La Cangrejera	X Central Gulf	40	20 000	1985	22 industries located in the southern part of the state of Veracruz.	Conagua.
11	Yurivia-Coatzacoalcos y Minatitlan	X Central Gulf	64	2 000	1987	Coatzacoalcos and Minatitlan, Veracruz with water from the Ocotal and Tizizapa rivers.	Coatzacoalcos Municipal Drinking Water and Sanitation Commission, Coatzacoalcos, Veracruz (Cmaps Coatzacoalcos).
12	Acueducto II Queretaro	VIII Lerma-Santiago-Pacific and IX Northern Gulf	122	1 500	2011	Santiago de Queretaro, Qro.	State Water Commission -Controladora de Operaciones de Infraestructura S.A. de C.V.
13	Rio Huitzilapan-Xalapa	X Central Gulf	55	1 000	2000	Xalapa-Enriquez, Ver.	Xalapa Municipal Water and Sanitation Commission (Cmas Xalapa).
14	Chicbul-Ciudad del Carmen	XII Yucatan Peninsula	122	390	1975	Sabancuy, Isla Aguada and Ciudad del Carmen, Camp.	Municipal Drinking Water System of Ciudad del Carmen, Campeche.
15	Conejos-Medanos	VI Rio Bravo	25	1 000	2009	Ciudad Juarez, Chih.	Municipal Water and Sanitation Board of Ciudad Juarez, Chihuahua - Administrator of Hydraulic Projects in Ciudad Juarez, S.A. de C.V.
16	Independencia	II Northwest	135	2 380	2013	Hermosillo, Son.	Conagua.
	Total		1 491	82 082			

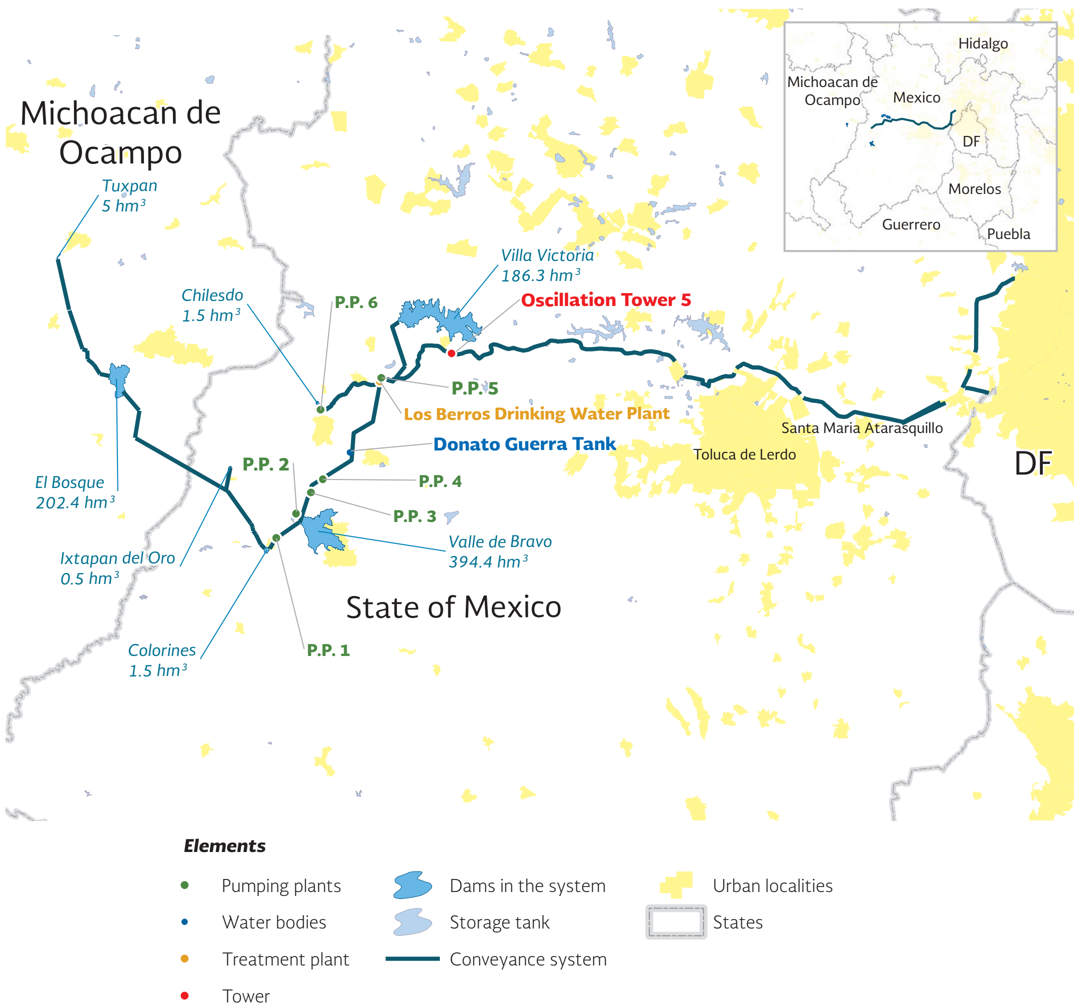
Source: Conagua (2014j).

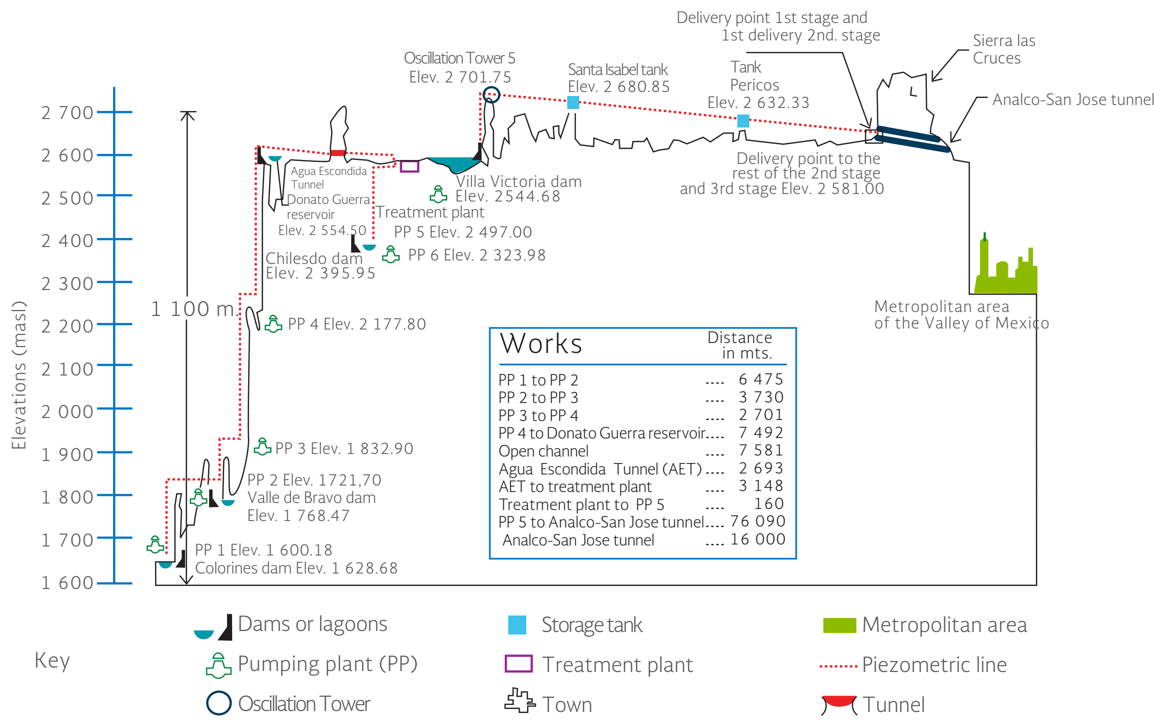
[Reporter: Sistema Cutzamala]

The Cutzamala System, which supplies 11 delegations of Mexico City (the Federal District) and eleven municipalities of the State of Mexico, is one of the biggest drinking water supply systems in the world, not only for the quantity of water that it supplies (approximately 485 million cubic meters every year), but also because of the difference in elevation (1 100 m) that it overcomes. It contributes 17% of the supply for all uses in the Valley of Mexico catchment, calculated at 88 m³/s, which is complemented by the Lerma System (5%), groundwater extraction (68%) and rivers and springs (3%) and water reuse (7%) (WB 2013). The Cutzamala System is made up of seven diversion and storage reservoirs, six pumping stations and one treatment plant with the characteristics indicated in [Additional: T4.H].

Graph G4.8 shows the location of the system and the difference in elevation that has to be overcome from the lowest point of Pumping Plant No. 1 to convey water to Oscillation Tower No. 5 and subsequently by gravity to the Valley of Mexico Metropolitan Area (ZMVM).

G4.8 Cutzamala System





Source: Produced based on Conagua (2014d). Inegi (2013a), Inegi (2013b).

The pumping of the system, necessary to overcome the difference in elevation, brings about a significant consumption of electricity. In 2013, the electricity employed was 1.2 TWh, which represented 0.5% of the total generation of electricity in Mexico that year, and its cost was 1.996 billion pesos.

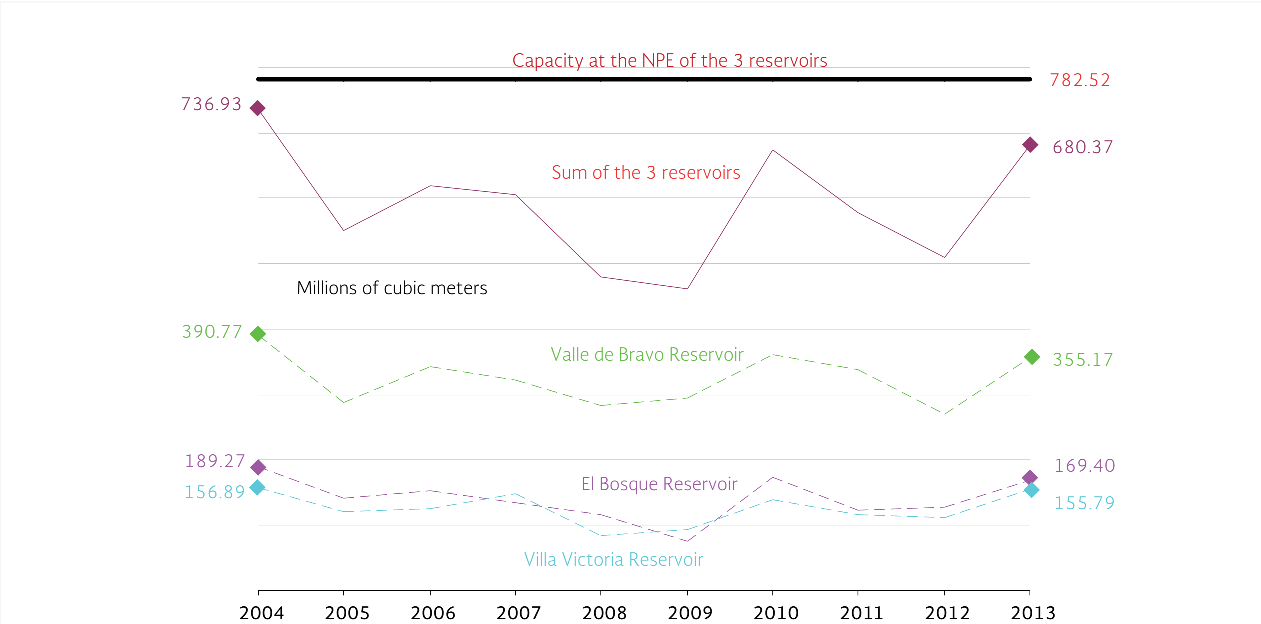
As a comparison, the cost represented 4.8% of the total Budget executed by the Conagua for that same year. The annual volumes provided and the consumption of electricity required by the Cutzamala System for the 2005-2013 period are presented in table T4.9.

T4.9 Volumes and flows supplied by the Cutzamala System, 1913-2013

Year	Volume hm³/year			Consumption (kWh)
	Delivery to the Federal District	Delivery to the State of Mexico	Total	
2005	310.39	182.80	493.19	1 414 293 873
2006	303.53	177.26	480.79	1 353 071 190
2007	303.90	174.56	478.46	1 388 314 682
2008	306.25	179.47	485.72	1 287 053 439
2009	244.60	155.38	399.97	1 135 976 290
2010	266.85	165.84	432.69	1 262 974 766
2011	296.46	182.17	478.63	1 417 659 193
2012	272.54	190.96	463.50	1 366 497 158
2013	255.05	165.19	420.24	1 200 088 371

Source: Conagua (2014d).

G4.9 Evolution in the storage in the reservoirs of the Cutzamala System



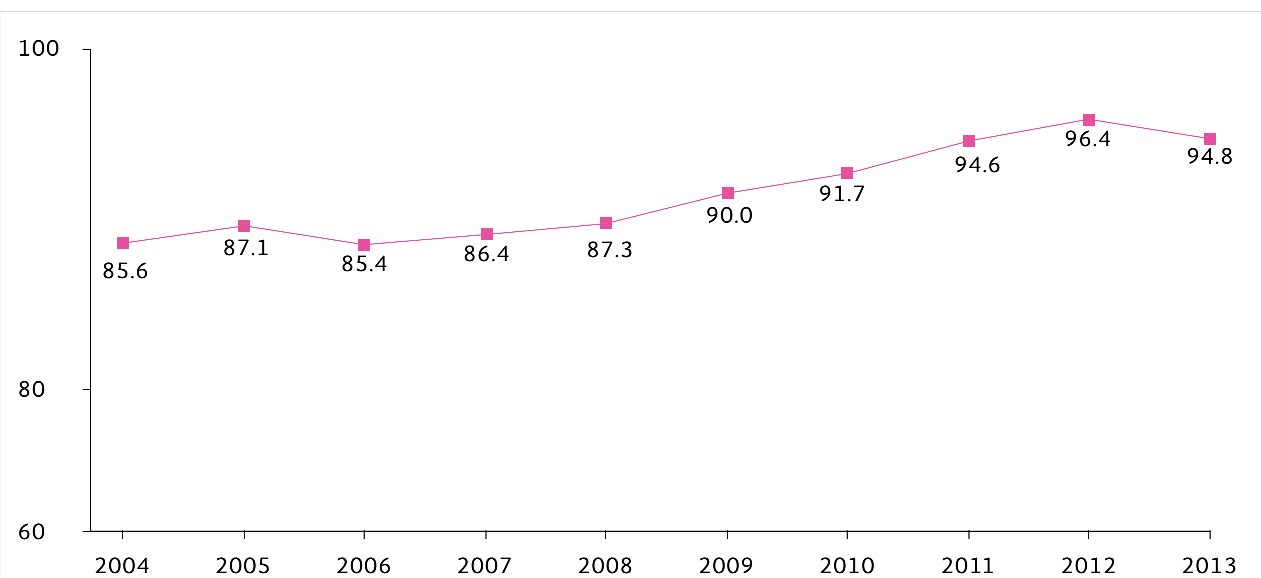
Source: Produced based on CONAGUA (2014d).

PURIFICATION PLANTS

[Reporter: Plantas potabilizadoras]

Municipal purification plants condition the water quality in surface and/or groundwater sources for public urban use. In 2013, 94.8 m³/s were treated in the 742 plants in operation in Mexico. The evolution in the flow treated annually is illustrated in graph G4.10.

G4.10 Municipal flow treated (m³/s)



Source: CONAGUA (2014j).

The distribution of purification plants is listed in table T4.9 by HAR, and they are listed at the state level in [Additional: T4.I]. It should be mentioned that the Los Berros treatment plant is included, found in the hydrological-administrative region IV Balsas. This plant is in the locality of the same name in the municipality of Villa de Allende, State of Mexico, and is part of the Cutzamala System.

It is operated by the Waters of the Valley of Mexico River Basin Organization.

T4.10 Purification plants in operation, 2013

Code	HAR	Number of plants in operation	Installed capacity (m^3/s)	Flow treated (m^3/s)
I	Baja California Peninsula	44	12.4	6.82
II	Northwest	24	5.6	2.29
III	Northern Pacific	158	9.5	8.44
IV	Balsas	23	22.9	17.25
V	Southern Pacific	9	3.2	2.61
VI	Rio Bravo	63	27.2	13.53
VII	Central Basins of the North	117	0.6	0.41
VIII	Lerma-Santiago-Pacific	132	20.3	15.39
IX	Northern Gulf	47	8.2	7.26
X	Central Gulf	13	7.1	4.59
XI	Southern Border	46	14.5	10.91
XII	Yucatan Peninsula	1	0.0	0.01
XIII	Waters of the Valley of Mexico	65	6.5	5.28
	Total	742	137.81	94.79

Source: Conagua (2014j).

Table T4.11 illustrates the main treatment processes applied in these plants.

T4.11 Main treatment processes applied, 2013

Main process	Purpose	Plants		Flow treated	
		No.	%	m^3/s	%
Softening	Elimination of hardness	19	2.6	0.47	0.49
Adsorption	Elimination of organic traces	3	0.4	0.06	0.07
Conventional clarification	Elimination of suspended solids	206	27.8	68.47	72.23
Patented clarification	Elimination of suspended solids	159	21.4	5.15	5.43
Direct filtration	Elimination of suspended solids	75	10.1	14.22	15.00
Activated carbon filters	Elimination of suspended solids	15	2.0	0.03	0.03
Slow filtering	Elimination of suspended solids	11	1.5	0.09	0.10
Reverse osmosis	Elimination of dissolved solids	231	31.1	1.58	1.66
Removal of iron and manganese		12	1.6	4.34	4.58
Others		11	1.5	0.39	0.41
	Total	742	100.0	94.79	100.00

Source: Conagua (2014j).

4.5 Water treatment and reuse

Wastewater discharges

[Reporter: Descarga de aguas residuales]

Wastewater discharges are classified as either municipal or industrial. Municipal ones are those which are managed in the urban and rural sanitation systems, whereas the latter are those that are discharged directly to national receiving water bodies, as is the case for self-supplying industry.

The sequence of generation of wastewater, collection in sewerage systems and treatment/disposal is shown in table T4.12. The table employs the abbreviation BOD_5, which corresponds to the parameter of five-day Biochemical Oxygen Demand.

T4.12 Municipal and non-municipal wastewater discharges, 2013

Urban centers (municipal discharges)		
Wastewater	7.26	thousands of hm^3/year (230.2 m^3/s)
Collected in sewerage systems	6.66	thousands of hm^3/year (211.1 m^3/s)
Treated	3.34	thousands of hm^3/year (105.9 m^3/s)
Generated	1.96	millions of tons of BOD_5 per year
Collected in sewerage systems	1.80	millions of tons of BOD_5 per year
Removed to treatment systems	0.73	millions of tons of BOD_5 per year
Non-municipal uses, including industry		
Wastewater	6.63	thousands of hm^3/year (210.26 m^3/s)
Treated	1.91	thousands of hm^3/year (60.72 m^3/s)
Generated	9.95	millions of tons of BOD_5 per year
Removed to treatment systems	1.30	millions of tons of BOD_5 per year

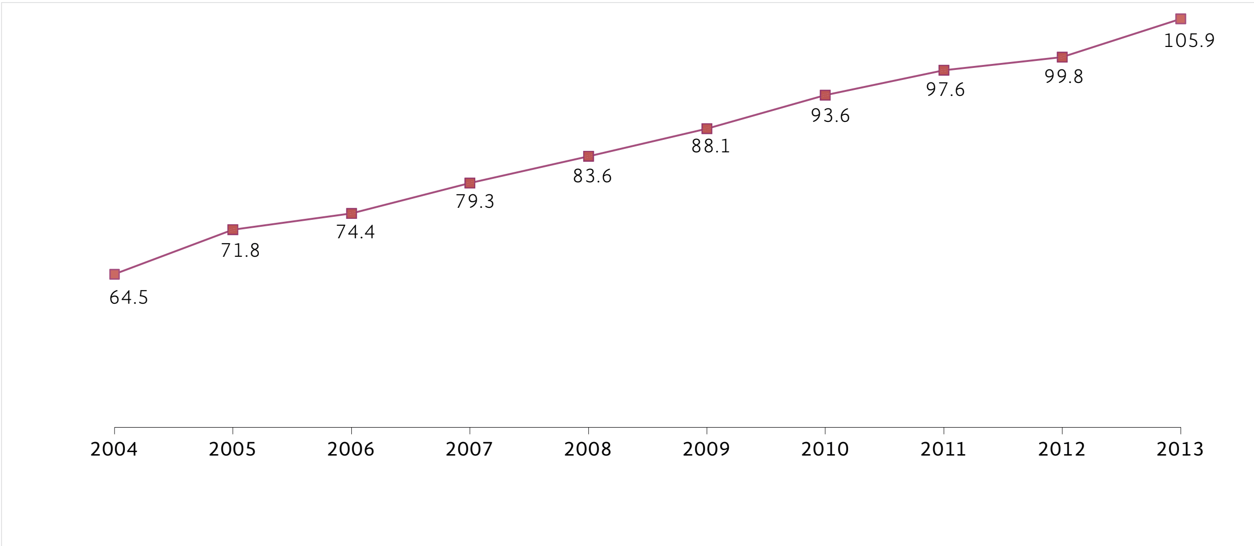
Source: Conagua (2014j), Conagua (2014l).

Municipal wastewater treatment plants

[Reporter: Plantas de tratamiento]

In 2013, the 2 287 plants in operation in Mexico treated 105.9 m^3/s, or 50.2% of the 211.1 m^3/s collected in sewer systems. The evolution in the flow treated per year is shown in graph G4.11.

G4.11 Flow of municipal wastewater treated (m³/s)



Source: CONAGUA (2014j).

The wastewater treatment plants in operation by hydrological-administrative region are shown in table T4.13, as well as at the state level in [Additional: T4.J].

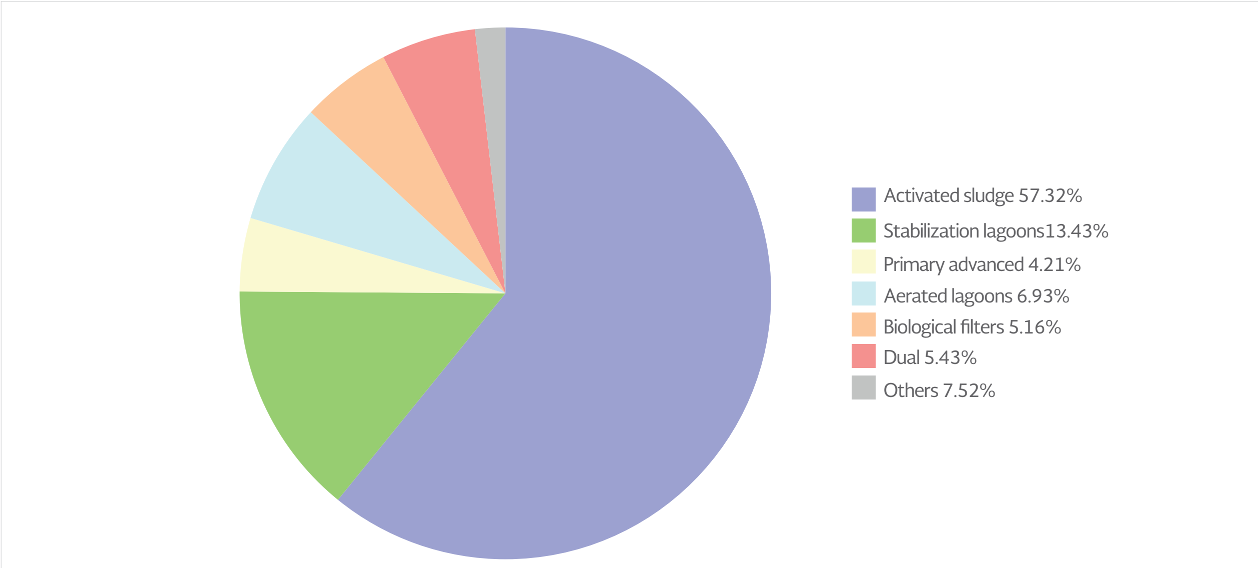
T4.13 Municipal wastewater treatment plants in operation, 2013

Code	HAR	Number of plants in operation	Installed capacity (m³/s)	Flow treated (m³/s)
I	Baja California Peninsula	63	9.25	6.52
II	Northwest	102	5.54	3.75
III	Northern Pacific	339	9.92	7.72
IV	Balsas	190	9.89	7.76
V	Southern Pacific	88	4.65	3.74
VI	Rio Bravo	227	33.86	23.02
VII	Central Basins of the North	146	6.71	5.43
VIII	Lerma-Santiago-Pacific	576	39.80	26.52
IX	Northern Gulf	94	5.63	4.27
X	Central Gulf	147	7.20	5.59
XI	Southern Border	114	4.42	2.58
XII	Yucatan Peninsula	83	3.06	1.98
XIII	Waters of the Valley of Mexico	118	12.27	7.05
	Total	2 287	152.17	105.93

Source: : CONAGUA (2014j).

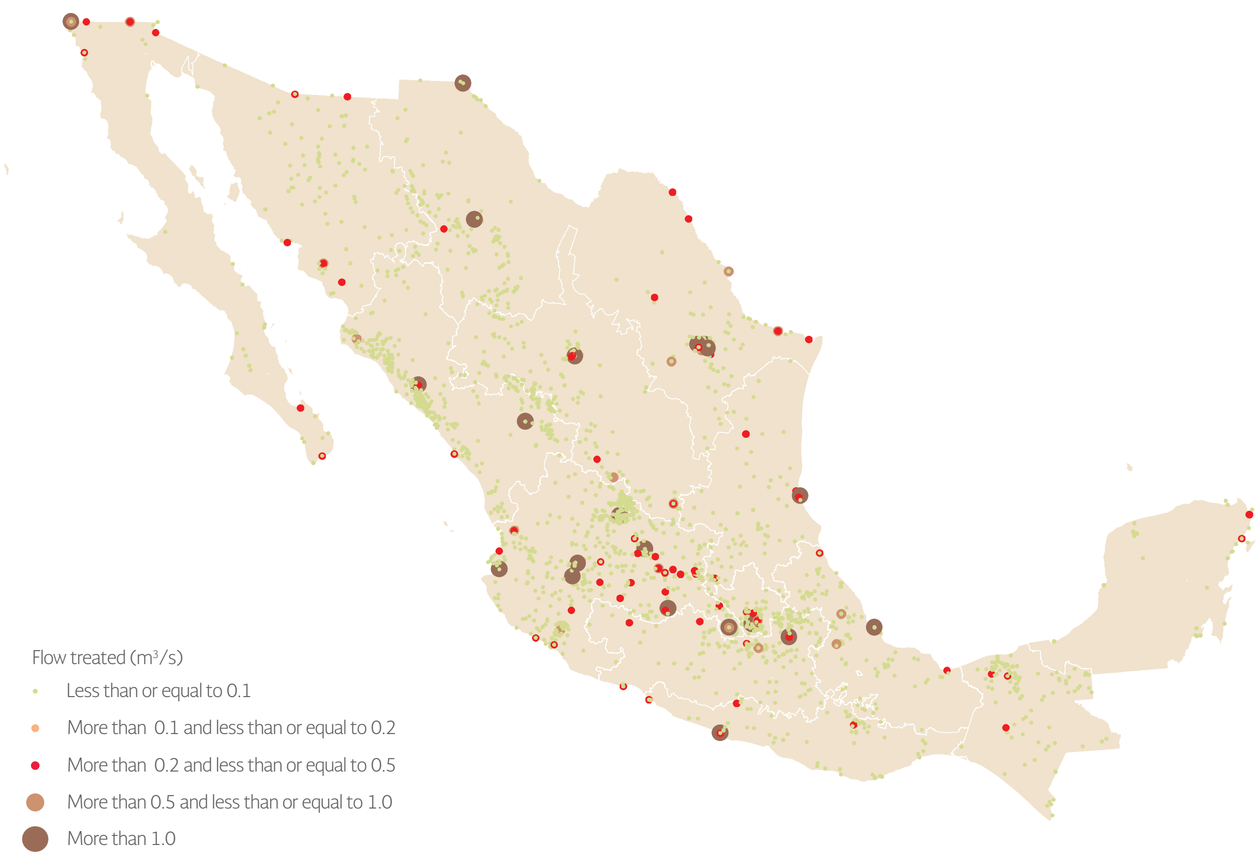
The distribution of treatment plants is shown in map M4.3, and their main treatment processes are illustrated in graph G4.12. It should be mentioned that the flow of wastewater treated was 105.9 m³/s in 2013.

G4.12 Main municipal wastewater treatment processes, by flow treated, 2013



Source: CONAGUA (2014j).

M4.3 Municipal wastewater treatment plants, 2013



Source: CONAGUA (2014j).

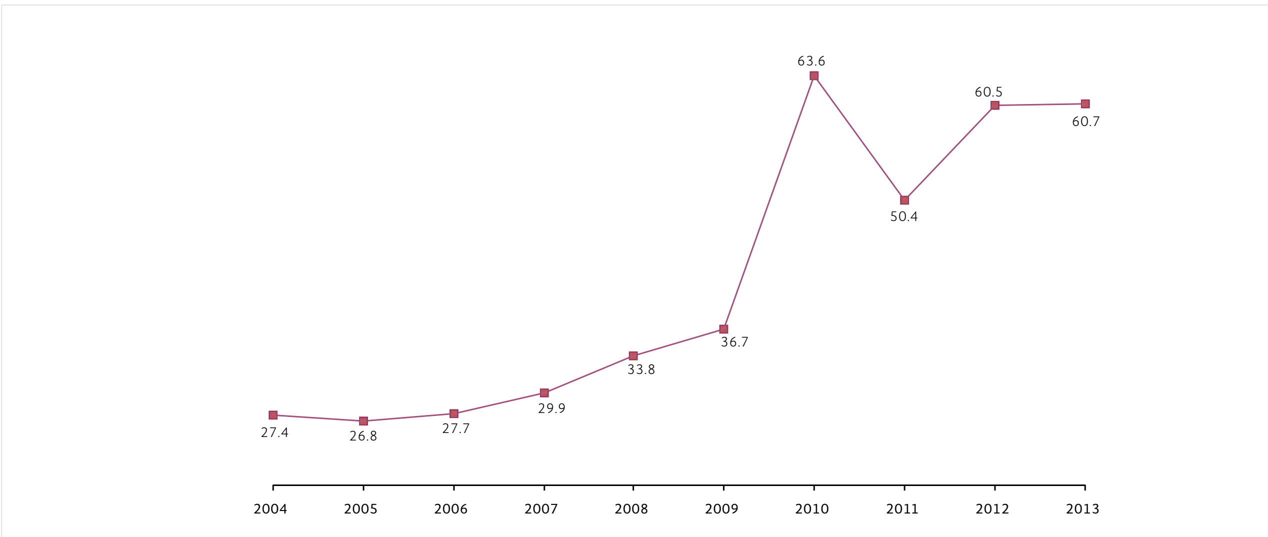
Industrial wastewater treatment plants

[Reporter: Plantas de tratamiento]

In 2013, industry treated 60.7 m³/s of wastewater, in 2 617 plants in operation nationwide.

The evolution in the 2004-2013 period is shown in graph G4.14, in table T4.14 the main processes into which industrial treatment is broken down are shown, whereas table T4.15 illustrates the distribution by states.

G4.13 Flow of industrial wastewater treated (m³/s)



Source: Produced based on Conagua (2014l).

T4.14 Types of industrial wastewater treatment, 2013

Type of treatment	Purpose	Number of plants	Operating flow (m³/s)	Percentage
Primary	To adjust the pH and remove organic and/or inorganic materials in suspension, with a size equal to or greater than 0.1 mm	839	21.8	32.06
Secondary	To remove colloidal and dissolved organic materials	1 555	34.8	59.42
Tertiary	To remove dissolved materials, including gases, natural and synthetic organic substances, ions, bacteria and viruses.	74	1.2	2.83
Not specified		149	3.0	5.69
	Total	2 617	60.7	100.00

Source: Conagua (2014l).

T4.15 Industrial wastewater treatment plants in operation by state, 2013

State	Number of plants in operation	Installed capacity (m^3/s)	Flow treated (m^3/s)
Aguascalientes	47	0.34	0.2
Baja California	50	0.43	0.4
Baja California Sur	24	4.95	4.9
Campeche	127	0.22	0.2
Coahuila de Zaragoza	61	0.77	0.5
Colima	7	0.44	0.3
Chiapas	75	6.90	6.4
Chihuahua	15	0.65	0.3
Distrito Federal	5	0.00	<0.1
Durango	41	0.84	0.5
Guanajuato	134	0.74	0.6
Guerrero	8	0.64	0.6
Hidalgo	45	1.84	1.4
Jalisco	71	1.54	1.5
Mexico	241	2.35	1.8
Michoacan de Ocampo	70	4.89	3.7
Morelos	102	2.34	2.3
Nayarit	6	0.16	0.2
Nuevo Leon	178	4.05	2.9
Oaxaca	16	2.51	2.2
Puebla	192	1.04	0.8
Queretaro	140	1.25	0.7
Quintana Roo	4	0.06	0.1
San Luis Potosi	50	0.82	0.7
Sinaloa	116	3.52	1.0
Sonora	235	9.16	9.0
Tabasco	119	0.87	0.9
Tamaulipas	99	8.06	7.5
Tlaxcala	76	0.28	0.2
Veracruz de Ignacio de la Llave	160	12.90	8.6
Yucatan	88	0.30	0.3
Zacatecas	15	0.16	<0.1
Total	**2 617**	**75.03**	**60.7**

Source: CONAGUA (2014l).

4.6 Emergency attention and flood protection

[Reporter: Atención a emergencias]

As part of the Infrastructure Protection and Emergency Attention program (PIAE in Spanish), the Conagua has set up 18 regional emergency attention centers (CRAEs in Spanish) in various areas of the country, with the aim of supporting states and municipalities in supplying drinking water and sanitation in situations of risk. Map M4.4 shows the location of these centers.

Among the equipment at the disposal of the CRAEs are mobile treatment plants, pumping equipment, generators for independent electricity generation, water trucks and transportation equipment for the machinery. This emergency attention is carried out by the Conagua in coordination with the states, municipalities and federal agencies.

M4.4 Regional emergency attention centers, 2013

Source: Produced based on Conagua (2014b).

As regards the issue of floods, in which emergency attention actions include early warning on risks of extreme hydro-meteorological phenomena, the development of prevention plans, the construction and maintenance of protection infrastructure and inter-institutional coordination, there is a national inventory of protection works (map M4.5).

M4.5 Flood protection infrastructure

Source: Produced based on CONAGUA (2008).

Chapter 5

Water management tools

5.1 Water management tools

The National Water Commission of Mexico (Conagua), an administrative, normative, technical, consultative and decentralized agency of the Ministry of the Environment and Natural Resources (Semarnat), has the following mission and vision:

Mission

"To manage and preserve the nation's water resources and its inherent public goods to achieve a sustainable use of these resources, with the co-responsibility of the three tiers of government and society-at-large".

Vision

"To be a technical authority and a promoter of the participation of society and governmental bodies in integrated water resources management and the management of inherent public goods".

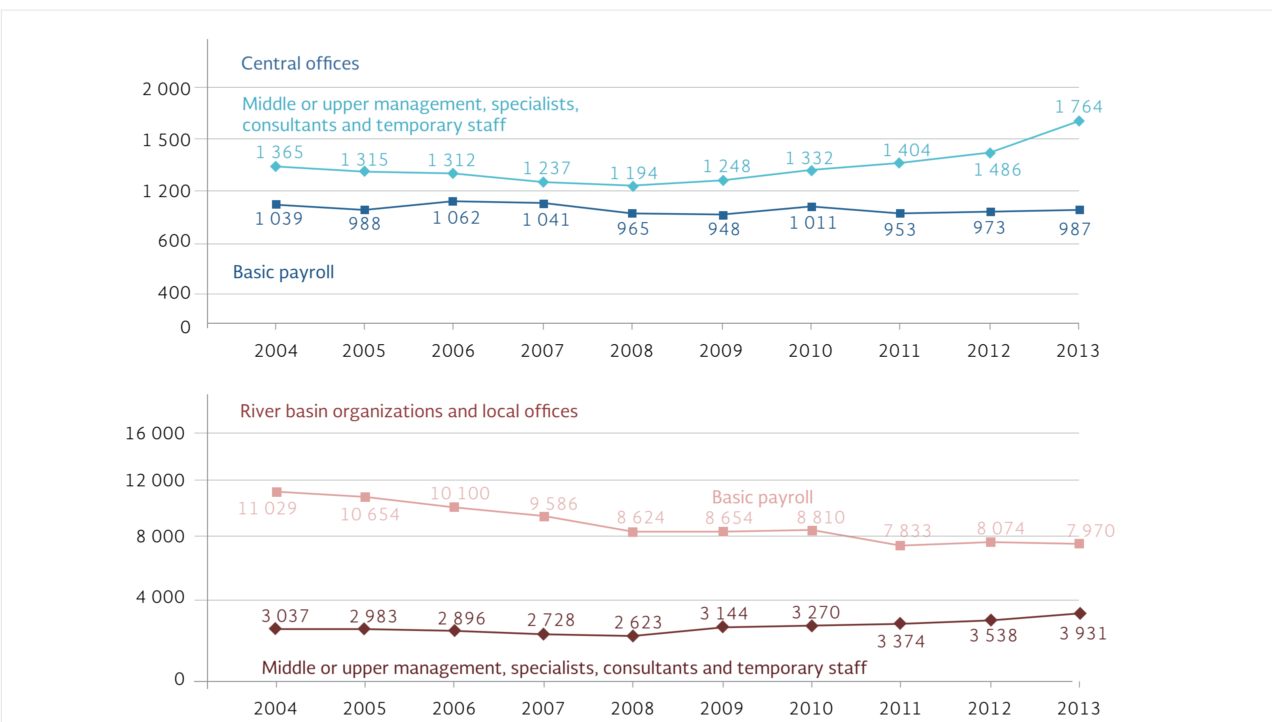
The following vision has also been development of the water sector:

Vision of the Water Sector

"A nation that has water in sufficient quantity and quality, recognizes its strategic value, uses it efficiently, and protects water bodies, in order to ensure sustainable development and preserve the environment".

In 1989, the year in which the Conagua was created, it had 38 188 employees, a number which in recent years has been reduced. Thus in December 2013, the Conagua had 14 652 employees, of which 2 751 were assigned to its central offices and the remainder to the river basin organizations (RBOs) and local offices (LOs). This trend can be observed in graph G5.1.

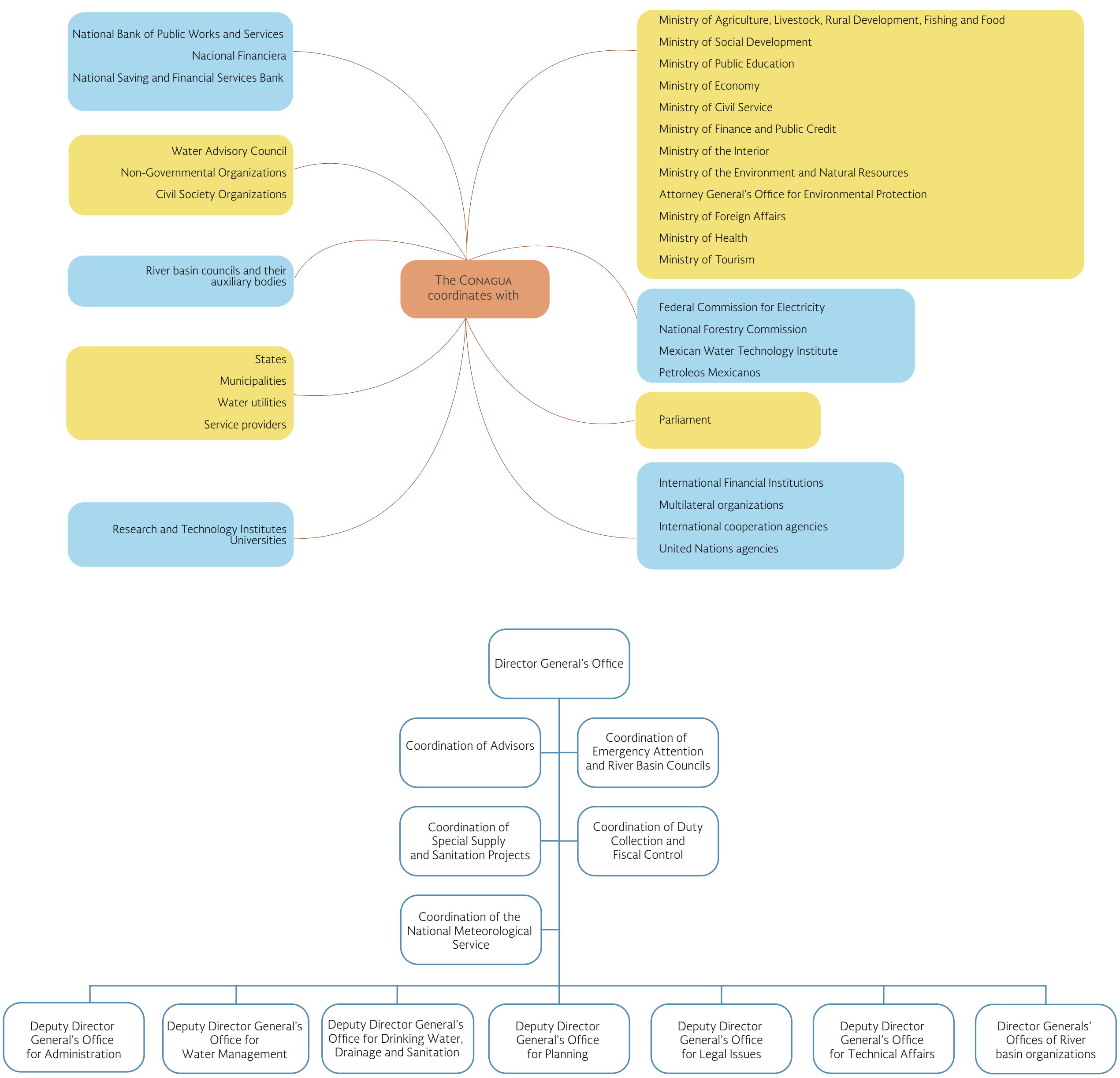
G5.1 Conagua staff, 2004-2013



Source: Conagua (2014i).

In order to carry out the functions assigned to it, the CONAGUA works in conjunction with various federal, state and municipal bodies, water user associations, companies, the private sector, civil society and international organizations. Graph G5.2 [Additional: T5.A] shows the main institutions with which the CONAGUA coordinates for the attainment of the goals of national water planning, as well as its organic structure.

G5.2 Main institutions, bodies and agencies with which the CONAGUA coordinates



Source: CONAGUA (2005), IFAI (2014), *Ley de Aguas Nacionales.*

According to article 115 of the Mexican Constitution, municipalities are responsible for providing drinking water, sewerage and sanitation services, subject to the compliance with both federal and state laws. The latest census that offered a complete registry nationwide found that the number of employees involved in the provision of drinking water, sewerage and sanitation services was 110 038 (INEGI 2009c).

5.2 Legal framework for the use of water in Mexico

The National Water Law (LAN) establishes that the use of the nation's water resources will be carried out through the assigning of concession or allocation deeds by the Federal Executive Branch, through the Conagua, by means of the RBOs, or directly by the Conagua when within its responsibilities, according to the rules and conditions laid down within the LAN and its By-Laws. Similarly, for wastewater discharges, it is necessary to have a discharge permit issued by the same institution.

Deeds registered in the Public Registry of Water Duties (Repda)

[Reporter: Usos (Títulos inscritos), Usos del agua]

Since the LAN was passed (1992), concession or allocation deeds and discharge permits have been registered in the Repda. Up to December 2013, 474 844 concession deeds for the use of the nation's water resources had been registered in the Repda, which corresponds to a volume of 81 651 million cubic meters (hm^3) allocated for offstream uses and 168 028 hm^3 for instream uses (in hydropower plants).

The distribution of deeds according to their use is shown in table T5.1, and in table T5.2 they are grouped by hydrological-administrative region (HAR), considering the discharge permits, federal zone permits and material extraction. By number, regions VI Rio Bravo, VIII Lerma-Santiago-Pacific and X Central Gulf concentrate 40% of the total number of concession and/or allocation deeds.

It should be noted that one concession deed may cover one or more uses or permits. The term "grouped use" is employed (see chapter 3), wherein the grouped use for agriculture includes the agricultural, livestock, aquaculture, multiple and "others" headings of the Repda classification; public supply includes public urban and domestic, self-supplying industry considers industrial, agro-industrial, services and trade. There may be slight variations in the figures owing to the dates in which the Repda was consulted.

T5.1 Concession or allocation deeds registered in the Repda, 2013

Grouped uses	Deeds registered in the Repda	
	Number	Percentage
Agriculture	302 879	63.78
Public supply	144 220	30.37
Self-supplying industry	27 562	5.80
Thermoelectric plants	48	0.01
Subtotal offstream uses	474 709	99.97
Instream uses (hydropower plants)	135	0.03
Total	474 844	100.00

Source: Conagua (2004g).

T5.2 Deeds in the Repda, 2013

Code	HAR	Concessions and/or allocations				
		Surface water	Groundwater	Discharge permits	Federal zone permits	Material extraction
I	Baja California Peninsula	2 256	9 169	579	1 592	420
II	Northwest	4 487	19 135	666	2 911	107
III	Northern Pacific	12 166	12 672	670	8 068	434
IV	Balsas	15 173	13 048	1 494	7 910	391
V	Southern Pacific	9 668	16 887	498	9 890	195
VI	Rio Bravo	6 029	37 119	675	5 895	61
VII	Central Basins of the North	3 678	26 911	928	3 537	67
VIII	Lerma-Santiago-Pacific	18 932	57 560	2 889	21 405	725
IX	Northern Gulf	9 083	14 291	837	12 960	173
X	Central Gulf	12 675	18 734	1 729	18 440	666
XI	Southern Border	24 648	8 449	824	11 760	362
XII	Yucatan Peninsula	254	30 216	3 274	86	3
XIII	Waters of the Valley of Mexico	1 189	2 379	828	1 839	0
	Total	**120 238**	**266 570**	**15 891**	**106 293**	**3 604**

Source: Conagua (2004g).

Legal instruments

[Reporteador: Zonas de veda]

Mexico's Political Constitution authorizes the Federal Executive Branch to establish regulatory means, if it is in public interest and utility, in order to maintain control over the extraction of the nation's groundwater resources through the issuing of prohibitions, regulations and reserves.

The different current legal control instruments were issued between 1948 and 2013. The LAN establishes that prohibition zones are necessary in those aquifers in which there is no mean annual availability of groundwater, as a result of which it is not possible to authorize concessions or allocations of water in addition to those legally authorized, due to the deterioration of water in quantity or quality, which affects hydrological sustainability

Regulated zones are for those aquifers in which there is still mean annual availability of groundwater, which may be granted as a concession or allocation, for any use, until the available volume is reached.

Reserve zones are specific areas of aquifers in which limits are established on the use of a part or all of the available water, with the aim of providing a service or setting up a restoration or conservation program. Through the corresponding declaration, the Executive Branch may declare the total or partial reserve of water resources for the following purposes: domestic and public-urban use, power generation for public service, and guaranteeing minimal flows for ecological protection, including the conservation of vital ecosystems.

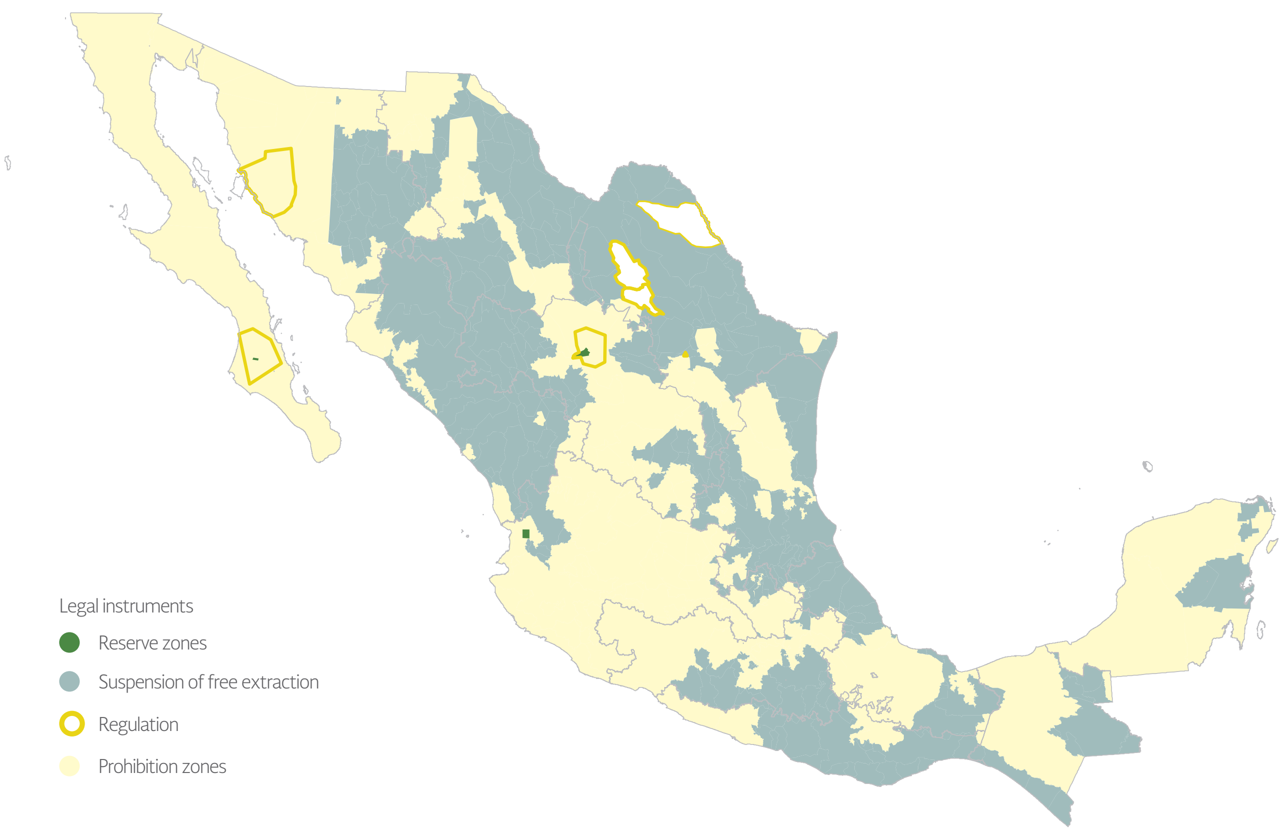
Up to December 31, 2013, 146 prohibition decrees, four aquifer regulations, three decrees of regulated zones and three declarations of reserve zones for public urban use had been declared, which together cover approximately

55% of the national territory (see map M5.1). In them it is established that to use groundwater within the territories outlined within them, it is necessary to request the corresponding concession or allocation. The CONAGUA, considering the results of the studies it carries out, may authorize or reject the concession or allocation.

For the remaining 45% of the country, in 2013 general agreements were published for a total of 333 aquifers, previously not subject to legal restrictions, and in which the digging or the construction of infrastructure to extract water from the subsoil is no longer permitted, or the increase in the previously authorized volume (62 aquifers) or a concession or allocation is required to extract water from the subsoil as well as authorization from the CONAGUA to increase the volume (271 aquifers).

In 2013 the Federal Executive Branch decreed the Cuatrocienegas and Allende-Piedras Negras aquifers as regulated zones.

M5.1 Groundwater instruments, 2013

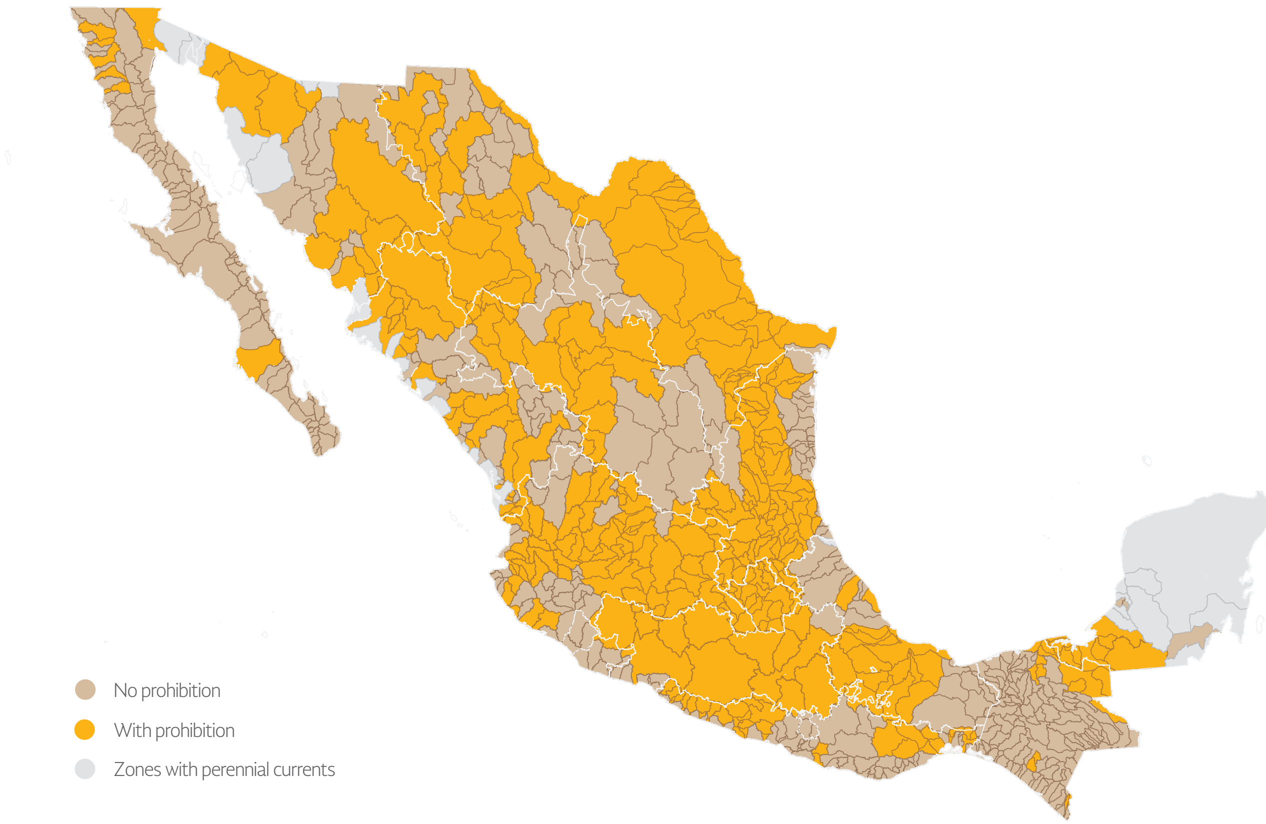


Source: Produced based on CONAGUA (2014l).

Surface prohibition zones are those specific areas of regions of watersheds in which additional uses of water to those that are legally established are not authorized, and the latter are controlled through specific regulations, by virtue of the deterioration in the quantity or quality of water, due to the impact on hydrological sustainability or the damage to surface water bodies. The CONAGUA consults with users and civil society organizations, within the scope of the river basin councils, and resolves the limitations resulting from the existence, declaration and implementation of prohibition zones.

Surface prohibition zones are shown in map M5.2.

M5.2 Surface prohibition zones, 2012



Source: Produced based on CONAGUA (2014l).

PUBLICATION OF MEAN ANNUAL WATER AVAILABILITIES

[Reporter: Zonas de veda]

The LAN establishes that in order to grant concession or allocation deeds, the mean annual availability of water in the watershed or aquifer in which the use is to be made should be taken into account. The CONAGUA is thus bound to publish these availabilities, for which the standard NOM-011-CONAGUA-2000 was created, "Conservation of Water Resources which establishes the specifications and the method to determine the mean annual availability of the nation's water resources".

Up to December 31, 2013, the availabilities of the 653 hydrogeological units or aquifers into which the country has been divided had been published in the DOF, as well as that of the 731 watersheds into which Mexico is subdivided.

Maps M5.3 and M5.4 show the location of Mexico's watersheds and aquifers, the availability of which had been published in the DOF up to December 31, 2013.

M5.3 Watersheds with availability published in the DOF, 2013

Source: Produced based on Conagua (2014l).

M5.4 Aquifers with availability published in the DOF, 2013

Source: Produced based on Conagua (2014l).

Classification declarations for Mexico's water bodies

The LAN establishes that in order to grant wastewater discharge permits, the classification declarations of the national water bodies should be consulted. The Conagua has the responsibility of drawing up and publishing these declarations in the DOF.

According to article 87 of the LAN, the classification declarations contain the limits of the water bodies studied in which the pollution assimilation and dilution capacity is determined, referring to their capacity to self-purify; as well as the quality parameters that wastewater should comply with and the maximum discharge limits of these parameters in the classified areas. Furthermore, they include quality targets in the receiving water bodies as regards the pollutants, as well as the periods to achieve these targets.

5.3 Water economy and finances

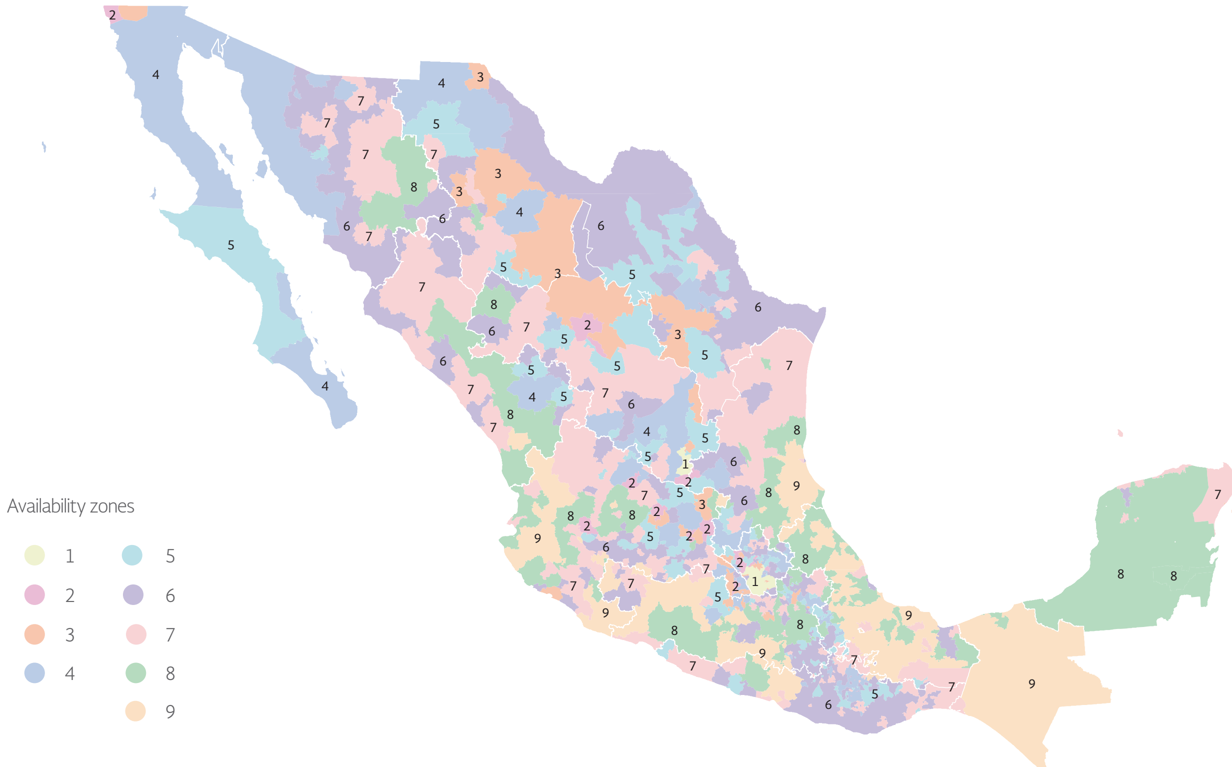
Duties for the use of the nation's water resources

[Reporter: Descarga de aguas residuales]

Both companies and individuals that use Mexico's water resources are bound to pay the corresponding duties, with or without the benefit of concession or allocation deeds, authorizations or permits assigned by the Federal Government. Those who discharge wastewater into rivers, catchments, reservoirs, seawater or water currents, be it permanently, intermittently or on a one-off basis, as well as into the soil or filter it into grounds which are public property or which could pollute the subsoil or aquifers. The same applies to those who use public goods which belong to the federation in ports, terminals and port installations, the federal sea zone, dikes, channels, reservoirs, areas with currents and tanks, which are the property of the nation.

In order to charge duties for the use of water, the Mexican republic has been divided into nine availability zones. The list of the municipalities that belong to each availability zone may be found in article 231 of the 2008 Federal Duties Law (LFD in Spanish), which is updated annually, and is shown in map M5.5. In general the cost per cubic meter is higher in the zones of lesser availability, as can be observed in table T5.3.

M5.5 Availability zones for the charging of duties, 2013



Source: Produced based on CONAGUA (2014c).

It should be mentioned that no payment is made for the extraction of seawater, or for brackish water with concentrations of more than 2 500 mg/l of total dissolved solids (certified by the CONAGUA). In table T5.3 "general regime" refers to any use other than those mentioned; the values are taken from the publication in the DOF (09/04/2012) on the reforms to the Federal Duties Law, with quantities updated in Annex 19 of the tax law for 2013, on December 28, 2012.

T5.3 The CONAGUA's collection through the charging of duties and concepts, 2013 (cents per cubic meter)

Use	Zone								
	1	2	3	4	5	6	7	8	9
General regime	2 050.42	1 640.28	1 366.89	1 127.70	888.45	802.97	604.37	214.72	160.92
Drinking water, consumption of more than 300 l/inhabitant-day	81.24	81.24	81.24	81.24	81.24	81.24	37.83	18.89	9.41
Drinking water, consumption equal to or less than 300 l/inhabitant-day	40.62	40.62	40.62	40.62	40.62	40.62	18.92	9.45	4.70
Agriculture and livestock, without exceeding the concession	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Agriculture and livestock, for every m³ that exceeds the	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52	14.52
Spas and recreation centers	1.17	1.17	1.17	1.17	1.17	1.17	0.57	0.27	0.13
Hydropower generation	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Aquaculture	0.33	0.33	0.33	0.33	0.33	0.33	0.16	0.08	0.04

Source: CONAGUA (2014c).

For the purpose of charging duties for wastewater discharges, receiving bodies (rivers, lakes and lagoons, among others) are classified into three types: A, B or C, according to the effects caused by the pollution. The C-type receiving bodies are those in which the pollution has the strongest effects. The list of the receiving bodies that belong to each category can be found in the LFD.

The rates for wastewater discharges are related to the volume of the discharge and the load of the pollutants, which may be consulted in Article 278C of the LFD.

The Conagua's collection

[Reporter: Recaudación de la Conagua, Volúmenes declarados]

As a fiscal authority, the Conagua intervenes in the charging of duties for the use of Mexico's water resources and its inherent public goods. In tables T5.4 and T5.5, its collection through the charging of duties may be visualized, which includes the concepts of the use of the nation's water resources, the use of receiving bodies, material extraction, bulk water supply to urban and industrial centers, irrigation services, use of federal zones, and various, such as transaction services, VAT and fines, among others. It should be mentioned that in 2013, the concept of "*Programa Ponte al Corriente*" (Get Up-to-date Program) was added, and the conversions to constant 2013 prices employed in the following was carried out the average National Consumer Price Index for each year.

T5.4 The Conagua's collection through the charging of duties and concepts, 2007-2013 (millions of pesos at constant 2013 prices)

Concept	2007	2008	2009	2010	2011	2012	2013
Use of the nation's water resources	9 166.8	9 316.5	9 240.6	8 815.6	9 293.6	9 833.1	9 259.9
Bulk water supply to urban and industrial centers	1 864.1	2 500.9	2 414.9	2 701.4	3 004.4	2 925.6	2 809.5
Irrigation services	244.7	238.4	262.7	245.8	296.5	216.6	193.8
Material extraction	46.7	52.2	53.1	54.9	31.8	38.6	21.7
Use of receiving bodies	73.8	71.2	208.8	248.1	289.4	311.0	390.3
Use of federal zones	44.2	38.4	44.5	41.1	42.4	48.0	42.1
Various (transaction services, VAT and fines, among others)	120.8	405.8	249.0	230.9	234.6	733.2	429.4
Collection through fiscal credits	0.0	0.0	0.0	0.0	0.0	604.3	476.2
Collection through "Programa ponte al corriente"	0.0	0.0	0.0	0.0	0.0	0.0	1 098.7
Total	11 561.2	12 623.5	12 473.6	12 337.8	13 192.6	14 710.3	14 721.7

Source: Conagua (2014c).

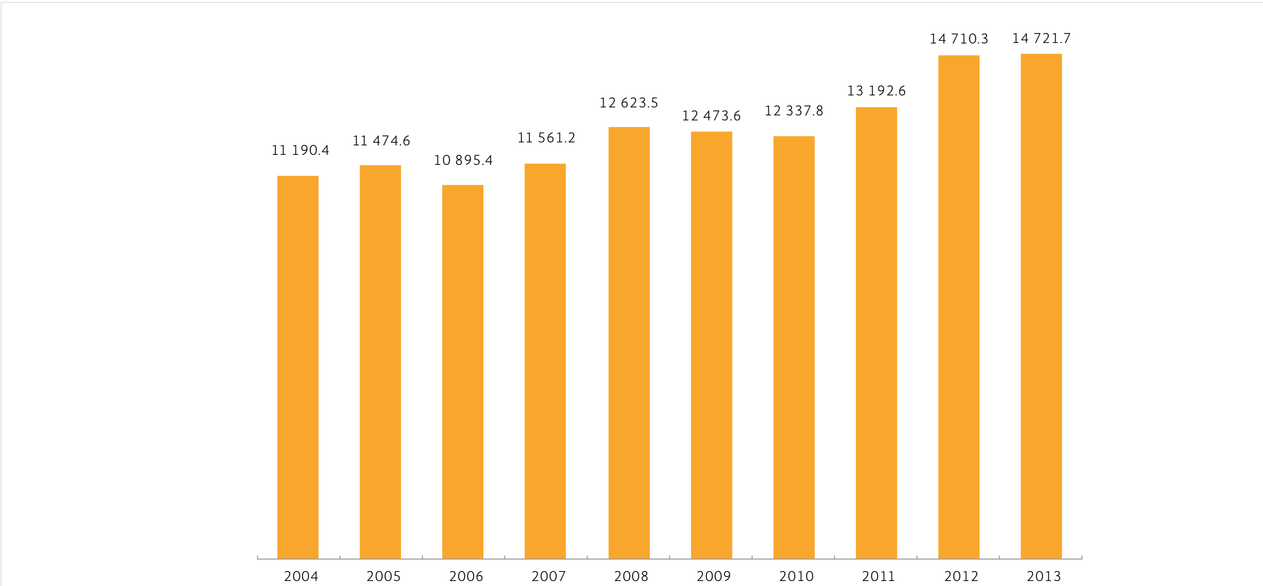
Periodically, the Ministry of Finance and Public Credit (SHCP in Spanish) authorizes the Conagua to apply charges for services, for example: bulk water supply from the Cutzamala System to the Metropolitan Area of the Valley of Mexico or to irrigation district (ID) modules. The Conagua's collection followed a growing trend through the 2004-2013 period, at constant 2013 prices. As can be observed in graph G5.3, the composition of this collection changed slightly. In percentage terms, the concept of extraction and use of the nation's water resources decreased, going from the range of 81.1% in 2004 to 62.9% in 2013

G5.3 Evolution in the Conagua's collection, showing the two main components by amount (millions of pesos at constant 2013 prices)

Source: Produced based on Conagua (2014c).

Since the creation of the Conagua in 1989, the collection through the charging of duties has increased noticeably. In the period from 2004 to 2013, it increased notably from 11.2 to 14.7 billion pesos, at constant 2013 prices, as can be appreciated in graph G5.4.

G5.4 Collection from the charging of duties (millions of pesos at constant 2013 prices)



Source: Produced based on CONAGUA (2014c).

By hydrological-administrative region, the collection for 2013 is presented in table T5.5. Particularly worth highlighting is that the regions VIII Lerma-Santiago-Pacific, XIII Waters of the Valley of Mexico and VI Rio Bravo contribute 66% of the collected. In table T5.5 "Various" refers to transaction services, regularizations and fines, among others.

T5.5 Collection (millions of pesos)

Code	HAR	Concepts									
		Use of the nation's water resources	Bulk water supply to urban and industrial centers	Irrigation services	Material extraction	Use of receiving bodies	Use of federal	Income from federal credits	Various	Income from "Programa ponte al corriente"	Total
I	Baja California Peninsula	171.0	0.0	44.5	3.6	4.6	7.5	8.6	7.3	3.9	251.1
II	Northwest	606.2	0.0	19.3	0.4	5.2	0.3	23.0	4.2	12.6	671.3
III	Northern Pacific	204.9	0.2	44.8	8.2	1.8	1.6	9.9	12.5	10.3	294.2
IV	Balsas	638.9	0.0	6.2	0.3	17.7	1.9	26.6	70.5	193.4	955.6
V	Southern Pacific	183.8	0.0	0.6	1.3	7.0	0.5	7.2	4.3	30.8	235.4
VI	Rio Bravo	1 415.8	0.2	22.3	0.8	7.3	2.6	53.7	32.8	229.3	1 764.6
VII	Central Basins of the North	566.5	0.0	7.3	0.3	14.3	0.7	21.9	15.5	14.8	641.2
VIII	Lerma-Santiago-Pacific	2 064.7	163.2	19.6	2.4	97.3	12.2	89.2	104.3	179.7	2 732.8
IX	Northern Gulf	381.4	0.0	14.8	0.4	11.1	3.5	15.2	7.6	66.6	500.7
X	Central Gulf	638.5	0.0	5.2	1.5	12.0	0.4	26.7	80.4	101.5	866.2
XI	Southern Border	317.0	0.0	0.6	2.6	38.5	1.0	14.7	46.0	16.0	436.5
XII	Yucatan Peninsula	151.0	0.0	0.7	0.0	7.2	0.1	6.0	6.0	13.5	184.3
XIII	Waters of the Valley of Mexico	1 920.2	2 645.8	7.8	0.0	166.4	9.8	173.4	38.0	226.3	5 187.8
	Total	9 259.9	2 809.5	193.8	21.7	390.3	42.1	476.2	429.4	1 098.7	14 721.7

Source: CONAGUA (2014c).

Table T5.6 shows the collection corresponding to each of the uses indicated in Article 223 of the LFD as regards water. Similarly, table T5.8 shows the values for 2013 by HAR.

T5.6 Collection for the use of the nation's water resources (millions of pesos at constant 2013 prices)

Use	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
General regime	6 381.1	6 246.0	5 938.8	6 376.6	6 378.3	6 265.9	5 887.4	6 245.6	6 863.9	6 835.9
Public urban	2 169.6	2 322.7	2 048.5	2 203.6	2 260.5	2 342.9	2 319.8	2 340.2	2 272.9	1 935.6
Hydropower plants	498.2	500.5	584.5	560.7	643.1	595.0	580.3	685.1	678.3	486.0
Spas and recreational centers	25.5	26.3	26.2	25.2	33.7	36.2	27.5	22.0	17.3	2.0
Aquaculture	0.8	0.7	0.4	0.7	0.8	0.6	0.6	0.7	0.6	0.4
General total	**9 075.3**	**9 096.2**	**8 598.4**	**9 166.8**	**9 316.5**	**9 240.6**	**8 815.6**	**9 293.6**	**9 833.1**	**9 259.9**

Source: CONAGUA (2014c).

The volumes reported by users in their declarations for the payment of duties are shown in table T5.7 for the 2004-2013 period, classified by uses, as well as in table T5.9 by HAR for 2013.

T5.7 Volumes declared for the payment of duties, 2004-2013 (millions of cubic meters, hm^3)

Use	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
General regime	1 369	1 265	1 306	1 764	1 796	1 939	1 675	1 373	1 132	1 180
Public urban	6 397	7 083	8 240	7 584	7 639	5 609	5 617	6 967	6 185	10 262
Hydropower plants	110 581	115 386	140 295	122 832	150 669	136 085	134 783	164 773	155 717	112 816
Spas and recreational centers	80	94	115	84	86	64	56	109	78	85
Aquaculture	285	397	159	308	309	344	222	218	256	258
General total	118 713	124 225	150 115	132 571	160 499	144 041	142 353	173 440	163 368	124 602

Source: CONAGUA (2014c).

T5.8 Collection for the use of the nation's water resources, 2013 (millions of pesos)

Code	HAR	General regime	Public urban	Hydropower plants	Spas and recreational centers	Aquaculture	Total
I	Baja California Peninsula	86.6	84.3	0.0	0.0	0.0	171.0
II	Northwest	556.4	38.4	11.3	0.0	0.0	606.2
III	Northern Pacific	100.6	77.8	26.4	0.0	0.0	204.9
IV	Balsas	401.7	115.2	121.2	0.6	0.2	638.9
V	Southern Pacific	150.9	25.5	7.4	0.0	0.0	183.8
VI	Rio Bravo	1 036.6	368.2	11.0	0.0	0.0	1 415.8
VII	Central Basins of the North	516.4	50.1	0.0	0.0	0.0	566.5

Code	HAR	General regime	Public urban	Hydropower plants	Spas and recreational centers	Aquaculture	Total
VIII	Lerma-Santiago-Pacific	1 665.4	374.6	23.9	0.7	0.1	2 064.7
IX	Northern Gulf	327.0	48.8	5.5	0.1	0.1	381.4
X	Central Gulf	535.7	31.9	70.9	0.0	0.0	638.5
XI	Southern Border	100.0	8.7	208.3	0.0	0.0	317.0
XII	Yucatan Peninsula	114.8	36.1	0.0	0.0	0.0	151.0
XIII	Waters of the Valley of Mexico	1 243.7	676.0	0.0	0.5	0.0	1 920.2
	Total	6 835.9	1 935.6	486.0	2.0	0.4	9 259.9

Source: CONAGUA (2014c).

T5.9 Volumes declared for the payment of duties for the use of the nation's water resources 2013 (millions of cubic meters)

Code	HAR	General regime	Public urban	Hydropower plants	Spas and recreational centers	Aquaculture	Total
I	Baja California Peninsula	7.6	173.3	0.0	0.4	0.0	181.3
II	Northwest	65.2	90.4	2 627.2	0.1	7.8	2 790.8
III	Northern Pacific	14.0	195.7	6 127.9	1.7	48.6	6 387.9
IV	Balsas	134.1	362.9	28 126.2	25.3	78.7	28 727.2
V	Southern Pacific	20.9	64.4	1 716.9	0.0	0.0	1 802.2
VI	Rio Bravo	125.4	864.3	2 556.8	0.3	0.3	3 547.2
VII	Central Basins of the North	48.3	97.9	0.0	0.7	0.4	147.3
VIII	Lerma-Santiago-Pacific	160.5	3 966.0	5 598.0	37.7	17.5	9 779.8
IX	Northern Gulf	103.5	132.7	1 273.5	4.1	52.3	1 566.1
X	Central Gulf	230.6	2 392.7	16 463.1	2.9	27.1	19 116.4
XI	Southern Border	58.3	172.5	48 325.9	0.1	8.5	48 565.3
XII	Yucatan Peninsula	35.4	144.1	0.0	6.1	0.7	186.2
XIII	Waters of the Valley of Mexico	176.6	1 605.6	0.3	5.4	16.1	1 804.0
	Total	1 180.5	10 262.4	112 815.9	84.7	258.2	124 601.6

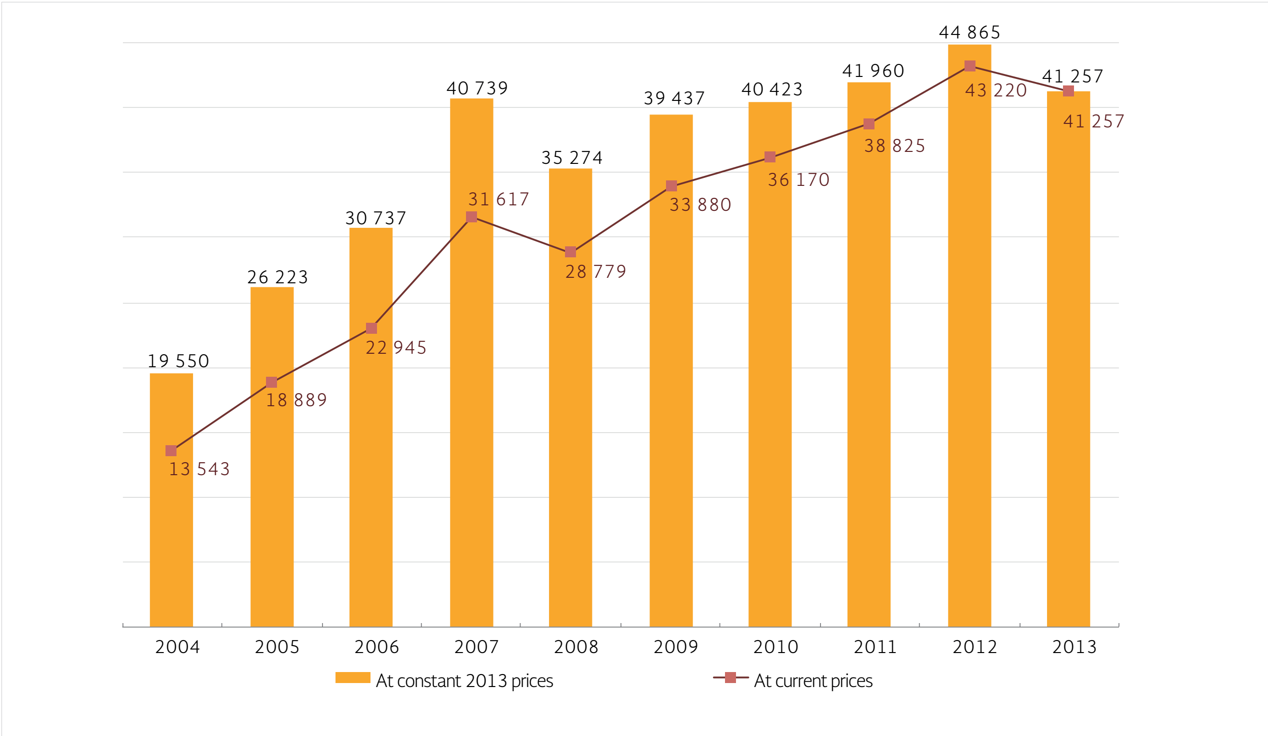
Source: CONAGUA (2014c).

THE CONAGUA'S BUDGET

[Reporter: Presupuesto ejercido]

The budget authorized for the CONAGUA for any given fiscal year is defined at the end of the previous year. Throughout the fiscal year budgetary adjustments take place, as a result of which the end-of-year budget, the evolution of which is shown in graph G.5, varies from the originally authorized budget.

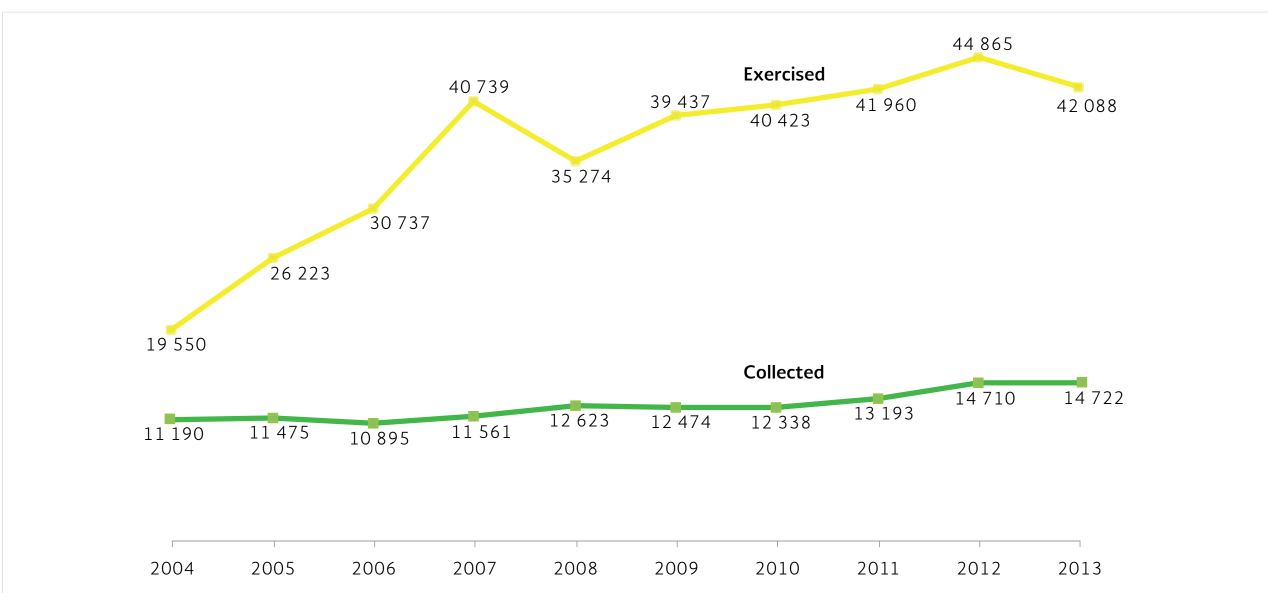
G5.5 Evolution in the CONAGUA's end-of-year budget (millions of pesos)



Source: CONAGUA (2014i).

It is interesting to compare the end-of-year revenues against the collection. As shown in graph G5.6, the CONAGUA manages a greater budget than the sum of its collected duties. For 2013, the collection was the equivalent of 35% of the end-of-year budget.

G5.6 Comparison between the CONAGUA's collection and end-of-year budget (millions of pesos at constant 2013 prices)



Source: Produced based on CONAGUA (2014i).

The evolution in the investment in the drinking water, drainage and sanitation subsector is shown in table T5.10. It should be mentioned that this investment has diverse origins. For 2013, as may be observed in table T5.11, 61.9% of the investment was of federal origin, whereas the states contributed 15.8%, municipalities 8.9% and other sources, considering state commissions, housing developers, credits, contributions from private initiative and others, the remaining 13.3%. For table T5.10 the "Others" concept considers studies, projects and supervision.

T5.10 Investments by area applied to the drinking water, sewerage and sanitation subsector (millions of pesos at constant 2013 prices)

Year	Drinking water	Sewerage	Sanitation	Improvement of efficiency	Others	Total
2002	5 637	6 386	2 420	1 891	129	16 462
2003	7 829	7 454	1 828	1 413	266	18 790
2004	7 727	7 857	2 222	1 565	102	19 473
2005	11 650	11 436	4 535	2 211	163	29 996
2006	7 294	7 801	2 440	3 205	330	21 070
2007	12 041	9 562	2 236	3 156	730	27 725
2008	12 866	11 469	2 834	3 738	1 353	32 260
2009	11 595	12 627	2 651	6 318	2 017	35 208
2010	10 236	13 828	3 191	5 435	2 515	35 205
2011	9 774	15 089	8 330	4 958	2 350	40 501
2012	11 295	7 683	16 519	3 922	2 625	42 044
2013	10 624	12 785	7 421	4 607	1 676	37 113

Source: Conagua (2014j).

For table T5.11, in the "Prossapys" concept the state investment includes municipal resources; the Valley of Mexico concept refers to the federal resources from the 1928 Trust Fund, derived from the payment of duties for the concept of bulk water supply; and the "Others" concept includes infrastructure projects such as Zapotillo, Realito, and Bicentenario.

T5.11 Investments reported by program and agency by the sector of origin of the resources, 2013 (millions of pesos at constant 2013 prices)

Concept	Federal	State	Municipal	Credit/Private/ Others	Total
Conagua investments	**19 786.9**	**5 350.6**	**2 757.7**	**1 528.2**	**29 423.3**
Agua Limpia	59.8	51.3	0.0	0.0	111.1
APAZU	5 188.1	2 583.8	647.1	437.7	8 856.7
Prodder	1 936.2	0.0	1 936.2	0.0	3 872.4
Prome	2 006.8	1 486.0	13.2	1 009.4	4 515.4
Promagua	364.5	0.0	0.0	0.0	364.5
Prossapys	2 889.3	745.4	0.0	0.0	3 634.7
Protar	1 656.2	484.1	161.1	81.1	2 382.5

Concept	Federal	State	Municipal	Credit/Private/ Others	Total
Valley of Mexico	6 759.5	0.0	0.0	0.0	6 759.5
Other Projects	1 171.3	0.0	0.0	0.0	1 171.3
Other agencies	**3 197.5**	**530.0**	**538.5**	**3 423.8**	**7 689.8**
CDI	1 654.0	252.2	142.7	0.0	2 049.0
CONAVI	0.0	0.0	0.0	3 384.0	3 384.0
SEDESOL	1 543.5	277.7	395.7	39.8	2 256.8
Total	**22 984.4**	**5 880.5**	**3 296.1**	**4 952.0**	**37 113.1**

Source: CONAGUA (2014j), SEDESOL, BANOBRAS, CONAVI, CDI and services providers.

WATER TARIFFS

[Reporter: Tarifas]

Drinking water tariffs are established independently for each municipality, depending on the provisions of the corresponding state's legislation. In some states, the tariffs are approved by the local state congress, whereas in others they are approved by the governing body or Board of Directors of the municipality's or locality's drinking water utility or the state water commission [Additional: T5.B].

In principle, tariffs have the objective of recovering the costs incurred by the service provider. There is a NOM on the evaluation of tariffs (NMX-AA-147-SCFI-2008), published in April 2009, which contains a definition of these costs.

The tariff level, or the payment due, is expressed in a tariff structure, more often than not differentiated by the type of users (domestic, commercial and industrial, among others), as well as by some mechanism of redistribution of costs through crossed subsidies, in which marginalized users are benefited by lower tariffs than those considered as non-marginalized users.

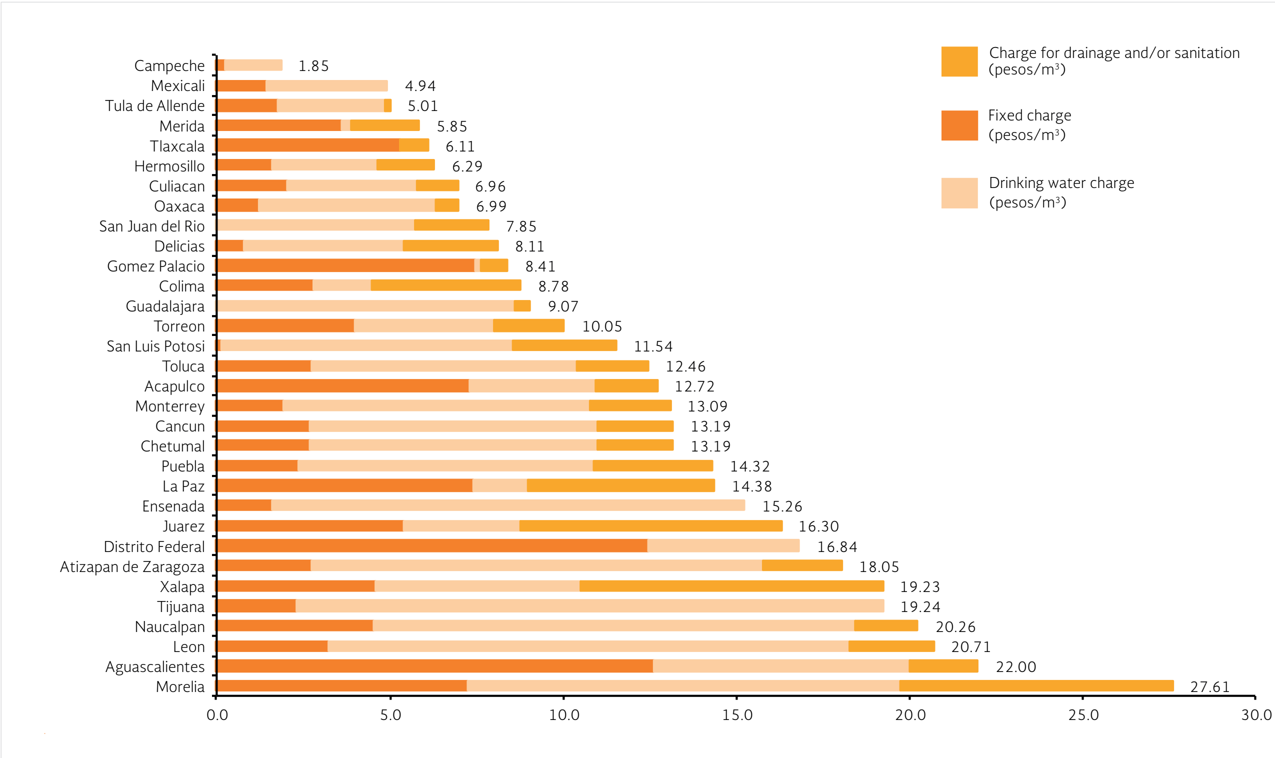
Tariff structures are generally based on increasing blocks, meaning that the price per cubic meter is higher for a greater consumption of water. It should be mentioned that there is a great variety of mechanisms, including the fixed price, meaning when the user pays a certain amount independently of the water that has been used.

Water tariffs generally include:

- Fixed costs, independent from the volume used,
- Variable costs for the water supplied, according to the volume used.
- Variable costs for sewerage and wastewater treatment, generally applied as a percentage of the costs for water supply.

Graph G5.7 indicates, for some cities in Mexico, the drinking water, sewerage and/or sanitation tariffs for a consumption of 30 m3/month for domestic use, as well as the highest tariff applicable.

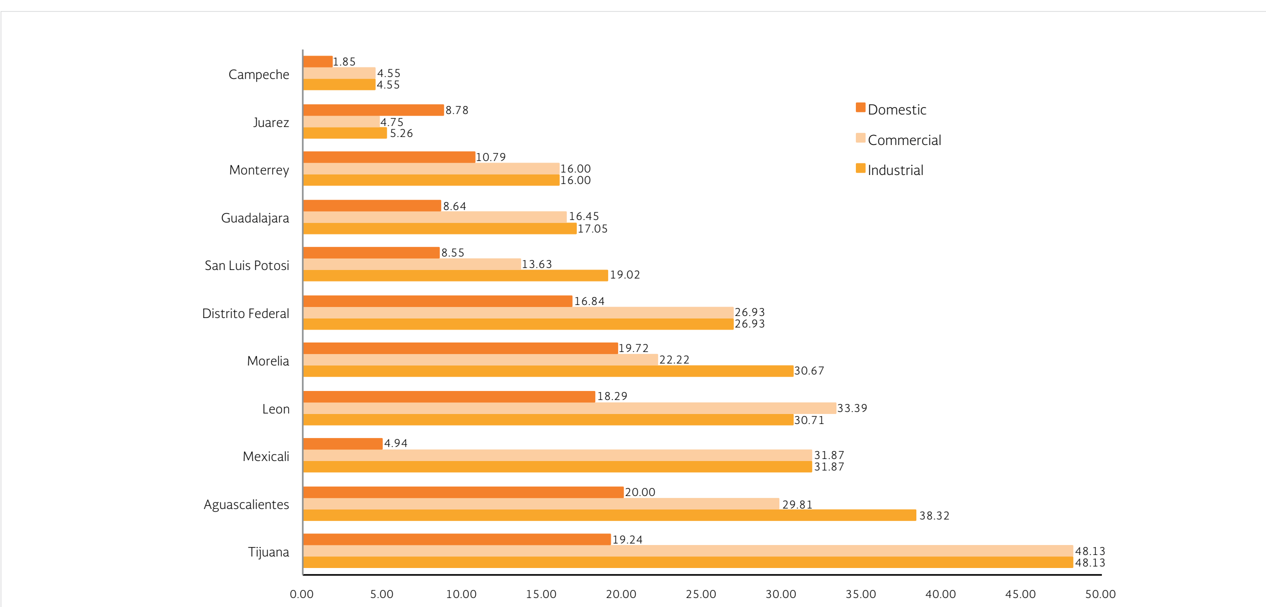
G5.7 Domestic drinking water, sewerage and/or sanitation tariffs in selected cities, 2013 (pesos per cubic meter per month)



Source: CONAGUA (2014j).

In graph G5.8 the tariffs are shown for domestic, industrial and commercial use in several localities in Mexico, assuming a consumption of 30 m³ per month and the highest applicable tariff for a consumption of 30 m³ per month.

G5.8 Comparison of tariffs for domestic, industrial and commercial use in selected cities, 2013 (pesos per cubic meter per month)

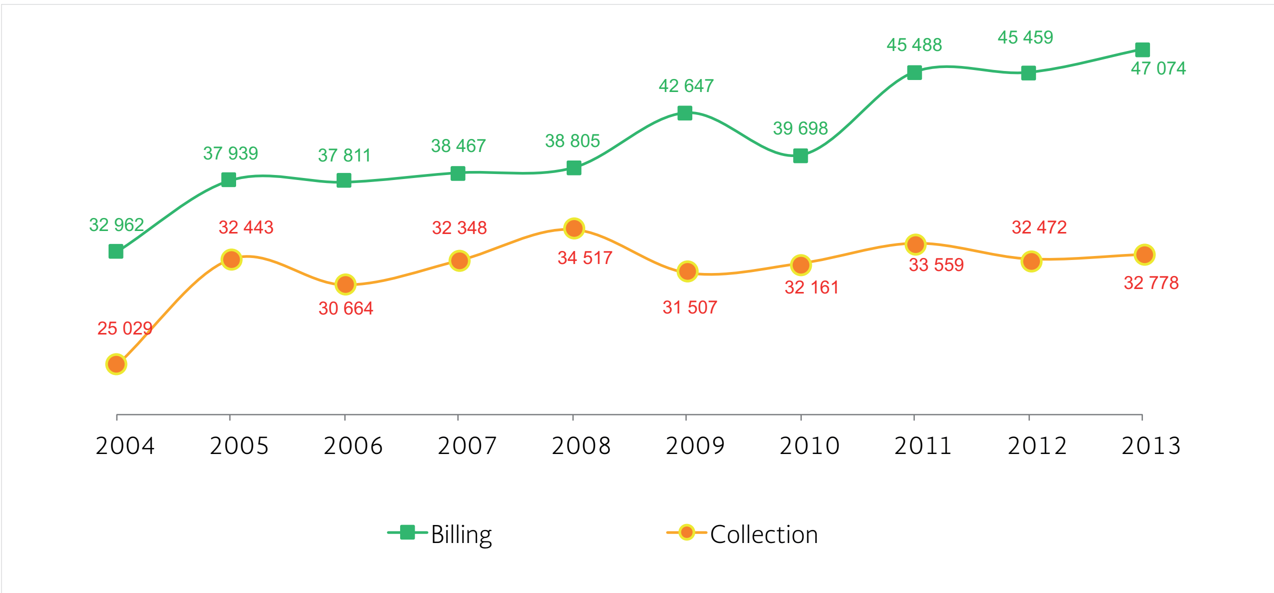


Source: CONAGUA (2014j).

It should be mentioned that with the level of the tariff established, the service provider carries out the billing to users as a necessary step to charge for the service. The payment of these bills represents the income collected by the service provider. There are payments that are carried out in the same billing period, whereas others are late payments, fines or surcharges.

The relationship between the bills issued and the collection by service providers can be viewed in graph G5.9, produced based on a simple of Mexico's water utilities.

G5.9 Annual billing and collection of water utilities (millions of pesos at constant 2013 prices)



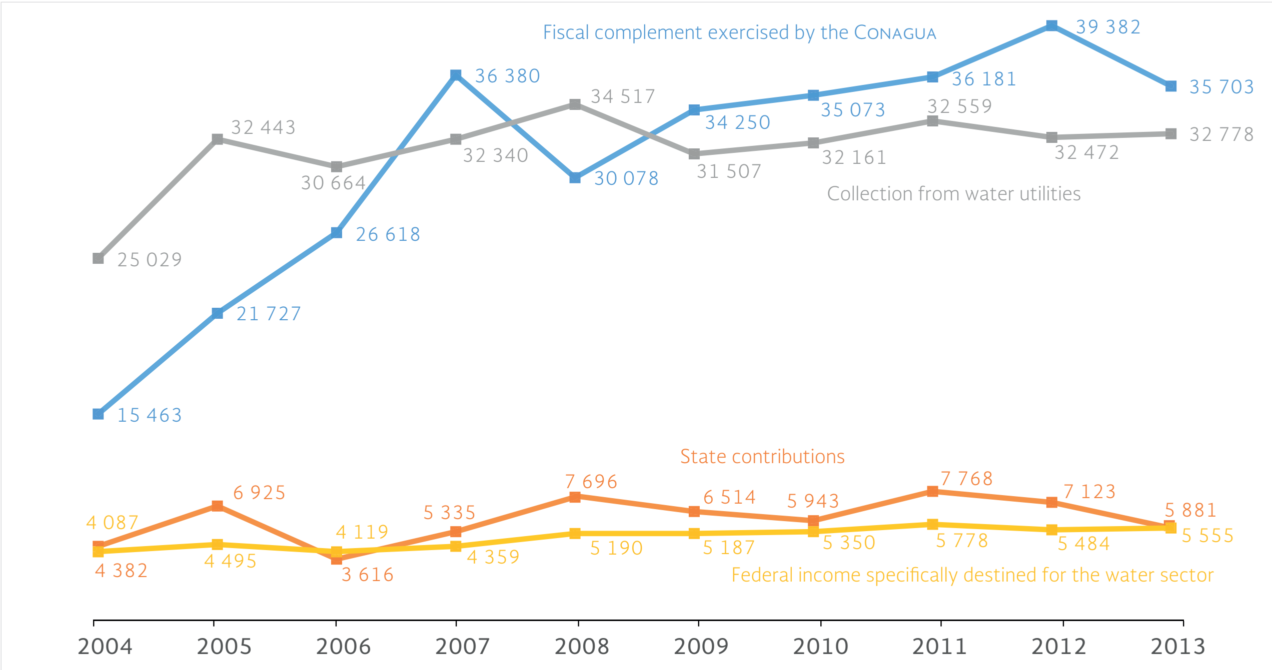
Source: CONAGUA (2014j).

RESOURCES INTENDED FOR THE SECTOR

It is interesting to contemplate the evolution in the main resources destined to the water sector, illustrated in graph G5.10 as the time series of the collection of water utilities, contributions from states to the water, sewage and sanitation sector, the income with a specific destination derived from collection[1], and the fiscal complement exercised by the CONAGUA, which for this purpose is calculated as the budget exercised by the CONAGUA, minus the income with a specific destination derived from collection.

1 The figures shown are the sum of the total value of all income with a specific destination. In this way this income is composed of the amounts reported by the existing programs with a specific destination: the Duty Return Program (PRODDER) (started in 2002); the Mexican Forest Fund and Payment for Environmental Services (2003); the Federal Wastewater Sanitation Program (PROSANEAR) (2008); the 1928 Trust Fund in the Federal District (2000), and in the State of Mexico (2008); and finally the Irrigation Districts Program (2008). It should be highlighted that the collection does not correspond to the income returned, due to it depending on the requests made by taxpayers, and the final authorization of the Deputy Ministry of Expenditure of the SHCP. Thus the income returned corresponds to the amount processed and authorized as an excess income by the Deputy Ministry of Income of the SHCP (CONAGUA 2014c).

G5.10 Main economic resources destined for the water sector (millions of pesos at constant 2013 prices)



Source: Produced based on Conagua (2014c), Conagua (2014i), Conagua (2014j).

External funding and international cooperation

The resources destined for the sector include those that come from international financial institutions, which additionally benefit from some innovative aspects of international experience.

In external credit, during 2013 the Conagua exercised three projects with a disbursement in 2013 for 20.7 million dollars, for an accumulated disbursement of 263 million dollars, on the issues of:

- Rural drinking water and sanitation: Program for the Sustainability of Drinking Water and Sanitation Services in Rural Communities (Prossapys III), financed by the IADB through the loan contract 2512/OC-ME.
- Improving efficiency in water utilities: Program for the Improvement of Efficiency in the Drinking Water and Sanitation Sector (Prome) financed by the IBRD through contract 7973-MX.
- Modernization of the National Meteorological Service: Modernizing the National Meteorological Service to Address Variability and Climate Change in the Water Sector in Mexico (MoMet), financed by the World Bank through the loan 8165-MX.

In 2013 the Conagua took part in negotiations for two projects with external credit that it is hoped will be formalized in 2014, on the issues of:

- Rural drinking water and sanitation: Program for the Sustainability of Drinking Water and Sanitation Services in Rural Communities (Prossapys IV) with the IADB.
- Public policy on drinking water and sanitation: Program to Support Public Policies in the Drinking Water and Sanitation Sector in Mexico with the French Development Agency and the German Development Bank.

The Conagua was awarded two non-refundable technical cooperations (IADB) for 1.45 million dollars on the issues of the efficient use of energy and water reserves, as well as a donation (IADB) for 400 000 dollars for mechanisms to promote private sector participation. In 2013 the Conagua took part in 8 international fora and processes, undertook bilateral actions with 9 countries and multilateral actions with 5 international organizations. It took part in 84 international events and undertook different capacity-development actions within the framework of international cooperation.

5.4 Participation mechanisms

River basin councils and their auxiliary bodies

[Reporter: Reporteador: Instrumentos de gestión]

The LAN establishes that river basin councils are multi-stakeholder collegiate bodies, which are coordination and consensus-reaching bodies providing support, consultation and advice, between the Conagua, including the corresponding river basin organization, the dependencies and entities of the federal, state or municipal governments and representatives of water users and civil society organizations, in the respective watershed or hydrological region.

Up to December 31, 2013, there were 26 river basin councils. [see location in Additional: D5.A].

In the process of consolidation of the river basin councils, it was necessary to attend very specific issues in more localized geographic zones, as a result of which auxiliary bodies known as river basin commissions were created to attend sub-catchments; river basin committees for micro-catchments; technical groundwater committees (Cotas) and clean beach committees in the country's coastal zones.

The clean beach committees are worthy of special mention. They have the purpose of promoting the cleaning up of beaches, watersheds and aquifers associated with them, as well as preventing and rectifying the pollution of Mexico's beaches, respecting the native ecology and raising the quality and the standard of living of the local population, tourism and the competitiveness of the beaches.

As regards the auxiliary bodies, up to 2013 there was a total of 194 auxiliary bodies of the river basin councils, with 32 commissions, 40 committees, 83 Cotas and 39 clean beach committees [Additional: T5.C].

5.5 Water-related standards

Official Mexican Ecological Standards and from the Water Sector

In the following pages, the Mexican standards related to water issues are presented.

T5.12 Mexican standards related with the water sector

No.	Group: Semarnat
1	NOM-001-SEMARNAT-1996 - Maximum permissible limits of pollutants in wastewater discharges in the nation's water resources and goods.
2	NOM-002-SEMARNAT-1996 - Maximum permissible limits of pollutants in wastewater discharges to urban and municipal sewerage systems.
3	NOM-003-SEMARNAT-1997 - Maximum permissible limits of pollutants for treated wastewater that is reused in services to the public.
4	NOM-004-SEMARNAT-2002 - Specifications and maximum permissible limits of pollutants in sludge and biosolids for their use and final disposal.
5	NOM-022-SEMARNAT-2003 - Preservation, conservation, sustainable use and restoration of coastal wetlands in areas of mangrove swamps.
6	NOM-083-SEMARNAT-2003 - Environmental protection for the sites of final disposal of solid urban and special requirement waste.
7	NOM-141-SEMARNAT-2003 - Procedures, specifications and criteria for mine tailings and mine tailing dams.
No.	**Group: Conagua**
1	NOM-001-CONAGUA-2011 - Drinking water systems, domestic intakes and sanitary sewerage- Specifications for airtightness in sanitary sewerage systems.
2	NOM-003-CONAGUA-1996 - Requirements for the construction of wells for the prevention of aquifer pollution.
3	NOM-004-CONAGUA-1996 - Requirements for the protection of aquifers during maintenance and rehabilitation of wells, and the closing of wells.
4	NOM-005-CONAGUA-1996 - Specifications and testing methods for flux meters.
5	NOM-006-CONAGUA-1997 - Specifications and testing methods for pre-manufactured septic tanks.
6	NOM-007-CONAGUA-1997 - Security requirements for the construction and operation of water tanks.
7	NOM-008-CONAGUA-1998 - Specifications and testing methods for showers.
8	NOM-009-CONAGUA-2001 - Specifications and testing methods for lavatories.
9	NOM-010-CONAGUA-2000 - Specifications and testing methods for inlet and discharge valves for lavatory.
10	NOM-011-CONAGUA-2000 - Conservation of water resources. Specifications and the method to determine the mean annual availability of the nation's water resources.
11	NOM-014-CONAGUA-2003 - Requirements for artificial aquifer recharge with treated wastewater
12	NOM-015-CONAGUA-2007 - Characteristics and specifications of works and of water for its artificial infiltration into aquifers.
No.	**Group: Salud**
1	NOM-127-SSA1-1994 - Environmental health. Water for human use and consumption. Permissible limits of quality and treatment to which water should be submitted for its purification.
2	NOM-179-SSA1-1998 - Monitoring and evaluation of the control of drinking water quality in networks.

3	NOM-201-SSA1-2002 - Products and services. Water and ice for human consumption, packaging and bulk. Sanitary specifications
4	NOM-230-SSA1-2002 - Health requirements for water management in drinking water networks.
5	NOM-244-SSA-2008. Equipment and germicidal substances for domestic water treatment. Sanitary requirements.
No.	Group: Mexican Standards
1	NMX-AA-120-SCFI-2006 - Requirements and specifications for the sustainability of beach quality
2	NMX-AA-147-SCFI-2008 - Methodology for the evaluation of drinking water, sewerage and sanitation tariffs.
3	NMX-AA-148-SCFI-2008 - Methodology to evaluate the quality of drinking water, sewerage and sanitation services. Guidelines for the evaluation and improvement of services to users.
4	NMX-AA-149/1-SCFI-20 - Methodology to evaluate the efficiency of drinking water, drainage and sanitation service providers. Guidelines for wastewater service provision and evaluation.
5	NMX-AA-149/2-SCFI-20 - Methodology to evaluate the efficiency of drinking water, drainage and sanitation service providers. Guidelines for drinking wastewater service provision and evaluation.

Source: Conagua (2014k).

It is worth highlighting that, according to the Federal Law on Metrology and Standardization, the Official Mexican Standards (NOMs in Spanish), are technical regulations to be obligatorily observed, whereas the Mexican Norms (NMX) are voluntarily applied. Table T5.12 [complemented with Additional T5.D] presents some significant standards. Of special interest is NOM-001-SEMARNAT-1996, given that it establishes compliance deadlines for its requirements regarding maximum permissible limits in wastewater discharges into the nation's water and public goods (see table T5.13).

T5.13 Compliance dates of NOM-001-SEMARNAT-1996

Municipal discharges		
Modified compliance dates from:	Population range (according to 1990)	Number of localities (according to 1990)
January 1, 2000	More than 50 000 inhabitants	139
January 1, 2005	From 20 001 to 50 000 inhabitants	181
January 2, 2010	From 2 501 to 20 000 inhabitants	2266
Non-municipal discharges		
Modified compliance dates from:	Biochemical Oxygen Demand per day (t/day)	Total Suspended Solids (t/day)
January 1, 2000	More than 3.0	More than 3.0
January 1, 2005	From 1.2 to 3.0	From 1.2 to 3.0
January 2, 2010	Less than 1.2	Less than 1.2

Source: Conagua (2014k).

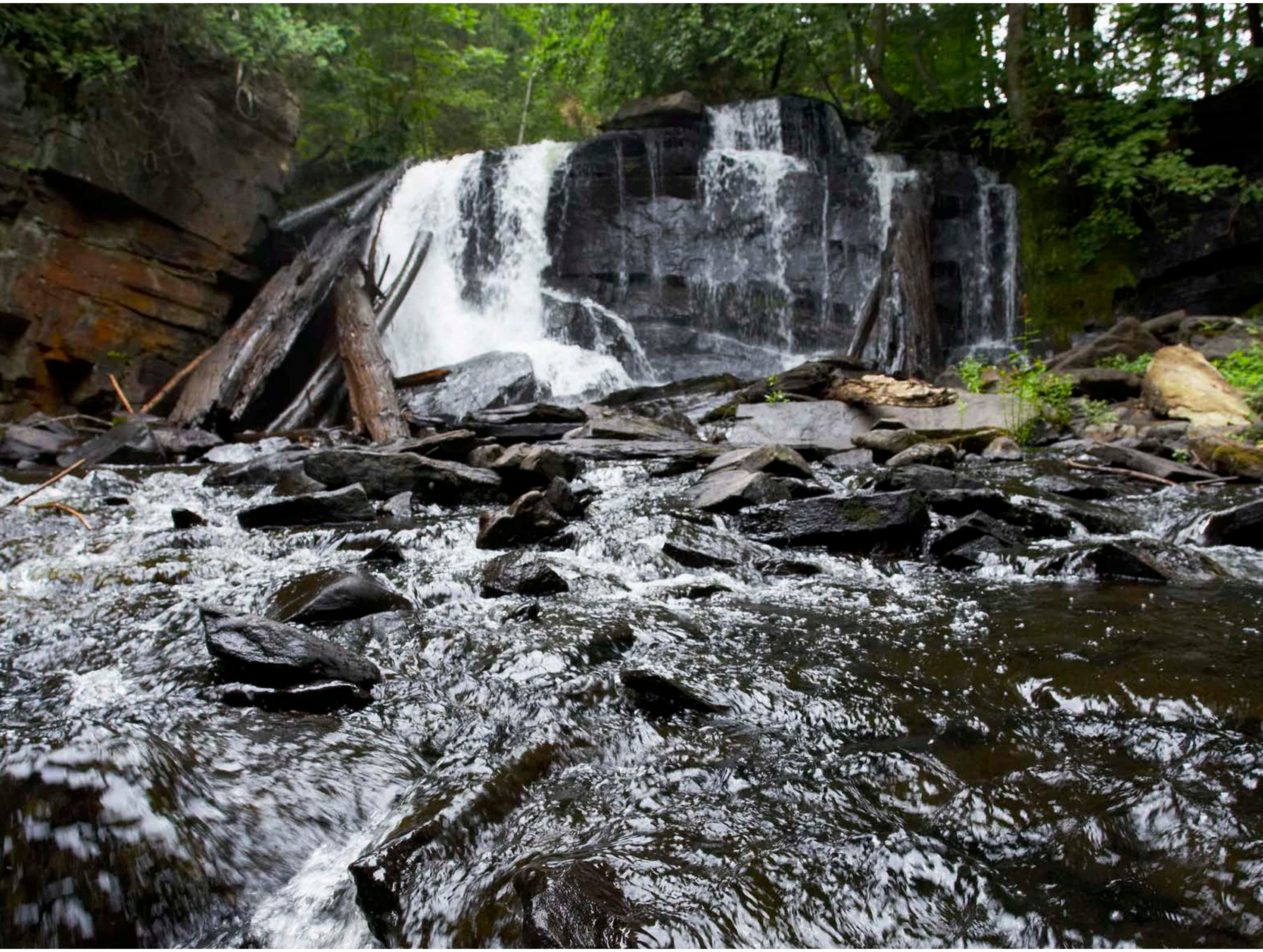
NOM-011-CONAGUA-2000 is another standard to be highlighted, since it is the basis upon which the calculation of availability of water in catchments and aquifers is carried out, and it thus makes it possible to comply with one of the Conagua's legal obligations.

On the other hand, the Conagua has issued standards that establish the dispositions, specifications and testing methods that guarantee that the products and services tendered to drinking water, sewerage and sanitation utilities comply with the objective of making use of and preserving water in quality and quantity.

Additionally, NOM-127-SSA1-1994 establishes the guidelines to guarantee water supply for human use and consumption with appropriate quality. This standard establishes permissible limits of bacteriological characteristics (fecal coliforms and total coliforms); physical and sensory characteristics (color, smell and taste, and cloudiness); chemical characteristics (which include 34 parameters, such as aluminum, arsenic, barium, etc.), as well as treatment methods which should be applied according to the pollutants encountered.

Chapter 6

Water, Health and the Environment

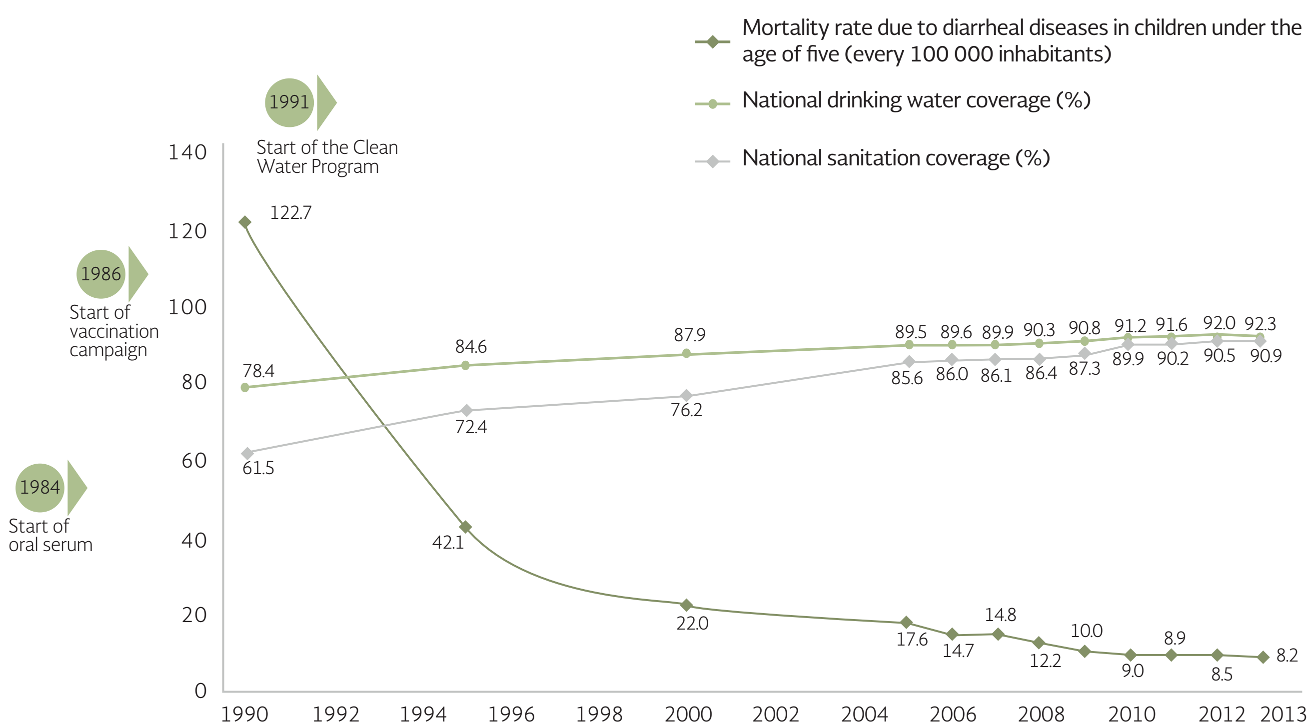


6.1 Health

[Reporter: Agua y salud]

The provision of drinking water and sanitation is a significant factor in public health, by avoiding exposure to pathogenic agents. Appropriate access to these services is fundamental for the reduction of mortality and morbidity among the population under the age of five, as well as the decrease in water-borne diseases (viral hepatitis, typhoid fever, cholera, dysentery and other causes of diarrhea), as well as illnesses resulting from drinking pathogenic chemical components (arsenic, nitrates or fluoride). In the case of diarrheal diseases, child mortality in Mexico has been reduced as a result of several public health-related actions and interventions [Additional: G6.A], including the distribution of oral serum from 1984 onwards, vaccination campaigns since 1986, the Clean Water Program in 1991, and the increase in drinking water, sewerage and sanitation coverage (Sepúlveda et al. 2007). In addition to these factors, those related to hygiene, education, access to health services and improvements in socio-economic and environmental conditions should be mentioned.

G6.1 Coverage of drinking water and sanitation and the mortality rate through diarrheal diseases in children under the age of five, 1990 to 2013



Source: Produced based on Conagua (2014j), Salud (2014).

It is interesting to compare the increasing trend in drinking water and sanitation coverage against the reduction in the mortality rate through diarrheal diseases in children under the age of five, which can be observed in graph G6.1.

In Mexico, drinking water service providers also carry out the disinfection of that water through chlorination (which is necessary in order to destroy pathogenic agents or microscopic parasites). The service provider is generally speaking the municipality, or in exceptional cases the state.

The effectiveness of the disinfection process of water in formal supply systems is evaluated through the determination of free chlorine residual, the presence of which in the domestic outlet signals the efficiency of the disinfection process.

6.2 Vegetation

[Reporter: Uso del suelo y vegetación]

According to data from the "Carta de Uso del Suelo y Vegetación" (Inegi 2014c), Mexico is classified into twelve vegetation groups compatible with the Rzedowski classification system. It should be mentioned that over time Inegi has generated updates on this series, and the result is the series I (updated in the 1980-90 period), II (1993), III (2002) IV (2007) and V (2011-2012) (see map M6.1).

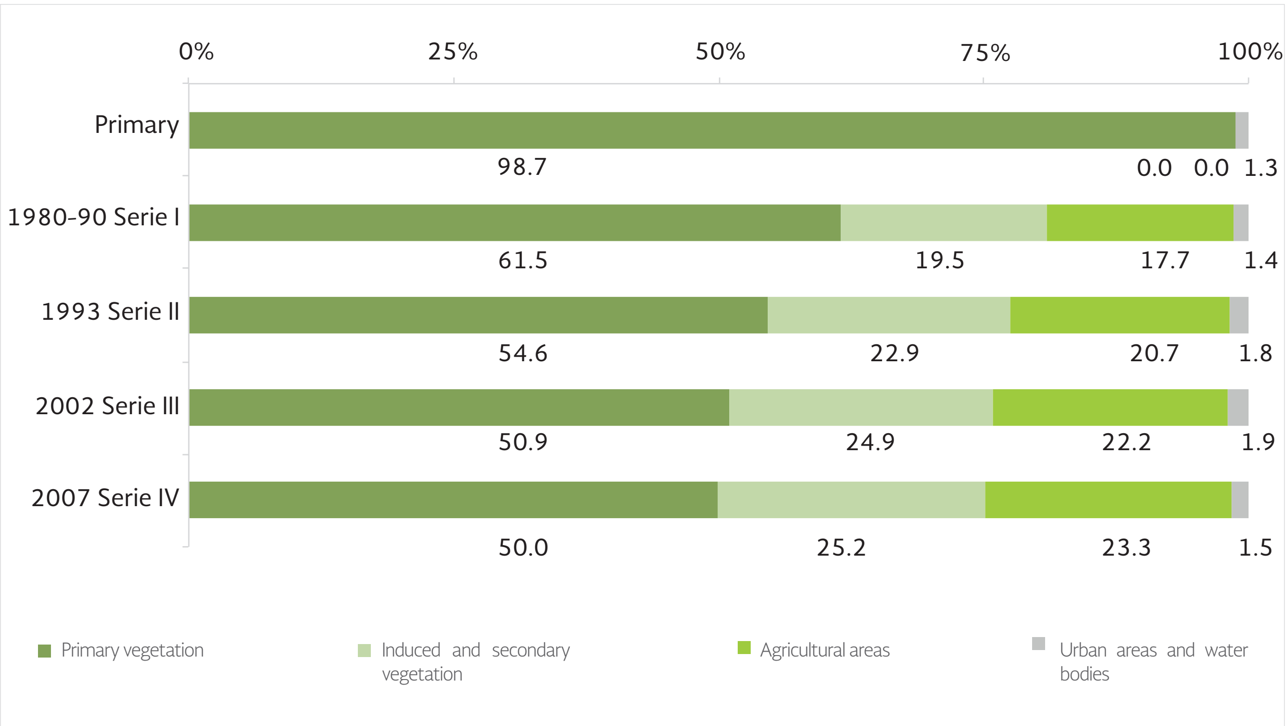
M6.1 Main uses of soil and vegetation series V

Source: Produced based on Conagua (2014g), Conagua (2014l).

Series V was generated during the 2011 – 2012 period, based on the information presented in series IV of Use of Soil and Vegetation and updated with Landsat satellite images from 2011.

It is possible to compare the evolution from series I to IV, as can be observed in graph G6.2. Primary vegetation is that which develops naturally according to the site's environmental factors, and which has not been significantly modified by human activity. Secondary refers to a successional state of vegetation, when there is an indication that the original vegetation has been eliminated or strongly disturbed. Induced is the vegetation that develops when the original vegetation has been eliminated, or in abandoned agricultural areas. The years correspond to the period in which the information used in each series was captured.

G6.2 Evolution in the use of soil and vegetation based on the INEGI maps



Source: Produced based on INEGI (2009a), INEGI (2014c).

Soil degradation reduces the soil's capacity to provide goods and services for the ecosystem and the latter's beneficiaries. It physically expresses itself as a result of the loss of productivity, of the availability of water, water logging or landslides. Chemical degradation increases the levels of pollution, salinization, alkalinization as well as eutrophication, which reduce the fertility and the content of organic matter in the soil. When the loss of vegetation cover occurs, since the latter acts as a protective layer, the soil is more vulnerable to water-based and wind erosion. The effects of erosion and degradation, estimated in 2008, the latest year available, are shown in table T6.1.

T6.1 Soil degradation: surface area affected by processes, types and levels of degradation, 2008 (percentage of the national surface area)

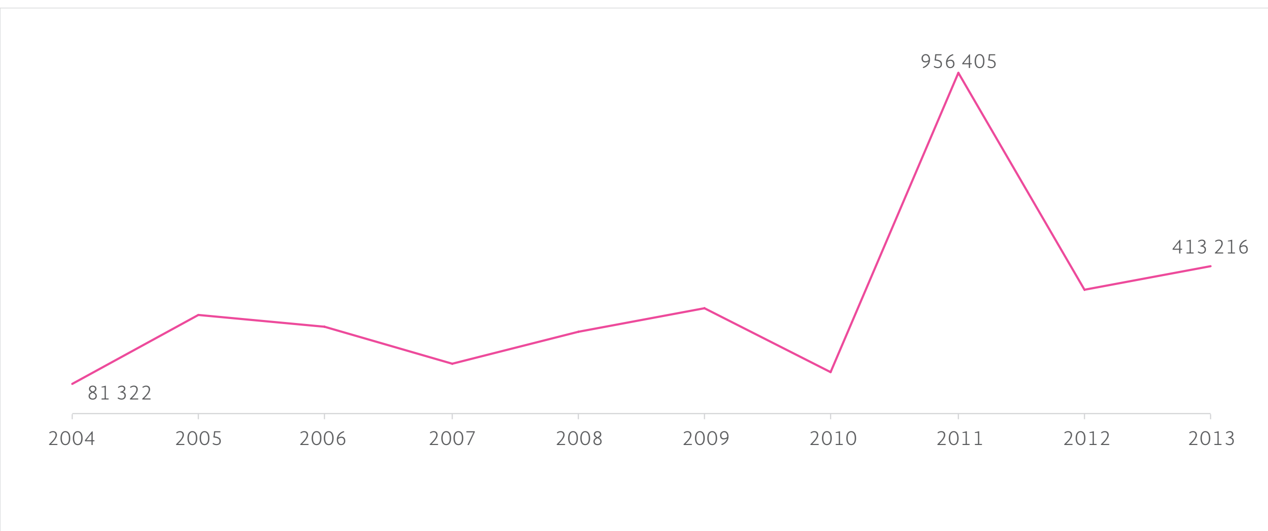
Process of degradation	Light	Moderate	Severe	Extreme	Total
Physical degradation	3.43%	1.19%	0.30%	0.61%	5.53%
Chemical degradation	9.55%	7.51%	0.28%	0.03%	17.38%
Wind erosion	2.73%	6.17%	0.35%	0.01%	9.25%
Water-based erosion	6.54%	4.61%	0.43%	0.02%	11.60%

Source: Semarnat (2014a).

The change in soil uses is highlighted by the increase in secondary and induced vegetation in urban and agricultural areas. Erosion processes gradually reduce the capacity of riverbeds and water bodies, inducing affectations by floods during intense or sustained rainfall. Another vector of change in vegetation is forest fires. In graph G6.3 the hectares affected by this phenomenon every year are shown.

It is estimated that in the 1990-2000 period, almost 354 000 hectares of forests changed to another soil use. For the 2000-2005 period, the rate of change slowed down to 235 000 hectares per year, and for the latest period reported on, from 2005 to 2010, it dropped to 155 000 hectares per year (FAO 2010).

G6.3 Surface area affected by fires (hectares)



Source: Semarnat (2014b).

In order to conserve the status of natural protected areas and ensure that they retain their function as areas of aquifer recharge, the necessary decrees are established for the protection of ground-based ecosystems and wetlands in particular, in Mexico and worldwide.

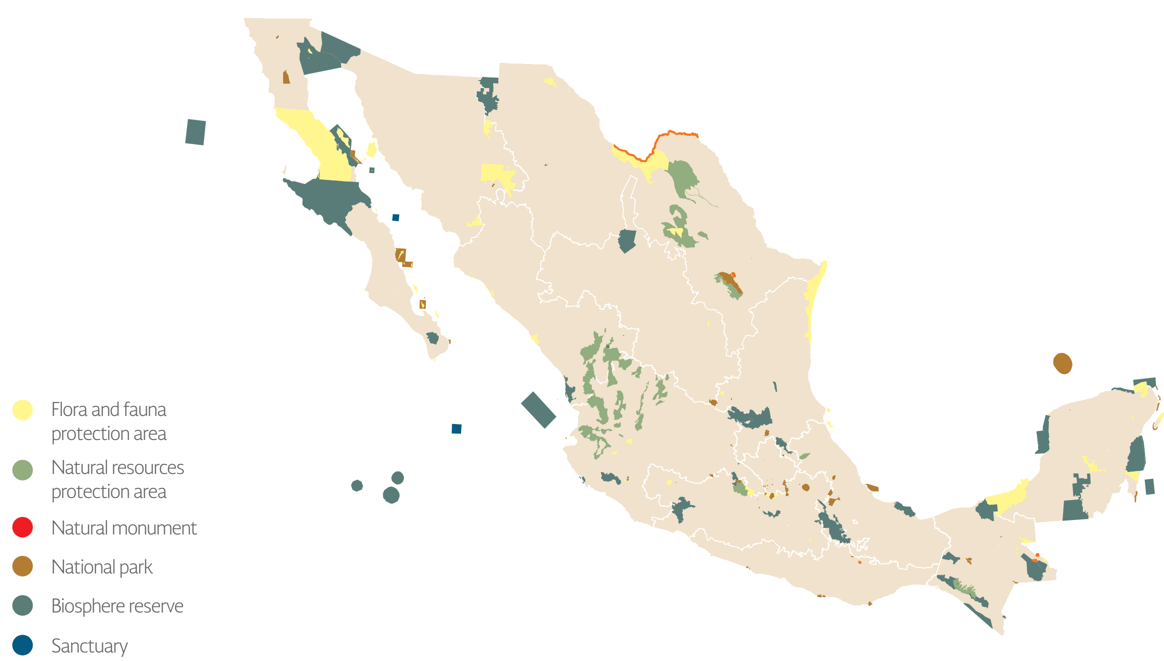
In Mexico, there are natural protected areas at the federal, state and municipal levels, as well as voluntary ones. At the time of going to press, the number of federal natural protected areas, administered by the National Commission for Protected Natural Areas (Conanp) was 176, covering a total surface area of 25.4 million hectares, as shown in table T6.2. Their geographical distribution is shown in map M6.2.

T6.2 Federal natural protected areas, 2013

Category	Number	Surface area (ha)
Biosphere reserves	41	12 652 787
National parks	66	1 398 517
Natural monuments	5	16 268
Natural resources protection area	8	4 440 078
Flora and fauna protection area	38	6 740 875
Sanctuaries	18	146 254
Total	176	25 394 779

Source: Conanp (2014a).

M6.2 Natural protected areas, 2013



Source: Conanp (2014a).

6.4 Wetlands

[Reporter: sitios RAMSAR]

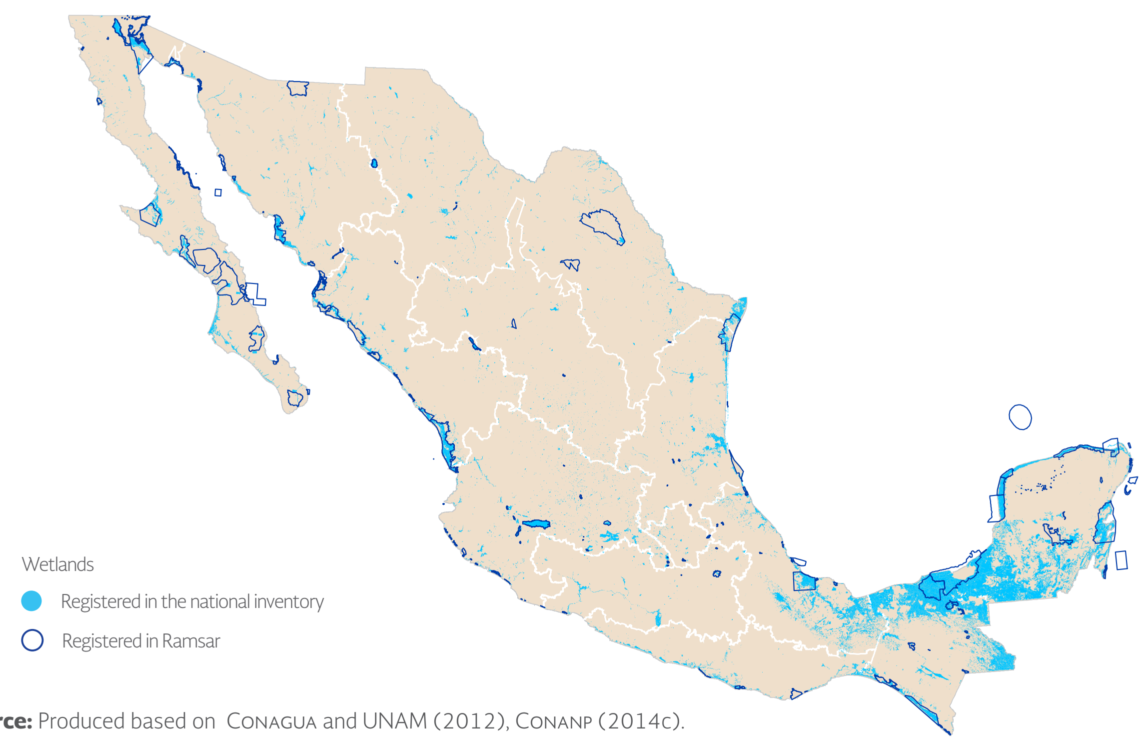
The conservation and sustainable management of wetlands can ensure the biological richness and environmental services that they provide, such as: water storage, the conservation of aquifers, water purification through the retention of nutrients, sediments and pollutants; storm protection and flood mitigation, the stabilization of coasts and erosion control.

These ecosystems have undergone transformation processes with various purposes. The lack of knowledge on wetlands and their inappropriate management constitute some of the problems that adversely affect their conservation. As stipulated in the National Water Law, it is the Conagua's responsibility to carry out and update the National Inventory of Wetlands (INH), as well as to define their contours, classify them and propose standards for their protection, restoration and use. In 2012, the study "Humedales de la República Mexicana" was produced, including the "Mapa Nacional de Humedales escala 1:250 000".

Internationally, an intergovernmental convention was signed in the city of Ramsar, Iran (1971), known as the Ramsar Convention. This convention "...provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources" (Ramsar 2014).

At the time of going to press, 142 Mexican wetlands had been registered in the Ramsar Convention, taking the total surface area of the country registered to 8.4 million hectares (Conanp 2014c). Map M6.3 shows the wetlands that have been registered in the Ramsar Convention, as well as the INH wetlands.

M6.3 Wetlands and Ramsar sites, 2013



Source: Produced based on Conagua and UNAM (2012), Conanp (2014c).

Chapter 7

Future scenarios

7.1 Sustainable water policy

In the history of Mexico's water policy, three clear phases can be discerned:

First stage: At the beginning of the 20th century, the focus was placed on the supply side, which explains why a large number of storage reservoirs, irrigation districts, aqueducts and water supply systems were built.

Second stage: From the 1980s-1990s onwards, water policy became more demand-oriented and based on the principle of decentralization. The responsibility for providing drinking water, sewerage and sanitation services was transferred to the municipalities, and the Conagua was created as an institution that concentrated the tasks of managing the nation's water resources. Among the actions which aimed to meet this objective was the creation of the Public Registry of Water Duties (Repda), as a mechanism to provide order to the use of water resources.

Third stage: At the dawn of the 21st century, a new phase is coming to the fore, that of water sustainability, in which wastewater treatment is being significantly increased, the reuse of water is being promoted and emphasis is being placed on the administration of the nation's water resources through the verification of extractions and legislation on aquifers.

7.2 Trends

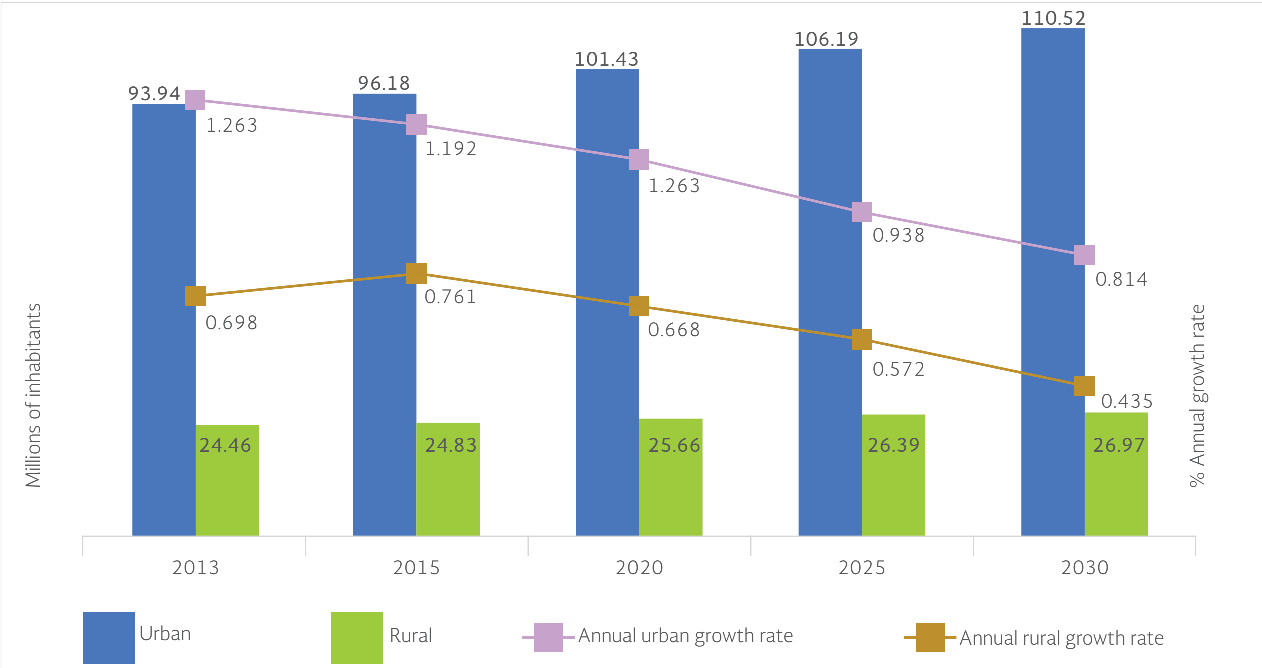
[Reporter: Población, Grado de presión, Agua renovable]

One very important aspect to be considered in Mexico's future scenarios is the population growth and the concentration of the population in urban areas.

According to estimates from the Conapo, between 2013 and 2030, the population of Mexico will increase by 19 million people, although the growth trend will decrease. Furthermore, by 2030 approximately 80.4% of the total population will be based in urban localities, as can be observed in graph G7.1. The data in the graph is at the mid-year point.

The rural population is considered as that which lives in localities of less than 2 500 inhabitants, whereas the urban population refers to that of 2 500 inhabitants or more.

G7.1 Projection for the growth of the urban and rural population in Mexico



Source: Produced based on Conapo (2014).

It is calculated that for the 2013-2030 period, more than half of the population growth will occur in the hydrological-administrative regions IV Balsas, VI Rio Bravo, VIII Lerma-Santiago-Pacific and XIII Waters of the Valley of Mexico. On the other hand, the four regions with the lowest growth (II Northwest, III Northern Pacific, V Southern Pacific and VII Central Basins of the North) will represent only 12.2% of the growth during that period, as shown in table T7.1.

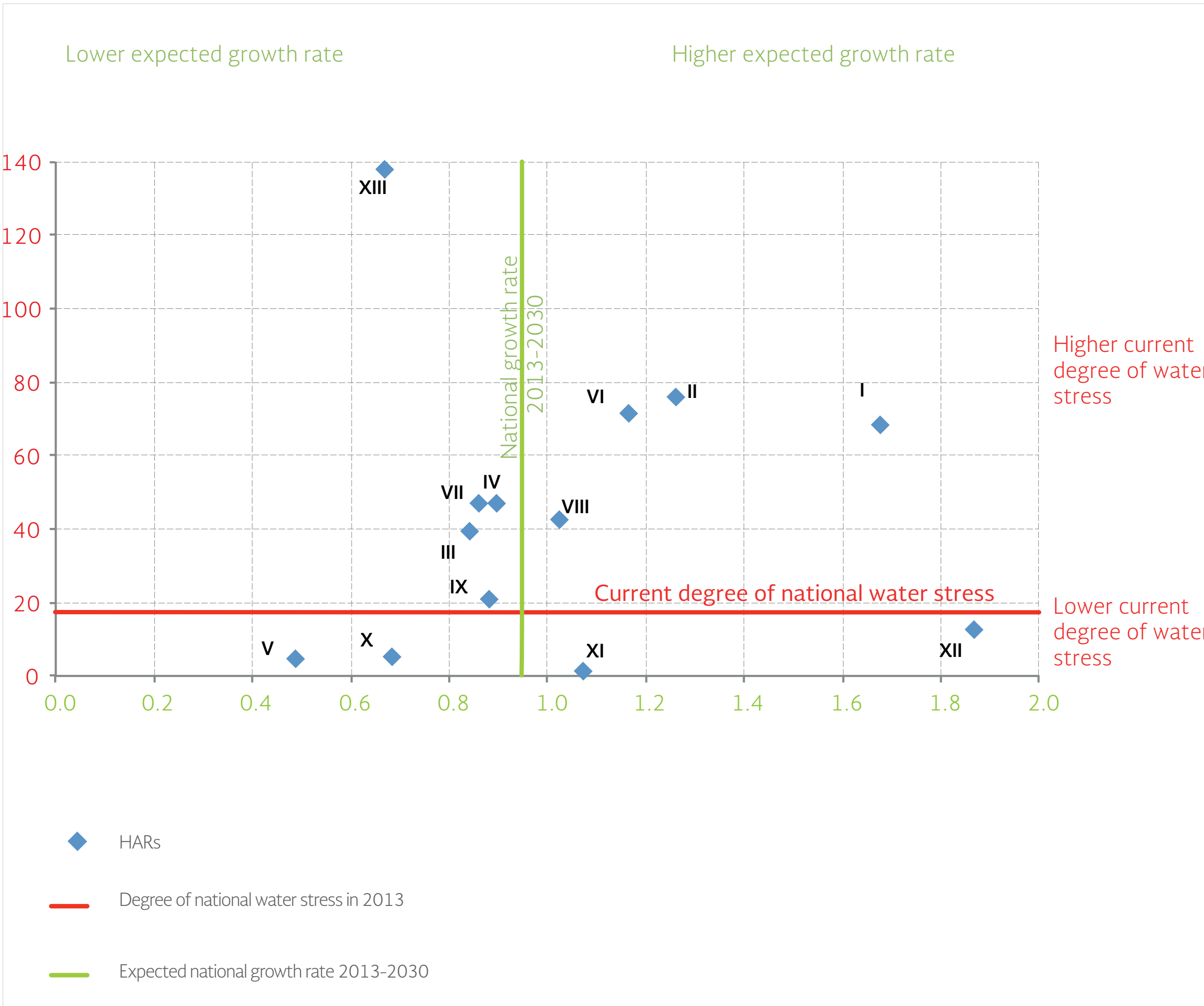
T7.1 Population in 2013 and 2030 (thousands of inhabitants)

Code	HAR	Population		Expected population increase
		2013	2030	
I	Baja California Peninsula	4 291	5 513	1 222
II	Northwest	2 764	3 357	592
III	Northern Pacific	4 424	5 057	633
IV	Balsas	11 563	13 315	1 752
V	Southern Pacific	4 986	5 400	414
VI	Rio Bravo	11 997	14 368	2 371
VII	Central Basins of the North	4 466	5 125	658
VIII	Lerma-Santiago-Pacific	23 595	27 699	4 103
IX	Northern Gulf	5 186	5 963	776
X	Central Gulf	10 397	11 607	1 210
XI	Southern Border	7 480	8 844	1 364
XII	Yucatan Peninsula	4 429	5 834	1 405
XIII	Waters of the Valley of Mexico	22 816	25 401	2 585
	Total	118 395	137 481	19 086

Sources: Produced based on Conapo (2014).

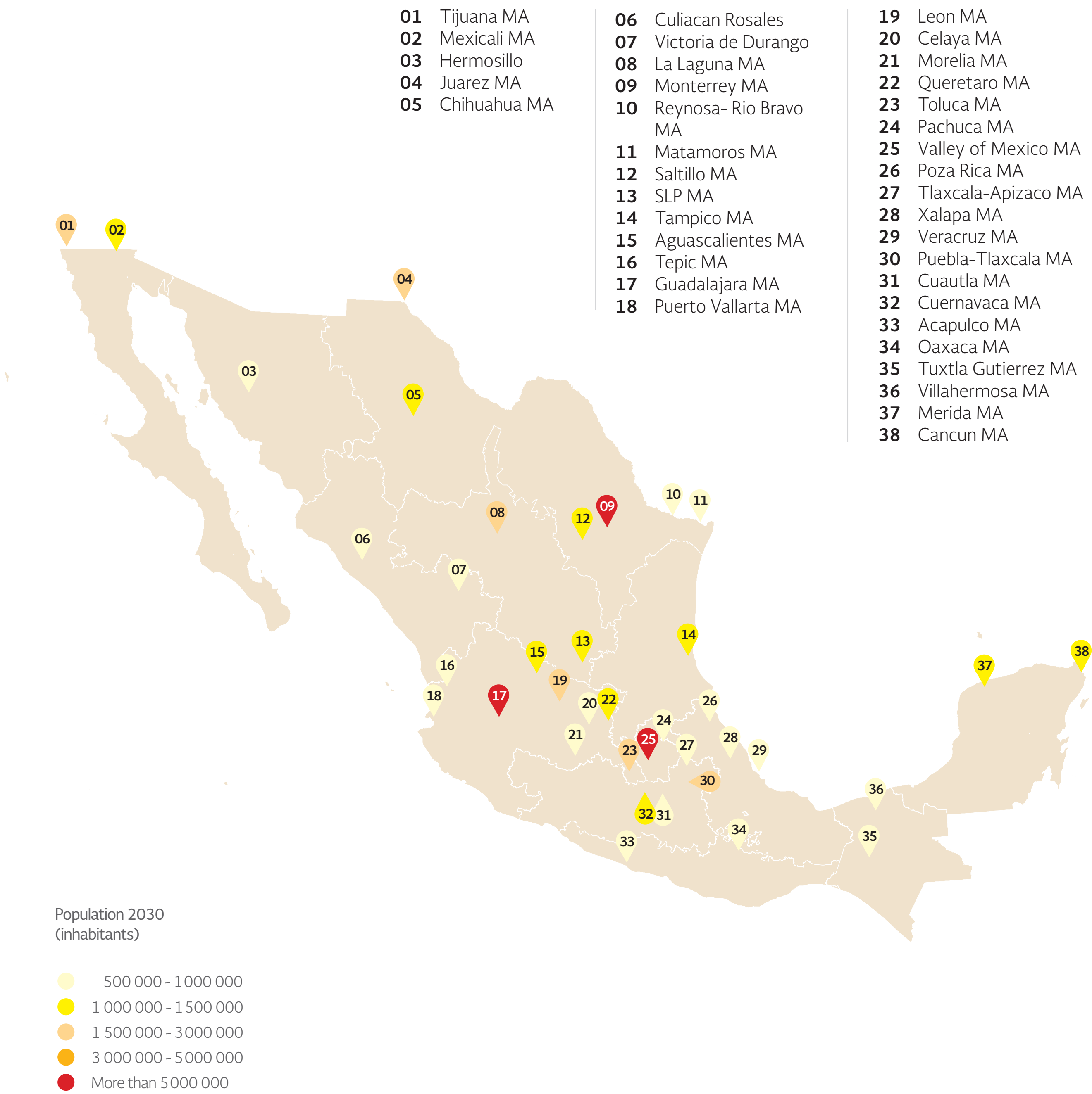
It should be noted that some of the HARs in which the highest population growth is expected are at the same time those where there is already a degree of water stress that is higher than the national average, as can be appreciated in graph G7.2. By contrast, in some HARs under a lower degree of water stress (V Southern Pacific and X Central Gulf) a lower population growth is expected. In 2030, it is expected that 53.6% of the population of Mexico will be living in 38 population centers (35 metropolitan areas and three non-suburban municipalities) with more than 500 000 inhabitants (see map M7.1).

G7.2 Current degree of water stress and growth rate, 2013-2030



Source: Produced based on Conagua (2014l), Conapo (2014).

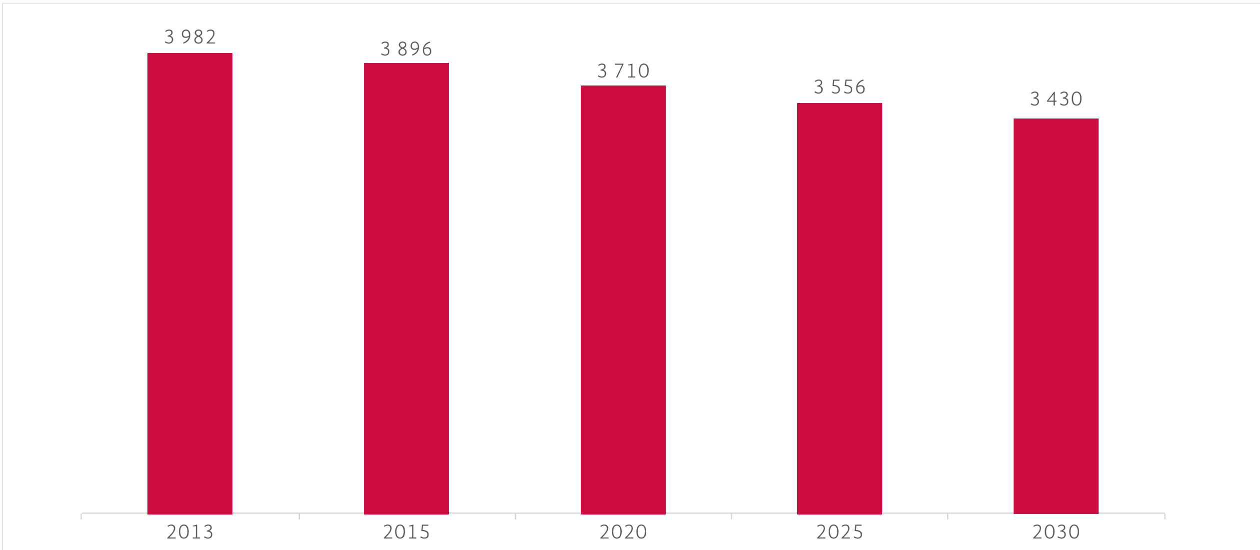
M7.1 Main population centers in 2030



Source: Produced based on Conapo (2010), Sedesol et al. (2012).

The increasing population will bring about a reduction in the per capita renewable water resources nationwide. The foreseen decrease is shown in graph G7.3, from 3 982 m^3/inhabitant/year in 2013 to 3 430 in 2030. It is worth mentioning that the renewable water resources in this chapter remain constant throughout the 2013-2030 period, corresponding to the reference value of the 2011 cycle of updating studies on watersheds and aquifers.

G7.3 Projections of per capita renewable water resources in Mexico, 2013-2030 m^3/inhabitant/year



Source: Produced based on CONAGUA (2014l), CONAPO (2014).

By 2030, in some of the country's HARs, the per capita renewable water resources will reach levels close to or even lower than 1 000 m^3/inhabitant/year, a condition classified as severe scarcity.

Table T7.2 and diagram D7.1 show the evolution in renewable water resources between 2013 and 2030. As can be observed, the HARs I Baja California Peninsula, VI Rio Bravo and XIII Waters of the Valley of Mexico will present extremely low per capita levels of renewable water resources in 2030.

T7.2 Per capita renewable water resources, 2013 and 2030

Code	HAR	Renewable water 2011 (millons of m^3/year)	Per capita renewable water resources 2013 (m^3/inhabitant/year)	Per capita renewable water resources 2030 (m^3/inhabitant/year)
I	Baja California Peninsula	4 999	1 165	907
II	Northwest	8 325	3 011	2 480
III	Northern Pacific	25 939	5 863	5 129
IV	Balsas	22 899	1 980	1 720
V	Southern Pacific	32 351	6 488	5 991
VI	Rio Bravo	12 757	1 063	888
VII	Central Basins of the North	8 065	1 806	1 574
VIII	Lerma-Santiago-Pacific	35 754	1 515	1 291
IX	Northern Gulf	28 115	5 421	4 715
X	Central Gulf	95 124	9 149	8 195
XI	Southern Border	163 845	21 906	18 526
XII	Yucatan Peninsula	29 856	6 740	5 117
XIII	Waters of the Valley of Mexico	3 468	152	137
		471 498	3 982	3 430

Source: Produced based on CONAGUA (2014l), CONAPO (2014).

D7.1 Per capita renewable water resources 2013

Projection of per capita renewable water resources 2030

Source: Produced based on Conagua (2014l), Conapo (2014).

Special attention should be paid to groundwater, the overexploitation of which leads to the reduction of phreatic levels and land subsidence, as well as causing wells to have to be dug ever deeper. The majority of the rural population, especially in arid areas, depends almost exclusively on groundwater.

With the aim of facing the decrease in the availability of water in the coming years, it will be necessary to carry out actions to reduce the demand, by increasing the efficiency in the use of water for crop irrigation and in water distribution systems in cities. Furthermore, the volumes of wastewater that are treated and reused should increase significantly, so as to increase the availability of water of appropriate quality for the uses for which it is destined.

In addition, in order to continue guaranteeing social development, it will be necessary to significantly increase the rural coverage of drinking water, drainage and sanitation.

7.3 National water planning

[Reporter: Política hídrica]

The Political Constitution of the United Mexican States establishes the planning of its national development as the basis for the articulation of public policies in the government of the republic, as well as the direct source of participatory democracy through consultation with society-at-large. The 2013-2018 National Development Plan (NDP) establishes the national targets and guiding objectives of public policies.

Within the scheme of the National System of Democratic Planning, the 2014-2018[1] National Water Program (NWP) is derived from and aligned with the NDP. It was developed within the framework of the system of water sector planning, with the collaboration of and contributions from institutions and agencies, experts as well as a public consultation process carried out in regional fora with the participation of users, academics, civil society organizations, communicators, legislators and scholars.

Graph G7.4 shows the alignment of the national targets of the NDP with the NWP by means of the latter's five overarching guidelines, articulated through the reforms and modernizations proposed for the water sector in the NWP's six objectivs.

1 For the date of publication it is referred to as 2014-2018.

G7.4 Alignment of the NDP with the NWP

Source: Produced based on Conagua (2014e).

It is worth mentioning the eight indicators proposed for the follow up and evaluation of the NWP's impacts.

T7.3 Indicators for the evaluation of the impact of the NWP

Objective	Indicator
1. Strengthen integrated and sustainable water management.	1. Global Water Sustainability Index.
2. Increase water security to face droughts and floods .	2. Water reserve decrees for environmental use.
	3. Population and productive surface area protected against floods.
	4. Drought management programs produced and approved by River Basin Councils.
3. Strengthen water supply and access to drinking water, sewerage and sanitation services.	5. Global index of access to basic water services.
4. Increase the technical, scientific and technological capacities of the sector.	6. Influence of the technological development of the water sector in decision making.
5. Sustainably ensure water for irrigated agriculture, energy, industry, tourism and other economic and financial activities.	7. Productivity of water in irrigation districts.
6. Consolidate the participation of Mexico in the international context on water issues.	8. International cooperation projects duly attended to.

Source: Conagua (2014k).

Chapter 8

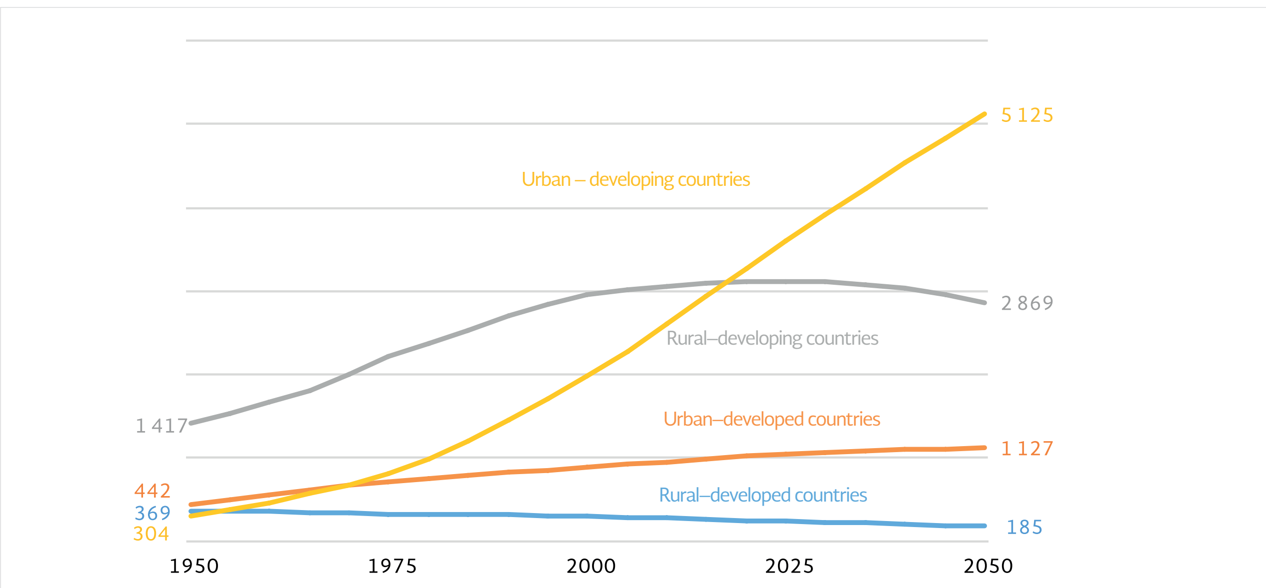
Water in the world

8.1 Socio-economic and demographic aspects

[Reporter: Indicadores económicos, Población]

It is estimated that in 1950, the world population was 2.53 billion, whereas for 2015, that number will have risen to 7.33 billion. Over the last sixty years, this growth has mainly been concentrated in developing regions, a trend that will continue for 2050, as can be observed in graph G8.1 [Additional: T8.A]. It is estimated that by 2050, the world population will be 9.31 billion (UNDESA 2014).

G8.1 World population, according to region and development (millions of inhabitants)



Source: Produced based on UN-DESA (2014).

The growing concentration of the population in urban areas should be highlighted, as shown in graph G8.1. Conversely, the rural population shows a decreasing trend in both developed and developing countries.

In table T8.1, the countries with the world's highest population are shown, among which Mexico is in eleventh place worldwide. In each table of this chapter, in addition to the countries in the first places for each concept (for example population and irrigation surface, among others), five countries appear as references (Brazil, United States of America, France, South Africa and Turkey), as well as Mexico, in order to facilitate comparisons. The population for Mexico corresponds to the definition of Conapo (2014).

T8.1 Countries with the highest population, 2013

No.	Country	Population (millions of inhabitants)	Population density (inhabitants/km²)
1	China	1 416.67	146.7
2	India	1 252.14	376.2
3	United States of America	320.05	32.3
4	Indonesia	249.87	129.2
5	Brazil	200.36	23.3
6	Pakistan	182.14	225.0
7	Nigeria	173.62	182.8
8	Bangladesh	156.60	1 042.0
9	Russian Federation	142.83	8.4
10	Japan	127.14	336.7
11	Mexico	118.40	60.4
12	Philippines	98.39	322.4
13	Ethiopia	94.10	83.1
14	Vietnam	91.68	274.3
15	Germany	82.73	231.8
16	Egypt	82.06	80.6
17	Islamic Republic of Iran	77.45	43.8
18	Turkey	74.93	94.4
19	Democratic Republic of Congo	67.51	28.0
20	Thailand	67.01	130.2
21	France	64.29	116.4
22	United Kingdom	63.38	258.7
23	Italy	60.99	202.0
25	South Africa	52.78	43.0

Source: Produced based on FAO (2014), Conapo (2014), Inegi (2014g).

In table T8.2 information is presented on the countries with the largest per capita Gross Domestic Product (GDP). The data is at current prices and varies from T1.3 due to the calculation process. Some values are estimated.

T8.2 Countries with the largest total and per capita GDP

Total GDP			Per capita GDP		
No.	Country	GDP (billions of US dollars)	No.	Country	Per capita GDP (US dollar)
1	United States of America	16 799.70	1	Luxembourg	110 423.84
2	China	9 181.38	2	Norway	100 318.32
3	Japan	4 901.53	3	Qatar	100 260.49
4	Germany	3 635.96	4	Switzerland	81 323.96
5	France	2 737.36	5	Australia	64 863.17
6	United Kingdom	2 535.76	6	Denmark	59 190.75
7	Brazil	2 242.85	7	Sweden	57 909.29
8	Russian Federation	2 118.01	8	Singapore	54 775.53
9	Italy	2 071.96	9	United States of America	53 101.01
10	India	1 870.65	10	Canada	51 989.51

Total GDP			Per capita GDP		
No.	Country	GDP (billions of US dollars)	No.	Country	Per capita GDP (US dollar)
11	Canada	1 825.10	11	Austria	48 956.92
12	Australia	1 505.28	12	Kuwait	47 639.04
13	Spain	1 358.69	13	Netherlands	47 633.62
14	Mexico	1 258.54	14	Finland	47 129.30
15	South Korea	1 221.80	15	Ireland	45 620.71
16	Indonesia	870.28	16	Iceland	45 535.58
17	Turkey	827.21	17	Belgium	45 384.00
18	Netherlands	800.01	18	Germany	44 999.50
19	Saudi Arabia	745.27	19	United Arab Emirates	43 875.93
20	Switzerland	650.81	20	France	42 999.97
21	Sweden	557.94	62	Brazil	11 310.88
22	Poland	516.13	65	Turkey	10 815.46
23	Norway	511.25	66	Mexico	10 629.88
33	South Africa	350.78	86	South Africa	6 620.72

Source: IMF (2014).

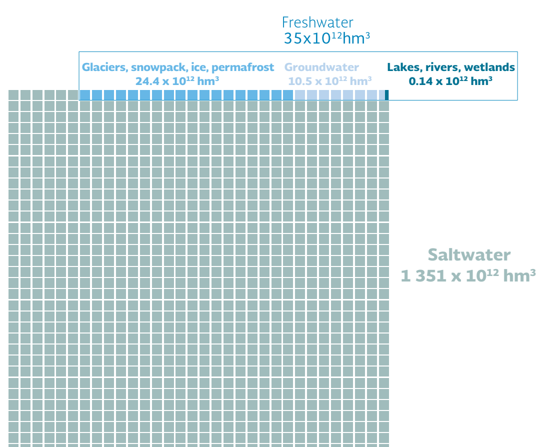
It is worth mentioning that Mexico is ranked 66th worldwide. In terms of the total GDP, the country is ranked 14th worldwide.

8.2 Components of the Water Cycle

[Reporter: Distribución global del agua en el mundo]

The mean annual availability of water in the world is approximately 1 386 trillion hm^3, of which 97.5% is saltwater and only 2.5%, or 35 trillion hm^3, is freshwater. Of that amount, almost 70% is unavailable for human consumption since it is locked up in glaciers, snowpack and ice (graph G8.2).

G8.2 Distribution of water in the world



Source: Produced based on Clarke and King (2014).

Of the water that is technically available for human consumption, only a small percentage is found in lakes, rivers, soil humidity and relatively shallow groundwater deposits, the renovation of which is the result of infiltration. Much of this theoretically usable water is far from populated areas, making it difficult or expensive to effectively use.

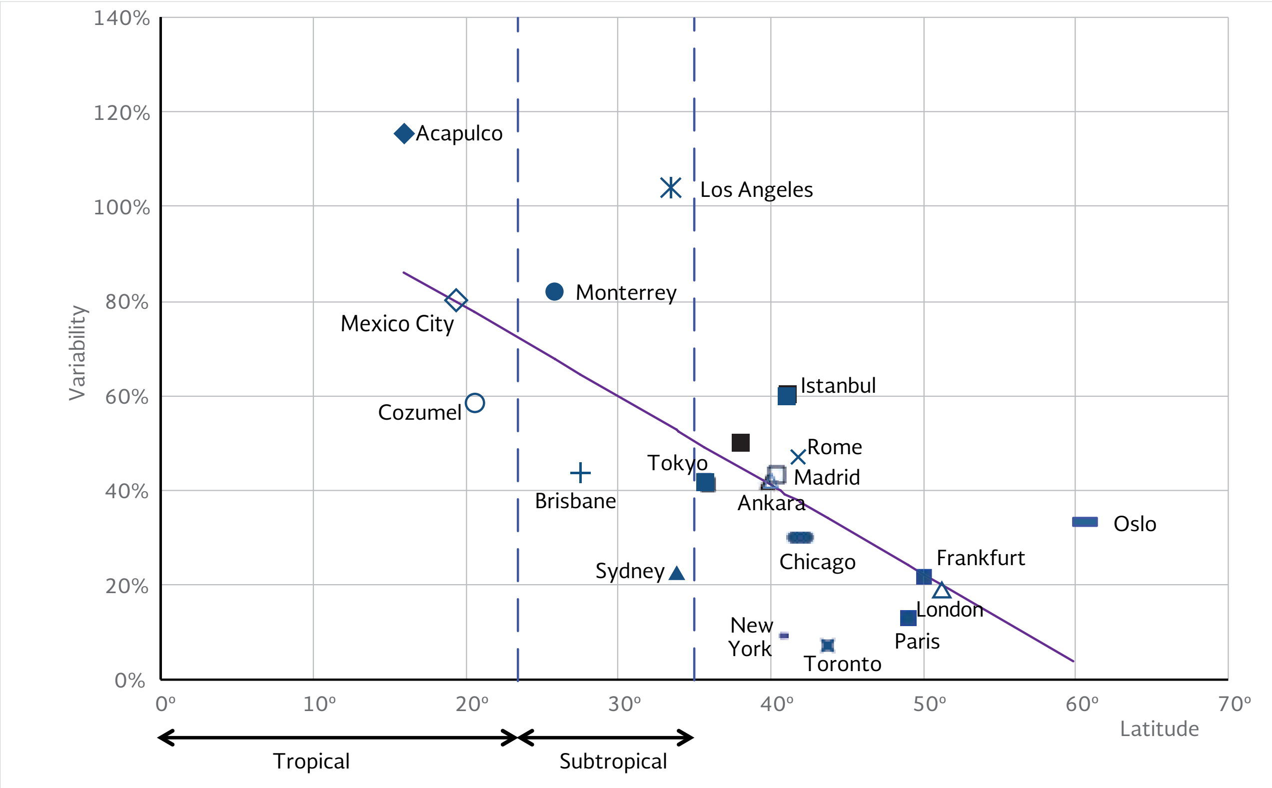
Precipitation

Precipitation constitutes an important part of the hydrologic cycle, since it produces the planet's renewable water resources. However, precipitation varies from region to region and seasonally.

Graph G8.3 allows the existing correlation to be observed between mean precipitation patterns, measured by their coefficient of variation, and the latitude in various cities in the world. This coefficient gives an approximation of the variability of annual precipitation throughout the year. The higher the value is, the greater the variability is throughout the year. In general, cities at higher latitudes are characterized by a uniform precipitation throughout the year, whereas cities closer to the equator have a more accentuated precipitation in the summer months.

The graph uses different normal periods for each city, which is why the years are not specified. For illustrative purposes, the representation of the latitudes was simplified.

G8.3 Correlation between the variability in precipitation and latitude



Source: Produced based on World Climate (2014).

[Reporter: Agua renovable]

A country's per capita renewable water resources may be calculated by dividing its renewable resources by the number of inhabitants. According to this criterion, Mexico is in 91st place worldwide out of 199 countries on which data is available, as shown in table T8.3. In this table the value for Mexico is from 2013, and from other countries the value is the latest one available.

T8.3 Countries with the highest per capita renewable water resources, 2013

No.	Country	Population (thousands of inhabitants)	Renewable water resources (millions of m³)	Per capita renewable water resources (m³/inhabitant/year)
1	Iceland	330	170	515 152
2	Guyana	800	271	338 750
3	Congo	4 448	832	187 050
4	Surinam	539	99	183 673
5	Papua New Guinea	7 321	801	109 411
6	Bhutan	754	78	103 448
7	Gabon	1 672	164	98 086
8	Canada	35 182	2 902	82 485
9	Salomon Islands	561	45	79 679
10	Norway	5 043	382	75 749
11	New Zealand	4 506	327	72 570
12	Belize	332	22	65 452
13	Peru	30 376	1 894	62 352
14	Paraguay	6 802	388	57 013
15	Liberia	4 294	232	54 029
16	Plurinational State of Bolivia	10 671	574	53 791
17	Chile	17 620	923	52 389
18	Uruguay	3 407	172	50 543
19	Lao People's Democratic Republic	6 770	334	49 261
20	Colombia	48 321	2 360	48 840
22	Brazil	200 362	8 647	43 157
60	United States of America	320 051	3 069	9 589
91	Mexico	118 395	471	3 982
99	France	64 291	211	3 282
107	Turkey	74 933	212	2 824
147	South Africa	52 776	51	974

Source: Produced based on FAO (2014), Conapo (2014), Conagua (2014l).

Climate change

In the Intergovernmental Panel on Climate Change's (IPCC) 5th Report (IPCC 2013) the evidence on climate change is consolidated. Human influence has been detected on both the climate system –evidenced by the growing concentrations of greenhouse gases– and on the warming of the atmosphere and the ocean, as well as on changes in the global water cycle, on the reductions in snow and ice, on the increase in sea level, and on changes in some climate extremes.

It is estimated that changes in the global water cycle, due to climate change, will not be uniform. The contrast in precipitation will increase between dry and humid regions, and between wet and dry seasons, although it is possible that there may be regional exceptions. This will result in risks related to the quantity and quality of water available for society.

It is considered that the impacts of recent extreme hydro-meteorological events, including heatwaves, droughts, floods, cyclones and fires reveal the significant vulnerability and risk exposure of certain ecosystems and many human systems to climate variability.

In terms of freshwater, it is foreseen that during the 21st century the renewable surface and groundwater resources will be reduced in the majority of sub-tropical dry regions, which will increase the competition between users. The effects of climate change are accentuated in the areas with rapid processes of urbanization, without disregarding the impacts in rural areas on the availability of water and changes in temperature, which could result in a shift in crop zones and the consequent impact both on rural population and on food security in general.

Mitigation, understood as an anthropogenic intervention to reduce the sources or improve greenhouse gas sinks, and adaptation, defined as the process of adjusting human or natural systems as a response to projected or real climate stimuli and their effects, will only be possible through joint collaborative efforts, which in turn involve issues of equity, justice and impartiality between stakeholders in a context of decision making through value judgments, ethical considerations and perceptions of risks and opportunities for individuals and organizations.

Extreme hydro-meteorological phenomena

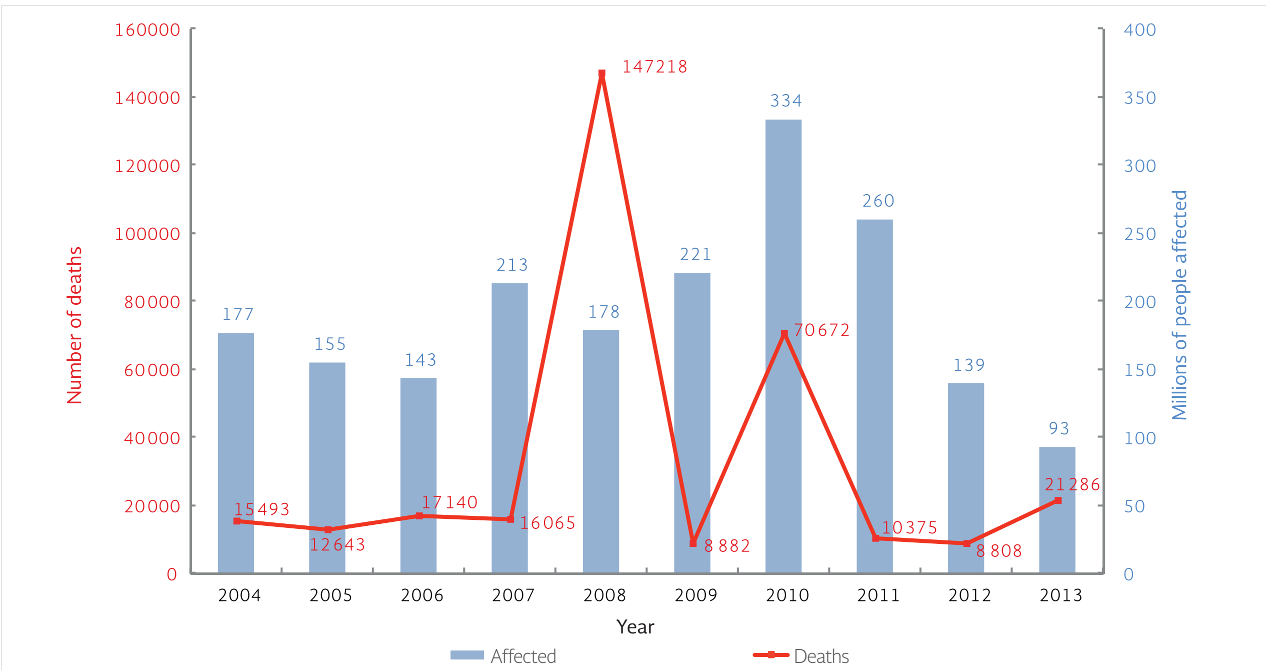
[Reporter: Desastres climáticos e hidrometeorológicos]

Extreme hydro-meteorological phenomena, such as droughts, floods and hurricanes, are natural events that frequently result in disasters with human and material losses. In the analysis of disasters, it may be inferred that the damages estimated as a percentage of GDP are significantly higher in developing countries, which may be further accentuated if the global trend towards the concentration of population in urban localities continues.

Droughts, food insecurity, extreme temperatures, floods, forest fires, insect infestations, water-related landslides and windstorms are all considered disasters of climate and hydro-meteorological origin (IFRC 2014). This type of events represents a significant proportion of the estimated damage caused by disasters, which in 2013 represented 109.56 billion dollars [Additional: G8.A], 92% of the total damage caused by all types of disasters.

The number of people affected by climate and hydro-meteorological disasters in the period between 2004 and 2013 is shown in graph G8.4, which reveals the annual variability in the occurrence of major disasters due to hydro-meteorological phenomena.

G8.4 People affected by climate-related and hydro-meteorological disasters



Source: Produced based on IFRC (2014).

It should be noted that disasters are expected to increase, both in number and as regards their effects, as a result of climate change. The risk of disasters is the result of the coming together of climate and weather events, vulnerability and exposure of social groups, environmental services and resources, infrastructure and economic, social and cultural assets (IPCC 2012).

8.3 Uses of water and infrastructure

[Reporter: Usos del agua]

While the world population tripled in the 20th century, water withdrawals multiplied six-fold, thus increasing the degree of water stress. In table T8.4, the countries with the highest water withdrawals are shown, in which it can be observed that Mexico is ranked in ninth place. The classification of uses in this table considers agriculture, industry –including cooling of power stations– and public supply. The values for each country vary since they are the latest available at the source; for Mexico they are updated to 2013.

The main use of water resources worldwide, according to estimations from the FAO (2011), is agriculture, with 70% of the total withdrawal.

T8.4 Countries with the highest water withdrawal and percentage of use for agriculture, industry and public supply

No.	Country	Total water withdrawal (billions of m³/year)	% use for agriculture	% use for industry	% use for public supply
1	India	761.00	90.4	2.2	7.4
2	China	554.10	64.6	23.2	12.2
3	United States of America	478.40	40.2	46.1	13.7
4	Pakistan	183.50	94.0	0.8	5.3
5	Indonesia	113.30	81.9	6.5	11.6
6	Islamic Republic of Iran	93.30	92.2	1.2	6.6
7	Japan	90.04	63.1	17.6	19.3
8	Vietnam	82.03	94.8	3.7	1.5
9	Mexico	81.65	75.7	9.6	14.6
10	Philippines	81.56	82.2	10.1	7.6
11	Brazil	74.83	60.0	17.0	23.0
12	Egypt	68.30	86.4	5.9	7.8
13	Russian Federation	66.20	19.9	59.8	20.2
14	Iraq	66.00	78.8	14.7	6.5
15	Thailand	57.31	90.4	4.8	4.8
16	Uzbekistan	56.00	90.0	2.7	7.3
17	Italy	45.41	44.1	35.9	20.1
18	Canada	42.20	U/D	U/D	U/D
19	Turkey	40.10	73.8	10.7	15.5
20	Argentina	37.78	73.9	10.6	15.5
21	Bangladesh	35.87	87.8	2.1	10.0
22	Chile	35.43	83.0	13.4	3.6
26	France	31.62	12.4	69.3	18.3
43	South Africa	12.50	62.7	6.0	31.2

Note: U/D Unavailable data
Source: FAO (2014), Conagua (2014g).

Industrial use

[Reporter: Usos]

Industry is one of the main motors of growth and economic development. Around 19% of water extracted worldwide is employed in industry (FAO 2011). Worldwide, around 19% of the water withdrawn is used in industry. Of this volume, more than half is used in thermoelectric stations in cooling processes. Among the greatest consumers of water under this heading are oil stations, and the metal, paper, wood, food processing and manufacturing industries.

[Reporter: Distritos de riego]

Irrigation is fundamental to meet the world's food requirements. Only 19% of the area on which crops are grown has irrigation infrastructure, but that area produces more than 40% of the world's crops (FAO, 2011). In recent years agriculture has used greater quantities of agrochemical products, resulting in pollution of soil and aquifers.

Mexico is ranked seventh worldwide in terms of the surface area with irrigation infrastructure, the first places being occupied by India, China and the United States of America, as shown in table T8.5. This table shows the latest values available at the source.

T8.5 Countries with the most irrigation infrastructure

No.	Country	Area with totally dominant irrigation infrastructure (thousands of ha)	Area cultivated (thousands of ha)	Irrigation infrastructure compared to the area cultivated (%)
1	India	66 334	169 000	39.3
2	China	62 938	122 527	51.4
3	United States of America	26 644	157 708	16.9
4	Pakistan	19 270	22 040	87.4
5	Islamic Republic of Iran	8 700	19 654	44.3
6	Indonesia	6 722	45 500	14.8
7	Mexico	6 460	25 808	25.0
8	Thailand	6 415	21 060	30.5
9	Brazil	5 400	79 605	6.8
10	Turkey	5 340	23 790	22.4
11	Bangladesh	5 050	8 525	59.2
12	Vietnam	4 585	10 200	45.0
13	Uzbekistan	4 198	4 690	89.5
14	Italy	3 951	9 560	41.3
15	Iraq	3 525	3 657	96.4
16	Spain	3 470	16 960	20.5
17	Egypt	3 422	3 612	94.7
18	Afghanistan	3 208	7 910	40.6
19	France	2 642	19 293	13.7
20	Australia	2 546	47 493	5.4
21	Japan	2 500	4 549	55.0
22	Russian Federation	2 375	121 350	2.0
23	Argentina	2 357	40 291	5.8
30	South Africa	1 670	12 413	13.5

Source: FAO (2014).

[Reporteador: Generación de energía]

Energy performs a key function in poverty alleviation, the promotion of economic activities and the improvement of the quality of life, health and education opportunities, especially for women and children.

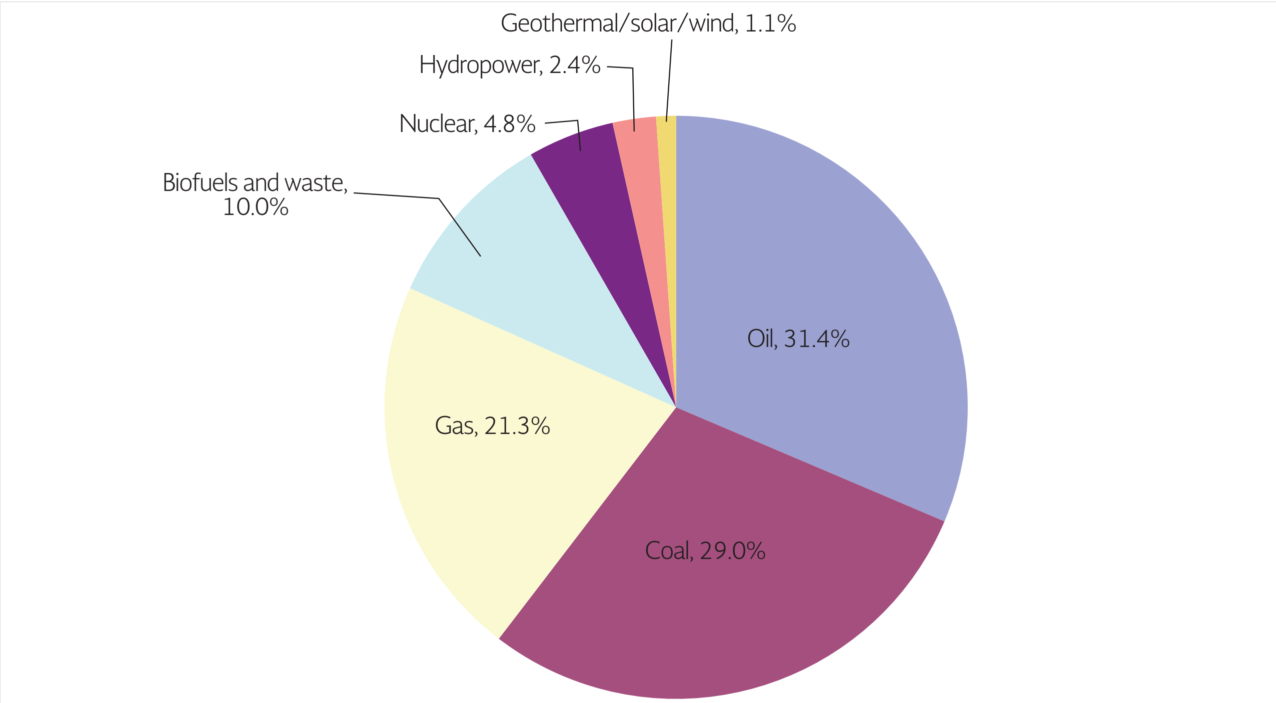
The International Energy Agency (IEA) considers that energy generation practically doubled in the period from 1973 to 2012, going from 6.12 to 13.37 billion metric tons of oil equivalent.

Water has a significant link with energy, since on the one hand energy is used to supply and treat water, and on the other water is employed in virtually all the phases of energy generation (IEA 2014b). In fuel production it is used to withdraw fossil fuel, to grow biofuel and in processing and refining. It is used in the generation of steam and cooling in thermic plants (fossil fuels, bioenergy, geothermal, nuclear and some types of solar stations), which represent more than 90% of the world energy generation. 2.4% of the world's energy is generated through the water contained in dams through hydropower stations. In this sense, energy generation is a use of water that has potential impacts on the quantity and quality of water available (IEA 2012).

The composition of the total energy supply in 2012 can be observed in graph G8.5.

Energy generation should be considered from the perspective of greenhouse gas emissions, which contribute to climate change. Hydropower is considered as a source of renewable energy, together with geothermal, solar and wind energy.

G8.5 Sources of energy supply, 2012



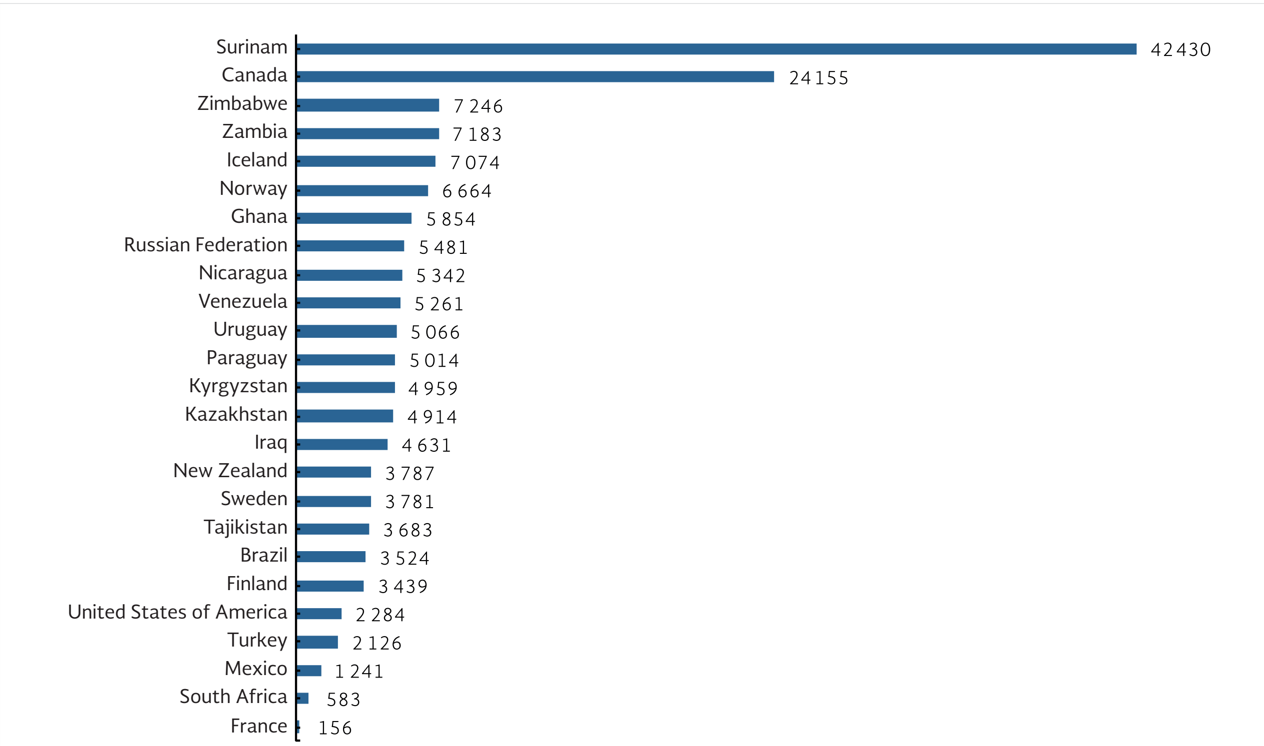
Source: IEA (2014).

Storage reservoirs in the world

[Reporter: Principales presas]

The water storage capacity for various uses and for flood control is directly proportional to the degree of hydraulic development of any given country. An indicator that allows this degree to be appreciated is the per capita storage capacity. It should be mentioned that according to the FAO, Mexico is in 35th place worldwide in terms of the per capita storage capacity, as shown in graph G8.6. This graph shows the latest data available for each country.

G8.6 Per capita storage capacity m³/inhabitant



Source: FAO (2014).

Water footprint

[Reporter: Agua virtual/Huella hídrica]

One means of measuring the impact of human activities on water resources is the so-called water footprint, which can be calculated by adding up the volume of water used by each person for his or her different activities, as well as the water needed to produce the goods and services that he or she consumes.

The four main factors that determine a country's water footprint are: the level of consumption, the type of consumption (for example the amount of meat consumed by each person), the climate and the efficiency with which water is used. According to this concept, each human being on average uses 1 240 m³ of water per year; however the differences between countries are significant. For example, in Mexico the water footprint is 1 441 m^3 of water per person per year, whereas in the United States, one of the countries with the highest water footprint, 2 483 m^3 is required, and in China, the figure is 702 m^3 [Additional: T8.B], one of the lowest water footprints (Hoekstra and Chapagain 2008).

In these calculations, both the water withdrawn from aquifers, lakes, rivers and streams (known as blue water), and the rainwater that feeds rainfed crops (green water) are included.

Virtual water

[Reporter: Agua virtual/Huella hídrica]

A concept that is closely related to the water footprint is that of virtual water. The virtual water content of a product is the volume of water employed in its productive process.

Commercial trade between countries entails an implicit flow of virtual water, corresponding to the water that was used for the generation of the products or services imported or exported. The total volume of virtual water exchanged between the countries of the world is 1 625 billion m^3 per year, of which approximately 80% corresponds to agricultural products, the remainder to industrial products.

Growing one kilogram of corn requires on average 900 liters of water, whereas growing one kilogram of white rice employs 3 400 liters. However, the production of one kilogram of beef requires 15 500 liters, which includes the water drunk by the animal throughout its lifetime and the water required to grow the grain that served as its food. The values are different in each country, depending on the climate conditions and the efficiency in the use of water [Additional: T8.C]. (Hoekstra and Chapagain 2008).

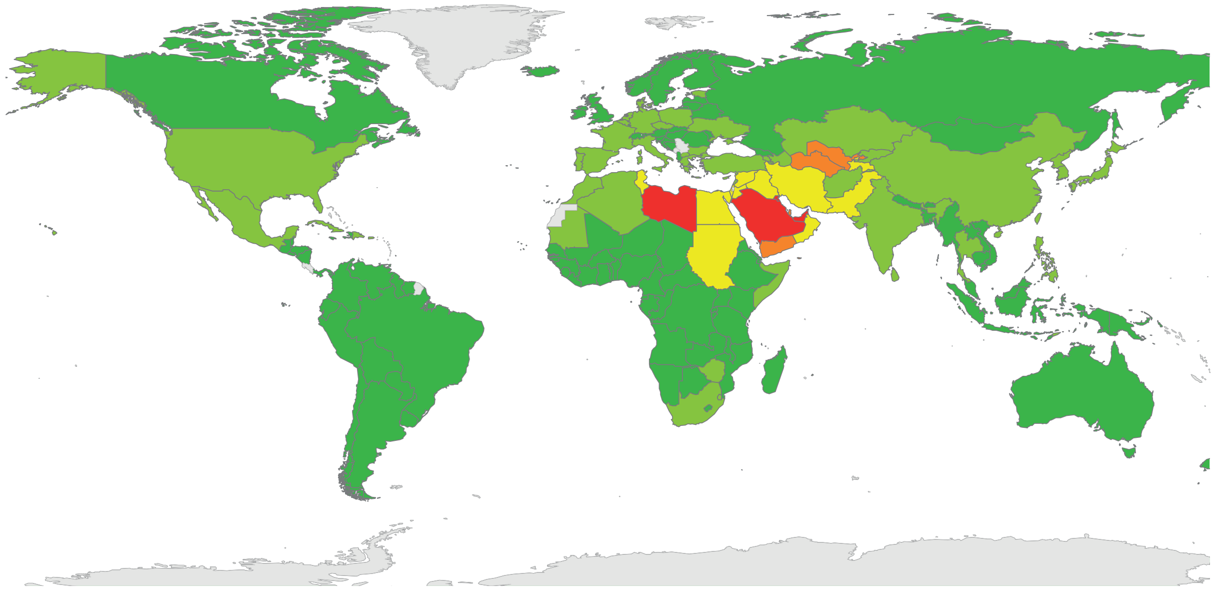
Virtual water imports may be an option to reduce the problems of water scarcity in some countries. Countries that export virtual water should evaluate the impact of this activity on the availability of their water resources and the possible distortions derived from subsidies applied to agricultural production.

Water stress

[Reporter: Grado de presión]

The degree of water stress is calculated by dividing the withdrawal between the renewable water resources. Due to their low availability, the Middle East countries suffer from very high water stress, as can be observed in map M8.1 [Additional: T8.D], whereas Mexico is in 53rd place according to this indicator. This map represents the latest data available for each country.

M8.1 Degree of water stress



Source: Produced based on FAO (2014).

Drinking water, sanitation and wastewater treatment

[Reporter: Cobertura universal]

In 2000, the United Nations established the Millennium Development Goals (MDGs), with the aim of reducing extreme poverty by 2015. Goal number seven, "Ensuring environmental sustainability", includes target 7.C, related to drinking water and sanitation, which establishes the aim of reducing by half the proportion of people without sustainable access to safe drinking water[1] and improved sanitation services[2], between 1990 and 2015[3].

By 2012, even though 89% of the world population and 87% of the population in developing countries had access to improved drinking water supply sources, around 748 million people remained without access to this service. On the other hand, whereas 64% of the world population and 57% of the population of developing countries had access to improved sanitation services, approximately 2.5 billion people did not benefit from this access.

For the last year reported on, 2012, 116 countries had met the improved drinking water target, and 77 the target of improved sanitation. However, it is considered that 40 countries are not on track to meet the drinking water target and 69 the sanitation one. The situation regarding the targets is summarized in table T8.6.

1 Those that are protected against outside pollution, especially fecal matter.

2 Those that hygienically ensure that there is no contact between people and fecal matter.

3 The follow-up of the MDGs is carried out through the joint UN-UNICEF-WHO program, known as the Joint Monitoring Programme on water supply and sanitation. The last report is from 2014, with data from 2012.

T8.6 Countries and their compliance with the MDG targets on drinking water and sanitation, 2012

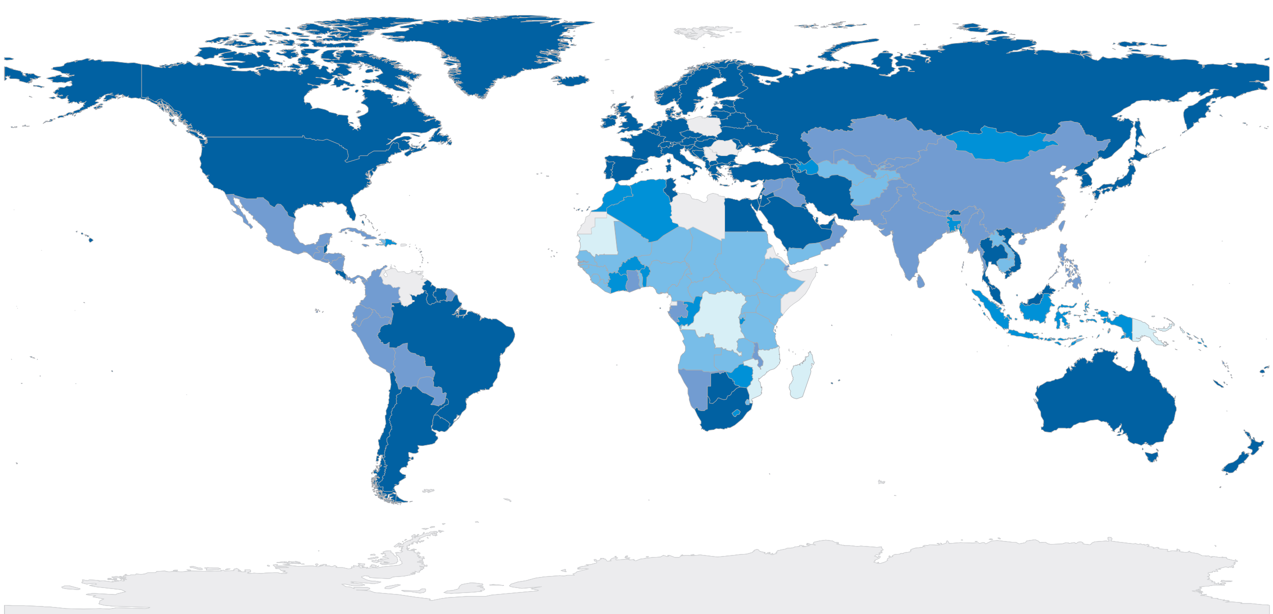
Status	Improved drinking	Improved sanitation	Improved drinking water and sanitation
Met	116	77	56
On track to be met	31	29	30
Insufficient progress	5	10	-
Not on track	40	69	20

Source: WHO-UNICEF (2014).

MDG target 7.C may be considered from two perspectives. The first is the close link between water and health, meaning that extending drinking water and sanitation coverage would contribute to a reduction in mortality through water-related diseases. The second is the effect that climate change will have on water resources and, in particular, on the availability and quality of water.

According to the definitions of the MDGs, in Mexico in 2012 95% of the population (96% urban and 91% rural) had access to improved drinking water sources, and 85% (87% urban and 79% rural) had access to improved sanitation services. Mexico is one of the countries that has already met both targets. The situation worldwide can be appreciated in maps M8.2 and M8.3 [Additional: T8.E, T8.F].

M8.2 Access to improved drinking water sources, 2012

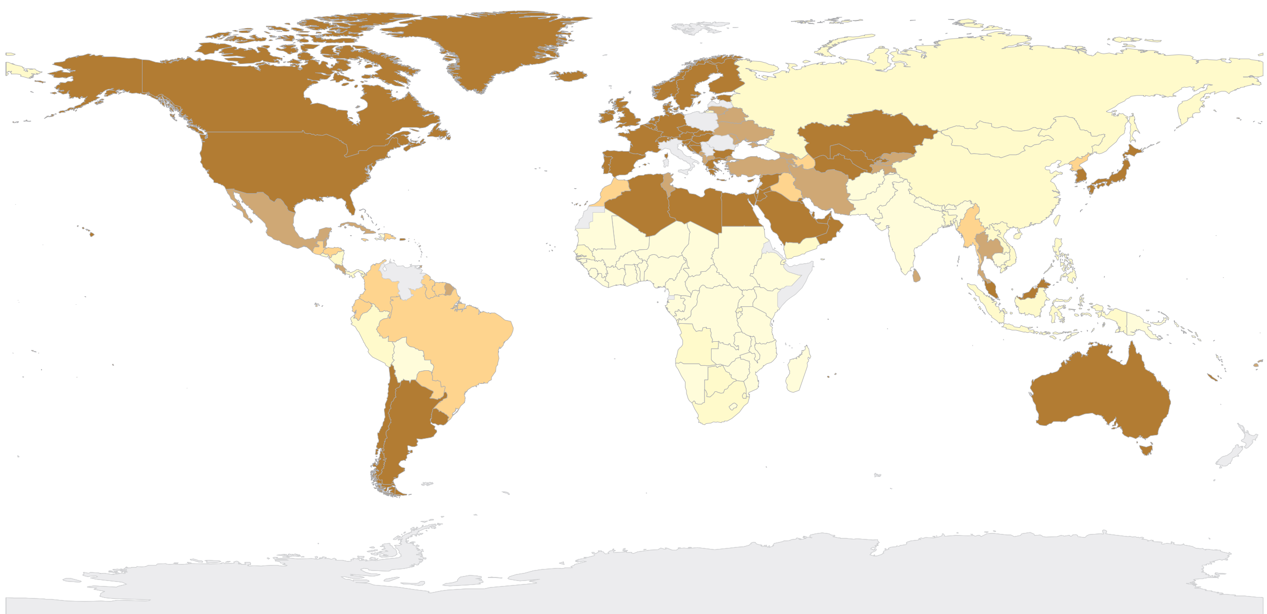


Population with access to improved drinking water sources (%)

- 100
- 85-95
- 75-85
- 50-75
- <50
- No data

Source: Produced based on WHO-UNICEF (2014).

M8.3 Access to improved sanitation services, 2012



Population with access to improved sanitation services (%)

- 100
- 85-95
- 75-85
- 50-75
- <50
- No data

Source: Produced based on OMS-UNICEF (2014).

Drinking water and sanitation tariffs

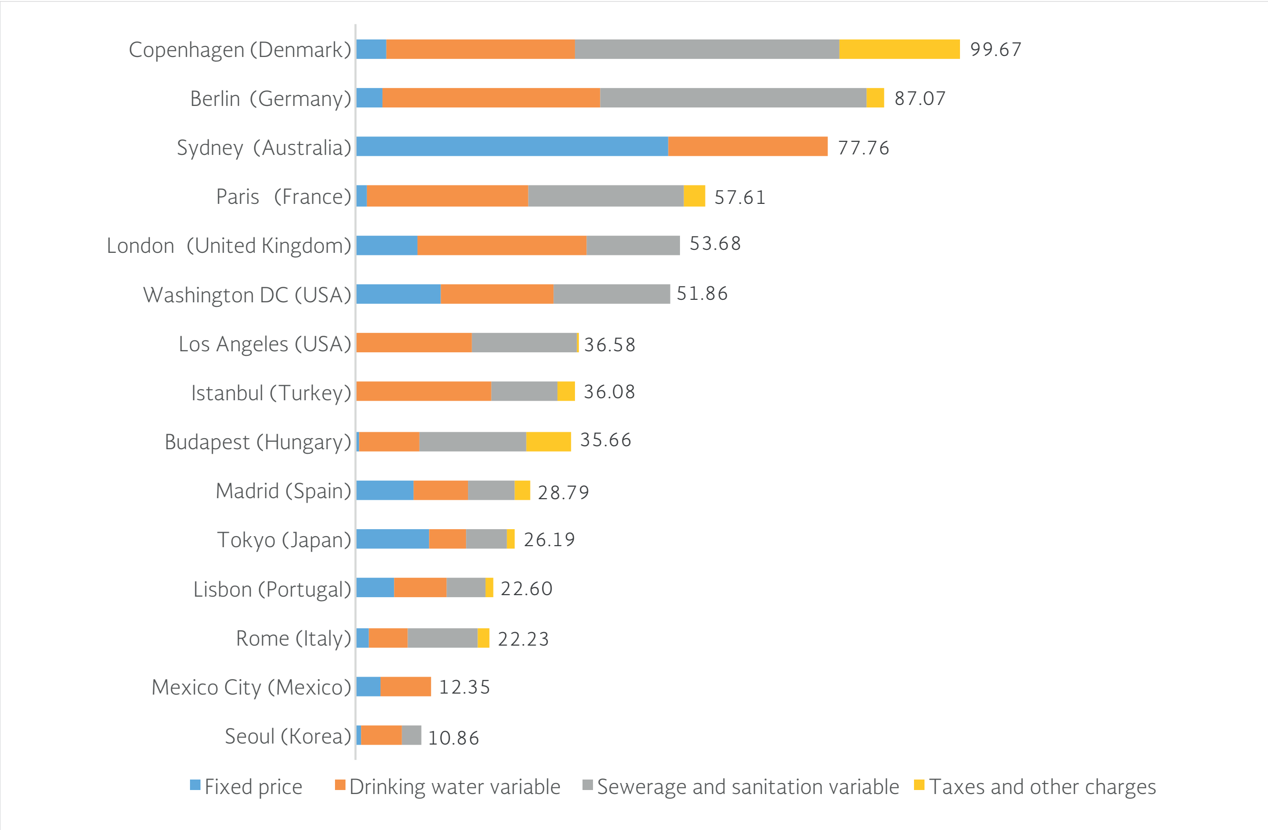
[Reporter: Tarifas]

It may be considered that drinking water, sewerage and sanitation services are financed through Tariffs, Transfers and Taxes (known collectively as the 3Ts). There is no uniformly applied definition of the costs derived from service provision, entailing that the relationship between tariffs and costs is also variable.

In some regions, the aim is for the tariffs to recover the total cost of the service. In others, the tariffs recover variable percentages of the cost.

In graph G8.7 the drinking water and sanitation tariffs, as well as the taxes associated with this service, are indicated for selected world cities, for a domestic consumption of 15 m^3 per month. The graph shows the values in pesos, with an exchange rate of 1 dollar = 13.00 pesos.

G8.7 Domestic tariffs in pesos/m³ for a consumption of 15 m³/month



Source: Produced based on GWI (2014).

Water and health

[Reporter: Agua y salud]

Estimations from the World Health Organization (WHO) indicate that every year in the world approximately 1.5 million children die from diarrheal diseases, of a total of 2.5 billion cases every year among children (Prüss-Üstün et al. 2008). On top of these deaths there are almost half a million more due to malnutrition and malnourishment, as a result of frequent gastro-intestinal infections. These child deaths occur mainly in developing countries, which represents a significant burden on the resources available for public health. Similarly, this type of diseases has a negative impact on the wellbeing and health of the population. Worldwide, the WHO estimated that in 2011 water- and sanitation-related diseases caused the death of two million people and four billion episodes of illness (WHO 2012b).

Cholera, typhoid fever and dysentery are among diarrheal diseases; all of them associated with the fecal-oral means of transmission. The majority of the deaths resulting from these diseases could be avoided through better access to drinking water, sewerage and sanitation services, since it is estimated that 88% of the cases of diarrhea are caused by polluted water, inadequate sanitation and poor hygiene habits (Corcoran et al. 2010). For 2012 it was estimated that 685 000 deaths were attributable to inadequate water and sanitation, a figure that rises to 842 000 when taking into account the combined effect of inadequate hand washing (Prüss-Üstün et al. 2014).

These figures are constantly refined, since the growing availability of data allows the key factors to be identified and analyzed, such as rehydration campaigns, the effects of hand washing, the incomplete coverage of services within the locality and improved sanitation schemes which do not involve treatment, all of which could continue exposing the population to sanitary risks.

It has been estimated that the lack of access to drinking water and adequate sanitation causes a cost of between 1 and 7% of each country's annual GDP (WSP 2012). A study by the WHO calculates that the investment return for sanitation is around 5.5, whereas for drinking water it is 2.0 (WHO 2012a).

Annexes

Annex A. Relevant data by hydrological-administrative region

Hydrological-administrative region: River basin council based in:		I. Baja California Peninsula Mexicali, Baja California	
Contextual data		**Renewable water, 2013**	
Number of municipalities	11	Normal annual precipitation 1971-2000	169 mm
Total population 2013	4 291 107 inhabitants	Mean surface runoff	3 300 hm³/year
Urban	3 923 332 inhabitants	Number of aquifers	88
Rural	367 775 inhabitants	Mean aquifer recharge	1 658 hm³/year
Population 2030	5 512 727 inhabitants	Per capita renewable water resources, 2013	1 165 hm³/inhabitant/year
Irrigation districts	2	Per capita renewable water resources, 2030	907 hm³/inhabitant/year
Surface area	245 695 hectares	Water stress, 2013	68.7% (High)

• Water quality monitoring classified as heavily polluted by COD, BOD_5 and/or TSS

Main rivers

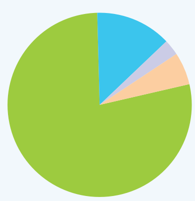
Irrigation districts

Urban localities

Water bodies

HAR

Uses of water, 2013 (hm³/year)



Agriculture	78%
Public supply	13%
Self-supplying industry	3%
Thermoelectric plants	6%

Offstream	Total	Surface water	Groundwater
Agriculture	2 686	1 753	933
Public supply	457	120	337
Self-supplying industry	96	72	24
Thermoelectric plants	196	0	196
Total	2 977	1 945	1 490
Instream			
Hydropower plants (Volume allocated)	129		

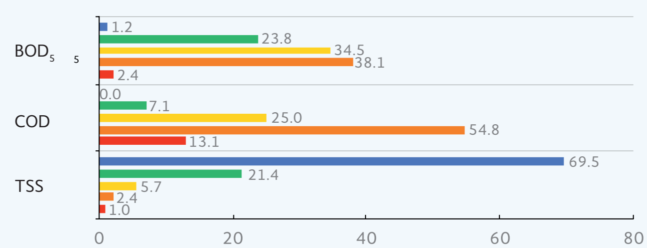
Coverage, 2010 (%)		
	Drinking water	Sanitation
Regional	95.46	93.08
Urban	97.20	95.43
Rural	76.59	67.68

Note: The projection considers the population at the mid-point of the year shown.

Municipal plants		
	Drinking water	Wastewater
Number in operation	44	63
Installed capacity (m³/s)	12.37	9.25
Flow processed (m³/s)	6.82	6.52

Surface water quality, 2013	
Number of monitoring sites according to water quality indicator	
BDO_5	84
COD	84
TSS	210

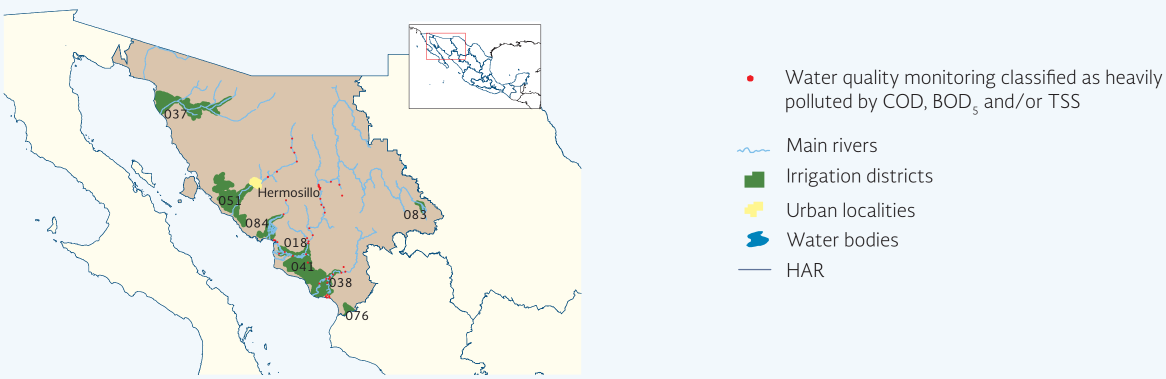
Distribution of the sites by indicator and classification (%)



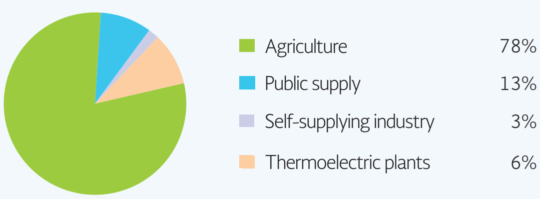
Excellent
Good quality
Acceptable
Polluted
Heavily polluted

Water bodies with sites classified as heavily polluted by BOD_5, COD and/or TSS: Cantamar stream, San Antonio de los Buenos stream, La Mision stream wetlands, Hanson lagoon, Mesa de Andrade 1 wetlands, Mesa de Andrade 3 wetlands, Colorado river, Tecate river and Tijuana river.

Hydrological-administrative region: River basin council based in:		II. Northwest Hermosillo, Sonora	
Contextual data		**Renewable water, 2013**	
Number of municipalities	78	Normal annual precipitation 1971-2000	445 mm
Total population 2013	2 764 401 inhabitants	Mean surface runoff	5 066 hm³/year
Urban	2 355 565 inhabitants	Number of aquifers	62
Rural	408 836 inhabitants	Mean aquifer recharge	3 207 hm³/year
Population 2030	3 356 804 inhabitants	Per capita renewable water resources, 2013	3 011 hm³/inhabitant/year
Irrigation districts	7	Per capita renewable water resources, 2030	2 480 hm³/inhabitant/year
Surface area	466 222 hectares	Water stress, 2013	75.9% (High)



Uses of water, 2013 (hm³/year)



Offstream	Total	Surface water	Groundwater
Agriculture	5 030	3 206	1 824
Public supply	575	289	286
Self-supplying industry	121	4	117
Thermoelectric plants	591	591	0
Total	5 741	4 090	2 227
Instream			
Hydropower plants (Volume allocated)	5 214		

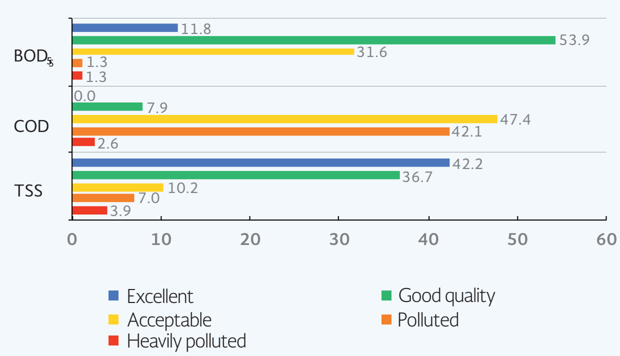
Coverage, 2010 (%)		
	Drinking water	Sanitation
Regional	96.28	88.08
Urban	97.31	94.68
Rural	90.95	53.97

Note: The projection considers the population at the mid-point of the year shown.

Municipal plants		
	Drinking water	Wastewater
Number in operation	24	102
Installed capacity (m³/s)	5.58	5.54
Flow processed (m³/s)	2.29	3.75

Surface water quality, 2013	
Number of monitoring sites according to water quality indicator	
BDO_5	76
COD	76
TSS	128

Distribution of the sites by indicator and classification (%)

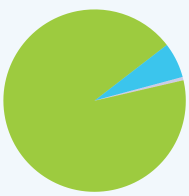


Water bodies with sites classified as heavily polluted for BOD_5, COD and/or TSS: drain Las Animas, Bacanuchi river, Sonora river and drain 300 Valle del Yaqui.

Hydrological-administrative region: River basin council based in:	III. Northern Pacific Culiacan, Sinaloa

Contextual data		Renewable water, 2013	
Number of municipalities	51	Normal annual precipitation 1971-2000	747 mm
Total population 2013	4 424 186 inhabitants	Mean surface runoff	22 519 hm³/year
Urban	3 138 128 inhabitants	Number of aquifers	24
Rural	1 286 058 inhabitants	Mean aquifer recharge	3 076 hm³/year
Population 2030	5 056 867 inhabitants	Per capita renewable water resources, 2013	5 863 hm³/inhabitant/year
Irrigation districts	9	Per capita renewable water resources, 2030	5 129 hm³/inhabitant/year
Surface area	788 877 hectares	Water stress, 2013	39.4% (Medium)

Uses of water, 2013 (hm³/year)



Offstream	Total	Surface water	Groundwater
Agriculture	9 528	8 871	657
Public supply	643	306	337
Self-supplying industry	57	38	20
Thermoelectric plants	0	0	0
Total	10 228	9 214	1 014
Instream			
Hydropower plants (Volume allocated)	11 010		

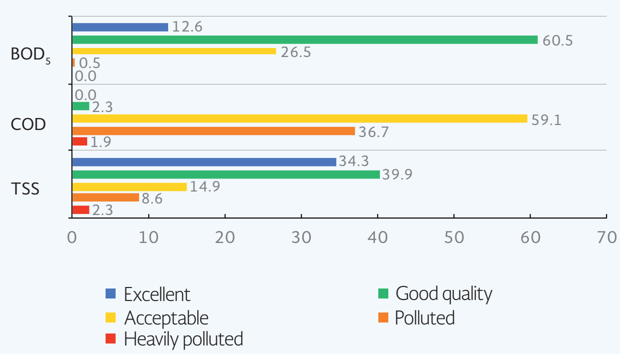
Coverage, 2010 (%)		
	Drinking water	Sanitation
Regional	91.29	87.45
Urban	98.03	96.60
Rural	76.98	68.01

Note: The projection considers the population at the mid-point of the year shown.

Municipal plants	Drinking water	Wastewater
Number in operation	158	339
Installed capacity (m³/s)	9.48	9.92
Flow processed (m³/s)	8.44	7.72

Surface water quality, 2013	
Number of monitoring sites according to water quality indicator	
BDO_5	215
COD	215
TSS	303

Distribution of the sites by indicator and classification (%)



Water bodies with sites classified as heavily polluted for BOD_5, COD and/or TSS: Huizache Lagoon, San Pedro river, Culiacan river, Badiraguato river, Piaxtla river, San Lorenzo river, San Pedro river, Mezquital river and J Refugio Salcido dam.

Hydrological-administrative region: River basin council based in:		IV. Balsas Cuernavaca, Morelos	
Contextual data		**Renewable water, 2013**	
Number of municipalities	420	Normal annual precipitation 1971-2000	963 mm
Total population 2013	11 562 886 inhabitants	Mean surface runoff	16 805 hm³/year
Urban	8 507 947 inhabitants	Number of aquifers	45
Rural	3 054 939 inhabitants	Mean aquifer recharge	5 351 hm³/year
Population 2030	13 315 109 inhabitants	Per capita renewable water resources, 2013	1 980 hm³/inhabitant/year
Irrigation districts	9	Per capita renewable water resources, 2030	1 720 hm³/inhabitant/year
Surface area	204 106 hectares	Water stress, 2013	46.7% (High)

Water quality monitoring classified as heavily polluted by COD, BOD_5 and/or TSS

Main rivers

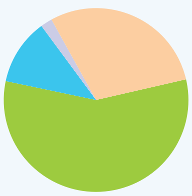
Irrigation districts

Urban localities

Water bodies

HAR

Uses of water, 2013 (hm³/year)



Agriculture	57%
Public supply	12%
Self-supplying industry	2%
Thermoelectric plants	29%

Offstream	Total	Surface water	Groundwater
Agriculture	6 090	4 997	1 094
Public supply	1 243	627	616
Self-supplying industry	221	130	90
Thermoelectric plants	3 148	3 122	26
Total	10 702	8 876	1 825
Instream			
Hydropower plants (Volume allocated)	34 832		

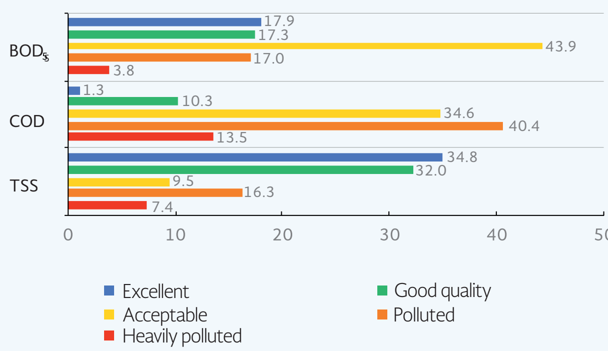
Coverage, 2010 (%)		
	Drinking water	Sanitation
Regional	85.76	86.87
Urban	91.74	94.47
Rural	71.80	69.13

Note: The projection considers the population at the mid-point of the year shown.

Municipal plants		
	Drinking water	Wastewater
Number in operation	23	190
Installed capacity (m³/s)	22.89	9.89
Flow processed (m³/s)	17.25	7.76

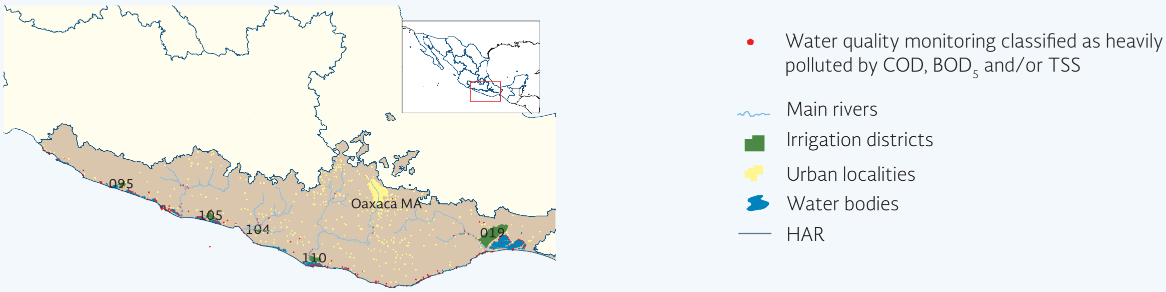
Surface water quality, 2013	
Number of monitoring sites according to water quality indicator	
BDO_5	312
COD	312
TSS	325

Distribution of the sites by indicator and classification (%)

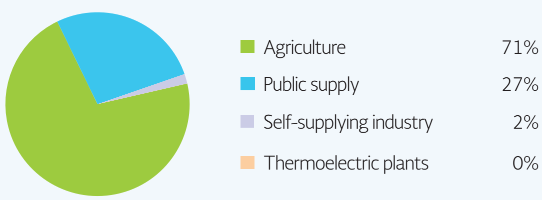


Water bodies with sites classified as heavily polluted by BOD_5, COD and/or TSS: Atenco stream, Acexcontintla gulley, Manzanilla gulley, Mixcxatlatl gulley, San Antonio gulley, San Diego Los Alamos gulley, Atlangatepec dam, Alseseca river, Atoyac river, Los Negros river, Viejo river, Xochiac river, Tlapalac, Cuautla river, Balsas river, Mixteco river, Balsas - Mezcala river, Cocula river, Cutzamala river, Mezcala Balsas river, Nexapa river and Coicoyan river.

Hydrological-administrative region: River basin council based in:		V. Southern Pacific Oaxaca, Oaxaca	
Contextual data		**Renewable water, 2013**	
Number of municipalities	378	Normal annual precipitation 1971-2000	1 187 mm
Total population 2013	4 986 101 inhabitants	Mean surface runoff	28 629 hm³/year
Urban	3 475 980 inhabitants	Number of aquifers	36
Rural	1 510 121 inhabitants	Mean aquifer recharge	1 936 hm³/year
Population 2030	5 399 687 inhabitants	Per capita renewable water resources, 2013	6 488 hm³/inhabitant/year
Irrigation districts	5	Per capita renewable water resources, 2030	5 991 hm³/inhabitant/year
Surface area	69 739 hectares	Water stress, 2013	4.7% (No stress)



Uses of water, 2013 (hm³/year)



Offstream	Total	Surface water	Groundwater
Agriculture	1 079	836	242
Public supply	406	179	227
Self-supplying industry	26	1	25
Thermoelectric plants	0	0	0
Total	1 510	1 016	494
Instream			
Hydropower plants (Volume allocated)	11 151		

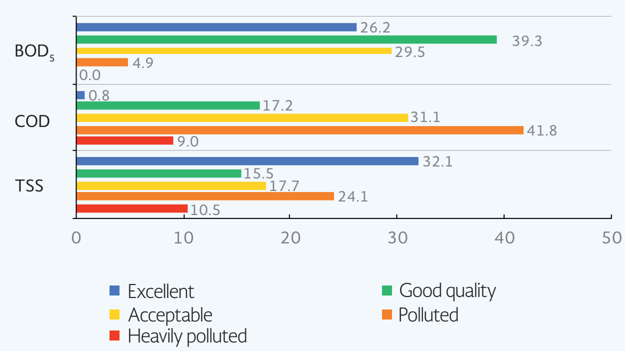
Coverage, 2010 (%)		
	Drinking water	Sanitation
Regional	75.60	72.55
Urban	83.82	89.49
Rural	63.66	47.94

Note: The projection considers the population at the mid-point of the year shown.

Municipal plants		
	Drinking water	Wastewater
Number in operation	9	88
Installed capacity (m³/s)	3.23	4.65
Flow processed (m³/s)	2.61	3.74

Surface water quality, 2013	
Number of monitoring sites according to water quality indicator	
BDO_5	122
COD	122
TSS	361

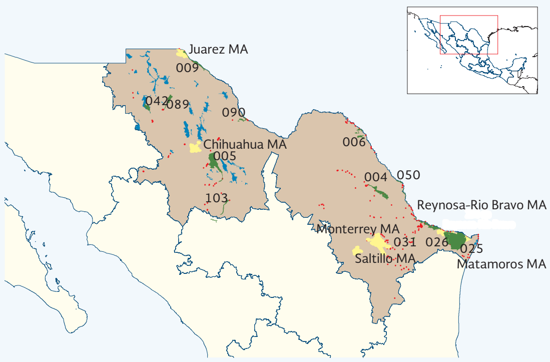
Distribution of the sites by indicator and classification (%)



Water bodies with sites classified as heavily polluted for BOD_5, COD and/or TSS: Pacific Ocean, Acapulco bay, Ixtapa - Zihuatanejo bay, Zihuatanejo bay, Superior lagoon, Superior Inferior lagoon, river-sea transition, Atoyac river, La Sabana river, Quetzala river, Santa Catarina river, Omitlan river, Papagayo river, Verde river, Ixtapa – Zihuatanejo bay and Potosi lagoon.

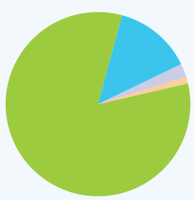
Hydrological-administrative region:	VI. Rio Bravo
River basin council based in:	Monterrey, Nuevo Leon

Contextual data		Renewable water, 2013	
Number of municipalities	144	Normal annual precipitation 1971-2000	438 mm
Total population 2013	11 996 849 inhabitants	Mean surface runoff	6 416 hm³/year
Urban	11 324 678 inhabitants	Number of aquifers	102
Rural	672 171 inhabitants	Mean aquifer recharge	5 900 hm³/year
Population 2030	14 368 012 vvvvv	Per capita renewable water resources, 2013	1 063 hm³/inhabitant/year
Irrigation districts	12	Per capita renewable water resources, 2030	888 hm³/inhabitant/year
Surface area	462 315 hectares	Water stress, 2013	71.7% (High)



- Water quality monitoring classified as heavily polluted by COD, BOD_5 and/or TSS
- Main rivers
- Irrigation districts
- Urban localities
- Water bodies
- HAR

Uses of water, 2013 (hm³/year)



Agriculture	83%
Public supply	14%
Self-supplying industry	2%
Thermoelectric plants	1%

Offstream	Total	Surface water	Groundwater
Agriculture	7 575	4 312	3 262
Public supply	1 248	549	699
Self-supplying industry	212	14	199
Thermoelectric plants	111	53	58
Total	9 145	4 928	4 218
Instream			
Hydropower plants (Volume allocated)	5 400		

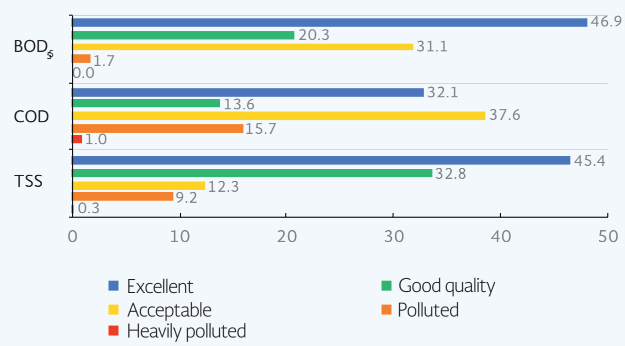
Coverage, 2010 (%)		
	Drinking water	Sanitation
Regional	97.00	95.42
Urban	98.16	97.23
Rural	80.94	70.57

Note: The projection considers the population at the mid-point of the year shown.

Municipal plants		
	Drinking water	Wastewater
Number in operation	63	227
Installed capacity (m³/s)	27.16	33.86
Flow processed (m³/s)	13.53	23.02

Surface water quality, 2013	
Number of monitoring sites according to water quality indicator	
BDO_5	286
COD	287
TSS	293

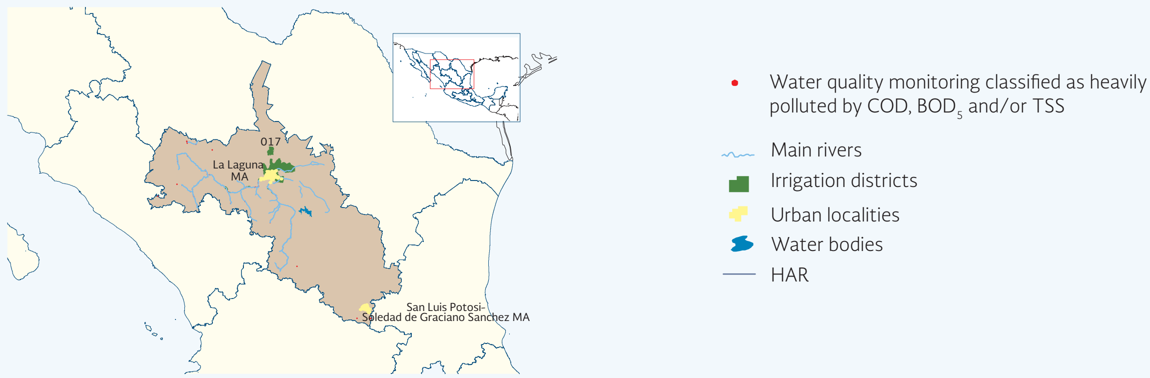
Distribution of the sites by indicator and classification (%)



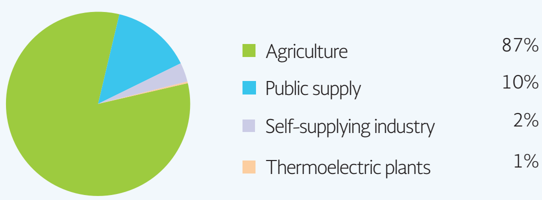
Water bodies with sites classified as heavily polluted by BOD_5, COD and/or TSS: Pesqueria river, Falcon International Dam, San Marcos dam and Chuviscar river.

Hydrological-administrative region: River basin council based in:	VII. Central Basins of the North Torreon, Coahuila de Zaragoza

Contextual data		Renewable water, 2013	
Number of municipalities	78	Normal annual precipitation 1971-2000	430 mm
Total population 2013	4 466 279 inhabitants	Mean surface runoff	5 529 hm³/year
Urban	3 417 008 inhabitants	Number of aquifers	65
Rural	1 049 272 inhabitants	Mean aquifer recharge	2 320 hm³/year
Population 2030	5 124 677 inhabitants	Per capita renewable water resources, 2013	1 806 hm³/inhabitant/year
Irrigation districts	1	Per capita renewable water resources, 2030	1 574 hm³/inhabitant/year
Surface area	71 964 hectares	Water stress, 2013	46.6% (High)



Uses of water, 2013 (hm³/year)

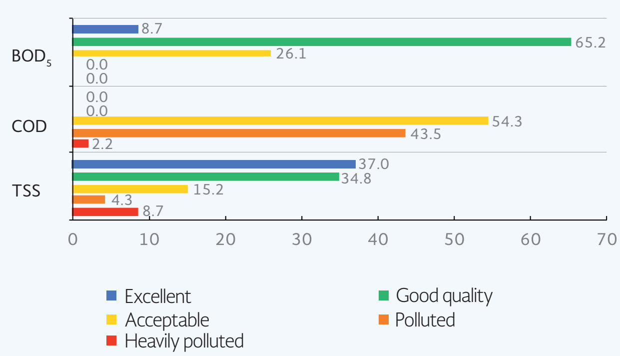


Municipal plants	Drinking water	Wastewater
Number in operation	117	146
Installed capacity (m³/s)	0.57	6.71
Flow processed (m³/s)	0.41	5.43

Surface water quality, 2013	
Number of monitoring sites according to water quality indicator	
BDO_5	46
COD	46
TSS	46

Offstream	Total	Surface water	Groundwater
Agriculture	3 272	1 285	1 987
Public supply	376	7	369
Self-supplying industry	85	1	84
Thermoelectric plants	28	0	28
Total	3 761	1 293	2 467
Instream			
Hydropower plants (Volume allocated)	0		

Distribution of the sites by indicator and classification (%)



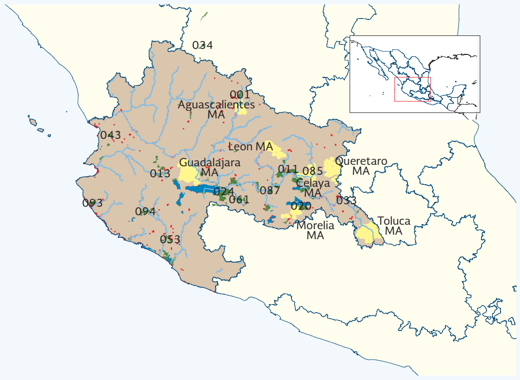
Coverage, 2010 (%)	Drinking water	Sanitation
Regional	95.04	90.72
Urban	98.84	97.30
Rural	84.20	71.96

Note: The projection considers the population at the mid-point of the year shown.

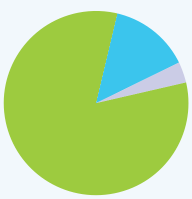
Water bodies with sites classified as heavily polluted for BOD_5, COD and/or TSS: Altamira stream, La Flor dam, Lazaro Cardenas dam and Ramos river.

Hydrological-administrative region: River basin council based in:	VIII. Lerma-Santiago-Pacific Guadalajara, Jalisco

Contextual data		Renewable water, 2013	
Number of municipalities	332	Normal annual precipitation 1971-2000	816 mm
Total population 2013	23 595 183 inhabitants	Mean surface runoff	25 423 hm³/year
Urban	18 605 141 inhabitants	Number of aquifers	128
Rural	4 990 041 inhabitants	Mean aquifer recharge	9 670 hm³/year
Population 2030	27 698 619 inhabitants	Per capita renewable water resources, 2013	1 515 hm³/inhabitant/year
Irrigation districts	14	Per capita renewable water resources, 2030	1 291 hm³/inhabitant/year
Surface area	497 513 hectares	Water stress, 2013	42.0% (High)



Uses of water, 2013 (hm³/year)



Offstream	Total	Surface water	Groundwater
Agriculture	12 359	6 650	5 709
Public supply	2 105	687	1 418
Self-supplying industry	505	77	428
Thermoelectric plants	43	0	43
Total	15 012	7 415	7 597
Instream			
Hydropower plants (Volume allocated)	22 943		

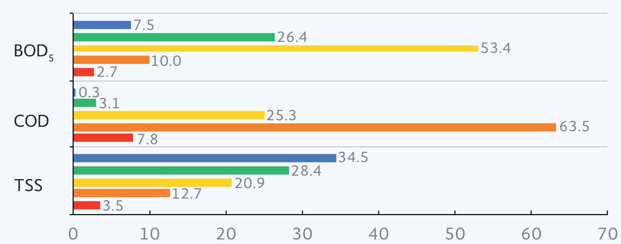
Coverage, 2010 (%)		
	Drinking water	Sanitation
Regional	94.86	93.05
Urban	96.92	97.40
Rural	87.76	78.01

Note: The projection considers the population at the mid-point of the year shown.

Municipal plants		
	Drinking water	Wastewater
Number in operation	132	576
Installed capacity (m³/s)	20.30	39.80
Flow processed (m³/s)	15.39	26.52

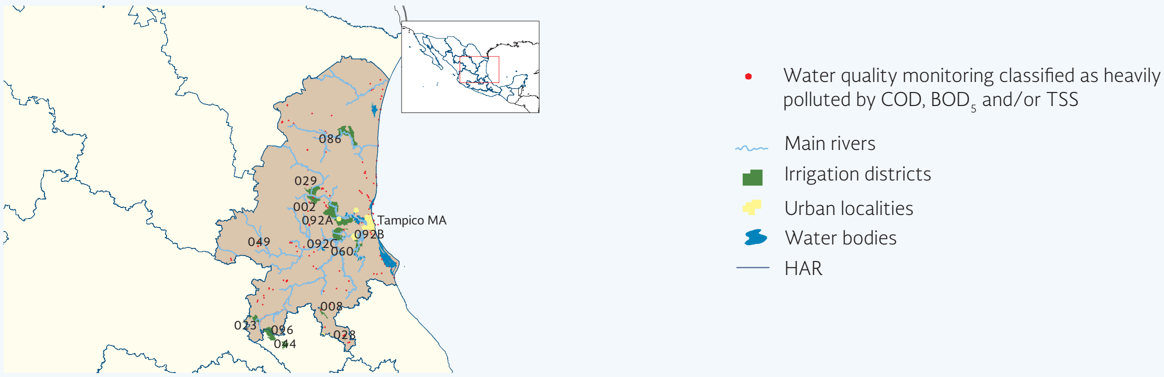
Surface water quality, 2013	
Number of monitoring sites according to water quality indicator	
BDO_5	639
COD	641
TSS	733

Distribution of the sites by indicator and classification (%)

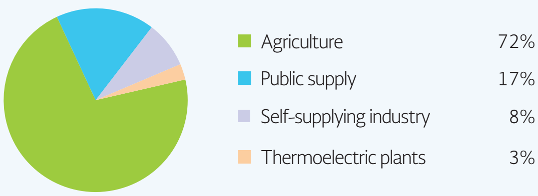


Water bodies with sites classified as heavily polluted by BOD_5, COD and/or TSS: Lerma river, Tlapajahua river (Las Minas), Lerma river tributary and soil; Temascatio river discharge body, Turbio river, river-sea transition, El Pueblito river, Queretaro river, Santiago river, lagoon, Jerez - Colotlan river, Excame dam, Alcuzahue lagoon, Coahuayana river, Ameca river, Salado river, Tuxpan river, Cuitzeo lake, Grande de Morelia river, Mexiquillo beach, Chicalote river, San Pedro river, Lagos river, La Joya stream, Mezapa stream, Lerma marshlands and Almoloya lagoon.

Hydrological-administrative region: River basin council based in:		IX. Northern Gulf Ciudad Victoria, Tamaulipas	
Contextual data		**Renewable water, 2013**	
Number of municipalities	148	Normal annual precipitation 1971-2000	914 mm
Total population 2013	5 186 289 inhabitants	Mean surface runoff	24 016 hm³/year
Urban	3 168 864 inhabitants	Number of aquifers	40
Rural	2 017 425 inhabitants	Mean aquifer recharge	4 069 hm³/year
Population 2030	5 962 759 inhabitants	Per capita renewable water resources, 2013	5 421 hm³/inhabitant/year
Irrigation districts	13	Per capita renewable water resources, 2030	4 715 hm³/inhabitant/year
Surface area	257 822 hectares	Water stress, 2013	20.5% (Medium)



Uses of water, 2013 (hm³/year)



Offstream	Total	Surface water	Groundwater
Agriculture	4 142	3 322	820
Public supply	1 002	843	160
Self-supplying industry	473	433	40
Thermoelectric plants	161	155	6
Total	5 777	4 753	1 024
Instream			
Hydropower plants (Volume allocated)	1 959		

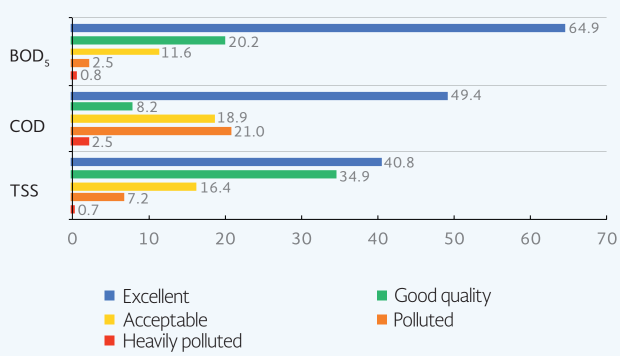
Coverage, 2010 (%)		
	Drinking water	Sanitation
Regional	84.94	72.98
Urban	96.71	92.13
Rural	71.83	51.66

Note: The projection considers the population at the mid-point of the year shown.

Municipal plants		
	Drinking water	Wastewater
Number in operation	47	94
Installed capacity (m³/s)	8.19	5.63
Flow processed (m³/s)	7.26	4.27

Surface water quality, 2013	
Number of monitoring sites according to water quality indicator	
BDO_5	242
COD	243
TSS	292

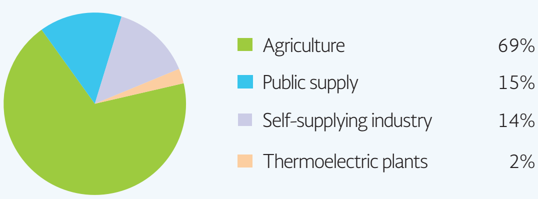
Distribution of the sites by indicator and classification (%)



Water bodies with sites classified as heavily polluted for BOD_5, COD and/or TSS: Extoraz river, Tulancingo river, Bernal stream, Escanela river, Colon river and Toliman river.

Hydrological-administrative region: River basin council based in:		X. Center Gulf Xalapa, Veracruz	
Contextual data		**Renewable water, 2013**	
Number of municipalities	432	Normal annual precipitation 1971-2000	1 558 mm
Total population 2013	10 397 327 inhabitants	Mean surface runoff	90 424 hm³/year
Urban	6 599 525 inhabitants	Number of aquifers	22
Rural	3 797 803 inhabitants	Mean aquifer recharge	4 705 hm³/year
Population 2030	11 606 944 inhabitants	Per capita renewable water resources, 2013	9 149 hm³/inhabitant/year
Irrigation districts	2	Per capita renewable water resources, 2030	8 195 hm³/inhabitant/year
Surface area	41 253 hectares	Water stress, 2013	5.2% (No stress)

Uses of water, 2013 (hm³/year)



Offstream	Total	Surface water	Groundwater
Agriculture	3 387	2 506	881
Public supply	723	443	280
Self-supplying industry	691	559	132
Thermoelectric plants	130	122	7
Total	4 931	3 630	1 300
Instream			
Hydropower plants (Volume allocated)	24 690		

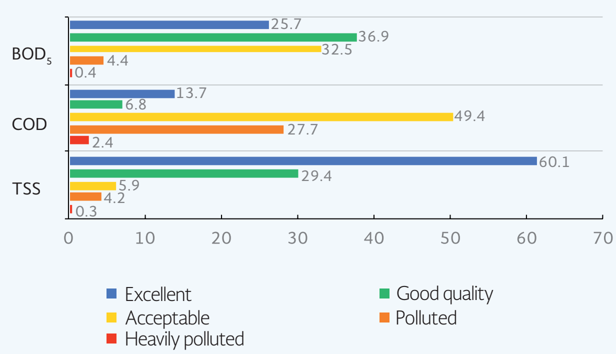
Coverage, 2010 (%)		
	Drinking water	Sanitation
Regional	81.24	81.60
Urban	91.18	94.69
Rural	68.18	64.40

Note: The projection considers the population at the mid-point of the year shown.

Municipal plants		
	Drinking water	Wastewater
Number in operation	13	147
Installed capacity (m³/s)	7.09	7.20
Flow processed (m³/s)	4.59	5.59

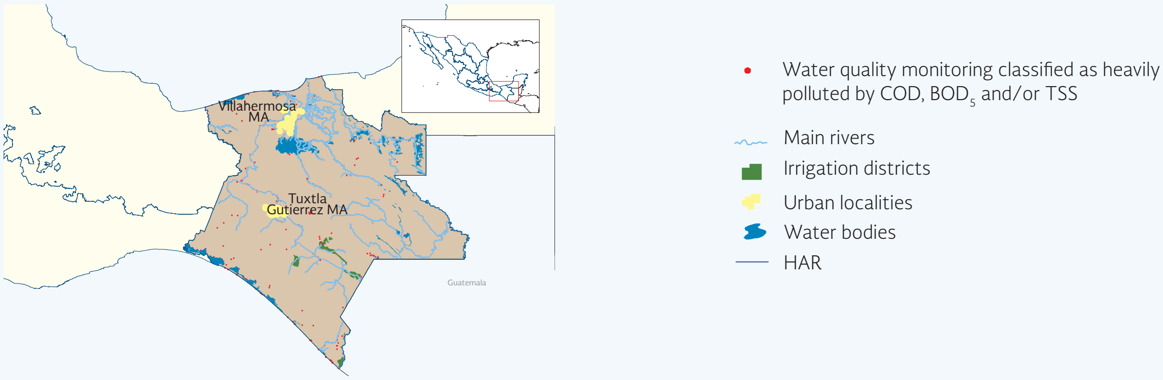
Surface water quality, 2013	
Number of monitoring sites according to water quality indicator	
BDO_5	249
COD	249
TSS	306

Distribution of the sites by indicator and classification (%)

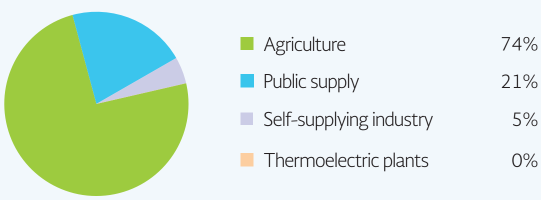


Water bodies with sites classified as heavily polluted for BOD_5, COD and/or TSS: Coatzacoalcos plains, Actopan river, Blanco river, Grande de Tulancingo river, Huazuntlan river, Jamapa-Cotaxtla river and Tuxpan river.

Hydrological-administrative region: River basin council based in:		XI. Southern Border Tuxtla Gutierrez, Chiapas	
Contextual data		**Renewable water, 2013**	
Number of municipalities	137	Normal annual precipitation 1971-2000	1 846 mm
Total population 2013	7 479 532 inhabitants	Mean surface runoff	121 742 hm³/year
Urban	4 027 309 inhabitants	Number of aquifers	23
Rural	3 452 223 inhabitants	Mean aquifer recharge	22 718 hm³/year
Population 2030	8 844 011 inhabitants	Per capita renewable water resources, 2013	21 906 hm³/inhabitant/year
Irrigation districts	4	Per capita renewable water resources, 2030	18 526 hm³/inhabitant/year
Surface area	35 815 hectares	Water stress, 2013	1.4% (No stress)



Uses of water, 2013 (hm³/year)



Offstream	Total	Surface water	Groundwater
Agriculture	1 668	1 193	475
Public supply	468	340	128
Self-supplying industry	105	47	58
Thermoelectric plants	0	0	0
Total	2 241	1 579	661
Instream			
Hydropower plants (Volume allocated)	50 480		

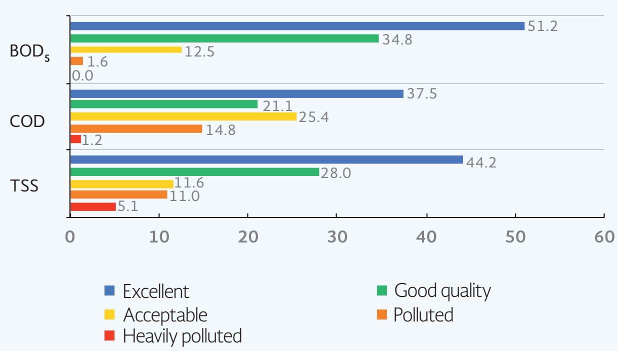
Coverage, 2010 (%)		
	Drinking water	Sanitation
Regional	78.51	85.61
Urban	88.72	96.60
Rural	67.63	73.90

Note: The projection considers the population at the mid-point of the year shown.

Municipal plants		
	Drinking water	Wastewater
Number in operation	46	256
Installed capacity (m³/s)	14.48	256
Flow processed (m³/s)	10.91	353

Surface water quality, 2013	
Number of monitoring sites according to water quality indicator	
BDO_5	256
COD	256
TSS	353

Distribution of the sites by indicator and classification (%)

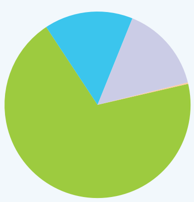


Water bodies con sitios clasificados como Fuertemente Con- taminados por BOD_5 ,COD and/or TSS: Humedal water body, La Joya lagoon, Boca del Cielo estuary system, Puerto Arista estuary system, Mar Muerto lagoon, Pacific Ocean, river-sea transition, Agua Caliente river and Grijalva river.

Hydrological-administrative region: River basin council based in:		XII. Yucatan Peninsula Merida, Yucatan	
Contextual data		**Renewable water, 2013**	
Number of municipalities	127	Normal annual precipitation 1971-2000	1 218 mm
Total population 2013	4 429 410 inhabitants	Mean surface runoff	4 008 hm³/year
Urban	3 722 074 inhabitants	Number of aquifers	4
Rural	707 336 inhabitants	Mean aquifer recharge	25 316 hm³/year
Population 2030	5 834 470 inhabitants	Per capita renewable water resources, 2013	6 740hm³/inhabitant/year
Irrigation districts	2	Per capita renewable water resources, 2030	5 117 hm³/inhabitant/year
Surface area	16 191 hectares	Water stress, 2013	12.8% (Low)

- Water quality monitoring classified as heavily polluted by COD, BOD_5 and/or TSS
- Main rivers
- Irrigation districts
- Urban localities
- Water bodies
- HAR

Uses of water, 2013 (hm³/year)



Agriculture	69%
Public supply	16%
Self-supplying industry	15%
Thermoelectric plants	0%

Offstream	Total	Surface water	Groundwater
Agriculture	2 643	118	2 525
Public supply	588	0	588
Self-supplying industry	573	0	573
Thermoelectric plants	9	0	9
Total	3 814	119	3 695
Instream			
Hydropower plants (Volume allocated)	0		

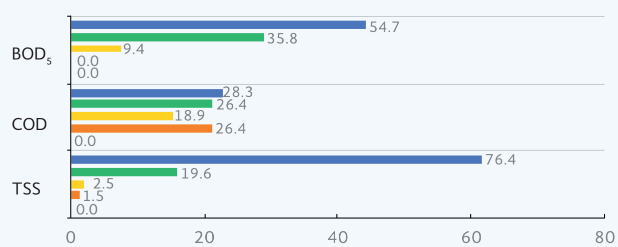
Coverage, 2010 (%)		
	Drinking water	Sanitation
Regional	94.22	84.48
Urban	94.89	89.24
Rural	90.87	60.67

Note: The projection considers the population at the mid-point of the year shown.

Municipal plants		
	Drinking water	Wastewater
Number in operation	1	83
Installed capacity (m³/s)	0.01	3.06
Flow processed (m³/s)	0.01	1.98

Surface water quality, 2013	
Number of monitoring sites according to water quality indicator	
BDO_5	53
COD	53
TSS	199

Distribution of the sites by indicator and classification (%)

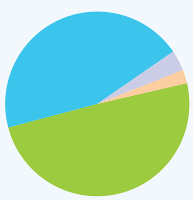


Water bodies with sites classified as heavily polluted by BOD_5, COD and/or TSS: none.

Hydrological-administrative region: River basin council based in:		XIII. Waters of the Valley of Mexico Mexico, Distrito Federal	
Contextual data		**Renewable water, 2013**	
Number of municipalities	121	Normal annual precipitation 1971-2000	606 mm
Total population 2013	22 815 504 inhabitants	Mean surface runoff	1 112 hm^3/year
Urban	21 672 687 inhabitants	Number of aquifers	14
Rural	1 142 818 inhabitants	Mean aquifer recharge	2 346 hm^3/year
Population 2030	25 400 649 inhabitants	Per capita renewable water resources, 2013	152 hm^3/inhabitant/year
Irrigation districts	5	Per capita renewable water resources, 2030	137 hm^3/inhabitant/year
Surface area	97 913 hectares	Water stress, 2013	137.8% (Very high)

- Water quality monitoring classified as heavily polluted by COD, BOD_5 and/or TSS
- Main rivers
- Irrigation districts
- Urban localities
- Water bodies
- HAR

Uses of water, 2013 (hm^3/year)

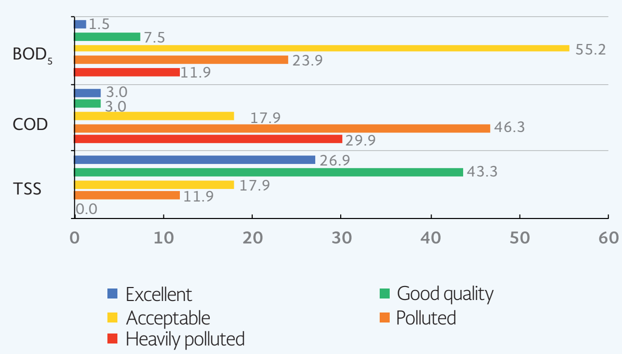


Municipal plants	Drinking water	Wastewater
Number in operation	65	118
Installed capacity (m^3/s)	6.46	12.27
Flow processed (m^3/s)	5.28	7.05

Surface water quality, 2013	
Number of monitoring sites according to water quality indicator	
BDO_5	67
COD	67
TSS	67

Offstream	Total	Surface water	Groundwater
Agriculture	2 365	1 990	375
Public supply	2 128	351	1 777
Self-supplying industry	173	32	141
Thermoelectric plants	113	46	68
Total	4 779	2 418	2 361
Instream			
Hydropower plants (Volume allocated)	221		

Distribution of the sites by indicator and classification (%)



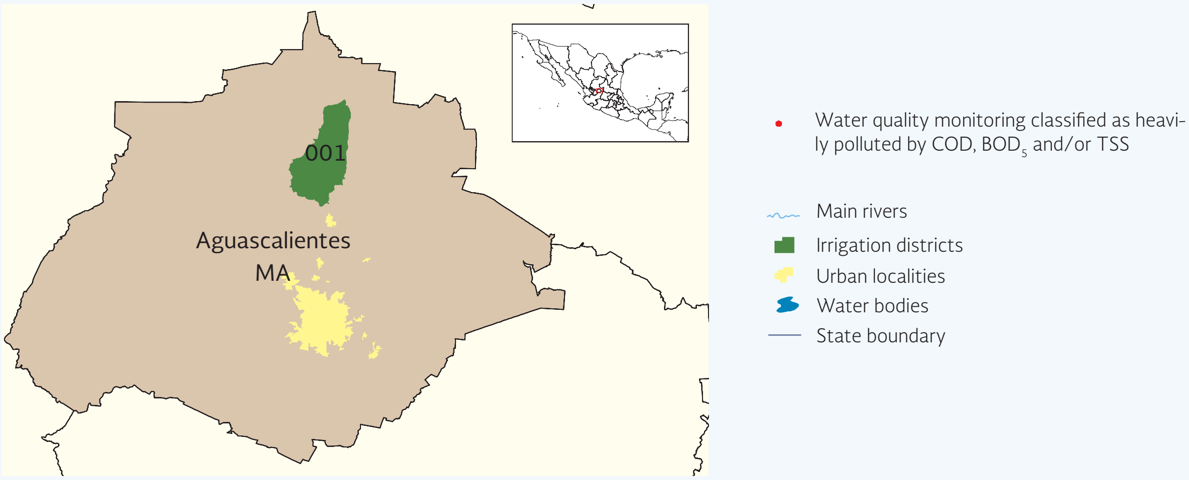
Coverage, 2010 (%)	Drinking water	Sanitation
Regional	96.79	97.82
Urban	97.36	98.68
Rural	86.75	82.68

Note: The projection considers the population at the mid-point of the year shown.

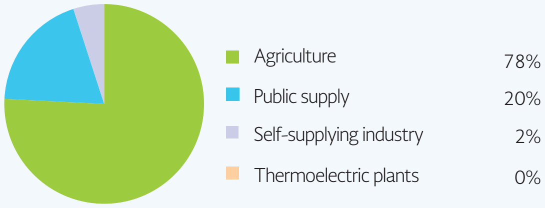
Water bodies with sites classified as heavily polluted by BOD_5, COD and/or TSS: San Javier river tributary and Canal Abierto discharge body and Canal de Guadalupe, green areas, Industrial, agricultural area and chinampa area in Xochimilco and Tlahuac, Gran Canal, Churubusco river, Los Remedios river, Tula river, Canal Santo Tomas, Emisor Poniente, Zumpango lake, Papalote stream, Chalco-Amecameca, Nabor Carrillo lake, La Compañia river, San Juan Teotihuacan river, San Buenaventura river and Xochimilco.

1. Aguascalientes

Contextual data		Plants, December 2013		
Number of municipalities	11	Municipal drinking water plants		
Total population 2013	1 252 265 inhabitants	Number in operation	3	
Urban	1 014 934 inhabitants	Installed capacity (l/s)	44.000	
Rural	237 331 inhabitants	Flow treated (l/s)	26.000	
Population 2030	1 507 807 inhabitants	Wastewater	Municipal	Industrial
		Number in operation	134	47
Normal annual precipitation 1971-2000	508 mm	Installed capacity (m³/s)	4.662	0.337
		Flow treated (m³/s)	3.162	0.171



Offstream uses of water, 2013 (hm³/year)



	Total	Surface water	Groundwater
Agriculture	481.8	175.8	306.0
Public supply	122.0	0.3	121.7
Self-supplying industry	14.6	1.9	12.7
Thermoelectric plants	0.0	0.0	0.0
Total	618.4	178.0	440.4

Coverage, 2010 (%)		
	Drinking water	Sanitation
State	98.84	98.09
Urban	99.68	99.37
Rural	95.28	92.65

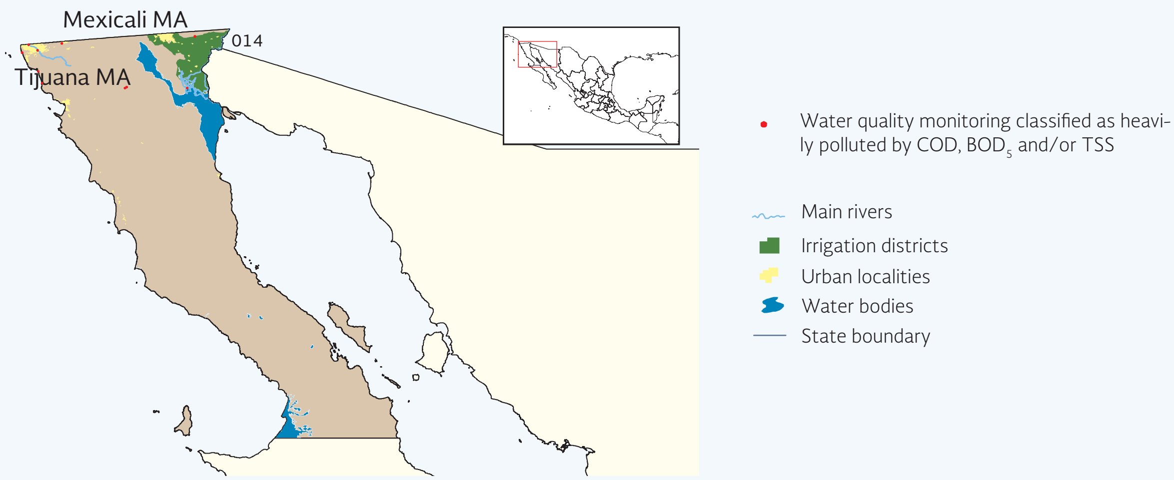
Surface water quality, 2013	
Number of monitoring sites according to water quality indicator	
BOD_5	45
COD	47
TSS	46

Distribution of the sites by indicator and classification (%)

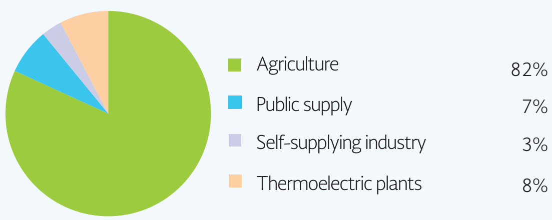
2. Baja California

Contextual data	
Number of municipalities	5
Total population 2013	3 381 080 inhabitants
Urban	3 118 118 inhabitants
Rural	262 962 inhabitants
Population 2030	4 169 240 inhabitants
Normal annual precipitation 1971-2000	177 mm

Plants, December 2013		
Municipal drinking water plants		
Number in operation	31	
Installed capacity (l/s)	12 156.000	
Flow treated (l/s)	6 635.900	
Wastewater	Municipal	Industrial
Number in operation	37	50
Installed capacity (m³/s)	7.592	0.434
Flow treated (m³/s)	5.240	0.434



Offstream uses of water, 2013 (hm³/year)

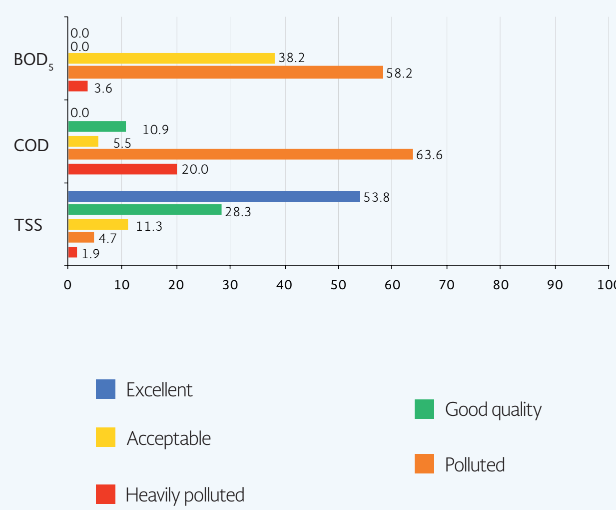


	Total	Surface water	Groundwater
Agriculture	2 079.6	1 517.0	562.6
Public supply	184.4	117.0	67.4
Self-supplying industry	81.9	69.3	12.6
Thermoelectric plants	195.3	0.0	195.3
Total	2 541.1	1 703.2	837.9

Coverage, 2010 (%)		
	Drinking water	Sanitation
State	95.87	93.08
Urban	97.62	95.34
Rural	74.50	65.65

Surface water quality, 2013	
Number of monitoring sites according to water quality indicator	
BOD_5	53
COD	53
TSS	103

Distribution of the sites by indicator and classification (%)



3. Baja California Sur

Contextual data	
Number of municipalities	5
Total population 2013	718 196 inhabitants
Urban	624 723 inhabitants
Rural	93 473 inhabitants
Population 2030	1 106 468 inhabitants
Normal annual precipitation 1971-2000	160 mm

Plants, December 2013		
Municipal drinking water plants		
Number in operation	13	
Installed capacity (l/s)	209.020	
Flow treated (l/s)	188.620	
Wastewater	**Municipal**	**Industrial**
Number in operation	26	24
Installed capacity (m³/s)	1.660	4.947
Flow treated (m³/s)	1.275	4.947

Water quality monitoring classified as heavily polluted by COD, BOD_5 and/or TSS

Main rivers

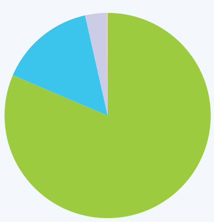
Irrigation districts

Urban localities

Water bodies

State boundary

Offstream uses of water, 2013 (hm³/year)



Agriculture	82%
Public supply	15%
Self-supplying industry	3%
Thermoelectric plants	0%

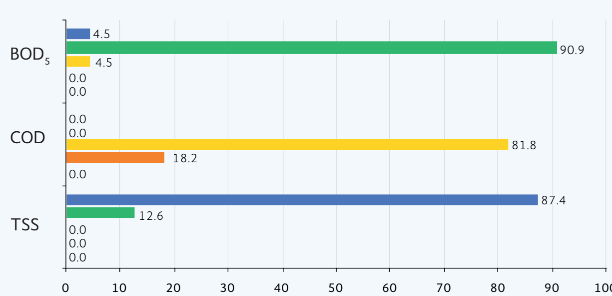
	Total	Surface water	Groundwater
Agriculture	333.8	28.3	305.5
Public supply	61.7	2.9	58.8
Self-supplying industry	13.8	2.9	10.9
Thermoelectric plants	0.6	0.0	0.6
Total	409.9	34.1	375.8

Coverage, 2010 (%)	Drinking water	Sanitation
State	92.56	93.68
Urban	94.40	96.56
Rural	80.65	75.10

Surface water quality, 2013

Number of monitoring sites according to water quality indicator	
BOD_5	22
COD	22
TSS	124

Distribution of the sites by indicator and classification (%)



Excellent

Good quality

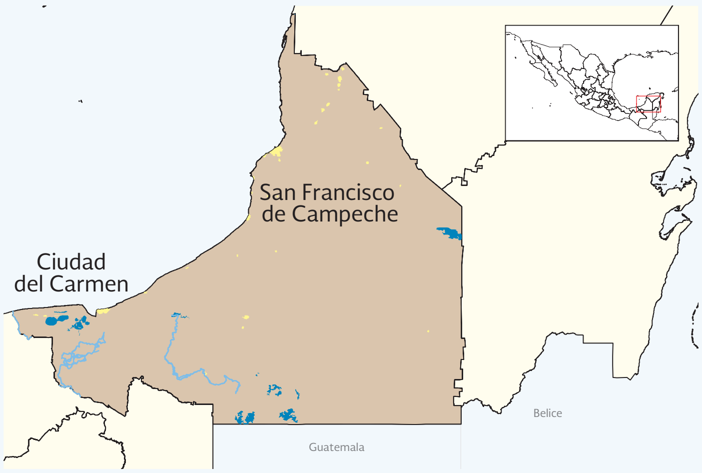
Acceptable

Polluted

Heavily polluted

4. Campeche

Contextual data		Plants, December 2013		
Number of municipalities	11	**Municipal drinking water plants**		
Total population 2013	880 299 inhabitants	Number in operation	2	
Urban	655 712 inhabitants	Installed capacity (l/s)	25.000	
Rural	224 587 inhabitants	Flow treated (l/s)	23.000	
Population 2030	1 098 636 inhabitants			
		Number in operation	19	127
Normal annual precipitation 1971-2000	1 337 mm	Installed capacity (m³/s)	0.145	0.216
		Flow treated (m³/s)	0.120	0.191



Water quality monitoring classified as heavily polluted by COD, BOD_5 and/or TSS

Main rivers

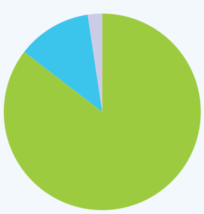
Irrigation districts

Urban localities

Water bodies

State boundary

Offstream uses of water, 2013 (hm³/year)



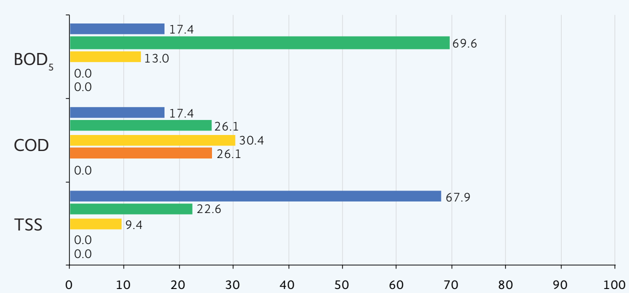
Agriculture	86%
Public supply	12%
Self-supplying industry	2%
Thermoelectric plants	0%

Surface water quality, 2013	
Number of monitoring sites according to water quality indicator	
BOD_5	24
COD	24
TSS	54

	Total	Surface water	Groundwater
Agriculture	1 021.6	117.1	904.5
Public supply	145.8	0.4	145.4
Self-supplying industry	27.5	0.1	27.3
Thermoelectric plants	0.0	0.0	0.0
Total	1 194.9	117.6	1 077.3

Coverage, 2010 (%)	Drinking water	Sanitation
State	89.99	84.92
Urban	92.39	92.34
Rural	82.95	63.17

Distribution of the sites by indicator and classification (%)



Excellent

Good quality

Acceptable

Polluted

Heavily polluted

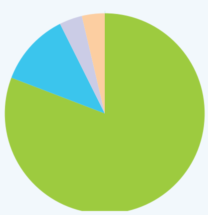
5. Coahuila de Zaragoza

Contextual data	
Number of municipalities	38
Total population 2013	2 890 108 inhabitants
Urban	2 613 353 inhabitants
Rural	276 755 inhabitants
Population 2030	3 427 879 inhabitants
Normal annual precipitation 1971-2000	386 mm

Plants, December 2013		
Municipal drinking water plants		
Number in operation	24	
Installed capacity (l/s)	2 133.290	
Flow treated (l/s)	1 708.180	
Wastewater	**Municipal**	**Industrial**
Number in operation	21	61
Installed capacity (m³/s)	4.977	0.771
Flow treated (m³/s)	3.878	0.528

- Water quality monitoring classified as heavily polluted by COD, BOD_5 and/or TSS
- Main rivers
- Irrigation districts
- Urban localities
- Water bodies
- State boundary

Offstream uses of water, 2013 (hm³/year)



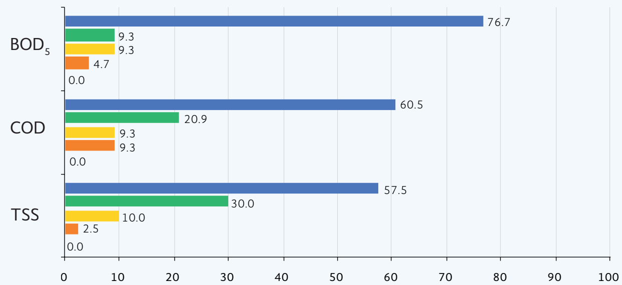
Agriculture	81%
Public supply	12%
Self-supplying industry	4%
Thermoelectric plants	3%

	Total	Surface water	Groundwater
Agriculture	1 642.8	845.7	797.1
Public supply	240.1	18.0	222.1
Self-supplying industry	75.2	1.3	73.9
Thermoelectric plants	74.9	47.5	27.4
Total	2 033.0	912.5	1 120.5

Coverage, 2010 (%)		
	Drinking water	Sanitation
State	98.32	95.41
Urban	99.20	97.54
Rural	90.44	76.46

Surface water quality, 2013	
Number of monitoring sites according to water quality indicator	
BOD_5	41
COD	41
TSS	41

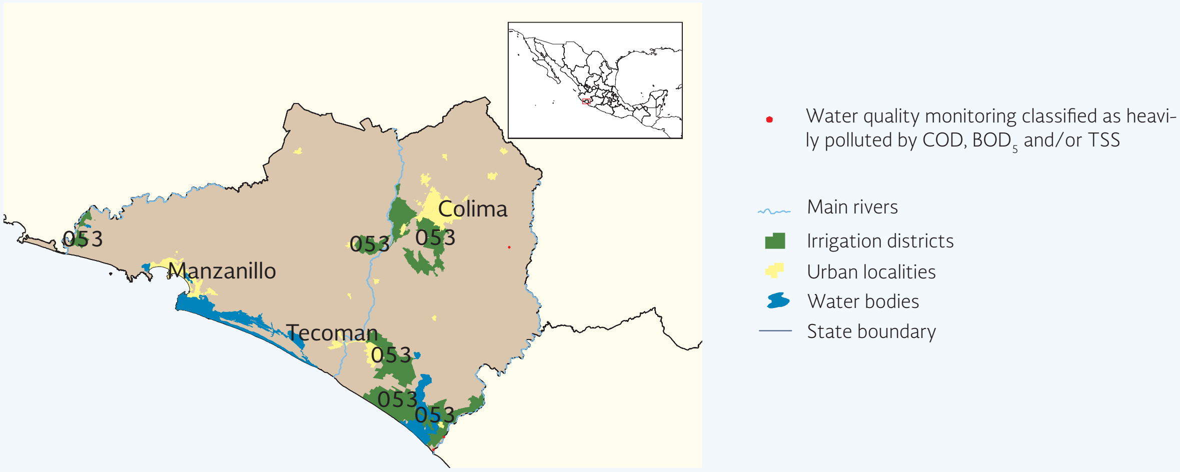
Distribution of the sites by indicator and classification (%)



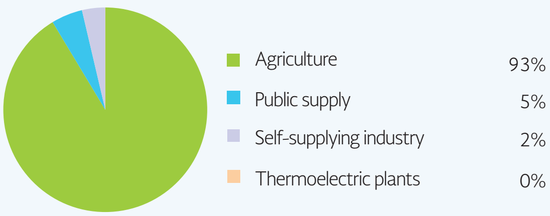
- Excellent
- Good quality
- Acceptable
- Polluted
- Heavily polluted

6. Colima

Contextual data		Plants, December 2013		
Number of municipalities	10	**Municipal drinking water plants**		
Total population 2013	698 295 inhabitants	Number in operation	39	
Urban	627 791 inhabitants	Installed capacity (l/s)	11.810	
Rural	70 504 inhabitants	Flow treated (l/s)	4.770	
Population 2030	891 050 inhabitants	Wastewater	Municipal	Industrial
		Number in operation	55	7
Normal annual precipitation 1971-2000	935 mm	Installed capacity (m³/s)	2.228	0.435
		Flow treated (m³/s)	1.580	0.311



Offstream uses of water, 2013 (hm³/year)



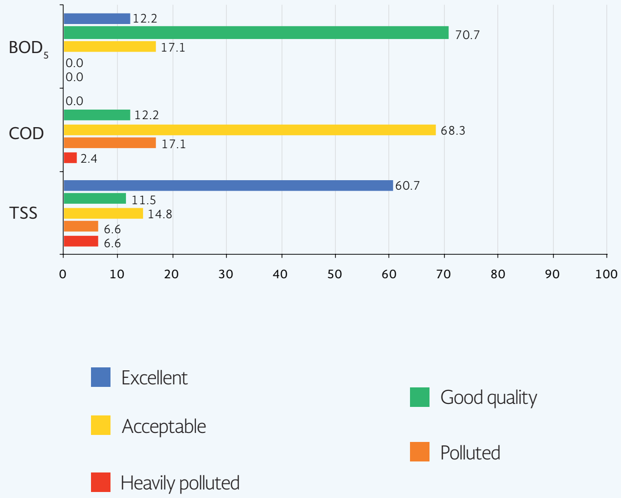
	Total	Surface water	Groundwater
Agriculture	1 634.9	1 354.0	280.9
Public supply	88.7	39.2	49.5
Self-supplying industry	27.6	4.2	23.4
Thermoelectric plants	0.0	0.0	0.0
Total	1 751.2	1 397.4	353.8

Coverage, 2010 (%)		
	Drinking water	Sanitation
State	98.57	98.69
Urban	99.48	99.19
Rural	91.35	94.68

Surface water quality, 2013

Number of monitoring sites according to water quality indicator	
BOD_5	33
COD	25
TSS	59

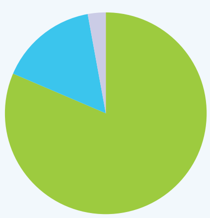
Distribution of the sites by indicator and classification (%)



7. Chiapas

Contextual data		Plants, December 2013		
Number of municipalities	118	**Municipal drinking water plants**		
Total population 2013	5 119 186 inhabitants	Number in operation	6	
Urban	2 659 646 inhabitants	Installed capacity (l/s)	4 662.000	
Rural	2 459 540 inhabitants	Flow treated (l/s)	2 588.000	
Population 2030	6 129 218 inhabitants	**Wastewater**	**Municipal**	**Industrial**
		Number in operation	33	75
Normal annual precipitation 1971-2000	1 768 mm	Installed capacity (m³/s)	1.597	6.895
		Flow treated (m³/s)	0.810	6.407

Offstream uses of water, 2013 (hm³/year)

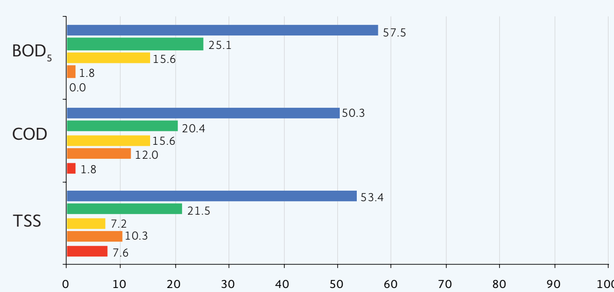


Surface water quality, 2013	
Number of monitoring sites according to water quality indicator	
BOD_5	166
COD	166
TSS	219

	Total	Surface water	Groundwater
Agriculture	1 477.3	1 093.7	383.5
Public supply	284.7	233.1	51.6
Self-supplying industry	37.3	1.6	35.7
Thermoelectric plants	0.0	0.0	0.0
Total	1 799.2	1 328.5	470.8

Coverage, 2010 (%)		
	Drinking water	Sanitation
State	77.29	81.00
Urban	87.47	95.75
Rural	67.53	66.84

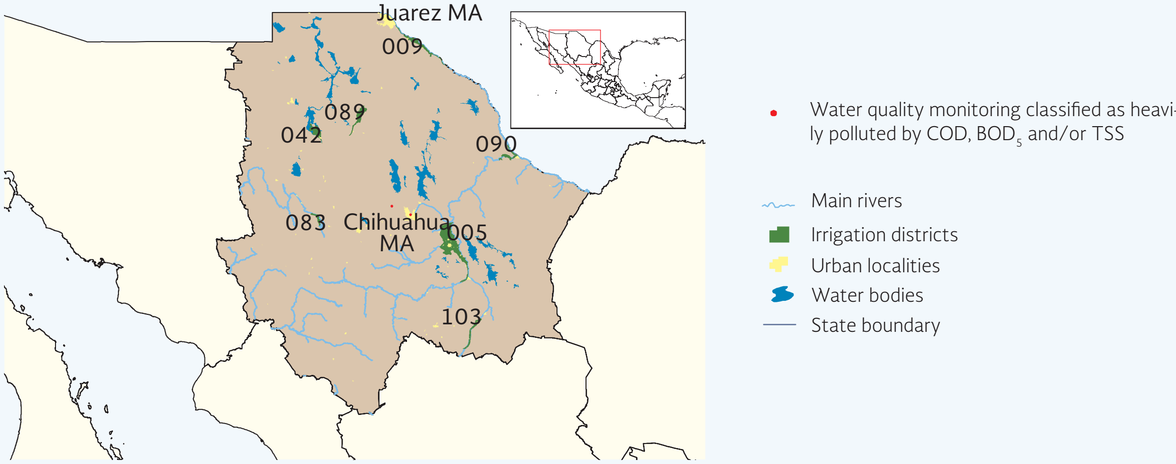
Distribution of the sites by indicator and classification (%)



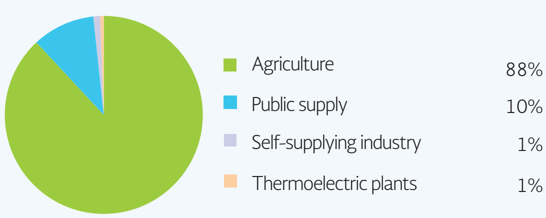
8. Chihuahua

Contextual data	
Number of municipalities	67
Total population 2013	3 635 966 inhabitants
Urban	3 225 986 inhabitants
Rural	409 980 inhabitants
Population 2030	4 177 815 inhabitants
Normal annual precipitation 1971-2000	459 mm

Plants, December 2013		
Municipal drinking water plants		
Number in operation	4	
Installed capacity (l/s)	650.000	
Flow treated (l/s)	380.000	
Wastewater	**Municipal**	**Industrial**
Number in operation	167	15
Installed capacity (m^3/s)	9.905	0.655
Flow treated (m^3/s)	6.751	0.283



Offstream uses of water, 2013 (hm^3/year)

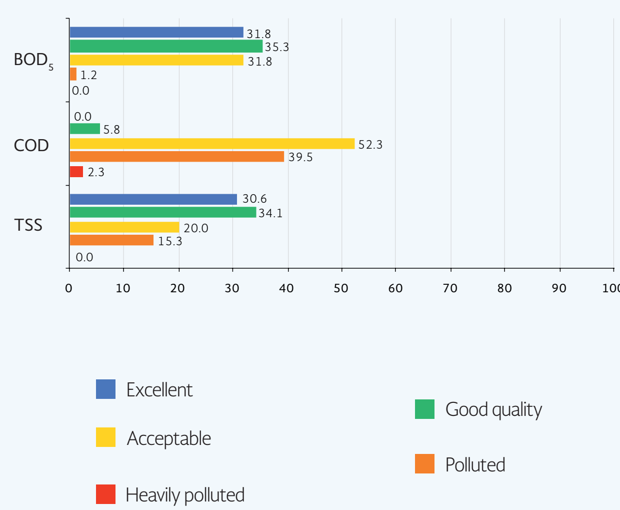


	Total	Surface water	Groundwater
Agriculture	4 220.9	1 933.3	2 287.6
Public supply	489.7	50.9	438.8
Self-supplying industry	53.9	6.1	47.8
Thermoelectric plants	27.5	0.0	27.5
Total	4 792.1	1 990.4	2 801.7

Coverage, 2010 (%)	Drinking water	Sanitation
State	94.57	92.09
Urban	98.29	97.66
Rural	74.22	61.62

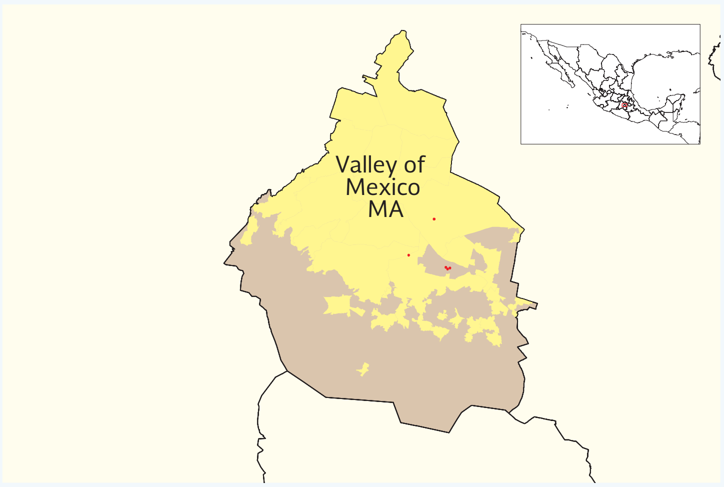
Surface water quality, 2013	
Number of monitoring sites according to water quality indicator	
BOD_5	56
COD	57
TSS	58

Distribution of the sites by indicator and classification (%)



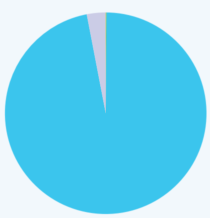
9. Distrito Federal

Contextual data		Plants, December 2013		
Number of municipalities	16	**Municipal drinking water plants**		
Total population 2013	8 893 742 inhabitants	Number in operation	42	
Urban	8 846 770 inhabitants	Installed capacity (l/s)	4 620.500	
Rural	46 972 inhabitants	Flow treated (l/s)	3 681.000	
Population 2030	8 439 786 inhabitants	**Wastewater**	**Municipal**	**Industrial**
		Number in operation	29	5
Normal annual precipitation 1971-2000	863 mm	Installed capacity (m³/s)	6.821	0.003
		Flow treated (m³/s)	3.113	0.001



- Water quality monitoring classified as heavily polluted by COD, BOD_5 and/or TSS
- Main rivers
- Irrigation districts
- Urban localities
- Water bodies
- State boundary

Offstream uses of water, 2013 (hm³/year)



Agriculture	0%
Public supply	97%
Self-supplying industry	3%
Thermoelectric plants	0%

	Total	Surface water	Groundwater
Agriculture	1.2	0.6	0.7
Public supply	1 089.6	309.1	780.5
Self-supplying industry	32.0	0.2	31.8
Thermoelectric plants	0.0	0.0	0.0
Total	1 122.8	309.8	813.0

Coverage, 2010 (%)

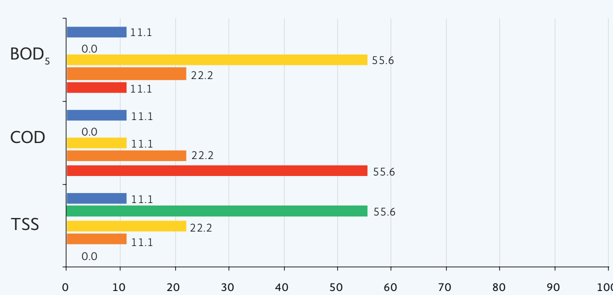
	Drinking water	Sanitation
State	97.67	99.07
Urban	97.92	99.10
Rural	44.89	92.69

Surface water quality, 2013

Number of monitoring sites according to water quality indicator

BOD_5	8
COD	8
TSS	8

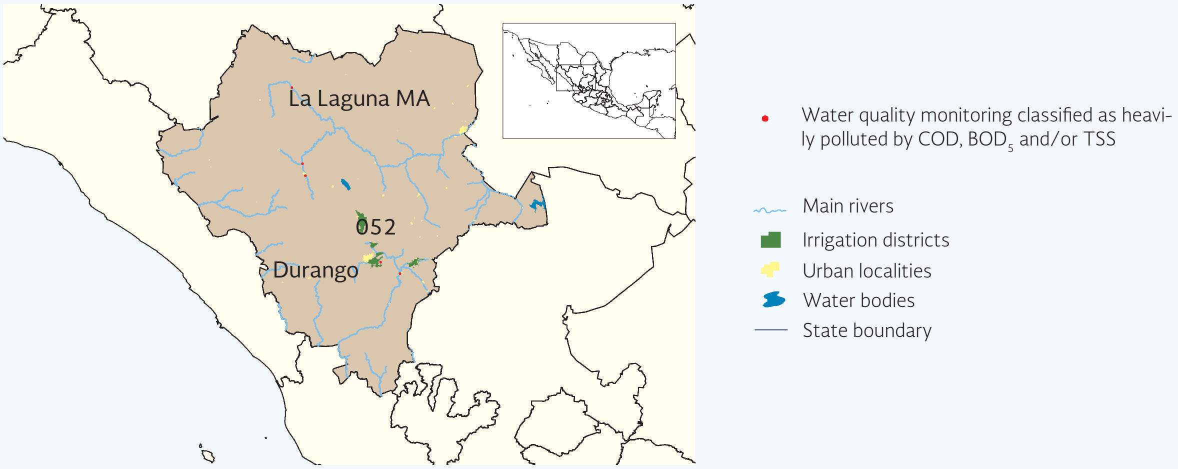
Distribution of the sites by indicator and classification (%)



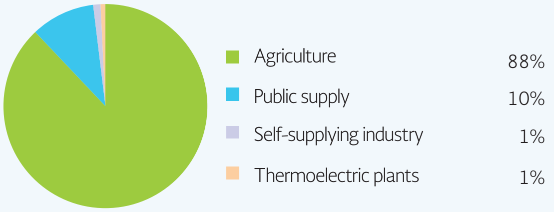
- Excellent
- Good quality
- Acceptable
- Polluted
- Heavily polluted

10. Durango

Contextual data		Plants, December 2013		
Number of municipalities	39	Municipal drinking water plants		
Total population 2013	1 728 429 inhabitants	Number in operation	59	
Urban	1 292 150 inhabitants	Installed capacity (l/s)	138.690	
Rural	436 279 inhabitants	Flow treated (l/s)	130.830	
Population 2030	1 983 389 inhabitants	Wastewater	Municipal	Industrial
		Number in operation	182	41
Normal annual precipitation 1971-2000	574 mm	Installed capacity (m^3/s)	4.520	0.843
		Flow treated (m^3/s)	3.426	0.510



Offstream uses of water, 2013 (hm^3/year)



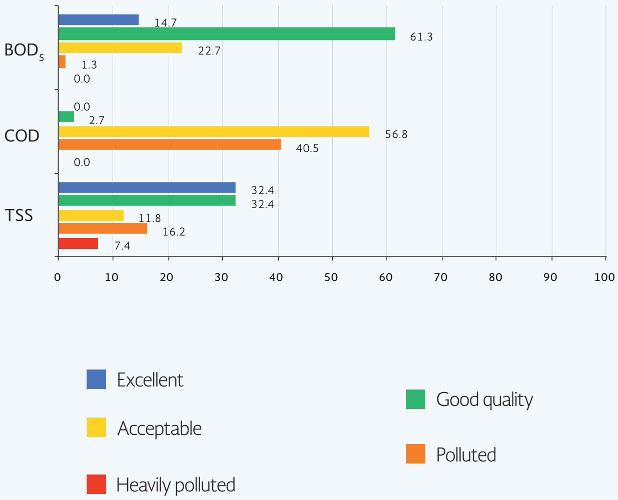
	Total	Surface water	Groundwater
Agriculture	1 327.8	741.4	586.4
Public supply	153.2	12.2	141.0
Self-supplying industry	17.6	1.9	15.7
Thermoelectric plants	11.5	0.0	11.5
Total	1 510.2	755.5	754.7

Coverage, 2010 (%)	Drinking water	Sanitation
State	93.87	87.61
Urban	99.31	96.73
Rural	82.12	67.91

Surface water quality, 2013

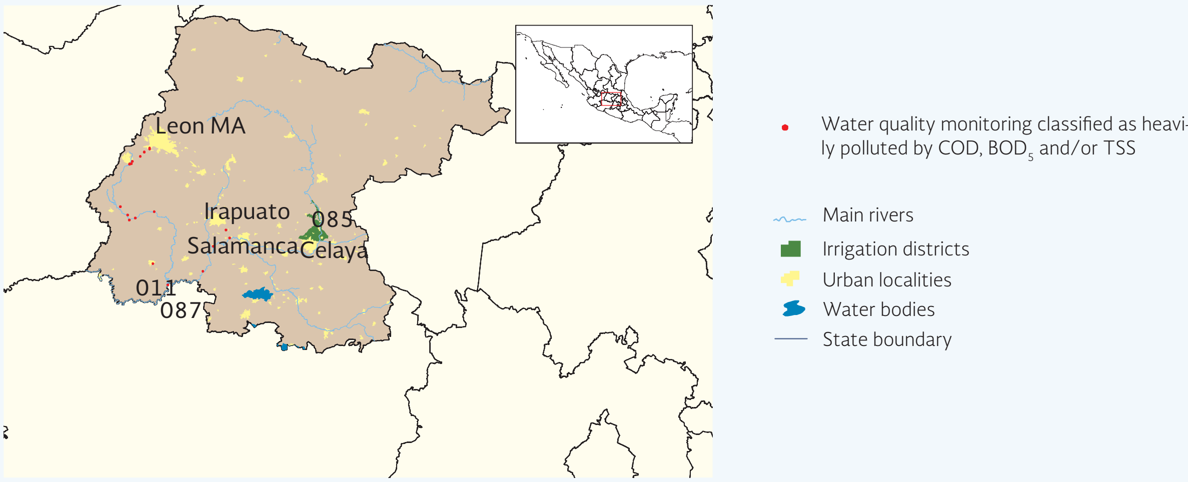
Number of monitoring sites according to water quality indicator	
BOD_5	57
COD	57
TSS	58

Distribution of the sites by indicator and classification (%)

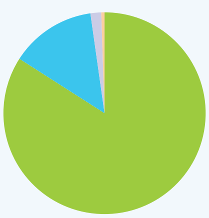


11. Guanajuato

Contextual data		Plants, December 2013		
Number of municipalities	46	Municipal drinking water plants		
Total population 2013	5 719 709 inhabitants	Number in operation	30	
Urban	4 031 517 inhabitants	Installed capacity (l/s)	679.840	
Rural	1 688 192 inhabitants	Flow treated (l/s)	492.540	
Population 2030	6 361 401 inhabitants	Wastewater	Municipal	Industrial
		Number in operation	69	134
Normal annual precipitation 1971-2000	595 mm	Installed capacity (m³/s)	7.378	0.742
		Flow treated (m³/s)	5.651	0.598



Offstream uses of water, 2013 (hm³/year)

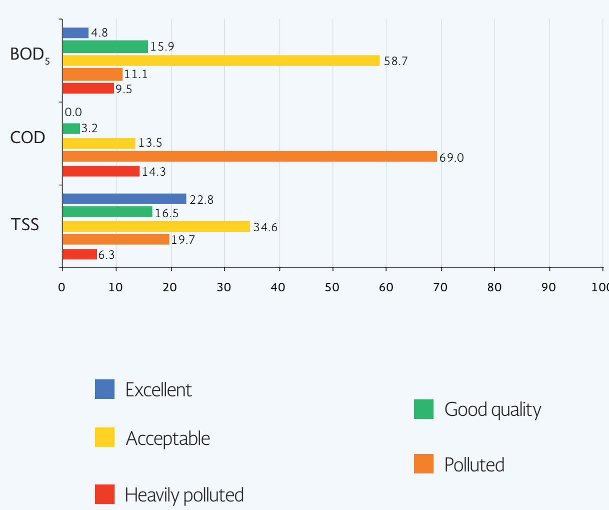


	Total	Surface water	Groundwater
Agriculture	3 351.4	1 333.7	2 017.7
Public supply	545.9	94.1	451.8
Self-supplying industry	68.6	0.4	68.2
Thermoelectric plants	20.5	0.0	20.5
Total	3 986.5	1 428.1	2 558.3

Coverage, 2010 (%)		
	Drinking water	Sanitation
State	94.36	90.32
Urban	96.95	97.57
Rural	88.37	73.57

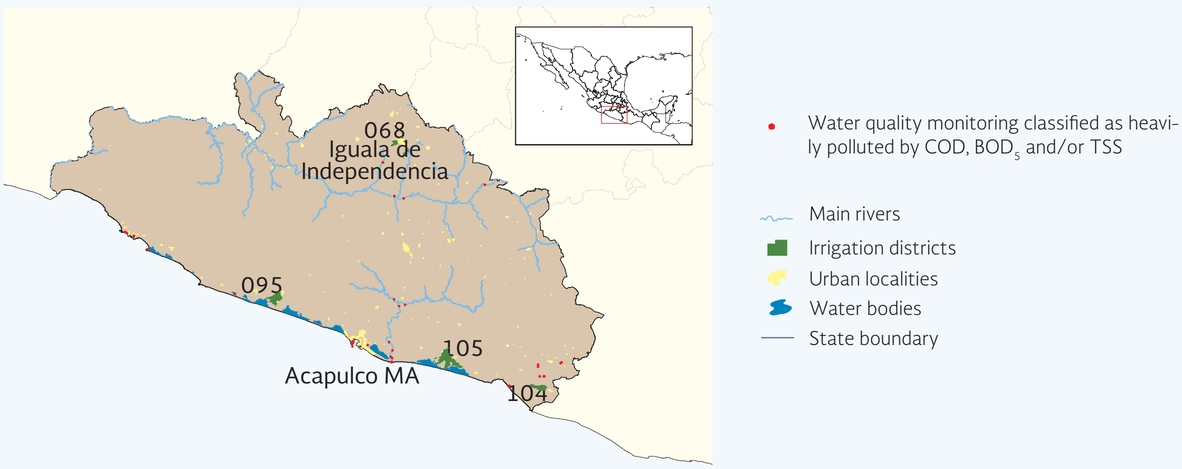
Surface water quality, 2013	
Number of monitoring sites according to water quality indicator	
BOD_5	129
COD	141
TSS	129

Distribution of the sites by indicator and classification (%)

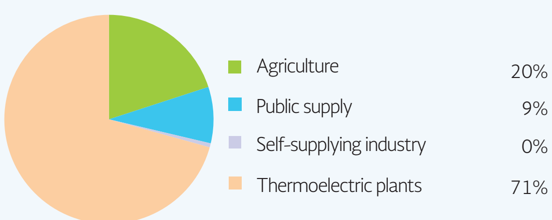


12. Guerrero

Contextual data		Plants, December 2013		
Number of municipalities	81	**Municipal drinking water plants**		
Total population 2013	3 523 858 inhabitants	Number in operation	13	
Urban	2 186 138 inhabitants	Installed capacity (l/s)	3 548.000	
Rural	1 337 720 inhabitants	Flow treated (l/s)	3 186.000	
Population 2030	3 772 110 inhabitants	**Wastewater**	**Municipal**	**Industrial**
		Number in operation	59	8
Normal annual precipitation 1971-2000	1 196 mm	Installed capacity (m^3/s)	4.200	0.643
		Flow treated (m^3/s)	3.497	0.632



Offstream uses of water, 2013 (hm^3/year)



	Total	Surface water	Groundwater
Agriculture	882.9	778.4	104.5
Public supply	384.8	216.7	168.1
Self-supplying industry	27.5	0.4	27.1
Thermoelectric plants	3 122.1	3 122.1	0.0
Total	4 417.3	4 117.5	299.7

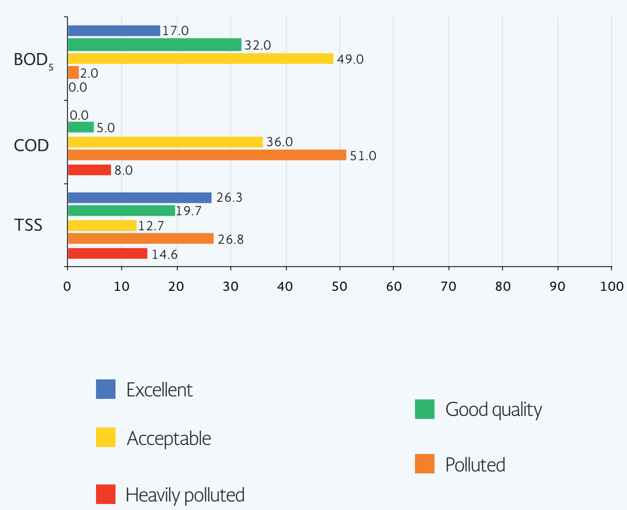
Coverage, 2010 (%)

	Drinking water	Sanitation
State	69.83	74.05
Urban	81.14	90.52
Rural	54.19	51.27

Surface water quality, 2013

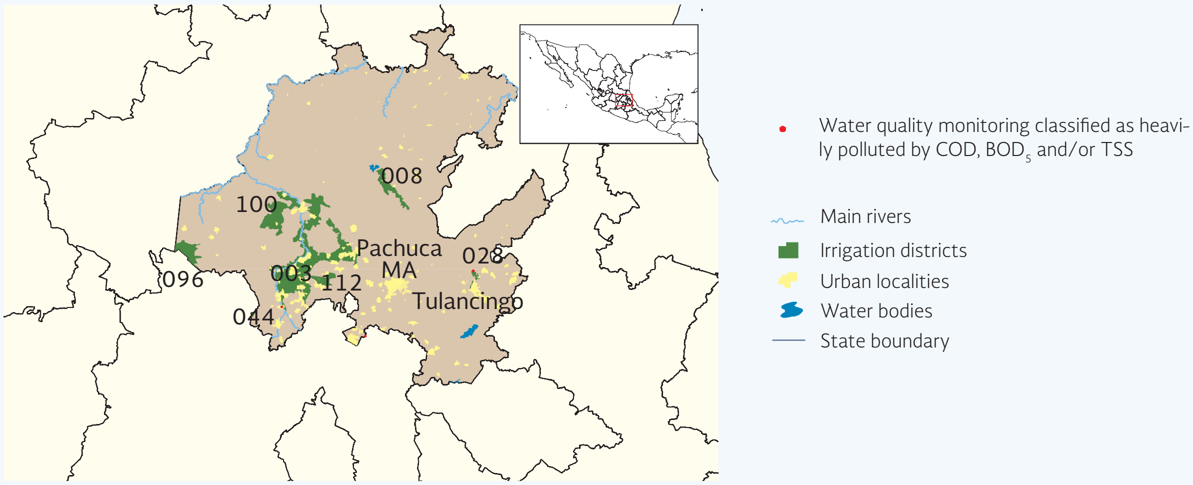
Number of monitoring sites according to water quality indicator	
BOD_5	96
COD	97
TSS	205

Distribution of the sites by indicator and classification (%)

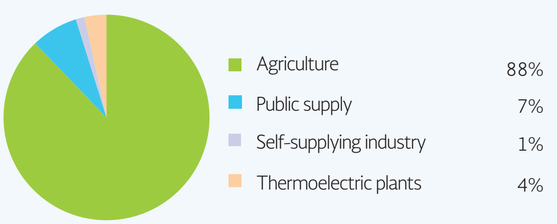


13. Hidalgo

Contextual data		Plants, December 2013		
Number of municipalities	84	Municipal drinking water plants		
Total population 2013	2 806 334 inhabitants	Number in operation	23	
Urban	1 682 386 inhabitants	Installed capacity (l/s)	362.000	
Rural	1 123 948 inhabitants	Flow treated (l/s)	356.000	
Population 2030	3 329 765 inhabitants	Wastewater	Municipal	Industrial
		Number in operation	9	45
Normal annual precipitation 1971-2000	829 mm	Installed capacity (m³/s)	0.159	1.840
		Flow treated (m³/s)	0.159	1.376



Offstream uses of water, 2013 (hm³/year)

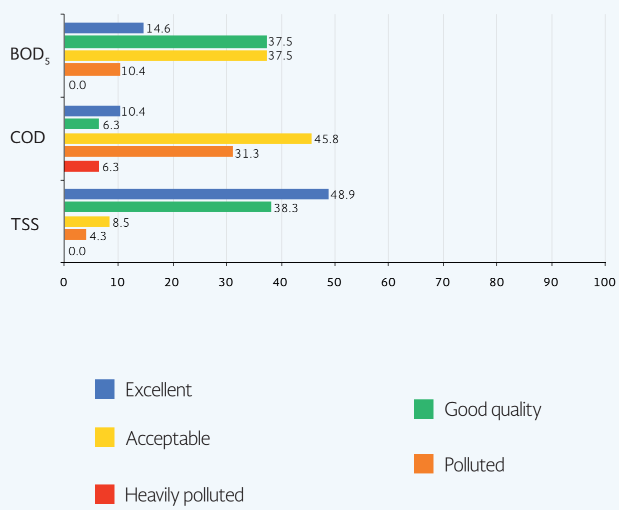


	Total	Surface water	Groundwater
Agriculture	2 107.4	1 898.8	208.7
Public supply	176.5	47.2	129.3
Self-supplying industry	32.9	13.7	19.2
Thermoelectric plants	82.6	22.0	60.6
Total	2 399.4	1 981.7	417.8

Coverage, 2010 (%)	Drinking water	Sanitation
State	90.66	85.01
Urban	96.89	96.72
Rural	83.91	72.33

Surface water quality, 2013	
Number of monitoring sites according to water quality indicator	
BOD_5	39
COD	39
TSS	39

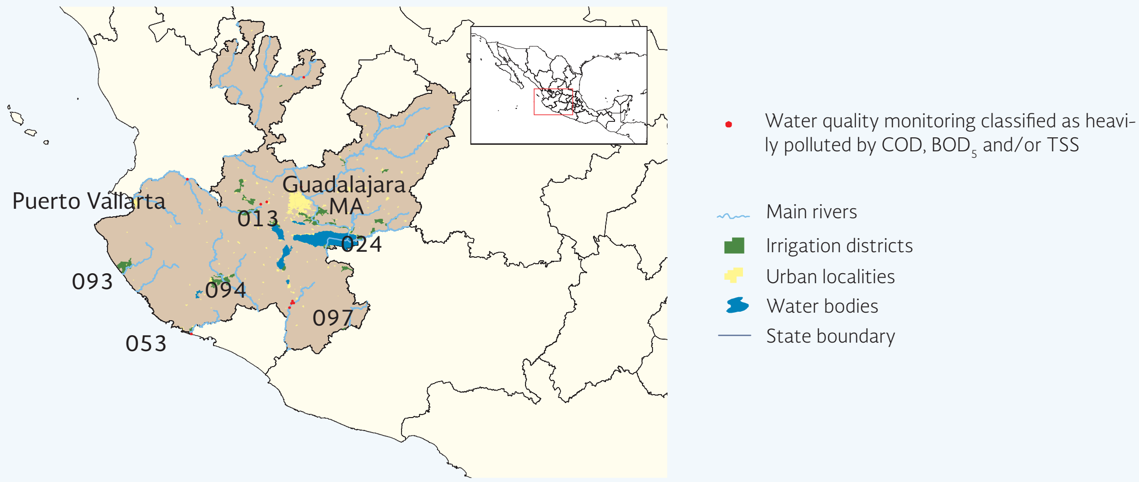
Distribution of the sites by indicator and classification (%)



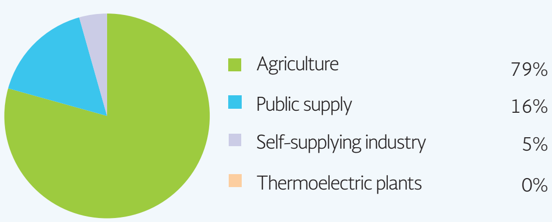
14. Jalisco

Contextual data	
Number of municipalities	125
Total population 2013	7 742 303 inhabitants
Urban	6 802 397 inhabitants
Rural	939 906 inhabitants
Population 2030	9 102 259 inhabitants
Normal annual precipitation 1971-2000	889 mm

Plants, December 2013		
Municipal drinking water plants		
Number in operation	30	
Installed capacity (l/s)	16 272.000	
Flow treated (l/s)	12 242.000	
Wastewater	**Municipal**	**Industrial**
Number in operation	154	71
Installed capacity (m^3/s)	15.435	1.543
Flow treated (m^3/s)	7.797	1.543



Offstream uses of water, 2013 (hm^3/year)



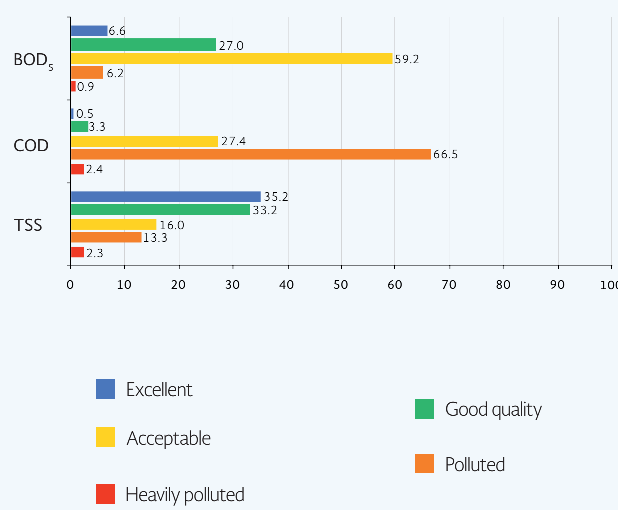
	Total	Surface water	Groundwater
Agriculture	3 661.4	1 722.9	1 938.5
Public supply	751.6	400.7	350.9
Self-supplying industry	201.8	19.7	182.1
Thermoelectric plants	0.1	0.1	0.0
Total	4 614.9	2 143.5	2 471.4

Coverage, 2010 (%)		
	Drinking water	Sanitation
State	95.77	97.38
Urban	97.40	98.94
Rural	85.33	87.39

Surface water quality, 2013

Number of monitoring sites according to water quality indicator	
BOD_5	233
COD	232
TSS	281

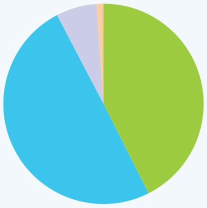
Distribution of the sites by indicator and classification (%)



15. Mexico

Contextual data		Plants, December 2013		
Number of municipalities	125	**Municipal drinking water plants**		
Total population 2013	16 364 210 inhabitants	Number in operation	11	
Urban	14 356 674 inhabitants	Installed capacity (l/s)	22 164.000	
Rural	2 007 536 inhabitants	Flow treated (l/s)	16 739.000	
Population 2030	20 167 433 inhabitants	**Wastewater**	**Municipal**	**Industrial**
		Number in operation	142	241
Normal annual precipitation 1971-2000	847 mm	Installed capacity (m³/s)	8.962	2.349
		Flow treated (m³/s)	6.789	1.755

Offstream uses of water, 2013 (hm³/year)



	Total	Surface water	Groundwater
Agriculture	1 150.0	800.6	349.4
Public supply	1 344.2	327.5	1 016.6
Self-supplying industry	176.6	38.5	138.0
Thermoelectric plants	30.6	23.7	6.9
Total	2 701.4	1 190.3	1 511.0

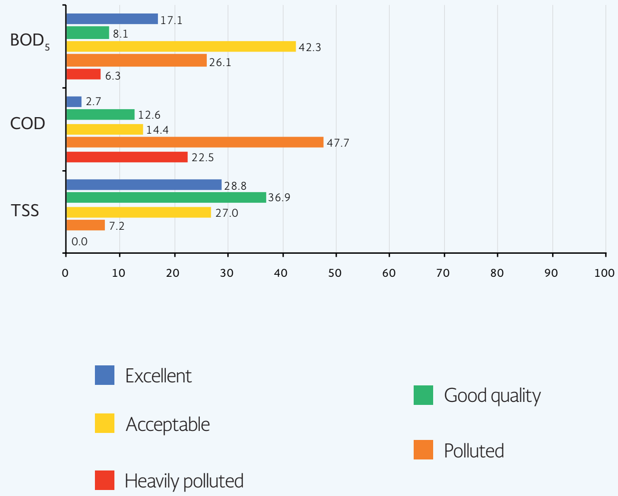
Coverage, 2010 (%)

	Drinking water	Sanitation
State	93.97	93.61
Urban	96.16	97.21
Rural	79.51	69.77

Surface water quality, 2013

Number of monitoring sites according to water quality indicator	
BOD_5	114
COD	114
TSS	114

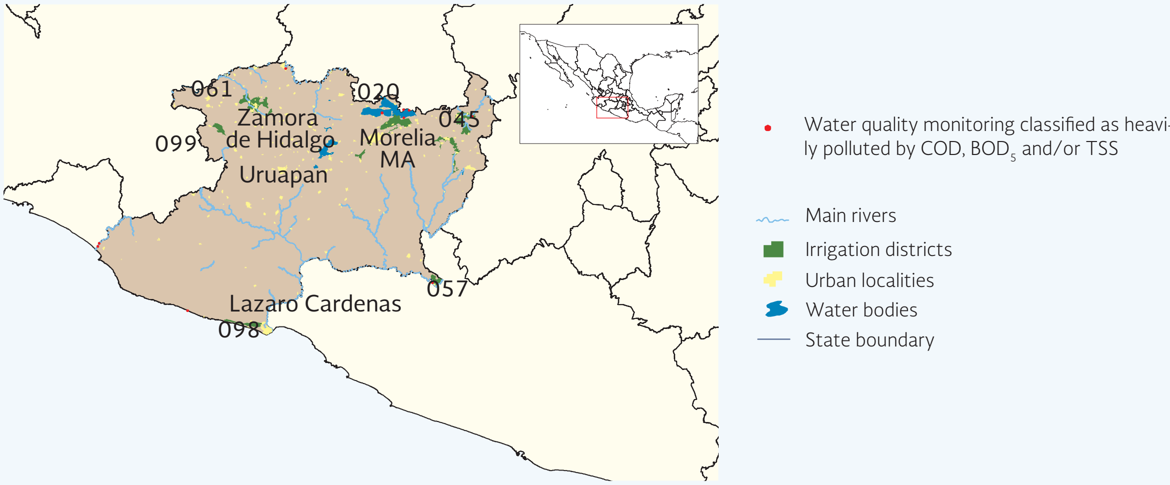
Distribution of the sites by indicator and classification (%)



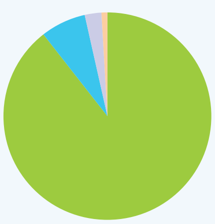
16. Michoacan de Ocampo

Contextual data	
Number of municipalities	113
Total population 2013	4 529 914 inhabitants
Urban	3 190 686 inhabitants
Rural	1 339 228 inhabitants
Population 2030	4 960 773 inhabitants
Normal annual precipitation 1971-2000	910 mm

Plants, December 2013		
Municipal drinking water plants		
Number in operation	5	
Installed capacity (l/s)	3 025.000	
Flow treated (l/s)	2 495.000	
Wastewater	**Municipal**	**Industrial**
Number in operation	38	70
Installed capacity (m^3/s)	4.051	4.887
Flow treated (m^3/s)	3.393	3.707



Offstream uses of water, 2013 (hm^3/year)



	Total	Surface water	Groundwater
Agriculture	4 702.4	3 705.4	997.0
Public supply	370.8	210.8	160.0
Self-supplying industry	136.3	99.9	36.4
Thermoelectric plants	48.2	0.0	48.2
Total	5 257.6	4 016.1	1 241.5

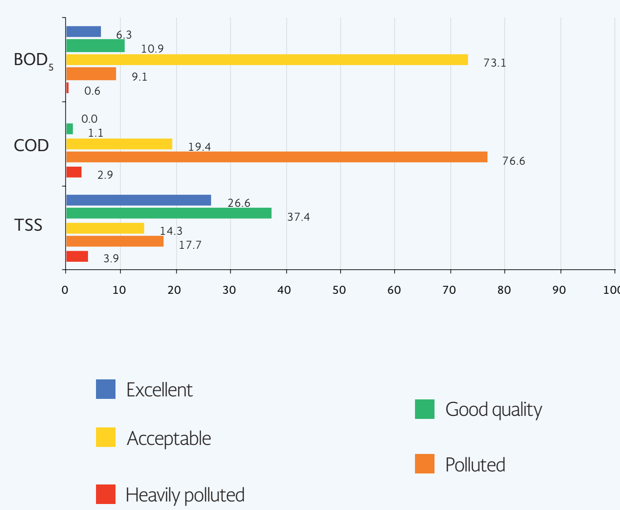
Coverage, 2010 (%)

	Drinking water	Sanitation
State	91.61	87.98
Urban	95.35	94.18
Rural	83.48	74.53

Surface water quality, 2013

Number of monitoring sites according to water quality indicator	
BOD_5	166
COD	166
TSS	194

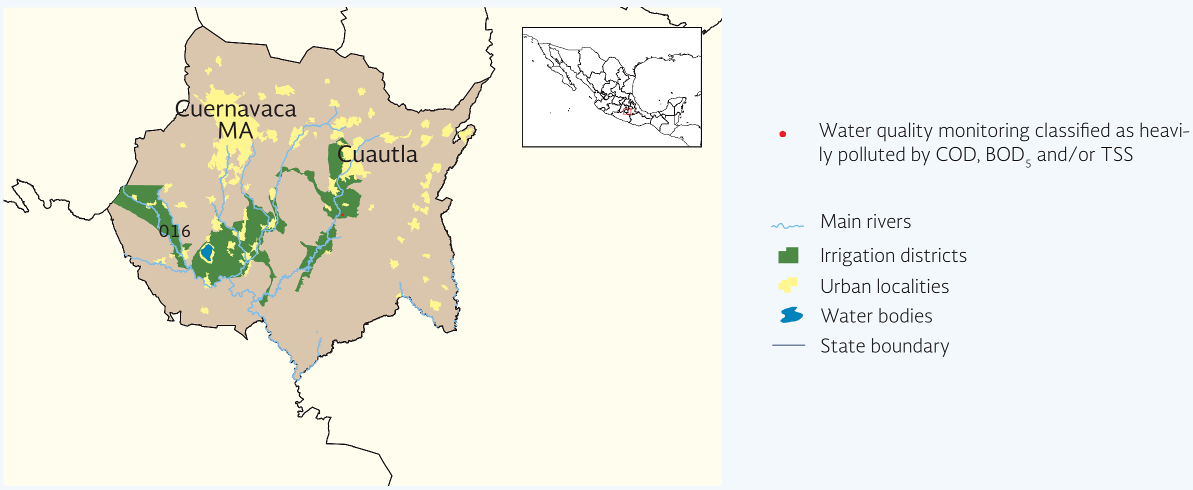
Distribution of the sites by indicator and classification (%)



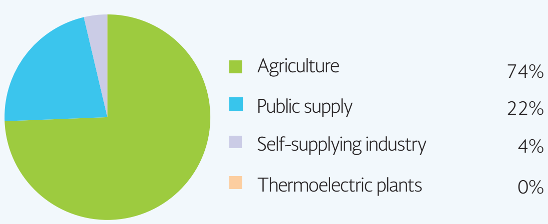
17. Morelos

Contextual data	
Number of municipalities	33
Total population 2013	1 874 188 inhabitants
Urban	1 568 166 inhabitants
Rural	306 023 inhabitants
Population 2030	2 222 863 inhabitants
Normal annual precipitation 1971-2000	976 mm

Plants, December 2013		
Municipal drinking water plants		
Number in operation	3	
Installed capacity (l/s)	5.900	
Flow treated (l/s)	2.500	
Wastewater	**Municipal**	**Industrial**
Number in operation	42	102
Installed capacity (m³/s)	2.719	2.343
Flow treated (m³/s)	1.596	2.311



Offstream uses of water, 2013 (hm³/year)



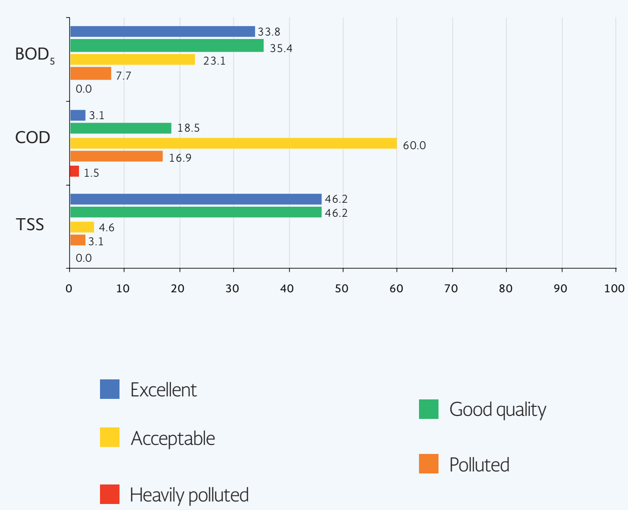
	Total	Surface water	Groundwater
Agriculture	983.1	875.4	107.6
Public supply	290.0	43.7	246.2
Self-supplying industry	48.7	24.6	24.0
Thermoelectric plants	0.0	0.0	0.0
Total	1 321.7	943.8	377.9

Coverage, 2010 (%)	Drinking water	Sanitation
State	91.45	94.98
Urban	95.35	97.00
Rural	71.04	84.43

Surface water quality, 2013

Number of monitoring sites according to water quality indicator	
BOD_5	87
COD	90
TSS	90

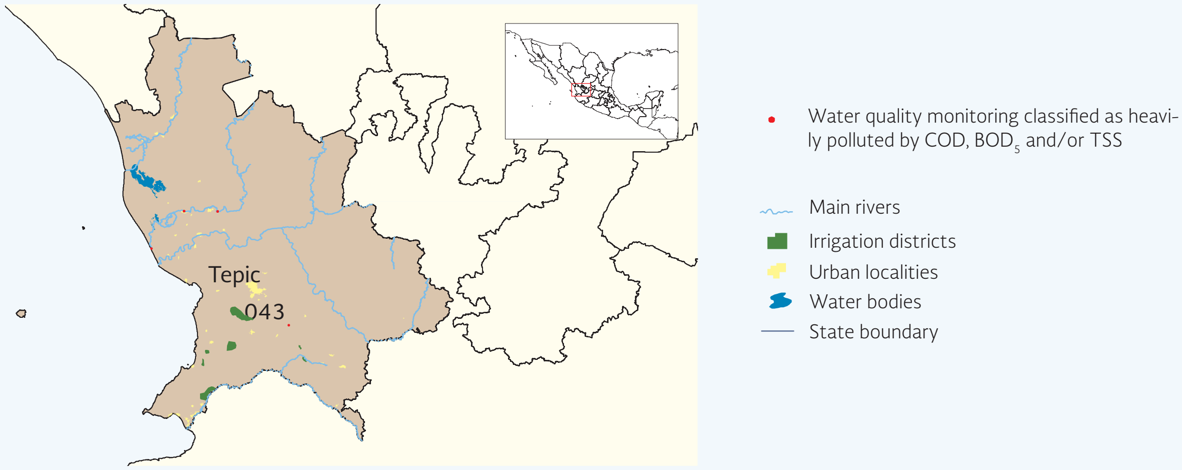
Distribution of the sites by indicator and classification (%)



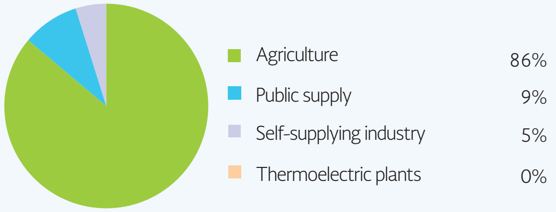
18. Nayarit

Contextual data	
Number of municipalities	20
Total population 2013	1 178 403 inhabitants
Urban	821 727 inhabitants
Rural	356 676 inhabitants
Population 2030	1 544 709 inhabitants
Normal annual precipitation 1971-2000	1 193 mm

Plants, December 2013		
Municipal drinking water plants		
Number in operation	0	
Installed capacity (l/s)	0.000	
Flow treated (l/s)	0.000	
Wastewater	**Municipal**	**Industrial**
Number in operation	68	6
Installed capacity (m³/s)	2.807	0.164
Flow treated (m³/s)	2.239	0.164



Offstream uses of water, 2013 (hm³/year)



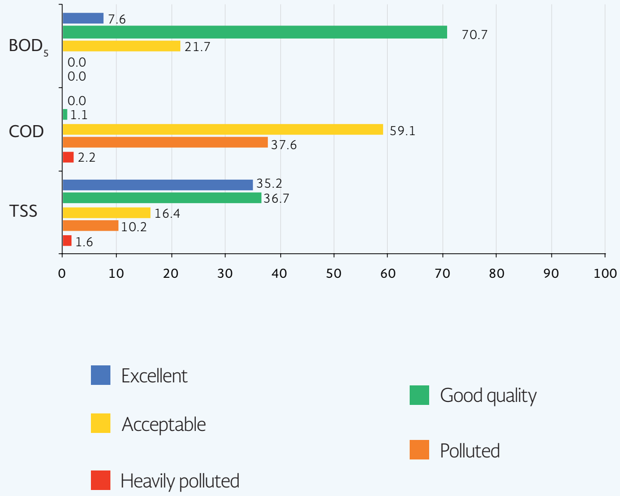
	Total	Surface water	Groundwater
Agriculture	1 081.7	974.4	107.3
Public supply	113.2	20.5	92.7
Self-supplying industry	61.0	21.8	39.2
Thermoelectric plants	0.0	0.0	0.0
Total	1 255.9	1 016.7	239.2

Coverage, 2010 (%)		
	Drinking water	Sanitation
State	92.38	93.07
Urban	96.67	98.42
Rural	82.85	81.18

Surface water quality, 2013

Number of monitoring sites according to water quality indicator	
BOD_5	99
COD	87
TSS	121

Distribution of the sites by indicator and classification (%)



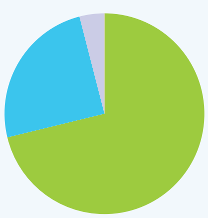
19. Nuevo Leon

Contextual data	
Number of municipalities	51
Total population 2013	4 941 059 inhabitants
Urban	4 718 964 inhabitants
Rural	222 095 inhabitants
Population 2030	6 097 769 inhabitants
Normal annual precipitation 1971-2000	589 mm

Plants, December 2013		
Municipal drinking water plants		
Number in operation	13	
Installed capacity (l/s)	14 748.000	
Flow treated (l/s)	4 469.160	
Wastewater	**Municipal**	**Industrial**
Number in operation	60	178
Installed capacity (m³/s)	17.615	4.045
Flow treated (m³/s)	11.489	2.916

- Water quality monitoring classified as heavily polluted by COD, BOD_5 and/or TSS
- Main rivers
- Irrigation districts
- Urban localities
- Water bodies
- State boundary

Offstream uses of water, 2013 (hm³/year)



Agriculture	71%
Public supply	25%
Self-supplying industry	4%
Thermoelectric plants	0%

	Total	Surface water	Groundwater
Agriculture	1 472.1	826.4	645.7
Public supply	511.9	356.0	155.9
Self-supplying industry	83.3	0.0	83.3
Thermoelectric plants	0.0	0.0	0.0
Total	2 067.3	1 182.4	884.9

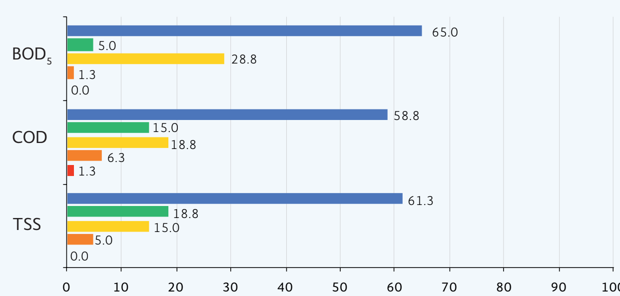
Coverage, 2010 (%)

	Drinking water	Sanitation
State	96.56	96.04
Urban	97.84	97.77
Rural	73.75	65.36

Surface water quality, 2013

Number of monitoring sites according to water quality indicator	
BOD_5	81
COD	81
TSS	81

Distribution of the sites by indicator and classification (%)

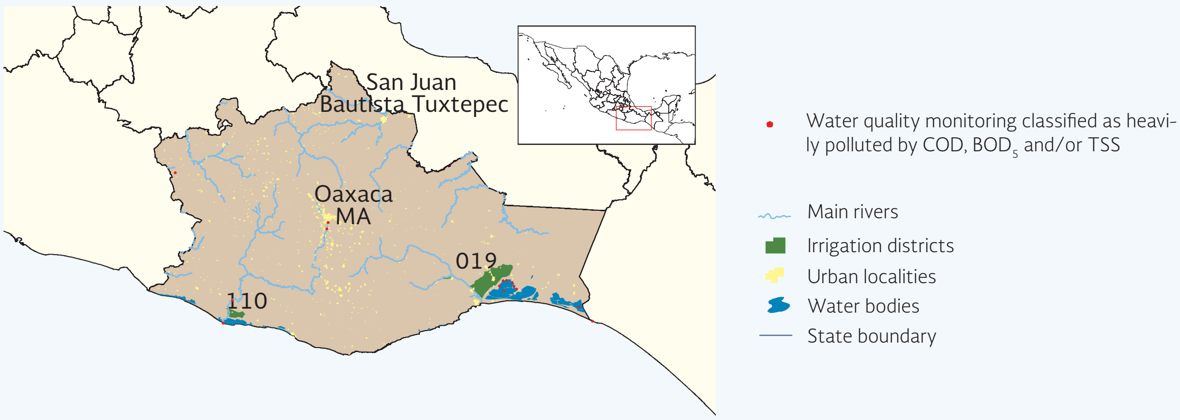


- Excellent
- Good quality
- Acceptable
- Polluted
- Heavily polluted

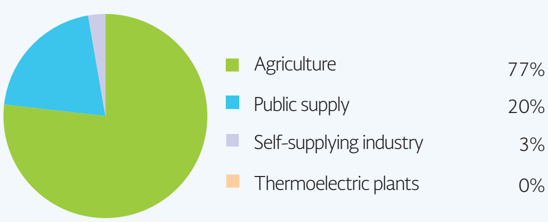
20. Oaxaca

Contextual data	
Number of municipalities	570
Total population 2013	3 959 042 inhabitants
Urban	2 573 196 inhabitants
Rural	1 385 846 inhabitants
Population 2030	4 293 423 inhabitants
Normal annual precipitation 1971-2000	1 183 mm

Plants, December 2013		
Municipal drinking water plants		
Number in operation	6	
Installed capacity (l/s)	1 291.300	
Flow treated (l/s)	71.300	
Wastewater	**Municipal**	**Industrial**
Number in operation	69	16
Installed capacity (m³/s)	1.521	2.513
Flow treated (m³/s)	0.995	2.194



Offstream uses of water, 2013 (hm³/year)



	Total	Surface water	Groundwater
Agriculture	969.8	733.5	236.3
Public supply	258.5	132.8	125.7
Self-supplying industry	34.4	8.0	26.4
Thermoelectric plants	0.0	0.0	0.0
Total	1 262.8	874.4	388.4

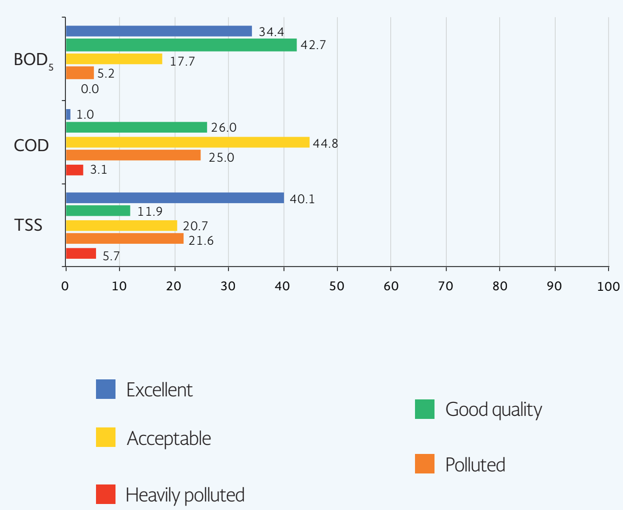
Coverage, 2010 (%)

	Drinking water	Sanitation
State	76.07	69.20
Urban	85.51	88.62
Rural	67.66	51.89

Surface water quality, 2013

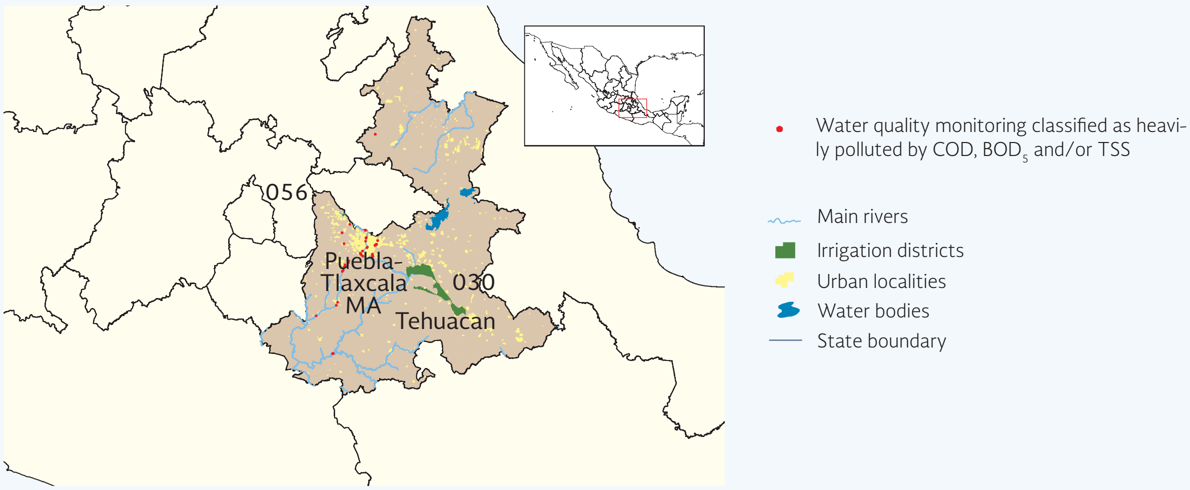
Number of monitoring sites according to water quality indicator	
BOD_5	97
COD	122
TSS	254

Distribution of the sites by indicator and classification (%)

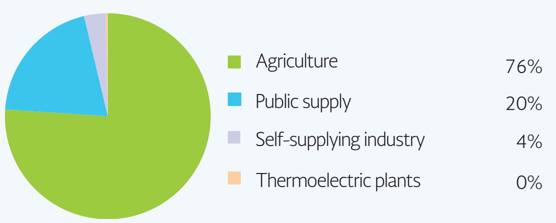


21. Puebla

Contextual data		Plants, December 2013		
Number of municipalities	217	Municipal drinking water plants		
Total population 2013	6 067 607 inhabitants	Number in operation	5	
Urban	4 738 301 inhabitants	Installed capacity (l/s)	815.000	
Rural	1 329 307 inhabitants	Flow treated (l/s)	514.520	
Population 2030	6 942 481 inhabitants	Wastewater	Municipal	Industrial
		Number in operation	67	192
Normal annual precipitation 1971-2000	1 040 mm	Installed capacity (m³/s)	3.203	1.040
		Flow treated (m³/s)	3.237	0.829



Offstream uses of water, 2013 (hm³/year)



	Total	Surface water	Groundwater
Agriculture	1 608.1	996.9	611.2
Public supply	427.9	177.7	250.3
Self-supplying industry	72.2	30.7	41.5
Thermoelectric plants	6.5	0.0	6.5
Total	2 114.7	1 205.3	909.4

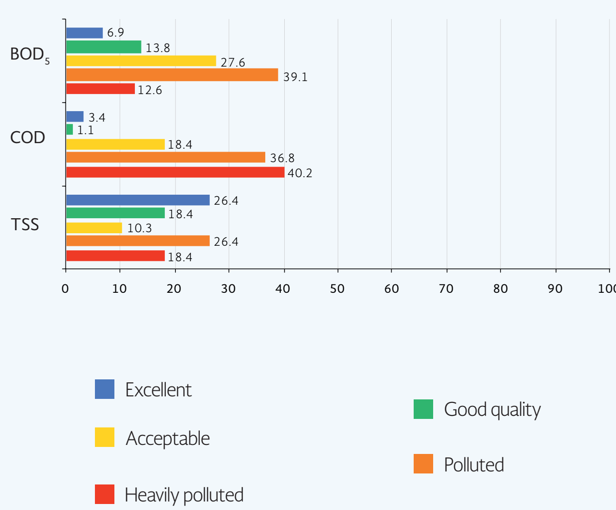
Coverage, 2010 (%)

	Drinking water	Sanitation
State	87.23	86.34
Urban	90.54	93.70
Rural	78.90	67.83

Surface water quality, 2013

Number of monitoring sites according to water quality indicator	
BOD_5	87
COD	87
TSS	87

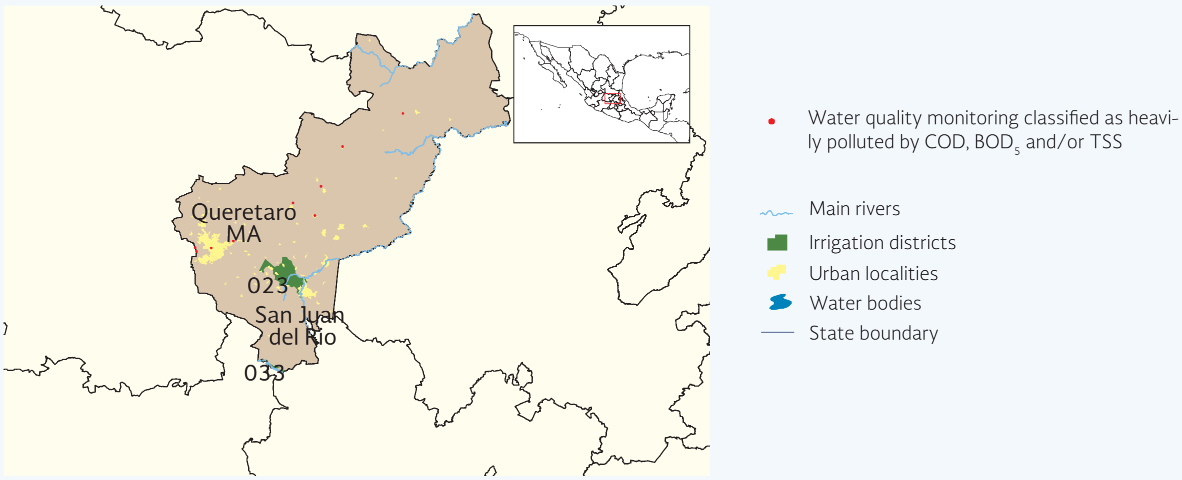
Distribution of the sites by indicator and classification (%)



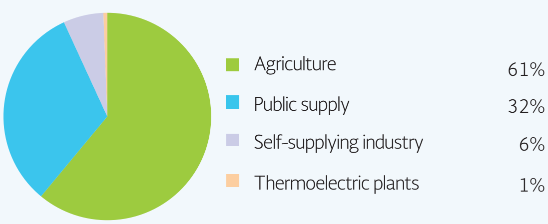
22. Queretaro

Contextual data	
Number of municipalities	18
Total population 2013	1 943 889 inhabitants
Urban	1 409 645 inhabitants
Rural	534 244 inhabitants
Population 2030	2 403 016 inhabitants
Normal annual precipitation 1971-2000	736 mm

Plants, December 2013		
Municipal drinking water plants		
Number in operation	7	
Installed capacity (l/s)	1 769.000	
Flow treated (l/s)	1 562.000	
Wastewater	**Municipal**	**Industrial**
Number in operation	47	140
Installed capacity (m³/s)	2.370	1.247
Flow treated (m³/s)	1.640	0.654



Offstream uses of water, 2013 (hm³/year)



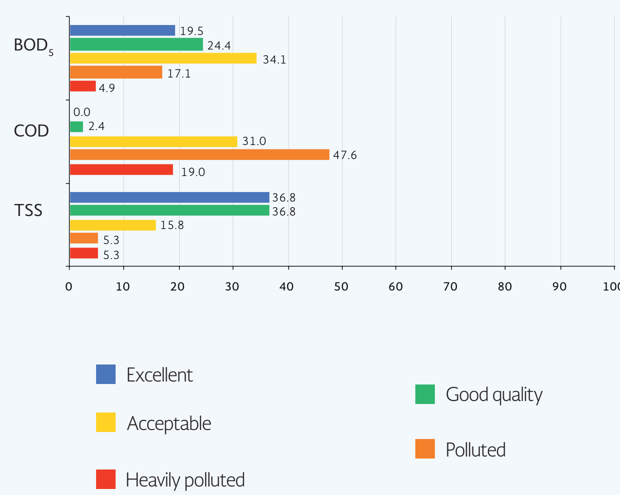
	Total	Surface water	Groundwater
Agriculture	577.1	171.4	405.7
Public supply	303.9	151.4	152.5
Self-supplying industry	59.1	0.7	58.4
Thermoelectric plants	5.7	0.0	5.7
Total	945.8	323.5	622.4

Coverage, 2010 (%)	Drinking water	Sanitation
State	94.72	90.42
Urban	98.23	97.07
Rural	86.38	74.64

Surface water quality, 2013

Number of monitoring sites according to water quality indicator	
BOD_5	42
COD	42
TSS	42

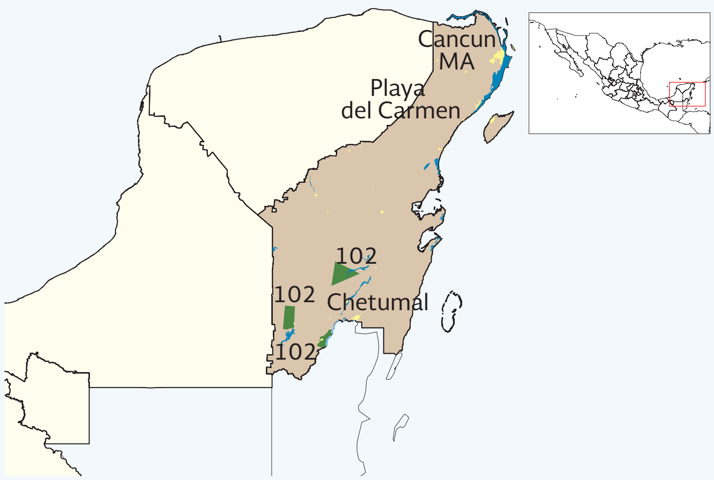
Distribution of the sites by indicator and classification (%)



23. Quintana Roo

Contextual data	
Number of municipalities	10
Total population 2013	1 484 960 inhabitants
Urban	1 309 736 inhabitants
Rural	175 224 inhabitants
Population 2030	2 232 702 inhabitants
Normal annual precipitation 1971-2000	1 237 mm

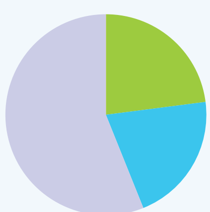
Plants, December 2013		
Municipal drinking water plants		
Number in operation	0	
Installed capacity (l/s)	0.000	
Flow treated (l/s)	0.000	
Wastewater	**Municipal**	**Industrial**
Number in operation	35	4
Installed capacity (m^3/s)	2.381	0.060
Flow treated (m^3/s)	1.734	0.055



Water quality monitoring classified as heavily polluted by COD, BOD_5 and/or TSS

Main rivers
Irrigation districts
Urban localities
Water bodies
State boundary

Offstream uses of water, 2013 (hm^3/year)



Agriculture	23%
Public supply	21%
Self-supplying industry	56%
Thermoelectric plants	0%

	Total	Surface water	Groundwater
Agriculture	207.1	0.8	206.4
Public supply	189.1	0.1	189.0
Self-supplying industry	505.3	0.1	505.2
Thermoelectric plants	0.0	0.0	0.0
Total	901.5	1.0	900.5

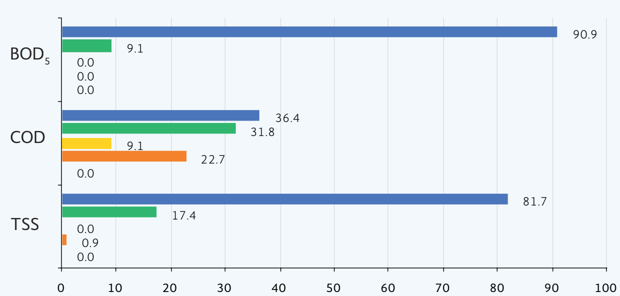
Coverage, 2010 (%)

	Drinking water	Sanitation
State	92.38	92.72
Urban	92.42	96.19
Rural	92.12	67.19

Surface water quality, 2013

Number of monitoring sites according to water quality indicator	
BOD_5	37
COD	37
TSS	132

Distribution of the sites by indicator and classification (%)

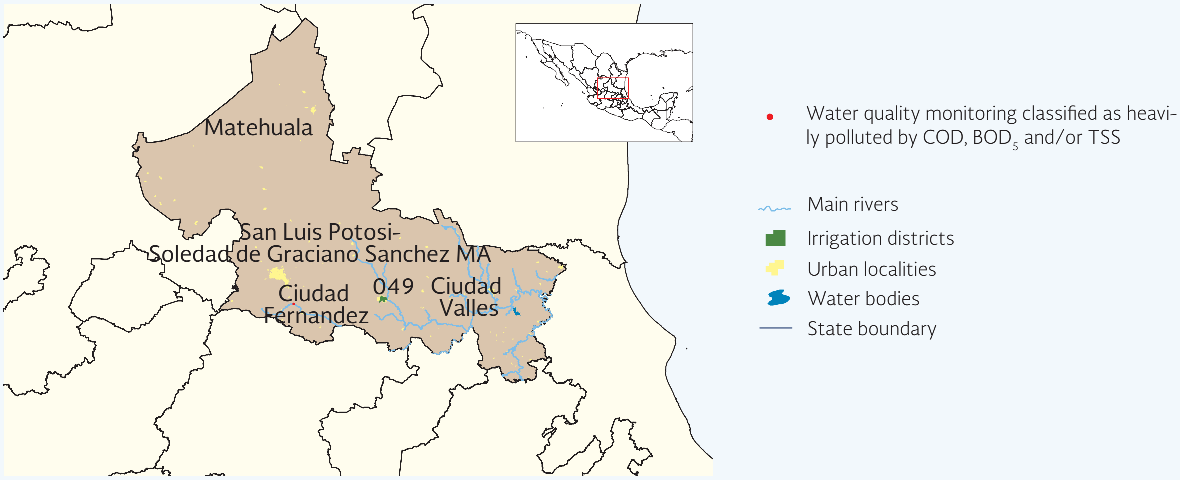


Excellent
Good quality
Acceptable
Polluted
Heavily polluted

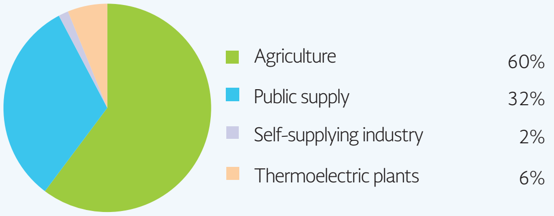
24. San Luis Potosi

Contextual data	
Number of municipalities	58
Total population 2013	2 702 145 inhabitants
Urban	1 840 326 inhabitants
Rural	861 819 inhabitants
Population 2030	3 055 130 inhabitants
Normal annual precipitation 1971-2000	699 mm

Plants, December 2013		
Municipal drinking water plants		
Number in operation	14	
Installed capacity (l/s)	1 314.950	
Flow treated (l/s)	957.100	
Wastewater	**Municipal**	**Industrial**
Number in operation	38	50
Installed capacity (m³/s)	2.510	0.823
Flow treated (m³/s)	2.115	0.709



Offstream uses of water, 2013 (hm³/year)



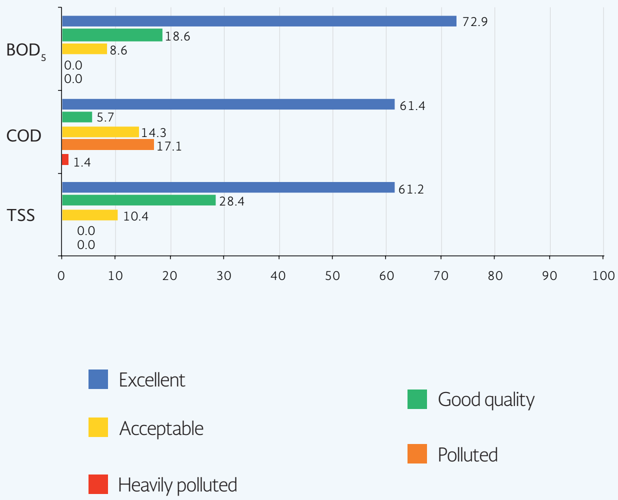
	Total	Surface water	Groundwater
Agriculture	1 228.9	670.0	558.9
Public supply	653.1	504.0	149.1
Self-supplying industry	31.4	9.2	22.2
Thermoelectric plants	126.1	109.3	16.8
Total	2 039.5	1 292.5	747.0

Coverage, 2010 (%)	Drinking water	Sanitation
State	85.52	79.65
Urban	97.47	95.33
Rural	64.70	52.33

Surface water quality, 2013

Number of monitoring sites according to water quality indicator	
BOD_5	69
COD	69
TSS	69

Distribution of the sites by indicator and classification (%)



25. Sinaloa

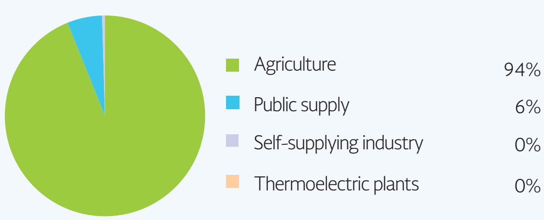
Contextual data	
Number of municipalities	18
Total population 2013	2 932 313 inhabitants
Urban	2 162 207 inhabitants
Rural	770 106 inhabitants
Population 2030	3 302 931 inhabitants
Normal annual precipitation 1971-2000	730 mm

Plants, December 2013		
Municipal drinking water plants		
Number in operation	143	
Installed capacity (l/s)	9 363.500	
Flow treated (l/s)	8 331.800	
Wastewater	**Municipal**	**Industrial**
Number in operation	218	116
Installed capacity (m³/s)	6.095	3.520
Flow treated (m³/s)	4.965	0.952

Water quality monitoring classified as heavily polluted by COD, BOD_5 and/or TSS

Main rivers
Irrigation districts
Urban localities
Water bodies
State boundary

Offstream uses of water, 2013 (hm³/year)

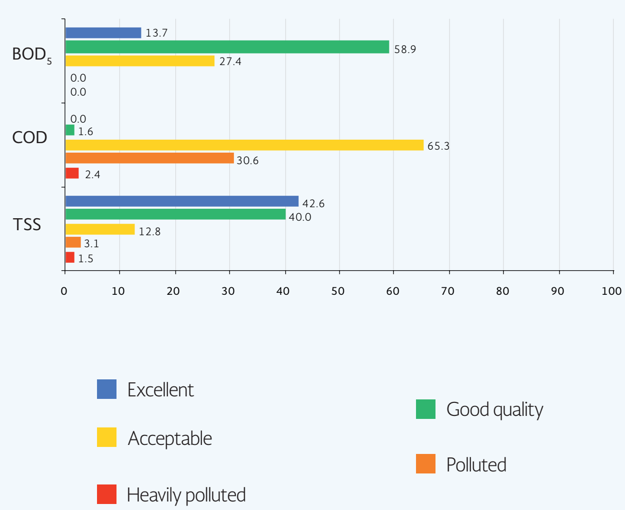


	Total	Surface water	Groundwater
Agriculture	8 505.5	8 109.0	396.4
Public supply	509.3	280.1	229.2
Self-supplying industry	42.5	34.4	8.1
Thermoelectric plants	0.0	0.0	0.0
Total	9 057.3	8 423.5	633.8

Coverage, 2010 (%)		
	Drinking water	Sanitation
State	94.73	91.08
Urban	98.43	96.57
Rural	84.85	76.41

Surface water quality, 2013	
Number of monitoring sites according to water quality indicator	
BOD_5	123
COD	118
TSS	187

Distribution of the sites by indicator and classification (%)

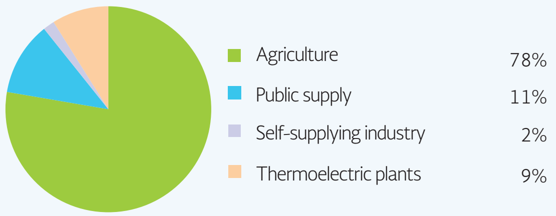


26. Sonora

Contextual data	
Number of municipalities	72
Total population 2013	2 851 462 inhabitants
Urban	2 477 312 inhabitants
Rural	374 149 inhabitants
Population 2030	3 476 930 inhabitants
Normal annual precipitation 1971-2000	419 mm

Plants, December 2013		
Municipal drinking water plants		
Number in operation	24	
Installed capacity (l/s)	5 576.960	
Flow treated (l/s)	2 293.050	
Wastewater	**Municipal**	**Industrial**
Number in operation	82	235
Installed capacity (m^3/s)	5.408	9.164
Flow treated (m^3/s)	3.651	9.033

Offstream uses of water, 2013 (hm^3/year)

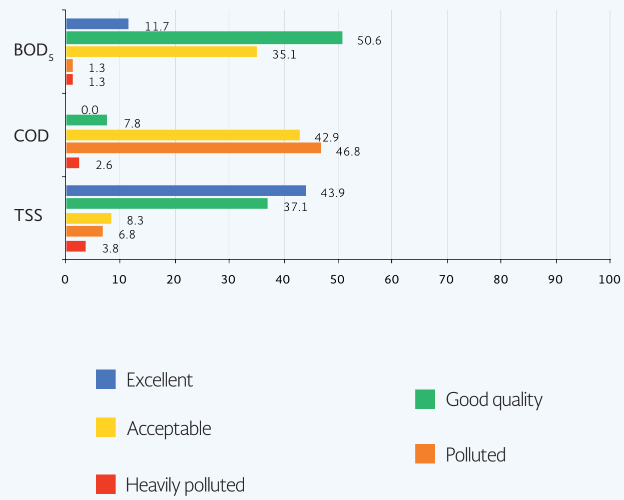


	Total	Surface water	Groundwater
Agriculture	5 137.4	3 373.4	1 764.0
Public supply	764.3	277.4	486.9
Self-supplying industry	119.6	3.3	116.3
Thermoelectric plants	590.6	590.6	0.0
Total	6 612.0	4 244.8	2 367.2

Coverage, 2010 (%)		
	Drinking water	Sanitation
State	96.62	89.22
Urban	97.40	94.85
Rural	91.72	54.17

Surface water quality, 2013	
Number of monitoring sites according to water quality indicator	
BOD_5	76
COD	76
TSS	123

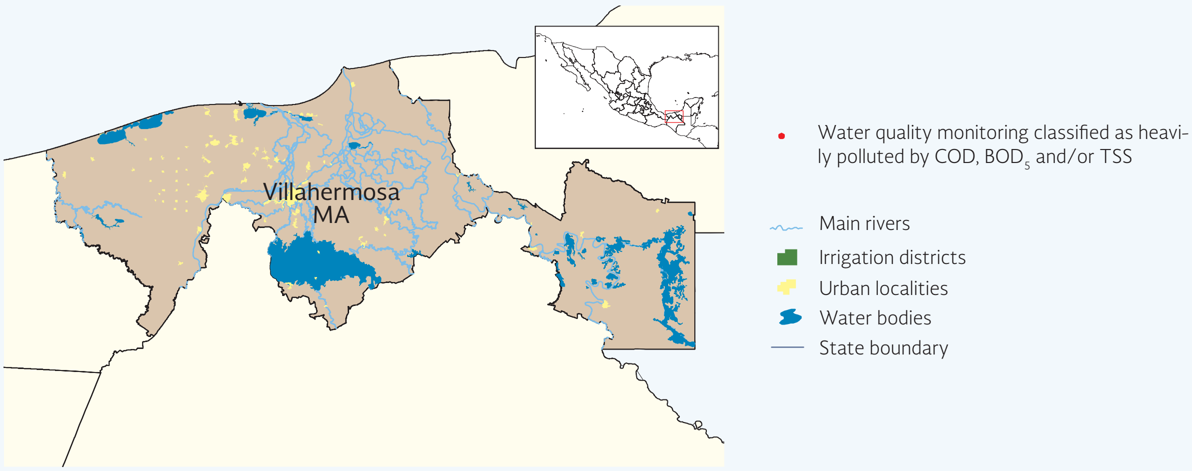
Distribution of the sites by indicator and classification (%)



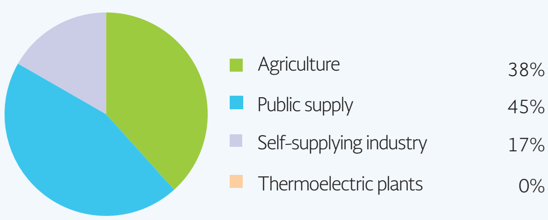
27. Tabasco

Contextual data	
Number of municipalities	17
Total population 2013	2 334 493 inhabitants
Urban	1 348 913 inhabitants
Rural	985 579 inhabitants
Population 2030	2 687 426 inhabitants
Normal annual precipitation 1971-2000	2 095 mm

Plants, December 2013		
Municipal drinking water plants		
Number in operation	39	
Installed capacity (l/s)	9 960.000	
Flow treated (l/s)	8 465.000	
Wastewater	**Municipal**	**Industrial**
Number in operation	80	119
Installed capacity (m³/s)	2.816	0.872
Flow treated (m³/s)	1.765	0.857



Offstream uses of water, 2013 (hm³/year)

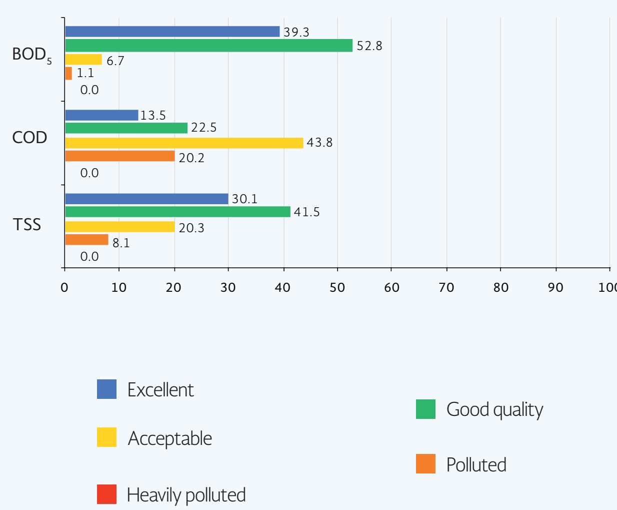


	Total	Surface water	Groundwater
Agriculture	155.1	72.6	82.5
Public supply	182.0	106.7	75.3
Self-supplying industry	67.7	44.9	22.7
Thermoelectric plants	0.0	0.0	0.0
Total	404.8	224.2	180.6

Coverage, 2010 (%)	Drinking water	Sanitation
State	81.18	95.41
Urban	91.24	98.18
Rural	67.87	91.74

Surface water quality, 2013	
Number of monitoring sites according to water quality indicator	
BOD_5	87
COD	90
TSS	124

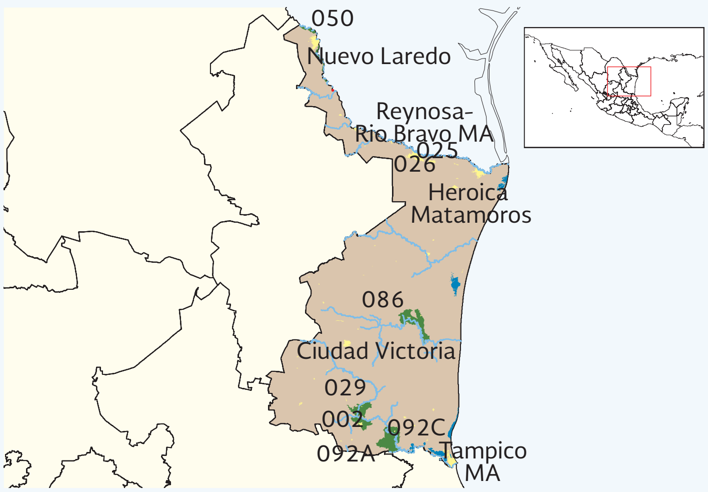
Distribution of the sites by indicator and classification (%)



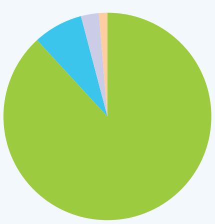
28. Tamaulipas

Contextual data	
Number of municipalities	43
Total population 2013	3 461 336 inhabitants
Urban	3 113 379 inhabitants
Rural	347 957 inhabitants
Population 2030	4 069 115 inhabitants
Normal annual precipitation 1971-2000	760 mm

Plants, December 2013		
Municipal drinking water plants		
Number in operation	53	
Installed capacity (l/s)	15 088.000	
Flow treated (l/s)	11 892.000	
Wastewater	**Municipal**	**Industrial**
Number in operation	44	99
Installed capacity (m³/s)	7.798	8.064
Flow treated (m³/s)	5.692	7.476



Offstream uses of water, 2013 (hm³/year)



	Total	Surface water	Groundwater
Agriculture	3 642.8	3 256.9	386.0
Public supply	319.0	276.7	42.3
Self-supplying industry	115.5	105.9	9.5
Thermoelectric plants	54.0	51.0	3.0
Total	4 131.4	3 690.6	440.8

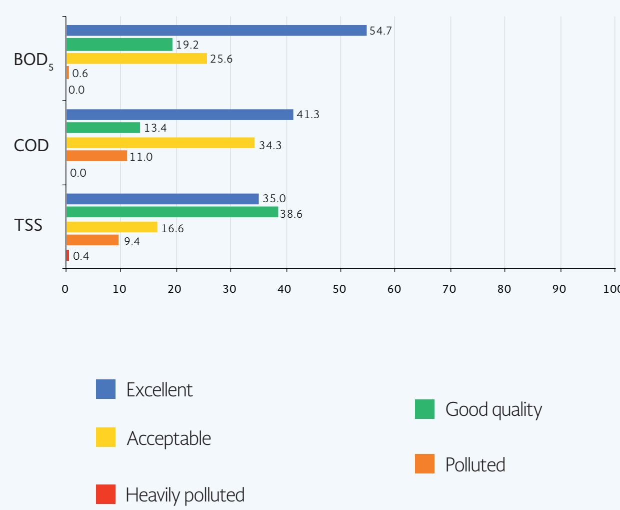
Coverage, 2010 (%)

	Drinking water	Sanitation
State	95.92	86.91
Urban	97.95	93.73
Rural	81.55	38.61

Surface water quality, 2013

Number of monitoring sites according to water quality indicator	
BOD_5	131
COD	131
TSS	188

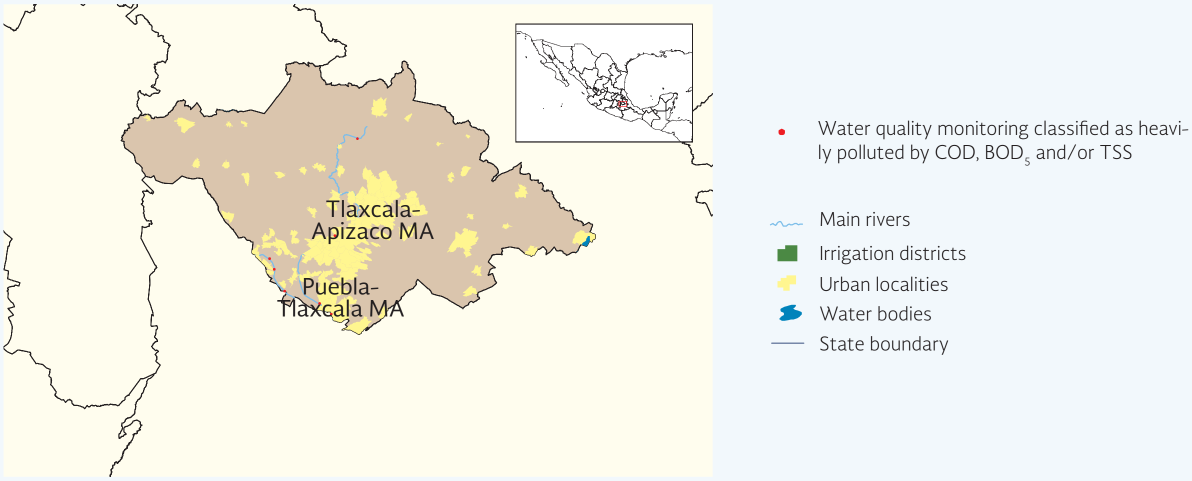
Distribution of the sites by indicator and classification (%)



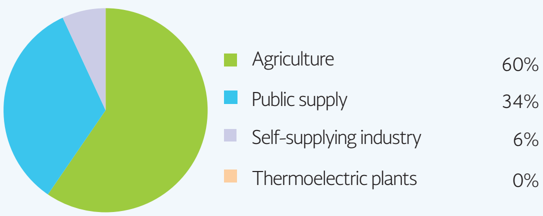
29. Tlaxcala

Contextual data	
Number of municipalities	60
Total population 2013	1 242 734 inhabitants
Urban	1 019 378 inhabitants
Rural	223 356 inhabitants
Population 2030	1 516 712 inhabitants
Normal annual precipitation 1971-2000	700 mm

Plants, December 2013		
Municipal drinking water plants		
Number in operation	0	
Installed capacity (l/s)	0.000	
Flow treated (l/s)	0.000	
Wastewater	**Municipal**	**Industrial**
Number in operation	55	76
Installed capacity (m^3/s)	1.048	0.280
Flow treated (m^3/s)	0.786	0.249



Offstream uses of water, 2013 (hm³/year)

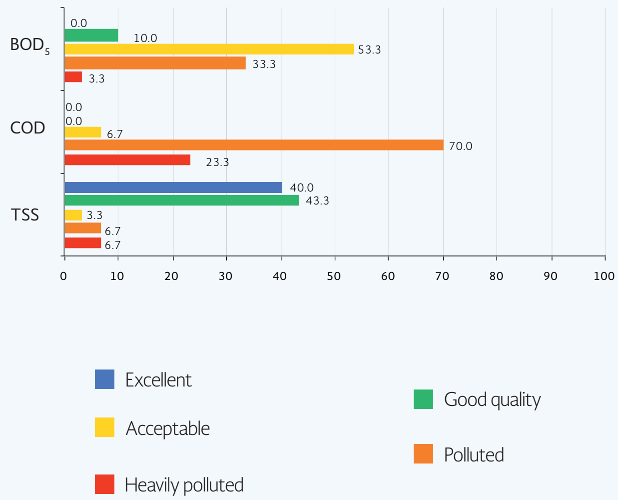


	Total	Surface water	Groundwater
Agriculture	158.6	58.5	100.1
Public supply	89.3	8.2	81.2
Self-supplying industry	17.0	0.2	16.9
Thermoelectric plants	0.0	0.0	0.0
Total	265.0	66.8	198.1

Coverage, 2010 (%)	Drinking water	Sanitation
State	98.24	94.52
Urban	98.57	95.90
Rural	96.92	89.07

Surface water quality, 2013	
Number of monitoring sites according to water quality indicator	
BOD_5	30
COD	28
TSS	23

Distribution of the sites by indicator and classification (%)



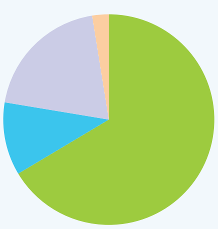
30. Veracruz de Ignacio de la Llave

Contextual data	
Number of municipalities	212
Total population 2013	7 923 198 inhabitants
Urban	5 153 283 inhabitants
Rural	2 769 915 inhabitants
Population 2030	8 781 620 inhabitants
Normal annual precipitation 1971-2000	1 617 mm

Plants, December 2013		
Municipal drinking water plants		
Number in operation	15	
Installed capacity (l/s)	7 162.000	
Flow treated (l/s)	4 643.700	
Wastewater	**Municipal**	**Industrial**
Number in operation	110	160
Installed capacity (m^3/s)	7.271	12.899
Flow treated (m^3/s)	5.612	8.599

- Water quality monitoring classified as heavily polluted by COD, BOD_5 and/or TSS
- Main rivers
- Irrigation districts
- Urban localities
- Water bodies
- State boundary

Offstream uses of water, 2013 (hm^3/year)



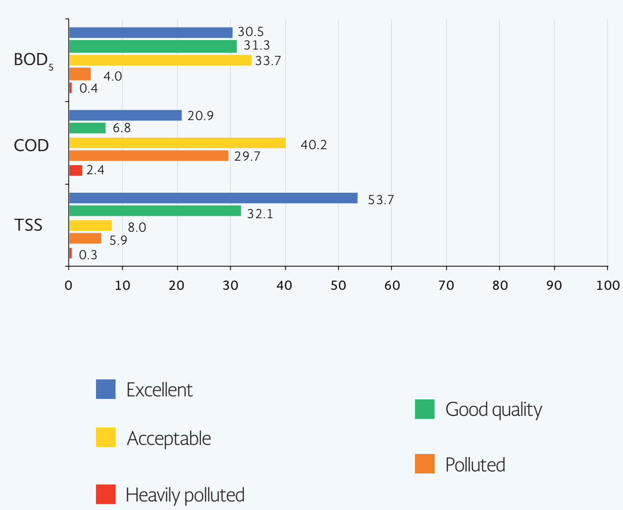
	Total	Surface water	Groundwater
Agriculture	3 234.9	2 534.6	700.2
Public supply	545.8	319.8	226.0
Self-supplying industry	966.5	861.6	104.9
Thermoelectric plants	123.2	122.3	0.9
Total	4 870.3	3 838.4	1 032.0

Coverage, 2010 (%)		
	Drinking water	Sanitation
State	80.26	82.56
Urban	90.93	95.54
Rural	63.78	62.53

Surface water quality, 2013

Number of monitoring sites according to water quality indicator	
BOD_5	234
COD	228
TSS	305

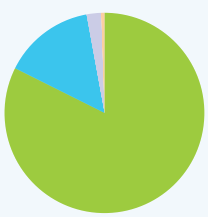
Distribution of the sites by indicator and classification (%)



31. Yucatan

Contextual data		Plants, December 2013		
Number of municipalities	106	**Municipal drinking water plants**		
Total population 2013	2 064 151 inhabitants	Number in operation	0	
Urban	1 756 626 inhabitants	Installed capacity (l/s)	0.000	
Rural	307 525 inhabitants	Flow treated (l/s)	0.000	
Population 2030	2 503 132 inhabitants	**Wastewater**	**Municipal**	**Industrial**
		Number in operation	29	88
Normal annual precipitation 1971-2000	1 062 mm	Installed capacity (m^3/s)	0.535	0.301
		Flow treated (m^3/s)	0.130	0.286

Offstream uses of water, 2013 (hm^3/year)



Agriculture	82%
Public supply	15%
Self-supplying industry	2%
Thermoelectric plants	1%

	Total	Surface water	Groundwater
Agriculture	1 414.5	0.0	1 414.5
Public supply	253.2	0.0	253.2
Self-supplying industry	40.6	0.0	40.6
Thermoelectric plants	9.1	0.0	9.1
Total	1 717.4	0.0	1 717.4

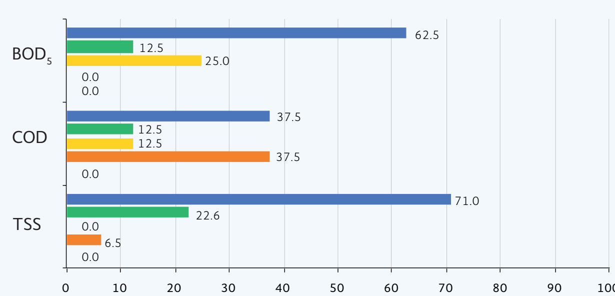
Coverage, 2010 (%)

	Drinking water	Sanitation
State	97.24	78.77
Urban	97.57	83.18
Rural	95.51	55.75

Surface water quality, 2013

Number of monitoring sites according to water quality indicator	
BOD_5	6
COD	6
TSS	39

Distribution of the sites by indicator and classification (%)



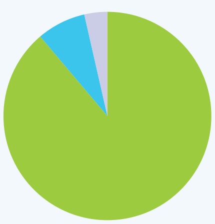
32. Zacatecas

Contextual data	
Number of municipalities	58
Total population 2013	1 550 179 inhabitants
Urban	998 097 inhabitants
Rural	552 082 inhabitants
Population 2030	1 726 347 inhabitants
Normal annual precipitation 1971-2000	463 mm

Plants, December 2013		
Municipal drinking water plants		
Number in operation	85	
Installed capacity (l/s)	12.970	
Flow treated (l/s)	12.720	
Wastewater	**Municipal**	**Industrial**
Number in operation	69	15
Installed capacity (m^3/s)	1.788	0.157
Flow treated (m^3/s)	1.645	0.048

- Water quality monitoring classified as heavily polluted by COD, BOD_5 and/or TSS
- Main rivers
- Irrigation districts
- Urban localities
- Water bodies
- State boundary

Offstream uses of water, 2013 (hm^3/year)



Agriculture	89%
Public supply	8%
Self-supplying industry	3%
Thermoelectric plants	0%

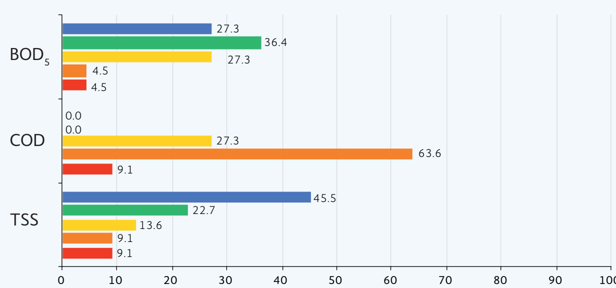
	Total	Surface water	Groundwater
Agriculture	1 368.6	337.9	1 030.7
Public supply	117.2	6.3	110.9
Self-supplying industry	48.0	0.8	47.3
Thermoelectric plants	0.0	0.0	0.0
Total	1 533.8	344.9	1 888.9

Coverage, 2010 (%)	Drinking water	Sanitation
State	94.31	89.07
Urban	98.38	97.60
Rural	88.42	76.69

Surface water quality, 2013

Number of monitoring sites according to water quality indicator	
BOD_5	20
COD	20
TSS	20

Distribution of the sites by indicator and classification (%)



- Excellent
- Good quality
- Acceptable
- Polluted
- Heavily polluted

Annex C. Characteristics of the hydrological regions, 2013

Hydrological region	Mainland extension (km²)	Normal annual precipitation 1971-2000 (mm)	Mean natural internal surface runoff 2013 (hm³/year)	Inflows (+) or outflows (-) from/to other countries	Total mean natural surface runoff (hm³/year)	Number of watersheds
1. B.C. Northwest	28 492	249	337		337	16
2. B.C. Central-West	44 314	103	251		251	16
3. B.C. Southwest	29 722	184	362		362	15
4. B.C. Northeast	14 418	190	122		122	8
5. B.C. Central-East	13 626	101	101		101	15
6. B.C. Southeast	11 558	274	200		200	14
7. Colorado River	6 911	107	78	1 850	1 928	4
8. Sonora North	61 429	304	132		132	5
9. Sonora South	139 370	505	4 934		4 934	16
10. Sinaloa	103 483	713	14 319		14 319	23
11. Presidio-San Pedro	51 717	818	8 201		8 201	23
12. Lerma-Santiago	132 916	723	13 180		13 180	58
13. Huicicila River	5 225	1 387	1 279		1 279	6
14. Ameca River	12 255	1 020	2 205		2 205	9
15. Jalisco Coast	12 967	1 175	3 606		3 606	11
16. Armeria-Coahuayana	17 628	908	3 537		3 537	10
17. Michoacan Coast	9 205	888	1 617		1 617	6
18. Balsas	118 268	952	16 805		16 805	15
19. Greater Guerrero Coast	12 132	1 234	5 113		5 113	28
20. Lower Guerrero Coast	39 936	1 391	18 170		18 170	32
21. Oaxaca Coast	10 514	967	2 892		2 892	19
22. Tehuantepec	16 363	821	2 453		2 453	15
23. Chiapas Coast	12 293	2 347	12 617	1 586	14 203	25
24. Bravo-Conchos	229 740	453	5 588	- 432	5 156	37
25. San Fernando-Soto La Marina	54 961	757	4 864		4 864	45
26. Panuco	96 989	892	19 673		19 673	77
27. North of Veracruz	26 592	1 427	14 155		14 155	12
28. Papaloapan	57 355	1 460	48 181		48 181	18
29. Coatzacoalcos	30 217	1 946	34 700		34 700	15
30. Grijalva-Usumacinta	102 465	1 709	59 297	44 080	103 378	83
31. Yucatan West	25 443	1 229	707		707	2
32. Yucatan North	58 135	1 091	0		0	0
33. Yucatan East	38 308	1 243	576	864	1 441	1
34. Closed Catchments of the North	90 829	404	1 261		1 261	22
35. Mapimi	62 639	361	568		568	6
36. Nazas-Aguanaval	93 032	425	2 085		2 085	16
37. El Salado	87 801	431	2 876		2 876	8
Total	1 959 248	760	307 041	47 949	354 990	731

Note: This information refers to the mean data determined through the latest studies carried out.
Source: Conagua (2014l).

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Alkalinization: Also known as salinization. It represents an increase of the salt content in the Surface soil that causes, among other imapcts, a decrease in crop yield. Its possible causes include saltwater intrusion and the use of irrigation systems that use water with a high sodium concentration. Salinization or alkalinization mainly occurs in arid regions, in closed catchments and in coastal areas that have naturally saline soils.[v]

Allocation: A deed granted by the Federal Executive Branch to municipalities, states of the Federal District in order to use the nation's water resources, destined to public-urban or domestic water services, in which case it is termed in Spanish an "asignación", or for the use of the nation's water resources and public inherent goods to individuals or companies, be they private or public, in which case they are termed a "concesión".[a]

Aquifer: Any geological formation or group of geological formations connected by water, through which subsoil water flows or is stored that may be withdrawn for different uses, and whose lateral and vertical limits are conventionally defined for the purpose of the evaluation, management and administration of the nation's subsoil water.[a]

Artificial recharge: A set of hydrogeological techniques applied to introduce water to an aquifer, through purpose-built infrastructure.[q]

Availability zone: For the purpose of the payment of water duties, the municipalities in the Mexican Republic have been classified into nine availability zones. This classification is contained in the Federal Duties Law.

Blue water: The quantity of water withdrawn from the country's rivers, lakes, streams and aquifers for various uses, both offstream and instream.

Brackish water: Water which contains between 525 and 1 400 mg/l of dissolved solids.

Channel of a current: A natural or artificial channel that has the necessary capacity for the waters of the maximum ordinary flow to run through it without overflowing. When currents are subject to overflowing, the natural channel is considered a riverbed, while no channeling infrastructure is built; at the origins of any current, is it considered a channel strictly speaking, when the runoff is concentrated towards a topographic depression and it forms an erosion gully or channel, as a result of the action of water flowing over the ground.[a]

Climate contingency: In terms of declarations related to extreme hydro-meteorological phenomena, this recognizes the risk of impacts on the productive capacity of economic activities.

Climate station: A given area or zone of open-air ground, with the peculiar climate conditions of the area, meant for measuring climate parameters. Equipped with instruments and sensors exposed to the open air, to measure precipitation, temperature, evaporation and the direction and speed of the wind.

Connate water: Connate or formation water is saltwater that is found inside rock, associated with the presence of hydrocarbons. It contains dissolved salts, such as calcium and sodium chlorides, sodium carbonates, potassium chlorides, calcium or barium sulfates, among others; it may even include some metals. The concentration of these components may lead to negative impacts on the environment when they are not appropriately managed and disposed of.[r]

Cyclone: Atmospheric instability associated with an area of low pressure, which causes convergent surface winds which flow anti-clockwise in the northern hemisphere. It originates over tropical or subtropical waters and is classified according to the wind intensity as a tropical depression, tropical storm or a hurricane.[m]

Dam: Infrastructure that serves to capture, store and control the water of a natural catchment and which includes a contention wall and an overflow spillway.[c]

Demand: For the drinking water, sewerage and sanitation subsector, the demand is the total volume of water required in order for a population to meet all types of consumption (domestic, commercial, industrial and public), including losses in the system.[e]

Demographic conciliation: Indirect method to establish the volume and structure of the population to carry out new population projections. It is carried out by reconstructing the demographic dynamic of the recent past.[w]

Disaster: In terms of extreme hydro-meteorological phenomena, the disaster declaration allows resources from the state and society to be focused on the the reconstruction of affected areas.

Discharge permits: A deed granted by the Federal Executive Branch through the Conagua or the corresponding river basin organization, in conformity with their respective areas of competence, for discharging wastewater into receiving bodies that are the property of the nation, for individuals or organizations, be they public or private.[a]

Discharge: The action of emptying, infiltrating, depositing or injecting wastewater into a receiving body.[a]

Drainage: Natural or artificial conducts that are an outlet or vent for water.

Drinking water and sanitation system: A series of infrastructure and actions that allow public drinking water and sanitation services to be provided, including sewerage, which contemplates the piping, treatment, removal and discharge of wastewater.[a]

Drinking water coverage: Percentage of the population living in private homes with running water within their house or on the lot, or with access to a public water tap or hydrant. This information is determined by means of censuses carried out by the Inegi and estimates from the Conagua for intermediate years.

Drinking water treatment plant: Infrastructure designed to remove elements that are dangerous to human health from water, prior to its distribution for water supply to population centers.

Drinking water: Literally, water that can be drunk. The Mexican standard (NOM-127-SSA1-1994) defines water for human use and consumption as that which does not contain noxious pollutants, be they chemical or infections agents, and which does not have a negative effect on human beings.[d]

Drought: Atypical drought, according to the operating rules of the Natural Disaster Fund, refers to a prolonged period (a season, a year or various consecutive years), with a deficit of precipitation as compared to the mean statistical value from various years (generally 30 years or more). Drought is a normal and recurring property of the climate and it will be considered that a drought is atypical when the deficit of precipitation has a probability of occurrence equal to or less than 10% (meaning that the aforementioned deficit occurs in one or less of every ten years) and that furthermore that situation has not occurred five time or more over the last ten years.[m]

Duty collection: In terms of the water sector, the amount charged to taxpayers for the use of the nation's water resources, as well as wastewater discharges and for the use of inherent goods associated with water.

Emergency: In terms of declarations related to extreme hydro-meteorological phenomena, this recognizes the risk of impacts on the life and health of the population.

Environmental services: The benefits of social interest that are generated by or derived from watersheds and their components, such as climate regulation, conservation of hydrological cycles, erosion control, flood control, aquifer recharge, maintenance of runoff in quality and quantity, soil formation, carbon capture, purification of water bodies, as well as the conservation and protection of biodiversity; for the application of this concept in the National Water Law, water resources and their link with forest resources are considered first and foremost.[a]

Eutrophication: The excess of soil nutrients which adversely affects the development of vegetation and may be due to the excessive application of chemical fertilizers.[x]

Evaporite rocks: Evaporite rocks are mainly chemical rocks, meaning that they are formed through direct chemical solidification of mineral components. They are often formed from seawater, although there is also continental evaporite, formed in saltwater lakes, or in desert regions which are sporadically flooded. It thus originates as a result of the evaporation of waters containing abundant dissolved salts. When, as a result of evaporation, the saturation level of the corresponding salts is reached, the solidification of the mineral that forms this composite takes place. Successive solidification often take place: at an initial stage the least soluble salts solidify, and when the evaporation increases, the more soluble salts then solidify.[s]

Exploitation: Application of water in activities aiming to extract chemical or organic elements disolved in it, after which it is returned to its original source without significant consumption.[a]

Extraction index: The result of dividing the volume of extraction of groundwater by the volume of mean total annual recharge.

Federal zone: Ten-meter strips adjacent to channels, currents or reservoirs which belong to the nation, measured horizontally from the normal pool elevation. The width of the bank or federal zone is five meters in channels with a width of less than five meters.[a]

Flood: An atypical flood, according to the operating rules of the Natural Disaster Fund, consists of the overflow of water beyond the normal limits of a channel or a stretch of water, or an accumulation of water as a result of an excess in areas that are not normally submerged.[m]

Freshwater: Water which has between 0 and 525 parts per million of total dissolved solids.[c]

Green water: The quantity of water that is part of the soil humidity and that is used for rainfed crops and general vegetation.

Gross Domestic Product (GDP): The total value of goods and services produced in the territory of a country in a given period, free from duplication.[h]

Groundwater extraction: The volume of water that is extracted artificially from a hydrogeological unit for different uses b

Groundwater: Water that is completely saturated into the pores or interstices of the subsoil.

Grouped use for agriculture: In this document, it includes agriculture, livestock and aquaculture, in conformity with the definitions in the National Water Law.

Grouped use for public supply: In this document, it is the volume of water employed for public-urban and domestic uses, in conformity with the definitions in the National Water Law.

Grouped use for self-supplying industry: In this document, it is the volume of water employed in industrial, agro-industry, services and trade uses, in conformity with the definitions in the National Water Law.

Housing: A place surrounded by walls and covered with a roof, with an independent entrance, in which people generally eat, prepare food, sleep and shelter from the environment.[k]

Human system: Any system in which human organizations play a predominant role. Often, but not always, the term is a synonym of 'society' or 'social system' (for example, agricultural system, political system, technological system, economic system).[y]

Hurricane: A tropical cyclone in which the maximum sustained wind reaches or surpasses 119 km/h. The corresponding cloudy area covers an extension between 500 and 900 km in diameter producing intense rainfall. The center of the hurricane, known as the "eye", normally reaches a diameter that varies between 20 and 40 km, however it may even reach 100 km. At that stage it is classified according to the Saffir-Simpson scale.[m]

Hydrogeological units: A combination of inter-connected geological layers, the lateral and vertical limits of which are conventionally defined for the purpose of the evaluation, management and administration of the nation's groundwater resources.[b]

Hydrological region: A territorial area shaped according to its morphological, orographical and hydrological features, in which the watershed is considered as the basic unit for water management, and the finality of which is to group and systematize information, analysis, diagnoses, programs and actions with regard to the occurrence of water in quantity and quality, as well as its use. Normally a hydrological region is made up of one or several watersheds. As a result, the limits of the hydrological region are generally speaking different from those of the political division of states, the Federal District and municipalities. One or several hydrological regions make up a Hydrological-Administrative Region.[a]

Hydrological-administrative region (HAR): A territorial area defined according to hydrological criteria, made up of one or several hydrological regions, in which the watershed is considered the basic unit for water resources management. The municipality, as in other legal instruments, represents the minimal unit of administrative management in the country.[a]

Hydropower dams: Infrastructure that generates electricity through dynamos or alternators, in which the energy is obtained through turbines propelled by water.

Incidental recharge: A recharge that is the result of some sort of human activity and that does not have specific infrastructure for artificial recharge.[q]

Inflow: Volume of water that is received in a watershed or hydrogeological unit from other watersheds, towards which it does not naturally drain.b

Irrigation district: A geographical area where irrigation services are provided by means of hydro-agricultural infrastructure works.

Irrigation sheet: The quantity of water, measured in longitudinal units, which is applied to a crop so that it may meet its physiological needs during the entire growth cycle, in addition to soil evaporation.

Irrigation surface: An area with irrigation infrastructure.

Irrigation unit: An agricultural area which has infrastructure and irrigation systems, different from an irrigation district and commonly of a more reduced area; it may be made up of user associations or other figures of organized farmers who are freely associated in order to provide irrigation services with autonomous management systems and operate water infrastructure works in order to capture, divert, conduct, regulate, distribute and remove the nation's water resources that are destined for agricultural irrigation.[a]

Irrigation: Application of water to crops through infrastructure, in comparison with crops that only receive precipitation, which are known as rainfed crops.

Lake, lagoon or marsh bed: The natural deposit of the nation's water resources outlined by the elevation of the maximum ordinary surge.[a]

Lake: A continental water body of considerable extension, surrounded by freshwater or saltwater.[c]

Large dams: Dams whose height above the bed is greater than 15 m or with a height of between 10 and 15m, with a maximum capacity of 3 million m3 at the surcharge pool elevation. [p]

Lentic: Water bodies whose liquid content moves basically within the depression they are located in, mainly with convective movements with a more or less limited replacement of water. A concept applied to stagnant water, such as swamps, ponds, lakes and wetlands, which are shallow water bodies.[x]

Locality: Any place occupied by one or more houses, which may or may not be inhabited; this place is recognized by both law and custom. According to their characteristics and for statistical purposes, they may be classified into urban and rural.

Lotic: Water bodies which move in a more or less defined direction, and in which the liquid is replaced by nimble flow. A term related to flowing water, such as a stream or river.[x]

Marsh: Swampy lowlands which are often filled with rainwater or from the overflow of a current, a nearby lagoon or the sea.[a]

Marshy: Belonging to or related to a lagoon or a swamp.[t]

Mean annual availability of groundwater: The mean annual volume of groundwater that may be allocated to be extracted from a hydrogeological unit or aquifer for different uses, in addition to the already allocated extraction and the natural discharge that has been committed, without jeopardizing the balance of the ecosystems.[a]

Mean annual availability of surface water: The value that results from the difference between the mean annual volume of runoff from a watershed to downstream areas, and the current mean annual volume committed downstream. [a]

Mean annual precipitation: Precipitacion calculated for any period of at least ten years which starts on January 1st of first year and ends on December 31st of last year.

Mean aquifer recharge: The mean annual volume of water that feeds into an aquifer.

Mean natural availability: The total volume of renewable surface water and groundwater that occurs naturally in a region.

Mean natural surface internal runoff: In a given territory, the volume of precipitation minus the volume of evapotranspiration minus the mean aquifer recharge. It represents the surface runoff in channels and currents without considering volumes of inflows or outflows from the territory to neighboring territories.

Mean natural surface runoff: The part of mean historical precipitation that occurs in the form of flows into a watercourse.

Meteorological station: A given area or zone of open-air ground, used for the measurement of surface meteorological parameters. It is equipped with instruments to measure precipitation, temperature, wind speed and direction, relative humidity, atmospheric pressure and solar radiation.

Mexican Standard (NMX): A standard produced by a national standardization body, or the Ministry of the Economy, which, for a common and repeated use, foresees rules, specifications, attributes, testing methods, guidelines, characteristics or previsions applicable to a product, process, installation, system, activity, service or production or operating method, as well as those related to terminology, symbology, packaging, marking or labelling. Mexican Standards are voluntarily applied, except for in those cases where private parties state that their products, processes or services comply with the standards, notwithstanding the agencies requiring their observance of an Official Mexican Standard for given purposes.[l]

Mine tailing dam: One of the systems for the final disposal of solid waste generated, for the benefit of minerals, which should meet conditions of maximum security, in order to guarantee the protection of the population, economic and social activities, and in general, ecological balance.

Municipality: A basic political entity of territorial division and political and administrative organization of the states of the Republic.

Natural recharge: The recharge generated by direct infiltration from precipitation, from surface runoff into channels or from water stored in water bodies.[q]

Normal pool elevation (NPE): For reservoirs, this is the equivalent of the elevation of the weir crest in the case of a freely-flowing structure; if it has floodgates, this refers to the highest level of water.

Normal precipitation: Precipitation measured for a uniform and relatively long period, which should have at least 30 years of data, which is considered a minimum representative climate period, and which starts on January 1 of a year ending in one, and ends on December 31 of a year ending in zero.

Official Mexican Standard (NOM): The obligatorily-observed technical regulation, issued by the competent authorities, which establishes rules, specifications, attributes, guidelines, characteristics or provisions applicable to a product, process, installation, system, activity, service or method of production or operation, as well as those related to terminology, symbology, packaging, marking or labelling and which refer to its compliance or application.[l]

Offstream use: The volume of water of a given quality that is consumed when implementing a specific activity, which is determined as the difference in the volume of a given quality that is extracted, minus the volume of an also given quality that is discharged, and which is indicated in the respective deed.[a]

Outflow: Volume of surface water that is transferred from one watershed or hydrogeological unit to another or others.[b]

Overdrafted aquifer: One in which the groundwater extraction is greater than the volume of the mean annual recharge, in such a way that the persistence of this condition over prolonged periods of time may bring about some of the following environmental impacts: depletion or disappearance of springs, lakes or wetlands; reduction or disappearance of river base flow; indefinite depletion of the groundwater level; formation of cracks; differential ground settlement; saltwater intrusion in coastal aquifers; and migration of poor quality water. These impacts may bring about economic losses for users and society-at-large.

Particular discharge conditions: The series of physical, chemical and biological parameters, and of their maximum permitted levels in wastewater discharges, determined by the Conagua or by the corresponding river basin organization, according to their respective areas of competence, for each user, for a specific use or user group of a specific receiver body, with the purpose of conserving and controlling the water quality, in accordance with the 2004 National Water Law and the By-Laws derived from that Law.[a]

Perennial crops: Crops whose maturation cycle is more than one year long.

Permits: Granted by the Federal Executive Branch through the Conagua or the corresponding river basin organization, for the use of the nation's water resources, as well as for the construction of hydraulic works and other of a diverse nature related with water and national assets referred to in Article 113 of the 2004 National Water Law.[a]

Physically irrigated surface: Surface which receives at least some irrigation within a given time period.

Pollution: Incorporation of foreign agents in water, capable of modifying its physical and chemical composition and quality.[c]

Population center: A group of one or more municipalities in which the population is concentrated mainly in urban localities. Metropolitan areas are considered population centers.

Precipitation: Water that falls from the atmosphere in liquid or solid form, onto the earth's surface; including dew, drizzle, rain, hail, sleet and snow.[c]

Private inhabited housing: Of interest for the calculation of coverage based on different types of censuses (called respectively "Censos" and "Conteos" in Spanish), it is an independent house, apartment in a building or a house in a neighborhood which at the time of the census was occupied by people that make up one or more homes.[k]

Productivity of water in irrigation districts: The quantity of agricultural produce from all crops in the irrigation districts to which irrigation has been applied, divided by the quantity of water applied to them. It is presented in kg/m^3.

Prohibition zone: Those specific areas of hydrological regions, watersheds or aquifers, in which no use of water is authorized in addition to those legally established, the latter being controlled through specific regulations, as a result of the deterioration in the quantity or quality of water, due to the impact on the sustainability of water resources, or the damage to surface and groundwater bodies.[a]

Protection zone: The strip of ground immediately surrounding dams, hydraulic structures and other infrastructure and related installations, when the aforementioned infrastructure is the property of the nation, of the extension that in each case is established by the Conagua or the corresponding river basin organization, in conformity with their respective competencies, for their protection and appropriate operation, conservation and surveillance.[a]

Public Registry of Water Rights (Repda): A Registry that provides information and legal certainty to the users of the nation's water resources and inherent assets through the registration of concession or allocation deeds or discharge permits, as well as the modifications that are made to their characteristics.

Receiving body: The current or natural water tank, dam, channel, salt-water zone or national asset into which wastewater is discharged, as well as the grounds into which this water is filtered or injected, when it may pollute the soil, subsoil or aquifers.[a]

Regulated zone: Those specific areas of aquifers, watersheds, or hydrological regions, which due to their characteristics of deterioration, hydrological imbalance, risks or damage to water bodies or the environment, fragility of vital ecosystems, Overdrafting, as well as for their reorganization and restoration, require a specific management of water in order to guarantee hydrological sustainability.[a]

Renewable water resources: The total amount of water that can feasibly be used every year. Renewable water resources are calculated as the annual unaltered surface runoff, plus the mean annual aquifer recharge, plus inflows from other regions or countries, minus the outflows to other regions or countries.

Reserve zone: Those specific areas of aquifers, watersheds or hydrological regions, in which limits are established in the use of a proportion or all of the available water, with the aim of providing a public service, implementing a restoration, conservation or preservation program, or when the State resolves to use those water resources for public utility.[a]

Reuse: The use of wastewater with or without prior treatment.[a]

River basin commission: A collegiate body of mixed membership, not subordinate to the Conagua or the river basin organizations. An auxiliary body of the river basin council at the sub-basin level.[a]

River basin council: A collegiate body of mixed membership, which carries out coordination and consultation, support and advice, between the Conagua, including the corresponding river basin organization, the agencies and bodies at the federal, state and municipal levels, and the representatives of water users and civil society organizations, from the respective watershed or hydrological region. They have the vocation of formulating and implementing programs and actions to improve water management, the development of water infrastructure and the respective services and the preservation of the watershed's resources.[a]

River basin organization: A technical, administrative and legal unit, autonomous in nature, which directly responds to the Head of the Conagua, the attributions of which are established in the National Water Law and its By-Laws, and whose resources and specific budget are determined by the Conagua. Prior to the 2004 reform, they were known as regional offices.[a]

River: A natural current of water, either permanent or intermittent, which flows into other currents, or into a natural or artificial reservoir, or the sea.[a]

Rural locality: A locality with a population of less than 2 500 inhabitants, which is not a municipal seat.

Saltwater intrusion: A phenomenon in which saltwater enters the subsoil towards the inner land mass, causing groundwater salinization; this occurs when the extraction of water causes a drop in the groundwater level below sea level, altering the natural dynamic balance between seawater and freshwater.

Saltwater: Water that has more than 1 400 parts per million of total dissolved solids.[c]

Sanitation coverage: Percentage of the population that lives in private housing, whose housing has an outlet connected to the public network or sewerage, or a septic tank, a river, lake or sea, or a ravine or crevice. Determined by means of the different types of census carried out by Inegi and estimations from the Conagua for intermediate years.

Sanitation: Collection and transportation of wastewater and the treatment of both wastewater and the sub-products generated in the course of these activities, in such a way that its evacuation produces the least possible impact on the environment.[i]

Sewerage: System of pipes that conduct wastewater to the site of its final disposal.[e]

Sink: Any process, activity or mechanism which withdraws a greenhouse gas, an aerosol, or a precursor of greenhouse gas from the atmosphere.[y]

Source: Site from which water is taken for its supply.

State: The 31 states and the Federal District, which together make up the Federation. [f]

Storage: Volume or quantity of water that can be captured, in millions of cubic meters.[c]

Stream gage: A place in which volumes of water are measures and recorded by means of different instruments and/or apparatuses. [c]

Stream: Channel of a current of water with a limited flow occupied over periods of time. [c]

Supply: Water supply.

Surcharge pool elevation (SPE): The highest level that water should reach in a reservoir under any condition.

Surface water extraction: Volume of water that is artificially extracted from surface water channels and reservoirs for different uses.[b]

Surface water: Water which flows over or is stored on the surface of the earth's crust in the form of rivers, lakes or artificial reservoirs such as dams, berms or canals.[c]

Sustainable development: As regards water resources, this is the process that is measurable through criteria and indicators related to water, the economy, social and environmental aspects, which aims to improve the quality of life and the productivity of people, supported by the necessary measures for the preservation of hydrological balance and the use and protection of water resources, in such a way that the meeting of needs for future generations is not compromised.

Tariff: The unit price established by the competent authorities for the provision of public drinking water, sewerage and sanitation services.[j]

Technical groundwater committee (Cotas): Collegiate bodies of mixed membership and which are not subordinate to the Conagua or the river basin organizations. They carry out their activities on a given aquifer or group of aquifers.[a]

Technified rainfed district: Geographical area intended for agricultural activities but which lacks irrigation infrastructure, and in which, through the use of certain techniques and infrastructure, the damage to production caused by periods of strong and prolonged rainfall is reduced – also known as drainage districts – or in conditions of drought, rain or agricultural soil humidity is used with greater efficiency; the technified rainfed district is made up of rainfed units.a

The nation's water: Water resources that are the property of the Nation, according to the terms of paragraph 5 of article 27 of the Political Constitution of the United Mexican States.[a]

Thermoelectric plant: Infrastructure that generates electricity through dynamos or alternators, in which power is obtained from steam-propelled turbines.

Tonne of oil equivalent: Acocunting unit employed to measure the use of energy. The IEA defines it as the net calorific value of 10 Gcal (Giga calories).[z]

Total capacity of a reservoir: The volume of water that a reservoir can store at the Normal Pool Elevation (NPE).

Total mean natural surface runoff: The mean natural surface runoff of a territory plus the volumes of inflows from neighboring territories minus the volumes of outflows to neighboring territories. It represents the total surface runoff in channels and currents.

Total recharge: The volume of water that enters a hydrogeological unit, in a given time period.[q]

Urban locality: A locality with a population equal to or more than 2 500 inhabitants, or a municipal seat, regardless of the number of inhabitants it has at the time of the previous census.

Use: Application of water in activities that do not imply its total or partial consumption, before it is returned to its source.a

Virtual water.- The sum of the quantity of water employed in the productive process for the elaboration of a product.

Wastewater treatment plant: Infrastructure designed to receive wastewater and remove materials that might degrade water quality or place public health at risk when is discharged into receiving bodies or channels.[g]

Wastewater: Water of varied composition coming from discharges from public urban, domestic, industrial, commercial, service, agricultural, livestock, from treatment plants and in general from any other use, as well as any combination of them.[a]

Water footprint: The sum of the quantity of water used by each person for his or her different activities and which is necessary to produce the goods and services that he or she consumes. This concept includes both blue and green water.

Water stress: A percentage indicator of the stress placed on water resources, calculated by the quotient between the total volume of water allocated and the natural mean availability of water.

Water utility: A body in charge of supplying drinking water and sanitation services in a given locality.[n]

Watershed: A territorial unit, differentiated from other units, normally outlined by a divide between waters through the polygonal line formed by the points of highest elevation of that unit-, in which water appears in different forms, and is stored or flows to an exit point, which may be the sea or another inland receiving body, through a hydrographic network or channels which converge into one main one, or the territory in which waters form an autonomous unit or one that is differentiated from others, without flowing out into the sea. In that space that is outlined by a topographic diversity, water resources, soils, flora, fauna, other natural resources related with the latter and the environment co-exist. The watershed together with aquifers constitutes the basic management unit of water resources.[a]

Wetlands: Transition zones between aquatic and terrestrial systems that constitute temporary or permanent flood zones, subject or not to the influence of tides, such as swamps, marshes and mudflats, the limits of which are made up by a type of moisture-absorbing vegetation, either permanent or seasonal; areas in which the soil is predominantly water-based; and lake areas or areas of permanently humid soils through natural aquifer discharge.[a]

Note: The glossary is a compilation from different sources, with the aim of illustrating the diverse concepts employed in this document. They thus do not constitute legally binding definitions.

Source:

- [a] Ley de Aguas Nacionales.
- [b] NOM-011-CONAGUA-2000.
- [c] Inegi (2000).
- [d] NOM-127-SSA1-1994.
- [e] Conagua (2003).
- [f] Constitución Política de los Estados Unidos Mexicanos.
- [g] USGS (2014b).
- [h] CEFP (2012).
- [i] Trillo (1995).
- [j] NMX-AA-147-SCFI-2008.
- [k] Inegi (2011).
- [l] Ley Federal sobre Metrología y Normalización.
- [m] Lineamientos de operación específicos del Fonden.
- [n] NOM-002-CNA-1995.
- [p] Arreguín et al. (2009).
- [q] NOM-014-CONAGUA-2003.
- [r] NOM-143-SEMARNAT-2003.
- [s] Higueras y Oyarzún (2013).
- [t] RAE (2014).
- [u] Conagua (2012).
- [v] Semarnat (2008).
- [w] Conapo (2014).
- [x] Sánchez et al (2010).
- [y] IPCC (2007).
- [z] BM (1996).
- [aa] Conagua (2014l).

Annex F. Abbreviations and acronyms

AECID	Spanish International Cooperation Agency
AFD	French Development Agency
AMEXCID	Mexican Agency for International Cooperation Development
ANEAS	National Association of Water and Sanitation Utilities
BANOBRAS	National Bank of Works and Services
Bansefi	Bank of National Saving and Financial Services
BOD_5	Five-day Biochemical Oxygen Demand
Cdi	National Commission for the Development of Indigenous Peoples
CEAS	State Water and Sanitation Commission
Cenapred	National Disaster Prevention Center
CFE	Federal Electricity Commission
CIAT	International Center for Tropical Agriculture
Cofepris	Federal Commission for Protection against Health Risks
Conabio	National Commission for Knowledge and Use of Biodiversity
Conagua	National Water Commission
Conapo	National Population Council
Conavi	National Housing Commission
Coneval	National Council for the Evaluation of the Social Development Policy
Cotas	Technical Groundwater Commission
CPL	Clean Beach Committee
CRAE	Regional Emergency Attention Center
CRED	Centre for Research on the Epidemiology of Disasters
DESA	Department of Economic and Social Affairs
DF	Federal District (Mexico City)
DOF	Official Government Gazette
DPL	Development Policy Loan
COD	Chemical Oxygen Demand
EEPs	External Energy Producers (also known as IPPs: Independent Power Producers)
Enoe	National Employement Survey
ETM	Enhanced Thematic Mapper
FAO	Food and Agriculture Organization
Fcas	Spanish Water and Sanitation Cooperation Fund
FICA	Water Conservation Investment Fund (Nadbank)
Fonadin	National Infrastructure Fund
Fonden	National Natural Disaster Fund
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GIS	Geographic Information System
GIZ	German Federal Enterprise for International Cooperation
GWI	Global Water Intelligence
HAR	Hydrological-administrative regions
IAH	International Association of Hydrogeologists
IBRD	International Bank for Reconstruction and Development
IBWC	International Boundary and Water Commission
Icold	International Commission on Large Dams
ID	Irrigation district
IDB	Inter-American Development Bank
IEA	International Energy Agency
INBO	International Network of Basin Organizations
INECC	National Institute of Ecology and Climate Change
Inegi	National Institute of Statistics and Geography (formerly the National Institute of Statistics, Geography and Informatics)
INH	National Inventory of Wetlands
IPCC	Intergovernmental Panel on Climate Change
ITAM	Autonomous Technical Institute of Mexico
IUs	Irrigation units
IWA	International Water Association
JBIC	Japan Bank for International Cooperation
KFW	German Development Bank
LAN	National Water Law
LFD	Federal Duties Law
MA	Metropolitan area
MDGs	Millennium Development Goals
MLN	Most likely number
MT	Master Table
Nadbank	North American Development Bank
NADM	North American Drought Monitor
NAICS	North American Industry Classification System
NASA	National Aeronautics and Space Administration
NDP	National Development Plan
NMX	Mexican standard
NOM	Official Mexican Standard
NPE	Normal Pool Elevation
NWP	National Water Program
Patme	Program for Technical Assistance for the Improvement of Efficiency in the Drinking Water and Sanitation Sector
PI	Private Initiative

PIAE	Protection for Infrastructure and Emergency Attention
PREMIA	Project to Strengthen Integrated Water Resources Management in Mexico
PRODDER	Program for Reimbursing Duties
PROFEPA	Attorney General's Office for Environmental Protection
PROMAGUA	Water Utility Modernization Project
PROSANEAR	Federal Program for Wastewater Treatment
PROSIBA	Program of Integral Sanitation of the Acapulco Bay
PROSSAPYS	Program for the Construction and Rehabilitation of Drinking Water and Sanitation Systems in Rural Areas
REPDA	Public Registry of Water Duties
SAGARPA	Ministry of Agriculture, Livestock, Rural Development, Fishing and Food
SCFI	Ministry of Trade and Industrial Development (obsolete, employed in the names of NOMs)
SDGs	Sustainable Development Goals (evolution of the Millennium Development Goals)
SECCI	Sustainable Energy and Climate Change Initiative (IADB)
SECTUR	Ministry of Tourism
SEDESOL	Ministry of Social Development
SEEA	System for Environmental-Economic Accounting
SEEAW	System of Environmental-Economic Accounting for Water
SEGOB	Ministry of the Interior
SEMAR	Ministry of the Navy
SEMARNAT	Ministry of the Environment and Natural Resources
SHCP	Ministry of Finances and Public Credit
SIAP	Agro-Food and Fishing Information Service
SINA	National Water Information System
SPE	Surcharge Pool Elevation
SPOT	Satellite for Earth Observation
SRTM	Shuttle Radar Topography Model
SS	Ministry of Health
SSA	Ministry of Healthiness and Assistence (obsolete, employed in the names of NOMs)
STPS	Ministry of Employment and Social Prediction
TD	Tropical depression
TRD	Technified rainfed district
TS	Tropical storm
TSS	Total Suspended Solids
UN	United Nations
UNDP	United Nations Development Programme
UNESCO	United Nations Education, Science and Culture Organization
UNISDR	United Nations International Strategy for Disaster Reduction
UNSD	United Nations Statistics Division
USGS	United States Geological Survey
WB	World Bank
WHO	World Health Organization
WMO	World Meteorological Organization
WQI	Water Quality Index
WWF	World Water Forum
WWTP	Wastewater treatment plant
ZMVM	Valley of Mexico metropolitan area
ZOFEMATAC	Federal Maritime Land Area and Coastal Areas

Annex G. Units of measurement and explanatory notes

Due to the rounding up or down of numbers, the sums in the tables, both in terms of values and percentages, do not necessarily add up to the totals given in the tables.

In the electronic version (available to be downloaded or viewed on http://www.conagua.gob.mx/ConsultaPublicaciones.aspx), you can have access to the original data and find registries on the issues mentioned in each chapter, in the Sina with the indication [Reporter: <name of the issue in Spanish>], as well as the complementary tables, graphs and maps, with the indication [Additional: <code>]. In general, all the available significant figures were conserved, applying the rounding up or down on the representation on the number through formatting, not to the number itself.

The units used in this document are expressed in conformity with the NOM-008-SCFI-2002 "General System of Measurement Units", considering its modification on September 24, 2009, which establishes that the decimal point may be a comma or a period.

This document uses billions following the English usage: meaning a thousand millions.

Baseline units, derived or conserved for their use by NOM-008-SCFI-2002		
Symbol	Unit	Equivalences
cm	centimeter	1 cm = 0.01 m
ha	hectare	1 ha = 10 000 m^2 = 2.47 acres
hm^3	cubic hectometer	1 hm^3 = 1 000 000 m^3
kg	kilogram	1 kg = 1 000 g
km/h	kilometer per hour	1 km/h = 0.2778 m/s
km^2	square kilometer	1 km^2 = 1 000 000 m^2
km^3	cubic kilometer	1 km^3 = 1 000 000 000 m^3
L, l	liter	1 l = 0.2642 gal
L/s, l/s	liter per second	1 l/s = 0.001 m^3/s
m	meter	1 m = 3.281 ft
m^3	cubic meter	1 m^3 = 0.000810 AF
m^3/s	cubic meter per second	1 m^3/s = 35.3 cfs
mm	milimeter	1 mm = 0.001 m
mm	milimeter	1 mm = 0.0394 in
t	ton	1 t = 1 000 kg
W	watt	1 W = 1 m^2 kg/s^3

Units not included in NOM-008-SCFI-2002		
Symbol	Unit	Equivalences
AF	acre-foot	1 AF = 1 233 m^3
cfs	cubic foot per second	1 cfs = 0.0283 m^3/s
ft	foot	1 pie = 0.3048 m
gal	gallon	1 gal = 3.785 L
hab	inhabitants	Not applicable
in	inch	1 in = 25.4 mm
MAF	million acre-feet	1 MAF = 1.23 km^3
msnm	meters above sea level	Not applicable
pesos	Mexican pesos	1 mexican peso = 0.07643 US dollars = 0.05553 euros *
ppm	parts per million	1 ppm = 0.001 g/L
USD	United States dollar	1 US dollar = 13.0843 Mexican pesos *

Examples of measurement:
1 m^3 = 1 000 liters
1 hm^3 = 1 000 000 m^3
1 km^3 = 1 000 hm^3 = 1 000 000 000 m^3
1 TWh = 1 000 GWh = 1 000 000 MWh

Prefixes to form multiples		
Symbol	Name	Value
T	tera	10^{12}
G	giga	10^9
M	mega	10^6
k	kilo	10^3
h	hecto	10^2
c	centi	10^{-2}
m	mili	10^{-3}

* The FIX exchange rate as of December 31, 2013 was considered (Banxico 2014a).

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